READ THIS FIRST

This Project Spec Document may need additional modifications to suit your project. It is recommended that you proofread each section, paying attention to any “Notes” boxes such as this one--you should remove these “Notes” sections as you go. Also, do a search for all bracket characters “ [ ] “ as they are used to show you areas containing options or project specific details (you can use Microsoft Word’s Find feature {Ctrl-F} to jump to an open bracket “ [ “ character quickly). Again, these bracket characters should be removed.

It is important that every paragraph be numbered to allow for easy referencing. If you use the document’s built in styles and formatting your outline should be fine (turn on the formatting toolbar by going to View > Toolbars > Formatting). Most paragraphs will use the style “Numbered Material” and can be promoted (Shift) or demoted (Shift-Tab).

You should not have to manually enter extra spaces, carriage returns or outline characters such as A, B, C, or 1.01, 1.02; the formatting will do this for you. The entire document is 11 pt. Arial. If you paste items in, you may need to reapply the “Numbered Material” format.

1. GENERAL
   1. SUMMARY OF WORK
      1. The extent and location of the “Steel Pipe Handrail and Railing” Work is indicated in the Contract Documents.
      2. Terms
         1. The terms “railing,” and other similar variations of this term used in the context of this section generally refer to a complete horizontal structural system designed to be grasped by the hand so as to provide stability or support.
   2. GOVERNING CODES, STANDARDS, AND REFERENCES
      1. American Institute of Steel Construction (AISC)
      2. American Association of State Highway and Transportation Officials (AASHTO)
         1. M180, Standard Specification for Corrugated Sheet Steel Beams for Highway Guardrail
         2. M314, Standard Specification for Steel Anchor Bolts
      3. American Society for Testing and Materials (ASTM)
      4. ASME International (ASME)
         1. B18.2.1, Square and Hex Bolts and Screws (Inch Series)
         2. B18.6.1, Wood Screws (Inch Series)
         3. B18.21.1, Washers: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series)
      5. International Building Code (IBC)
         1. International Building Code as adopted and amended by the [City of Seattle as the Seattle Building Code] [Seattle-Tacoma International Airport Building Department] [Authority Having Jurisdiction] [other].
      6. National Association of Architectural Metal Manufacturers Association (NAAMM)
      7. The Society for Protective Coatings (SSPC)
   3. SUBMITTALS
      1. Submit materials data in accordance with Section 01 33 00 - Submittals. Furnish manufacturers’ technical literature, standard details, product specifications, and installation instructions for all products.
      2. Submittals shall include the following:
         1. Shop Drawings shall include railing profile, dimensions, and assembly of components, including handrails, handrail supports, anchorages, welds, hardware, weld finishing, and coating operations
         2. Provide samples for engineering and architectural review. Include the following
            1. Six inch-long samples of distinctly different railing members, including handrails' top rails and posts.
            2. Include samples of fittings, corners, brackets, end conditions, and welded connections.
2. MATERIALS

A. If only one product is acceptable (single or sole source product), obtain an approved Competition Waiver and submit to the CPO Construction, Contract Administrator. The language shall read as: “Manufacturer Name, Product # XXXXX, No Equal.” Refer to CPO-6 Competition Waiver Policy for more information.

B. If a Competition Waiver is not approved or more than one product is acceptable, this section must list a minimum of 2 products plus the language “Or Approved Equal,” along with salient characteristics. Refer to CPO Construction’s Salient Characteristics Guidelines for more information.

* 1. PROJECT INFORMATION
  2. PREPARATION FOR MATERIALS
  3. FABRICATION, PRODUCTION, AND SUPPLY OF MATERIALS
     1. Fabrication of structural steel items shall comply with Section 05 12 00 – Structural Steel.
  4. MATERIAL REQUIREMENTS
     1. Steel Elements
        1. All steel shall be of structural grade.
        2. Structural steel materials shall comply with the material requirements of Section 05 12 00 – Structural Steel.
  5. MATERIAL HANDLING, DELIVERY, AND STORAGE
  6. QUALITY ASSURANCE

1. EXECUTION
   1. PROJECT INFORMATION
   2. PREPARATION FOR EXECUTION OF WORK
      1. Design
         1. Handrails and railings shall be installed in accordance with local building codes.
         2. Handrails shall be designed to resist an allowable concentrated live load of 250 lb. in any direction at any point of the top of the rail or 20 lb. per foot distributed live load applied horizontally to the top of the rail, whichever is more severe.
         3. Intermediate rails (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 lb. on an area equal to 1 square foot, including openings and space between rails.
         4. Grab bars shall be designed to resist a single concentrated load of 250 lb. applied in any direction at any point.
   3. EXECUTION OF WORK
      1. Fabrication
         1. Curves
            1. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required
            2. Maintain the profile of the member throughout the entire bend without buckling, twisting, or otherwise deforming exposed surfaces of handrail and railing components.
         2. Lines
            1. Form exposed Work true to line and level with accurate angles and surfaces and straight sharp edges.
         3. Connectors
            1. Form exposed connections with hairline joints that are flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of the type indicated or, if not indicated, use Phillips
         4. Welding
            1. Methods

Welding of structural steel items shall comply with Section 05 05 23 – Welding.

* + - * 1. Warping

Fabricator shall use jigs, fixtures, strategic heating and cooling, and any means necessary to protect assemblies from local and gross section distortion due to welding operations.

* + - * 1. Weld Finishing

Weld contours may or may not be shown on drawings for brevity. The following finishing operations apply unless shown specifically otherwise for all handrails and railings.

All welds shall be ground smooth.

Finished welds shall match and blend with adjoining surfaces.

Fillet welds shall be generally ground smooth with a concave shape.

Welds at splices shall be ground flush.

Minimum weld throat thicknesses shall be maintained throughout and after finishing operations are complete.

* + - 1. Fittings
         1. Provide manufacturer’s standard wall brackets, flanges, miscellaneous fittings and anchors for interconnection of handrail and railing members to other Work, unless otherwise indicated. Furnish inserts and other anchorage devices for connecting handrails and railings to concrete Work. Fabricate and space anchorage devices as indicated and as required to provide adequate support.
      2. Posts
         1. For railing posts set in concrete, provide sleeves of galvanized steel, not less than six inches long and with an inside dimension of not less than 1/2 inch greater than the outside dimensions of the post. Provide galvanized steel plate closure welded to the bottom of sleeves; make the closure one inch greater than the outside dimensions of the sleeve.
         2. Galvanize exterior steel railings, and interior steel railings where shown, including pipe, fittings, brackets, fasteners and other ferrous components. Provide black steel pipe for interior railings where not indicated otherwise.
      3. Exposed Edges
         1. Remove all edges, snags, burs, or other surface discontinuity shall be removed.
         2. All pronounced edges subject to potential human contact shall be ground smooth to a radius of no less than 3/32”.
      4. Coatings
         1. Coatings shall comply with Section 09 90 00 – Paints and Coatings.
         2. Cleaning in Section 09 90 00 - Paints and Coatings. and touch-up painting of field welds, bolted connections and abraded areas of shop paint is specified
    1. Assembly
       1. Shop Assembly
          1. Preassemble items in the shop to the 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. Assembly of structural steel elements shall comply with Section 05 12 00 – Structural Steel.
       2. Field Assembly
          1. Perform the cutting, drilling and fitting required for installation of handrails and railings in a controlled shop environment to the greatest extent possible.
          2. Pre-assemble items in the shop prior to shipping to the greatest extent possible. Disassemble units only to the extent necessary for shipping and handling.
          3. Clearly mark units for reassembly and coordinated installation.
          4. Fit exposed connections accurately together to form tight hairline joints.
          5. Set the Work accurately in location, alignment and elevation, plumb, level, true and free of rack.
          6. Do not weld, cut, or abrade surfaces of handrail or railing components which have been coated or finished after fabrication and are intended for field connection by mechanical means without further cutting or fitting.
          7. Adjust handrails and railings prior to anchoring to ensure matching alignment of abutting joints. Space posts at the interval indicated.
    2. Installation
       1. Anchoring Posts:
          1. Anchor posts in concrete by means of sleeves preset and anchored into concrete. After posts have been inserted into sleeves, fill the annular space between post and sleeve solid with non-shrink, non-metallic grout, mixed and placed to comply with the grout manufacturer’s directions.
          2. Anchor posts to steel with steel oval flanges, angle type or floor type as required by conditions, welded to posts and bolted to steel supporting members.
       2. Attachment of Handrails to Walls:
          1. Secure handrails to walls with the manufacturer’s standard wall brackets and end fittings, unless otherwise indicated.
          2. For concrete, use drilled-in expansion shields and concealed hanger bolts, unless otherwise indicated.

1. MEASUREMENT AND PAYMENT
   1. GENERAL
      1. No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for the applicable bid items in the [Schedule of Unit Prices] [Lump Sum price bid for the Project].

End of Section

Revision History:

05/01/2014 Conversion to 2004 CSI Numbering System

10/15/2014 Added Sole Source and Salient Characteristics Note to Part 2