



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

JOHN ELIAS BALDACCI  
GOVERNOR

DAVID A. COLE  
COMMISSIONER

July 29, 2010  
Subject: **Ocean Gateway Pier 2,  
Berth 2**  
State Project No: 017832.00  
Location: Portland  
**Amendment No. 4**

Dear Sir/Ms:

Make the following change to the Bid Documents:

In the Bid Book **Add** the attached "Section 05500 – Miscellaneous Metals", dated 06/08/10, five pages total.

In the Bid Book **Add** the attached "Section 05520 – Railings and Handrails", dated 06/08/10, nine pages total.

In the Bid Book **Add** the attached "Section 07411 – Preformed Roof and Wall Panels", dated 06/08/10, four pages total.

The following questions have been received:

**Question:** The original bid documents in 2005 included sections 05500, 05510, and 05520 which were for metal fabrications, metal stairs, railings and handrails. These spec sections were not included with documents for the bid. There are steel handrails, stainless steel handrails, perforated panels, ladders, and grating, etc. as part of this scope. Please advise if any miscellaneous metal specs will be issued.

**Response:** Sections 05500 and 05520 are being added to the documents and are attached to this amendment. Section 05510 does not apply to this work.

**Question:** Duralcan 90/10 is a discontinued product we recommend 28 E from Metallization Inc. The manufacturer of this Aluminum Titanium alloy that is specifically manufactured for Anti-skid practices. We have attached the data sheet for your review.

**Response:** The proposed product is acceptable with a sealer applied that is approved for the marine environment.

**Question:** We do not see a clear detail for field splicing the pedestrian gangway or the catwalks, do you have a detail? We see only one catwalk that may be too long for shipping.



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**Response:** No field splices were intended, but if they become necessary for the transportation of the unit, then all field welded butt splices shall be complete penetration groove welds all around. Splices shall be proposed during the shop submissions and shall be in compliance with the applicable codes and standards.

**Question:** The catwalks are specified to be galvanized; due to the length this would require multiple field splices and many areas to repair the galvanizing. Would the State entertain Zinc metalized, and a penetrating sealer to protect these larger sections?

**Response:** Zinc metalizing with a sealer approved for the marine environment would be an acceptable alternative to galvanizing.

**Question:** The State has specified Tnemec Zinc, Urahane system; would the State be willing to use an approved equal with less VOC?

**Response:** The specification allows for an approved equal coating system.

**Question:** There are no coating specifications for the breasting dolphins above the piles, can you please advise?

**Response:** Refer to Specification Section 09960, Section 506.02 for dolphin cap coating requirements.

**Question:** Structural Steel pay items to be painted, are they to be shop primed and field painted top coat?

**Response:** All painting shall be done in the shop when possible. Field applications are to be done on the portions of components that will require welded assembly in the field.

**Question:** Is paint required over the items to be metalized? Shop or field applied?

**Response:** No

**Question:** In order to galvanize catwalks 1, 2, & 3 there will need to be some splices. Who will be responsible for the design of the splices? Will they be bolted or welded splices? Galvanizing will require repair if welded.

**Response:** See responses above.

**Question:** Please clarify pile method of payment, if the piles don't drive full length, how do you get paid for the material that is in the cutoff?

**Response:** Piles will be paid for by actual length (LF) delivered and installed.

**Question:** On Sheet W400 the file schedule calls for 60' uncoated length, DOT specs 501.09 Splicing Piles calls for one splice per 40' for pile lengths exceeding 79', you can

only get 40' lengths in 24" and 30" pipe piles. Will you accept a 20' splice for the uncoated 60' length listed on the plans? If not, you will only have 40' length bare with the balance coated.

**Response:** Yes, 20 foot lengths would be acceptable for making up the 60 feet of uncoated pile length.

**Question:** Item 504.855 Foam filled Fenders, you specify 1" Galvanized stud link anchor chain, we are having a difficult time finding American made 1" Galvanized stud link, will you accept foreign made chain?

**Response:** There is no "Buy America" requirement on this project.

**Question:** Drawing W310, on the pedestrian Gangways the print specifies metal roof. Is there a size, color, or any particular specifications? Who is to supply the additional support brackets as needed, or how is this to be handled?

**Response:** Section 07411 – Preformed Roof and Wall Panels is being added to the documents and is attached to this amendment.

Consider these changes and information prior to submitting your bid on August 4, 2010.

Sincerely,



Scott Bickford  
Contracts & Specifications Engineer

## SECTION 05500 - MISCELLANEOUS METALS

All Marine/Water Components work and materials shall conform to the Drawings and the provisions of SECTION 504 – STRUCTURAL STEEL and SECTION 507 – RAILINGS with the following modifications:

### MODIFICATIONS:

Section 504.58 – Add the following: All Support Structures deposited weld metal shall have a minimum Charpy impact resistance of 20 ft-lbs. at negative 20-degrees F. Weld metal shall also have chemistry similar to the base metal.

All other project work and materials shall conform to the Drawings and Specifications, with the following additions:

### **PART 1 GENERAL**

#### 1.01 WORK INCLUDED

- A. Provide miscellaneous metals, sections, shapes and sheets, fittings, fasteners, wirework, angles and channel sections, supports, hangers, connections, anchors and other fabrications which are principally of metal composition, not specified elsewhere in these Specifications and as shown on the Drawings or required to complete the Work.

#### 1.02 RELATED WORK

- A. Section 05120 - Structural Steel

#### 1.03 SUBMITTALS

- A. Submit shop drawings indicating fabrication, assembly and erection details, sizes of members, profiles, fastenings, supports and anchors, patterns, clearances and connection to other work, before fabrication begins.
- B. Submit complete materials list of all items proposed to be provided under this Section.

#### 1.04 QUALITY ASSURANCE

- A. Reference Standards - Comply with the following:
  - 1. BOCA Building Code, latest Edition.
  - 3. AISC - Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings.
  - 4. AISC - Code of Standard Practice for Steel Buildings and Bridges.
  - 5. AISC - Specification for the Design of Cold Formed Steel Structural Members.
  - 6. American Welding Society Code AWS D1.1, D1.2 and D1.3.
  - 7. OSHA Standards.
  - 8. Local codes and regulations.

**PART 2 PRODUCTS**

2.01 MATERIALS

- A. General: Provide material that is free from defects impairing strength, durability or appearance, that is of best commercial quality for purposes specified, and that has structural properties to safely sustain or withstand strains and stresses to which normally subjected. Throughout the facility, provide materials having the same inherent texture and color of exposed surfaces for like locations. Insofar as practicable, provide non-corrosive, non-staining and concealed fastenings. Where fastenings must be exposed, match materials, color and finish as material to which applied, countersink and finish flush. Grind exposed welds smooth to form a neat uniform fillet without weakening base metal. Remove all slag from welds before applying shop coating. Form molded bent or shaped members with clean, sharp arises, without dents, scratches, cracks or other defects. Provide all anchors, bolts, shims and accessory items as required for building into or fastening to adjacent work. Unless otherwise specified, use only galvanized ferrous metals.
- B. Steel: Provide miscellaneous steel plates, shapes, bars and connections conforming to the requirements of ASTM A36.
1. Primer for Steel: Comply with surface preparation recommendations of the primer manufacturer, using SSPC methods. Use lead free, rust inhibitive materials compatible with finish coatings, if such are specified.
    - a. Comply with VOC emissions requirements.
    - b. Minimum solids content: 47%.
    - c. Vehicle: Alkyd resins, oil, or oleoresinous mixtures.
    - d. Minimum Dry Film Thickness: 3 mils.
  2. Galvanized: Hot-dip method, ASTM A123, after fabrication.
    - a. When size or other reasons preclude galvanizing in one piece after fabrication, approval may be granted to fabricate in sections as large as possible to keep welds and connections to a minimum compatible with the size of galvanizing tanks.
  3. Galvanizing Repair Paint: Comply with Military Specifications MIL-21035 (Ships). Galvicon and ZRC coatings are also acceptable.
  4. Prime exposed surfaces, except when galvanized or intended to be embedded in concrete, with one shop coat of rust inhibiting primer.
- C. Steel Pipe: Provide steel pipe for miscellaneous members and connections that conforms to the requirements of ASTM A 53, Type E, Grade B, Schedule 40, galvanized, unless otherwise indicated.

- D. Anchor Bolts And Fasteners: Use adhesive anchors consisting of self contained vinylester adhesive cartridges and Type 304 stainless steel anchor rods equal to HVA adhesive anchoring system, as manufactured by Hilti, or equal, of the size and at the locations shown on the Drawings. Provide all other fastenings, bolts, nuts, washers and anchors as shown in the Drawings. Zinc coated fastenings will not be approved except at wood nailers, or when other types of corrosion resistant materials are not available and approval is granted in writing by the Resident. Use fasteners of adequate strength for purpose intended. When steel anchors are indicated, use a one-piece design with expander ring consisting of steel zinc-coated and chrome plated, as manufactured by McCullough Industries, Inc., Kwick Bolt, Hilti, or equal.
- E. Welding Electrodes: Provide welding electrodes for structural steel conforming to AWS A5.5, E70XX.
- F. Expansion Joint Covers: Use expansion joint covers equal to Balco XH4FS-2m for joints in floors and equal to Balco XH4FVS-2m for joints in walls. Use covers of extruded aluminum, 6063-T5 alloy, standard mill finish, equipped with dual locked-in filler strips and vinyl water seals as shown or noted on the Drawings. Apply a factory coating of zinc chromate primer to all aluminum surfaces to be in contact with concrete or masonry. Provide covers complete with metal anchoring devices, non-corrosive, electrolytically inert concrete anchor bolts, masonry and cover screws, lead fiber masonry anchors, filler strips, seals and other accessories as required for installation per the manufacturer's instructions. Use filler strips of PVC or SBR, gray in color, manufacturer's option for performance required.
- G. Steel Ladders: Provide steel ladders, having welded joints, hot-dipped galvanized after fabrication and complying with OSHA Standards, as detailed on Drawings. To secure ladders to concrete substrate, use 1/2-inch diameter red heads by Hilti or approved equal.
- H. Safety Nosings: 3-inches wide safety groove treads complete with anchors for concrete stairs, equal to Type 231 Supergrit as manufactured by Wooster Products, Inc., or as manufactured by American Abrasive Metals Co., Safety-T-Metal Co., Inc., or Andeo Industries.
- I. Steel Stairs: Construct steel stairs as indicated on the Drawings, to support dead loads and additional live working stresses permitted for materials in the BOCA Building Code. Connect stair to the appropriate structural members. Size of various members and number of parts indicated on the Drawings are minimum. Increase as necessary to meet requirements. Construct stairs to comply with OSHA Standards.
- J. Steel Pipe Guards: Provide galvanized steel pipe guards as detailed on the Drawings, including pipe sleeves, concrete fill, crushed fill and grouting to secure parts. Use schedule 40 steel pipe conforming to ASTM A53.

- K. Aluminum: Shapes and dimensions shown on the Drawings.
  - 1. Finish for exposed surfaces (unless otherwise noted): Electrostatically applied acrylic or polyester enamel (ESP), minimum 1.0 mil dry thickness, specular gloss value approximately 20, applied over a buffed and etched surface (AAMA M22C22), color to be selected. Comply with AAMA 603.8-85 standards. Coordinate shade of selected color to match finish on other items specified elsewhere. Submit color samples for approval.
- L. Stainless Steel: Chromium-nickel alloy, type 302 unless another type is approved by Resident in writing. Do not use sheet materials with gage smaller than 16.
  - 1. Finish: Unless otherwise noted, give exposed surfaces a #4 (satin) finish.
  - 2. Welded Connections: Made in the shop, ground and finished to match the adjacent surfaces and to present a smooth, invisible seam.

## 2.02 FABRICATION

- A. Insofar as possible, fit and shop assemble fabricated material ready for erection. Provide welding equipment and perform welding in compliance with American Welding Society's Code for Welding in Building Construction, latest edition. Construct all work to be square, plumb and true, accurately fitted with tight joints and intersections. Finish exposed work smooth with welds ground smooth.
- B. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing the work.
- C. Painting and Protective Coating:
  - 1. Except for stainless steel and galvanized surfaces, properly clean all ferrous metal and coat surfaces with one shop coat of primer compatible with coating system specified in 09960 Paints and Coatings-Water Marine Components. Coat anchors that are built into masonry with asphalt paint unless specified to be galvanized. Do not coat metal work to be encased in concrete unless specified or noted otherwise. Clean castings that are to be left unpainted and coat with Galvacon or approved equal.
  - 2. Provide products fabricated from rolled, pressed or forged steel shapes, plates, bars and strips with hot-dip galvanizing or zinc coatings in compliance with ASTM A 123. Provide assembled steel products with hot-dip galvanizing or zinc coatings in compliance with ASTM A 386. Provide weight of coatings as designated in Table 1 for the class and thickness of material to be coated. Except for bolts and nuts, perform all galvanizing after fabrication.
  - 3. Provide shop coating of galvanized or zinc coated surfaces only where specifically specified or shown on the Drawings. Chemically treat such surfaces prior to applying the coating to provide a bond for the paint.

**PART 3 EXECUTION**

3.01 ERECTION

- A. Where the contact of dissimilar metals may cause electrolysis and where aluminum will contact other non-compatible metals, concrete, mortar or plaster, separate the contact surfaces of the metals using non-reactive materials or not less than one coat of zinc chromate primer and one heavy coat of aluminum pigmented asphalt paint on each surface; or where deemed necessary by the Resident, use not less than one course of asphalt saturated cotton fabric cemented to both metals with flashing cement. Clean finished works and remove excess cement.
  
- B. Adequately anchor all work in place at proper elevations, planes and locations. Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction including threaded fasteners for concrete inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
  
- C. Cutting, Fitting and Placement:
  - 1. Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications.
  - 2. Set work accurately in location, alignment, and elevation, and make plumb, level, true, and free from rack, measured from established lines and levels.
  - 3. Provide temporary anchors in form work for items which are to be built into concrete or similar construction.
  - 4. Fit exposed connections accurately together to form tight hairline joints.
  - 5. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations.
  - 6. Grind exposed joints smooth, and touch up shop paint coat. Do not weld, cut, or abrade the surface of exterior units which have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.
  - 7. Conceal fasteners and anchoring devices in locations exposed to view in finished spaces. Obtain Resident's approval for locations where concealment is not practical.
  
- D. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of weld made, and methods in correcting welding work.
  
- E. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded area of shop paint and paint exposed areas with same material as used for shop painting. Apply by brush or spray to provide minimum dry film thickness of 2.0 mils.
  - 1. Touch-up galvanized surfaces where the galvanizing is abraded, welded, scratched, etc., with two coats of galvanized repair paint.

\*\*\*END OF SECTION\*\*\*



SECTION 05520 - RAILINGS AND HANDRAILS

**PART 1 GENERAL**

1.01 SUMMARY

A. Section Includes: Handrails and railings of various types, including:

1. Galvanized steel stair railings and handrails.
2. Glass Railing System – N/A
3. Steel railings and ladders.
4. Fences and Gates.

B. Related Sections:

1. 05120 – Structural Steel
2. 05500 – Miscellaneous Metals
3. 09960 - Paints and Coatings-Water Marine Components

1.02 SYSTEM DESCRIPTION

A. Structural Performance: Railing systems shall be designed and constructed to withstand the following structural loads required by the BOCA Building Code, latest Edition, without exceeding the allowable design working stress of the materials. Loading conditions listed below shall not be applied simultaneously, but each shall be applied to produce the maximum stress in each of the respective components or any of the supporting components.

1. Handrail:

- a. Concentrated load of 200 lb. applied at any point and in any direction.
- b. Uniform load of 50 lb. per linear foot applied in any direction.

2. Guardrail System:

- a. Concentrated load of 200 lb. applied at any point and in any direction.
- b. Uniform load of 50 lb. per linear foot applied horizontally at the required guardrail height and simultaneous load of 100 lb. per linear foot applied vertically downward at the top of the guardrail.
- c. Infill Area: Concentrated horizontal load of 200 lb. Applied on a 1 sq.ft. area at any point in the system including intermediate rails or other elements serving this purpose; or wind loads prescribed by code, whichever is greater.

1.03 REFERENCE STANDARDS

- A. Except as otherwise specified herein or shown on the Drawings, comply with the latest editions of all applicable codes and regulations including the applicable requirements of the following reference Standards and Codes which are hereby made a part of this Section, as they relate to the railings and handrails.
1. BOCA Building Code, 2003 Edition.
  2. The Occupational Health and Safety Administration (OSHA) Code of Federal Regulations(CFR), Volume 29.
  3. American Society for Testing and Materials (ASTM):
    - a. A36 - Structural Steel.
    - b. A53 - Pipe, Steel, Black and Hot-Dipped, Zinc Coated and Seamless.
    - c. A167 - Stainless and Heat-Resisting Chromium-Nichel Steel Plate, Sheet and Strip.
    - d. A269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
    - e. A307 - Carbon Steel Externally and Internally Threaded Standard Fasteners.
    - f. A312 - Seamless and Welded Austenitic Stainless Steel Pipe.
    - g. A500 - Cold Formed and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
    - h. B209 - Aluminum-Alloy Sheet and Plate.
    - i. B221 - Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes.
    - j. B308 - Aluminum-Alloy Standard Structural Shapes, Rolled or Extruded.
    - k. B429 - Aluminum-Alloy Extruded Structural Pipe and Tube.
    - l. F468 - Nonferrous Bolts, Hex Cap Screws, and Studs for General Use.
    - m. B483 - Aluminum and Aluminum-Alloy Drawn Tubes for General Purpose Applications.
  4. American Iron and Steel Institute - Finishes for Stainless Steel.
  5. AWS: D1.1 Structural Welding Code – Steel.
  6. NAAMM: Metal-Finishes Manual.

1.04 SUBMITTALS

- A. Product Data: Manufacturer's technical data for products and processes not covered in shop drawings, installation instructions, finishes and grout.
- B. Shop Drawings: Show fabrication and installation details for each type and material. Include plans, elevations, sections, profiles of rails, fittings, connections, and anchors.

1. Provide templates for anchors and bolts installed by other trades.
2. Include structural computations or test results signed and sealed by a Maine Registered Professional Engineer, evidencing compliance with required design loadings.

1.05 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain handrails and railing systems of each type and material from a single manufacturer.
- B. Design Responsibility: Maine Registered Professional Engineer to prepare structural computations for handrail and railing systems to determine compliance with structural performance requirements.

**PART 2 PRODUCTS**

2.01 MATERIALS

- A. General: Comply with standards indicated. Provide railings and handrails and other metalwork composed of metals of the forms and types which comply with requirements of the Drawings and referenced standards, and which are free from surface blemishes where exposed to view in the finished unit. Exposed-to-view surfaces exhibiting pitting, seam marks, roller marks, "oil canning," stains, discolorations or other imperfections on finished units are not acceptable.
- B. Aluminum: Alloy and temper recommended by producer or finisher for type of use and finish indicated, with not less than the strength and durability properties of the alloy and temper designated below:
  1. Extruded Bar and Shapes: ASTM B 221, 6063-T6.
  2. Extruded Pipe and Tube: ASTM B 429, 6063-T6, Schedule 40.
  3. Drawn Seamless Tube: ASTM B 483, 6063-T832.
  4. Plate and Sheet: ASTM B 209, 6061-T6.
  5. Finish for Exposed Surfaces (unless otherwise noted): Electrostatically applied acrylic or polyester enamel (ESP), minimum 1.0 mil dry thickness, specular gloss value approximately 20, applied over a buffed and etched surface (AAMA M22C22), color to be selected. Comply with AAMA 603.8-85 standards. Coordinate shade of selected color to match finish on other items specified elsewhere. Submit color samples for approval.
- C. Miscellaneous Materials:
  1. Welding Electrodes and Filler Metal: Type and alloy of filler metal and electrodes as recommended by producer of metal to be welded, complying with applicable AWS

specifications, and as required for color match, strength and compatibility in the fabricated items.

2. Fasteners: Of same basic metal and alloy as fastened metal and parts being joined unless otherwise indicated. Do not use metals which are corrosive or otherwise incompatible with metals joined.
  - a. Provide concealed fasteners for interconnection of ornamental metalwork components and for their attachment to other work except where exposed fasteners are unavoidable or are the standard fastening method.
  - b. Provide Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.
  - c. Provide stainless steel fasteners at aluminum connections and at stainless steel connections.
3. Anchoring Cement: Nonshrink nonmetallic hydraulic controlled expansion cement grout equal to Por-Rok manufactured by Minwax Construction Products Division. Pre-mixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with CE CRD C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.
4. Anchors and Inserts: Provide anchors of type, size, and material required for type of loading and installation condition shown, as recommended by manufacturer, unless otherwise indicated. Use nonferrous metal or hot-dipped galvanized anchors and inserts for exterior locations and elsewhere as required for corrosion resistance. Use toothed steel or expansion bolt devices for drilled-in-place anchors.
5. Bituminous Paint: SSPC-Paint 12 (cold-applied asphalt mastic).
6. Accessory Materials: Provide highest quality as required for the complete work.
7. Shop Coating for Ferrous Steel: Provide one of the following, or equivalent as approved by Resident.
  - a. Tnemec No. 99QD Red Metal Primer, by Tnemec Co., Inc.
  - b. Rust-Oleum 678 Quick Dry Red Bare Metal Primer or No. 7086 Quick Dry Gray Zinc Chromate Primer, by Rust-Oleum Corp.
  - c. No.SR-50 or SR-51 Steelcote Universal Primer, by Steelcote Manufacturing Co.
  - d. Zinc Chromate Primer No. 13800 by Devoe Paint Co.
  - e. Heavy Duty RIP Primer No. 1-0900 or No. 1-0969, by Southern Coatings & Chemical Co., Inc.

2.02 FABRICATION, GENERAL

- A. Form ornamental metalwork to required shapes and sizes, with true curves, lines and angles. Provide components in sizes and profiles indicated, but not less than required to comply with requirements indicated for structural performance.
- B. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature, in the design, fabrication, and installation of installed metal assemblies

to prevent buckling, opening up of joints and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and night time sky heat loss.

1. Temperature Change (Range): 100 deg F,(55.5 deg C).
2. Provide necessary rebates, lugs and brackets for assembly of units. Use concealed fasteners wherever possible.
3. Comply with AWS for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of exposed side. Clean exposed welded joints of all welding flux, and dress on all exposed and contact surfaces.
4. Mill joints to a tight, hairline fit. Cope or miter corner joints. Form joints exposed to weather to exclude water penetration.
5. Provide castings that are sound and free of warp or defects which impair strength and appearance.
6. Finish exposed surfaces to smooth, sharp, well-defined lines and arrises.
7. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

#### 2.03 FABRICATION OF RAILINGS, FENCES AND GATES

- A. Fabricate systems for interconnection of members by means of concealed internal welds and fittings which eliminate surface grinding. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- B. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors for interconnection of members to other work.
  1. Furnish inserts and other anchorage devices for connecting systems to concrete or masonry work.
  2. Fabricate anchorage devices which are capable of withstanding loadings imposed by systems. Coordinate anchorage devices with supporting structure.
- C. Swing Gates: Comply with ASTM F 900.
  1. Gate Hardware: Provide galvanized hardware and accessories for each gate according to the following:
    - a. Hinges: Size and material to suite gate size, non-lift-off type, offset to permit 180-degree gate opening. Provide 1-1/2 pair of hinges for each leaf over 6-foot nominal height.
    - b. Latch: Forked type or plunger-bar type to permit operation from either side of gate, with padlock eye as an integral part of latch.

- c. Keeper: Provide a keeper for vehicle gates that automatically engages gate leaf and holds it in the open position until manually released.
    - d. Gate Stops: Provide gate stops for double gates consisting of mushroom-type flush plate with anchors, set in concrete, and designed to engage a center drop rod of plunger bar. Include a locking device and padlock eyes as an integral part of the latch, permitting both gate leaves to be locked with a single padlock.
  - D. Sliding Gates: Comply with ASTM F 1184.
    - 1. Cantilever: Manufacturer's standard top rail gate incorporating a track for the top roller. Brace frame to prevent sagging and apply fabric to entire gate. Provide external rollers with accessible grease fittings, a safety enclosure, and guide posts to keep the gate on the rollers.
- 2.04 ALUMINUM PIPE RAILINGS AND HANDRAILS
  - A. Pipe Railings: 1-1/2" diameter pipe and 3/4" diameter pipe fabricated to configurations shown on Drawings and approved shop drawings, smooth welded connections, AAMA M22C22 finish to receive coating specified.
  - B. Handrails: Match free standing railings in construction and finish, fabricated to configurations shown on Drawings and approved shop drawings.
    - 1. Brackets for Wall Handrails: Cast aluminum, equal to J. G. Braun No. 4498.
- 2.05 GALVANIZED STEEL PIPE RAILINGS AND HANDRAILS.
  - A. Standard weight galvanized steel, ASTM A53, smooth welded construction with welds ground smooth and coated with galvanizing paint, fabricated to the configurations shown on the drawings, ready for field painting. Shop coated with primer as specified in Section 05500. Provide fittings for anchoring to concrete as shown on details.
  - B. Handrails: Match free standing railings in construction and finish, fabricated to configurations shown on Drawings and approved shop drawings.
    - 1. Brackets for Wall Handrails: Galvanized steel ASTM A53, equal to J. G. Braun No. 4595.
- 2.06 STAINLESS STEEL PIPE RAILINGS
  - A. ASTM A312 Type 304 with No. 4 finish, 1-1/2 in. O.D. Schedule 40, .145 in. wall thickness, unless noted otherwise.
- 2.07 GLASS RAILING SYSTEM – N/A

- A. Point supported rail system as detailed in Drawings and as manufactured by Livers Bronze Co., Kansas City, MO. or approved equal.
  - 1. Guardrail: 42 in. high guardrail post of stainless steel at 4'-0" o.c. maximum as detailed in Drawings.
  - 2. Handrail: 2 in. diameter stainless steel handrail.
  - 3. Glass: 1/2 in. thick fully tempered plate glass with polished edges on all four sides, furnished by Livers Bronze for field attaching to post with stainless steel point supports. Kinetic energy impact loading of the glass shall comply with ANSI Z07.1-1984 using a 400 ft.-lb. (542 N-m) energy impact, as tested by an accredited laboratory.
  - 4. Finish: As selected by Resident from manufacturer's standard color charts.

2.08 SPECIFIC ITEMS

- A. Those items which are of standard or stock design or which are sufficiently detailed or described on the Drawings to permit their fabrication and installation are not described in detail herein.

**PART 3 EXECUTION**

3.01 INSPECTION

- A. Examine surfaces for conditions that will adversely affect execution, performance and quality of work.
- B. Correct unsatisfactory conditions before proceeding with the work.

3.02 FABRICATION

- A. Fabricate work to field measurements whenever possible. When fabrication must precede construction and field measurements are not practical, make sure construction conforms to fabricated dimensions. Ill-fitting work due to failure to coordinate will not be accepted.
- B. Joints: Close fitting, uniform, designed and assembled to be as strong and rigid as adjoining sections. Locate in symmetrical patterns and inconspicuous places whenever possible. Do not make joints in straight runs unless the available stock length is shorter than the run.
  - 1. Provide caps or flush matching profile fittings at exposed ends. Finish to match ending member.
- C. Railing Ends at Walls: Provide concealed fittings unless otherwise approved by Owner.
  - 1. For concrete or solid masonry: Expansion shields.

2. For hollow masonry: Toggle bolts.
- D. Assemble railings at the shop in as large sections as possible. Make field joints by welding whenever possible. Mechanical fasteners will not be permitted unless shown and approved in shop drawings, in concealed locations. Grind welds smooth and flush.
  - E. Aesthetics: Fabricate all work to accurately express the character and detail indicated on the Drawings and approved shop drawings.
  - F. Formed work: Form metal work to the required dimensions, shapes and sizes, with true curves, lines and angles. Provide necessary rebates, lugs, flanges, covers and brackets for assembly of units. Use concealed fasteners wherever possible.
  - G. Welding: Comply with AWS for recommended practices in shop welding. Provide welds behind finished surfaces without distortion or discoloration of the exposed side. Clean exposed welded joints.
    1. Unless specified, detailed, or approved otherwise on shop drawings, weld all shop connections and all field connections.
    2. Unless otherwise approved, grind exposed welds smooth and flush to match and blend with adjoining surfaces.
  - H. Fit-up: Mill joints to a tight, hairline fit. Cope or miter corner joints.
  - I. Castings: Provide castings that are sound and free of warp or defects which impair strength and appearance. Finish exposed surfaces to smooth, sharp, well-defined lines and arrises.
  - J. Anchorage: Provide brackets and anchors for joining and securing rails. Furnish inserts and sleeves as required for anchorage to concrete, and structural supports.
- 3.03 INSTALLATION
- A. Install manufactured items in accord with manufacturer's instructions and approved shop drawings.
  - B. Set all work accurately to lines and levels, plumb and secure.
  - C. Install members, bolts, anchors, and inserts to be covered, inserted or built-in, as the work progresses.
  - D. Perform all cutting, drilling and fitting required for the installation of work specified.
  - E. Where cutting, welding and grinding are required for proper fitting and jointing of the work, restore finishes to match original shop applied finish.



- F. Set posts in 2" diameter drilled holes not less than 3" deep, but not more than 4" deep. Clean holes of loose material and fill with anchoring cement flush with the surface of the slab. Do not leave a recess where water may collect.
- G. Fit work to existing structural supports with close uniform joints. Secure rigidly, without movement, level and plumb. Top rail shall present a straight level appearance, without waves in any direction.
- H. Where field welding is required and approved, conform to requirements of AWS.
- I. Corrosion Protection: Coat concealed surfaces of aluminum, which will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint or zinc chromate primer.
- J. Upon completion of the work, touch up minor abrasions and defects. Work damaged or defaced to the extent that in the opinion of the RESIDENT constitutes an unsightly condition may not be corrected by field touching up. Invisible field repair, removal and shop refinishing, or replacement will be required.

3.04 CLEANING AND ADJUSTMENT

- A. Protect work after installation use temporary covers. Before final acceptance, clean work, adjust fastenings and anchors that have worked loose, restore finishes soiled, damaged, or defaced during construction.

\*\*\*END OF SECTION\*\*\*

SECTION - 07411 PREFORMED (MANUFACTURED) ROOF & WALL PANELS

All work shall conform to the Drawings, MDOT Standard Specifications and the following:

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

This work includes, but is not necessarily limited to, furnishing and installation of all preformed metal roofing and walls, and accessories as indicated Pier 2 Berth 2 Gangway drawings and specifications herein.

**1.02 SUBMITTALS**

- A. Product Data:
  - 1. Submit Manufacturer's technical product data, installation instructions and recommendations for each type of roofing panel required. include data substantiating that material comply with requirement.
- B. Samples:
  - 1. Prior to ordering products, submit Manufacturer's standard color Samples for Resident's selection.
  - 2. Prior to starting work, submit (one) 12" long Panel Sample showing shape and a representative color chip for Resident's acceptance.
- C. Shop Drawings:
  - 1. Show panel layout, trim installation, and panel attachment.
- D. Site Conditions:
  - 1. Provide completed site condition form for the specified finish to suit project conditions.

**1.03 QUALITY ASSURANCE**

- A. Installer's Qualifications:
  - 1. Installation of panels and accessories by installers with a minimum of 5 years experience on panel installation of this nature.
- B. Manufacturer's Qualifications
  - 1. Manufacturer shall have a minimum of 10 years experience supplying metal roofing to the region where the work is to be done.
  - 2. Manufacturer shall provide proof of \$2,000,000 liability insurance for their metal roof system and comply with current independent testing and certification as specified. See specific product literature for testing information.
  - 3. Panel manufacturers without full supporting literature, Flashing & Details Guides, Guide Specifications and Technical Support shall not be considered equal to the specified product.
- C. Regulatory Agency Requirements
  - 1. Comply with UBC and local Building Code requirements if more restrictive than those specified herein.

**1.04 PRODUCT DELIVERY, STORAGE AND HANDLING**

- A. Protect against damage and discoloration.
- B. Handle panels with non-marring slings.

- C. Do not bend panels.
- D. Store panels above ground, with one end elevated for drainage.
- E. Protect panels against standing water and condensation between adjacent sheets.
- F. If panel becomes wet, immediately separate sheets, wipe dry with clean cloth, and allow to air dry.
- G. Remove and strippable film coating prior to installation and do not allow it to remain on the panels in extreme cold, heat of direct sunlight.

#### **1.05 WARRANTY**

- A. Manufacturers Product Warranty
  - 1. Manufacturer's standard coating performance warranty, as available for specified installation and environmental conditions.
- B. Contractor's Warranty
  - 1. Warrant panels, flashing, sealant, fasteners and accessories against defective materials and/or workmanship, to remain watertight and weatherproof with normal usage for two (2) years following Project Substantial Completion.

### **PART 2 – PRODUCTS**

#### **2.01 ACCEPTABLE MANUFACTURER**

- A. ASC Profiles Inc. or approved equal, 2110 Enterprise Boulevard, West Sacramento, California 95691-3493, 800-726-2727, 916-372-6851, Fax: 916-372-7606
- B. Panel Designation:
  - 1. HR-36™ Roof and Wall. Net coverage 36", rib depth 1-1/2" @7.2" o.c. or approved equal.

#### **2.02 MATERIALS**

- A. Panels
  - 1. Base Material:
    - a. Material:
      - (1) Steel conforming to ASTM A792 Zincolume®, minimum yield 40,000 psi, thickness 24 gauge or approved equal.
    - b. Protective Coating:
      - (1) Conform to ASTM A792, AZ50 (Zincolume®) or approved equal.
  - 2. Exterior Finish:
    - a. DURANAR XL PLUS coating or approved equal.
  - 3. Interior Finish:
    - a. Primer Coat Material: Corrosion-resistant primer; primer coat dry film thickness: 0.15 mils; finish coat material: polyester paint, finish coat dry film thickness: 0.35 mils.
    - b. Total Interior Dry Film Thickness: 0.50 mils.
    - c. Color: Off-White.
  - 4. Color:
    - a. As selected by Resident from manufacturer's standard selection of colors.
- B. Fabrication
  - 1. Unless otherwise shown on drawings or specified herein, panels shall be full length. Fabricate flashings and accessories in longest practical lengths.

2. Roofing panels shall be factory formed. Field formed panels are not acceptable.

### **PART 3 – EXECUTION**

#### **3.01 EXAMINATION**

- A. Existing Conditions
  1. Inspect installed work of other trades and verify that such work is complete to a point where this work may continue.
  2. Verify that installation may be made in accordance with approved shop drawings and manufacturer's instructions.

#### **3.02 PREPARATION**

- A. Field Measurements
  1. Verify prior to fabrication.
  2. If field measurements differ from drawing dimensions, notify Resident prior to fabrication.
- B. Protection
  1. Treat, or isolate with protective material, and contacting surfaces of dissimilar materials to prevent electrolytic corrosion.
  2. Require workmen who will be walking on Roofing Panels to wear clean, soft-soled work shoes that will not pick up stones or other abrasive material, which could cause damage or discoloration.
  3. Protect work of other trades against damage and discoloration.
- C. Surface Preparation
  1. Clean and dry surfaces prior to applying sealant.

#### **3.03 INSTALLATION**

- A. Panels
  1. Follow roof panel manufacturer's directions.
  2. Install panel seams (choose one) vertically or horizontally.
  3. Lap panels away from prevailing wind direction.
  4. Do not stretch or compress panel side-laps.
  5. Secure panels without warp or deflection.
- B. Allowable Erection Tolerances
  1. Maximum Alignment Variation: 1/4 inch in 40 feet.
- C. Flashing
  1. Follow manufacturer's directions and approved Shop Drawings.
  2. Overlap roof panels at least 6 inches.
  3. Install flashings to allow for thermal movement.
  4. Remove strippable protective film, if used, immediately preceding flashing installation.
- D. Cutting and Fitting
  1. Neat, square and true. Torch cutting is prohibited where cut is exposed to final view.
  2. Openings 6 inches and larger in any direction: Shop fabricate and reinforce to maintain original load capacity.
  3. Where necessary to saw-cut panels, debur cut edges.

**3.04 CLEAN UP AND CLOSE OUT**

- A. Panel Damage and Finish Scratches
  - 1. Do not apply touch-up paint to damaged paint areas that involve minor scratches.
  - 2. Panels or flashings that have severe paint and/or substrate damage shall be replaced as directed by the RESIDENT.
- B. Cleaning and Repairing
  - 1. At completion of each day's work and at work completion, sweep panels, flashings and gutters clean. Do not allow fasteners, cuttings, filings or scraps to accumulate.
  - 2. Remove debris from project site upon work completion or sooner, if directed.

\*\*\* END OF SECTION \*\*\*