

## SECTION 05120

# STRUCTURAL STEEL

### PART 1 – GENERAL

#### 1.01 REFERENCES

- A. AISC – Code of Standard Practice – Manual of Steel Construction – Allowable Stress Design (ASD).
- B. ASTM A36/A36M – Structural Steel.
- C. ASTM A53 – Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.
- D. ASTM A108 – Steel Bars, Carbon, Cold-Finished, Standard Quality.
- E. ASTM A153 – Zinc Coating (Hot Dip) on Iron and Steel Hardware.
- F. ASTM A307 – Carbon Steel Externally Threaded Standard Fasteners.
- G. ASTM A325 – High Strength Bolts for Structural Steel Joints.
- H. ASTM A500 – Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- I. ASTM A 501 – Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- J. AWS A2.4 – Symbols for Welding, Brazing, and Non-destructive Examination.
- K. AWS D1.1 – Structural Welding Code.
- L. SSPC (Steel Structures Painting Council) – Painting Manual.
- M. UL – Fire Resistance Directory.
- N. Structural General Notes on Structural Drawings.

## 1.02 SUBMITTALS

- A. Section 01330 – Submittals: Procedures for submittals.
- B. Shop drawings shall detail all structural members showing sizes, spacing, cambers, connections, openings, welds, etc. showing all aspects of fabrication.

## 1.03 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC Code of Standard Practice.
- B. Perform Work in accordance with AISC Section 10.
- C. Fabricator: Company specializing in performing the work of this Section with minimum five (5) years documented experience.
- D. Erector: Company specializing in performing the work of this Section with minimum five (5) years documented experience.
- E. Welder(s): Qualified within previous twelve (12) months for type of welding required for this project in accordance with AWS D1.1 and AWS D1.4 and/or WABO (Washington Association of Building Officials) certified as required by local Building Department.

## 1.04 SPECIAL INSPECTOINS

- A. Coordinate and pay for special inspections required by governing agencies.

## 1.05 TESTS

- A. Testing of field welding will be performed under provisions of Section 01400.

## 1.06 ALTERNATES

- A. See Section 01230 for bidding alternates affecting work of this Section.

## 1.07 COLORS

- A. Colors are specified in Colors/Materials Schedule on drawings.

## 1.08 SUSTAINABLE BUILDING REQUIREMENTS

- A. See Section 01011 for sustainable building requirements affecting the work of this Section.

## PART 2 – PRODUCTS

### 2.01 MATERIALS

- A. Structural Steel Members: Refer to structural notes on structural drawings.
- B. Structural Tubing: Refer to structural notes on structural drawings.
- C. Bolts, Nuts and Washers: Refer to structural notes on structural drawings.
- D. Welding Materials: Refer to structural notes on structural drawings.
- E. Non-Shrink Grout: Refer to structural notes on structural drawings.
- F. Shop and Touch-up Primer: SSPC 15, Type 1 red oxide.
- G. Touch-up Primer for Galvanized Surfaces: SSPC 20, Type 1, inorganic, zinc rich.

### 2.02 FABRICATION

- A. Field verify actual dimensions and conditions on site prior to shop fabrication.
- B. Fabricate in accordance with AISC Specifications.
- C. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- D. Welding shall conform to AWS D1.1.

### 2.03 FINISH

- A. Prepare structural component surfaces in accordance with SSPC SP-3 for interior locations. SSPC SP-6 for exterior locations.
- B. Shop prime structural steel members with primer paint.

- C. All structural members on building exterior, exposed to outdoor atmosphere or shown on drawings shall be hot-dip galvanized in accordance with ASTM A386; provide minimum 2.0 oz/sq. ft. galvanized coating.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Beginning of installation means erector accepts existing conditions.

### 3.02 ERECTION

- A. Allow for erection loads and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion or erection and installation of permanent bracing.
- B. Field weld components in accordance with AWS D1.1.
- C. After erection, prepare any unprimed bare metal surfaces on primed or galvanized steel in accordance with SSPC SP-3 and prime/paint.
- D. Do not field cut or alter structural members without approval of Design Consultant.
- E. Grout under baseplates.

### 3.03 ERECTION TOLERANCES

- A. Maximum Variation from Plumb:  $\frac{1}{4}$  inch per story, non-cumulative.
- B. Maximum Offset from True Alignment:  $\frac{1}{4}$  inch.

END OF SECTION

## SECTION 05310

# STEEL DECKING

### PART 1 – GENERAL

#### 1.01 REFERENCES

- A. AISI – Specification for the Design of Cold-Formed Steel Structural Members.
- B. ASTM A446 – Steel Sheet, Zinc-Coated, (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
- C. ASTM A525 – Steel Sheet, Zinc-Coated, Galvanized by the Hot-Dip Process.
- D. AWS D1.1 – Structural Welding Code.
- E. SDI – Design Manual for Composite Decks, Form Decks, Roof Decks.

#### 1.02 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01330.
- B. Shop Drawings shall indicate decking type and gauge, decking plan, support locations, projections, openings, welding schedule, pertinent details, and accessories.
- C. Product data shall indicate deck profile characteristics and dimensions, structural properties, finished and acoustic noise reduction coefficient.

#### 1.03 QUALIFICATIONS

- A. Installer: Company specializing in performing the work of this Section with minimum five (5) years experience.
- B. Welder(s): Qualified within previous twelve (12) months for type of welding required for this project in accordance with AWS D1.1 and AWS D1.4 and/or WABO (Washington Association of Building Officials) certified as required by local Building Department.

#### 1.04 **DELIVER, STORAGE AND HANDLING**

- A. Deliver products to site under provisions of Section 01600.
- B. Store and protect products under provisions of Section 01600.
- C. Cut plastic wrap to encourage ventilation.
- D. Separate sheets and store decking on dry wood sleepers; slope for positive drainage.

#### 1.05 **ALTERNATES**

- A. See Section 01230 for bidding alternates affecting the work of this Section.

#### 1.06 **COLORS**

- A. Colors are specified in Colors/Materials Schedule on drawings.

#### 1.07 **SUSTAINABLE BUILDING REQUIREMENTS**

- A. See Section 01011 for sustainable building requirements affecting the work of this Section.

### PART 2 – PRODUCTS

#### 2.01 **MATERIALS**

- A. Sheet Steel: See Structural Drawings: Provide G60 galvanized coating conforming to ASTM A525.
- B. Welding Materials: AWS D1.1 is minimum requirement; see Structural Drawings for additional special requirements.
- C. Touch-Up Primer: Zinc chromate type.

#### 2.02 **ACCESSORIES**

- A. Acoustical Insulation: Glass fiber type, minimum 1.1 lb/cu ft. density; profiled to suit decking.

## 2.03 **FABRICATION**

- A. Steel Decking: See Structural Drawings for gauge, profile and special requirements.
- B. Acoustical Steel Decking: See Structural Drawings for gauge, profile, and special requirements. Perorate vertical face of flutes so as to achieve noise reduction coefficient (NRC) of 0.90. Provide acoustical insulation concealed in flutes.
- C. Metal Closure Strips, Cover Plates, and Related Accessories: See Structural Drawings for gauge, configuration, ad special requirements.

## PART 3 – EXECUTION

### 3.01 **EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Beginning of installation means installer accepts existing conditions.

### 3.02 **INSTALLATION**

- A. Erect metal decking in conformance with SDI Design Manual for Composite Decks, Form Decks, Roof Decks.
- B. Bear ends and perimeter of decking on structural supports with 3 inch minimum overlap between sheets. Align and level.
- C. Fasten deck to steel support members at ends and intermediate supports with welds per Structural Drawings.
- D. Weld in conformance with AWS D1.1.
- E. Connect decking sidelaps as shown on Structural Drawings.
- F. Cut openings for work of other trades.
- G. Install acoustic insulation in deck flute of acoustic decking.

END OF SECTION

## SECTION 05500

# METAL FABRICATIONS

### PART 1 – GENERAL

#### 1.01 REFERENCES

- A. ANSI A14.3 – Ladders, Fixed, Safety Requirements.
- B. ASTM A36 – Structural Steel.
- C. ASTM A53 – Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.
- D. ASTM A123 – Zinc (Hot-Dip Galvanized Coatings on Iron and Steel Products).
- E. ASTM A153 – Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- F. ASTM A283 – Carbon Steel Plates, Shapes, and Bars.
- G. ASTM A307 – Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
- H. ASTM A500 – Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- I. ASTM a501 – Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
- J. AWS A2.0 – Standard Welding Symbols
- K. AWS D1.1 – Structural Welding Code.
- L. SSPC (Steel Structures Painting Council) – Steel Structures Painting Manual.

#### 1.02 SUBMITTALS

- A. Section 01330 - Submittals; Procedures for submittals.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.



- C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

#### 1.03 **QUALITY ASSURANCE**

- A. Fabricator: Company specializing in performing the work of this Section with minimum five (5) years experience.

#### 1.04 **REGULATORY REQUIREMENTS**

- A. Welder(s): Qualified within previous twelve (12) months for type of welding required for this project in accordance with AWS D1.1 and AWS D1.4.

#### 1.05 **DELIVERY, STORAGE AND PROTECTION**

- A. Protect products and fabrications under provisions of Section 01600.

#### 1.06 **ALTERNATES**

- A. See Section 01230 for bidding alternates affecting the work of this Section.

#### 1.07 **COLORS**

- A. Colors are specified in Colors/Materials Schedule on drawings.

#### 1.08 **SUSTAINABLE BUILDING REQUIREMENTS**

- A. See Section 01011 for sustainable building requirements affecting the work of this Section.

### PART 2 – PRODUCTS

#### 2.01 **MATERIALS**

- A. Steel Sections: ASTM A36.
- B. Steel Tubing: ASTM A500, Grade B.
- C. Plates: ASTM A283.
- D. Pipe: ASTM A53, Grade B, Schedule 40.

- E. Bolts, Nuts, and Washers: ASTM A307 galvanized to ASTM A153 for galvanized components.
- F. Welding Materials: AWS D1.1; type required for materials being welded.
- G. Shop and Touch-Up Primer: SSPC 15, Type 1 red oxide.
- H. Perforated Metal Panels: 18 gauge steel with ¼" round perforations at 1" on center. Provide unperforated edges and field areas at structural support and backing areas.

## 2.02 FABRICATION – MISCELLANEOIUS ITEMS

- A. Fit and shop assemble items in largest practical sections for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screw or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## 2.03 FINISHES – STEEL

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime paint interior items with one (1) coat.
- D. All metal exposed to outdoor atmosphere or shown on drawings shall be hot-dipped galvanized to minimum 2.0 oz/sq. ft. zinc coating in accordance with ASTM A386.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Beginning of installation means erector accepts existing conditions.

### 3.02 PREPARATION

- A. Obtain Architect/Engineer approval prior to site cutting or making adjustments not scheduled.
- B. Clean and strip primed steel items to bare metal where site welding is required.
- C. Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

### 3.03 INSTALLATION – MISCELLANEOUS ITEMS

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

### 3.04 INSTALLATION – PAN STAIRS AND LANDINGS

- A. Erect stairs level and plumb, free from distortion or defects detrimental to appearance or performance.
- B. Provide anchors, plates, hangers, and struts required for connecting stairs to structure.
- C. Verify alignment with adjacent construction. Coordinate related work.

- D. Do not field cut or alter members.
- E. Field bolt and weld to match standard of shop bolting and welding. Hide bolts and screws whenever possible. Where not hidden, use flush countersunk fasteners.
- F. Mechanically fasten joints butted tight, flush, and hairline. Grind weld smooth and flush.

### 3.05 **ERECTION TOLERANCES**

- A. Maximum Variation from Plumb:  $\frac{1}{4}$  inch per story, non-cumulative.
- B. Maximum Offset from True Alignment:  $\frac{1}{4}$  inch.
- C. Maximum Out-of-Position:  $\frac{1}{4}$  inch.

### 3.06 **SCHEDULE**

- A. Provide and install items listed or shown on drawings with anchorage and attachments necessary for installation.

END OF SECTION

## SECTION 05520

# HANDRAILS AND RAILINGS

### PART 1 – GENERAL

#### 1.01 REFERENCES

- A. ASTM A386 – Zinc-Coating (Hot-Dip) on Assembled Steel Products.
- B. ASTM A500 – Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- C. SSPC – Steel Structures Painting Council.

#### 1.02 QUALIFICATIONS

- A. Fabricator: Company specializing in performing the work of this Section with minimum five (5) years experience.
- B. Welder(s): Qualified within previous twelve (12) months for type of welding required in accordance with AWS D1.1 and AWS D1.4.

#### 1.03 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01330.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, welds, and accessories.

#### 1.04 ALTERNATES

- A. See Section 01230 for bidding alternates affecting work of this Section.

#### 1.05 COLORS

- A. Colors are specified in Colors/Materials Schedule on drawings.

#### 1.06 SUSTAINABLE BUILDING REQUIREMENTS

- A. See Section 01011 for sustainable building requirements affecting work of this Section.

## PART 2 – PRODUCTS

### 2.01 STEEL RAILING SYSTEM

- A. Steel Tubing: ASTM A500, Grade B.
- B. Fittings: Steel elbows, radius wall returns, and wall brackets suitable for welded connection to tubing.
- C. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.
- D. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.
- E. Touch-Up Paint for Galvanized Surfaces: SSPC 20, Type II inorganic zinc rich.
- F. Galvanizing: 2.0 oz/sq. ft. zinc coating in accordance with ASTM A386.

### 2.02 FABRICATION

- A. Field verify actual dimensions and conditions at site prior to shop fabrication.
- B. Fit and shop assemble components in largest practical sizes, for delivery to site.
- C. Fabricate components with joints tightly fitted and welded full circumference. Align components accurately.
- D. If tubing has seams, locate in position concealed from view.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- G. Continuously seal joined pieces by continuous welds; grind welds flush and smooth.
- H. Ease exposed edges to small uniform radius.

- I. All components, connections, and parts shall be smooth, uniform and free from defects.
- J. Accurately form components to suit stairs and landings, to each other and to building structure.
- K. Provide radius wall return fitting at ends of all handrails not terminating in vertical post or wall.
- L. Maximum spacing between wall brackets supporting handrail shall be 48 inches, with wall bracket located within 12 inches of handrail end. Provide equal space layout between wall brackets for any length/run of handrail.

### 2.03 **FINISH**

- A. Clean surfaces to SSPC SP-6 prior to finishing.
- B. Do not prime surfaces in direct contact bond with concrete or where field welding is required.
- C. All metal on building exterior, exposed to outdoor atmosphere or shown on drawings shall be hot-dipped galvanized to minimum 2.0 oz/sq. ft. zinc coating in accordance with ASTM A386.

## PART 3 – EXECUTION

### 3.01 **EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Beginning of installation means erector accepts existing conditions.

### 3.02 **PREPARATION**

- A. Clean and strip primed steel items to bare metal where site welding is required.

### 3.03 **INSTALLATION**

- A. Install components plumb, level, and straight, accurately fitted, free from distortion or defects.
- B. Field weld anchors and field splices full circumference. Touch-up welds with primer. Grind welds flush and smooth.

- C. Conceal bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings. Rigidly secure to building structure or solid wood backing.
- D. Provide removable sleeves in concrete stairs/sidewalks for installation of handrails after concrete is poured. Set handrail in opening with fast-setting cement based grout.
- E. Completed installation, including connection to building structure of backing shall resist 350 pound imposed load from any direction without permanent deflection or failure.
- F. After installation, prepare any field welds, scratched or damaged finishes per SSPC SP-3 and prime/paint.

#### 3.04 **ERECTION TOLERANCES**

- A. Maximum Variation from Plumb: 1/8 inch.
- B. Maximum Offset from True Alignment: ¼ inch.

END OF SECTION



## SECTION 05712

# MANUFACTURED STEEL STAIR SYSTEMS

### PART 1 – GENERAL

#### 1.01 SUMMARY

- A. Section includes:
  - 1. Manufacture red steel stairs.

#### 1.02 REFERENCES

- A. AISC “ASD Manual of Steel Construction”, Ninth Edition.
- B. AISC “Manual of Steel Construction”, Eighth Edition.
- C. ASTM A36 “Specifications for Structural Steel”, 1995.
- D. ASTM A53 “Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless”, 1990.
- E. ASTM A123 “Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products”, 1989.
- F. ASTM A500 “Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes”, 1993.
- G. ASTM A513 “Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing”, 1992.
- H. ASTM A569 “Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial Quality”, 1991.
- I. ASTM A615 “Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement”, 1993.
- J. ASTM A780 “Specification for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings”, 1993.

- K. ASTM E303 “Method of Measuring Surface Frictional Properties Using the British Pendulum Tester”, 1974.
- L. AWS D1.1 “Structural Welding Code – Steel”, 1994.
- M. AWS D1.3 “Structural Welding Code – Sheet Steel”, 1989.
- N. AWS “Welding Procedure and Performance Qualification”, 1994.
- O. NAAMM “Metal Stair Manual”, Fifth Edition.
- P. NOMMA “Guideline 1 – Joint Finishes”, December 1994.
- Q. SPC “Steel Structures Painting Manual”, Volume 11, Sixth Edition.

### 1.03 **SYSTEMS DESCRIPTION**

- A. Performance requirements: Stair manufacturer shall engineer and fabricate stairs to comply with requirements of the following, when installed.

### 1.04 **SUBMITTALS**

- A. Product Data: Submit manufacturer’s product data substantiating compliance with drawings and specifications.
- B. Shop Drawings: Submit shop drawings for stairs and railings. Include plans, elevations, and details. Show connection and accessory items, indicate field welds. Show locations for anchor and bolt installation.
  - 1. Include design loads, structural calculations and material properties. Shop drawings shall be signed and sealed by a Structural Engineer licensed in Washington State.

### 1.05 **QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Manufacturer shall have produced the types of stair and railing systems required for not less than ten (10) years, with not less than five (5) years on similar projects that have been in successful use for not less than five (5) years.
- B. Installer Qualifications: Minimum five (5) years experience in the successful installation of steel stair and railing systems of the type indicated for this Project.

C. Applicable Standards:

1. NAAMM "Metal Stairs Manual".
2. AISC "ASD Manual of Steel Construction" and "Manual of Steel Construction".
3. AWS D1.1 "Structural Welding Code – Steel", AWS D1.3 "Structural Welding Code – Sheet Steel" and AWS "Welding Procedure and Performance Qualification".

1.06 **WARRANTY**

- A. Provide manufacturer's written warranty that its standard products are free from defects in material and workmanship for the life of the building and agreeing to repair or replace items, proven to be defective, or refund the purchase price of the item.

1.07 **COLORS**

- A. Colors are specified in Colors/Materials Schedule on drawings.

1.08 **SUSTAINABLE BUILDING REQUIREMENTS**

- A. See Section 01011 for sustainable building requirements affecting the work of this Section.

PART 2 – PRODUCTS

2.01 **MANUFACTURERS**

- A. Acceptable Manufacturers: Drawings and specifications are based on products of American Stair Corporation. Provide the specified products.
- B. Substitutions: Other manufacturers wishing consideration of their products, shall submit information to the Architect not less than ten (10) business days prior to the bid due date. Comply with requirements of Section 01600.

2.02 **MATERIALS**

- A. Steel Plates, Shapes and Bars: ASTM A36.
- B. Formed Steel Sheet: ASTM A569.

- C. Steel Tubing: Cold formed, ASTM A500-B and A513.
- D. Steep Pipe: ASTM A53; type and grade selected by fabricator as required for design loading, black finish.
- E. Reinforcing Bars: ASTM A615, Grade 40, deformed.

#### 2.03 FABRICATION, GENERAL

- A. Exposed Work: True to line and level with accurate angles and surfaces and with straight sharp edges. Use only smooth materials free from burrs, pitting and other marks.
  - 1. Fastener Connections: Provide flush hairline joints at exposed connections.
  - 2. Welded Connections: Exposed welds to have finished appearance in accordance with NOMMA "Guideline 1 – Joint Finishes" for Finish #3.

#### 2.04 STAIR AND LANDING FABRICATION

- A. Provide complete stair and landing systems including stringers, landing framing, treads landings, connections, and other components necessary for the support and installation of stairs and landings. Comply with NAAMM "Metal Stairs Manual" requirements for Service Class Stairs.
- B. Stringers:
  - 1. Steel plates, tubing, or channels as required for compliance with performance requirements.
  - 2. As shown on Drawings.
- C. Treads:
  - 1. Metal Pan for Cast-in-Place Concrete: Sheet steel tread pan formed for concrete fill for treads, factory-welded to stringers, with all welds on inside of pan to be concealed by concrete fill.
    - a. Concrete Fill
- D. Risers:
  - 1. Sheet steel.

2. Open risers.
- E. Landings: Provide 4 inch toe plates at open edges of landings. Provide landing type as follows:
1. Metal Pan for Cast-in-Place Concrete: Sheet steel decking pan and factory-installed steel reinforcing bars for concrete fill; steel channel supports.
    - a. Concrete Fill: Refer to Section
- F. Stair Unit Connections: Provide angle brackets, bolts, expansion anchors, weld plates and other connection devices as recommended by stair manufacturer for substrates indicated.

## 2.05 RAILINGS AND HANDRAILS

- A. Refer to Section 05520.

## 2.06 SHOP PAINTING

- A. Surface Preparation: SSPC SP-1 Solvent Cleaning, SSPC SP-2 Hand Tool Cleaning and SSPC SP-3 Power Tool Cleaning as required.
- B. Shop Primer: Apply shop primer to stairs and railings after fabrication.
1. Primer: Manufacturer's standard lead-free and chromate-free modified phenolic alkyd, FS TT-P-664C.
  2. Dry Film Thickness: 1.5 mil. Minimum.
- C. Galvanizing: Hot-dip galvanize stairs and railings after fabrication in accordance with ASTM A123.
1. Galvanizing Repair Paint: ASTM A780.

## PART 3 – EXECUTION

### 3.01 **INSTALLATION**

- A. Install stairs in accordance with manufacturer's instructions and approved shop drawings and to comply with specified performance requirements when installed.
- B. Fit exposed connections accurately together to form tight hairline joints.
- C. Provide anchorage devices and fasteners for securing stairs and railings to in-place construction.
- D. Weld connections which cannot be shop welded because of shipping size limitations. Grind exposed joints smooth and touch-up shop paint coat.
- E. Clean field welds, bolted connections, and abraded areas and prime with same material used for shop priming.
- F. Refer to Section 09900 for additional paint touch-up of primer abraded after stair and railing installation.

END OF SECTION