

## **SECTION 05 21 00 - STEEL JOIST FRAMING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:

- 1. K-series steel joists.
- 2. Joist accessories.

#### **1.3 DEFINITIONS**

- A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

#### **1.4 SUBMITTALS**

- A. Action Submittals:

- 1. Product Data: For each type of joist, accessory, and product.
  - a. Submit description of shop primer.
- 2. Shop Drawings:
  - a. Include layout, designation, number, type, sizes, location, and spacing of joists.
  - b. Include joining and anchorage details, bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.

- B. Informational Submittals

- 1. Mill Certificates: For each type of bolt.

#### **1.5 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications." Fabricator and Erector to have at least 5 years experience with projects of similar size and scope.

- B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle joists as recommended in SJI's "Specifications."
- B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.
- C. Store joist bundles off the ground.
- D. Do not place joist bundles on un-braced structural frame.

## PART 2 - PRODUCTS

### 2.1 K-SERIES STEEL JOISTS

- A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
  - 1. Joist Type: K-series steel joists.
- B. Do not camber joists.
- C. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches.

### 2.2 PRIMERS

- A. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.
- B. Standard Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

### 2.3 JOIST ACCESSORIES

- A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.
  - 1. Provide bridging anchors for ends of bridging lines terminating at walls or beams.
  - 2. Provide additional bridging as required to stabilize joists when net uplift pressure is indicated on Drawings.
- B. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A, carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers, complying with ANSI B27.2, Type B.
  - 1. Finish: Plain, uncoated, unless noted otherwise.

- C. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
  - 1. Finish: Plain.
- D. Welding Electrodes: Comply with AWS standards.
- E. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

## 2.4 CLEANING AND SHOP PAINTING

- A. Shop prime all steel joist members.
- B. For members to receive primer leave following locations unprimed:
  - 1. Surfaces to be field welded.
  - 2. Surfaces to be high-strength bolted with slip-critical connections.
- C. Surface Preparation: Remove loose scale, heavy rust and other foreign materials from fabricated joists and accessories. Prepare surfaces according to the following specifications and standards:
  - 1. SSPC-SP 3, "Power Tool Cleaning," unless noted otherwise below.
  - 2. ASTM D 6386, "Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting," for galvanized surfaces noted to be painted.
- D. Priming:
  - 1. Immediately after surface preparation, apply one coat of primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness as listed below. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
    - a. Steel Joists to Receive Standard Primer: 1.0 mils.
  - 2. Stripe paint corners, crevices, bolts, welds, and sharp edges.
  - 3. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

### 3.2 INSTALLATION

- A. Do not install joists until supporting construction is in place and secured.
- B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to approved shop drawings and to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.
  - 1. Before installation, splice joists delivered to Project site in more than one piece.
  - 2. Space, adjust, and align joists accurately in location before permanently fastening.
  - 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
- C. Field weld joists to supporting steel bearing plates and/or framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
- D. Bolt joists to supporting steel framework in accordance with AISC and SJI specifications for type of joists used. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with Research Council on Structural Connection's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.
- E. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.
- F. Field Modifications: Notify Architect if it becomes evident that field modifications to joists, joist girders and accessories are required during erection. Submit field modification proposed by joist manufacturer to Architect for review.
- G. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

### 3.3 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect joist materials, inspect field welds and bolted connections, and prepare test and inspection reports.
- B. Material Inspection: Inspect joists, joist girders and accessories for dents, bends and other damage that may compromise the structural integrity of the member.
  - 1. Contractor to remove, replace or repair joists found to be damaged to the satisfaction of the Architect at no additional cost to Owner.
- C. Visually inspect field welds according to AWS D1.1/D1.1M.
- D. Visually inspect bolted connections.
- E. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements. Contractor is responsible for cost of corrective action and repeated inspection caused by deficient work or materials.

END OF SECTION 05 21 00

## **SECTION 05 31 00 - STEEL DECKING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Roof deck.
  - 2. Accessories.

#### **1.3 SUBMITTALS, GENERAL**

- A. General: Submit all action submittals and informational submittals required by this Section concurrently.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: Submit manufacturer's specifications and installation instructions for each type of deck, accessory, and product.

#### **1.5 INFORMATIONAL SUBMITTALS**

- A. Product Certificates: For each type of steel deck.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
  - 1. Power-actuated mechanical fasteners.

#### **1.6 QUALITY ASSURANCE**

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."

#### **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

- B. Stack steel deck off the ground on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

### 2.2 ROOF DECK

- A. Roof Deck: Design and fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 31, and with the following:
  - 1. Galvanized-Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33, G60 zinc coating.
  - 2. Deck Profile: Type WR, wide rib.
  - 3. Profile Depth: As indicated on Drawings.
  - 4. Design Uncoated-Steel Thickness: As indicated on Drawings.
  - 5. Side Laps: Flat overlapped.

### 2.3 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, carbon-steel, self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.
- D. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 20 gauge (0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- E. Galvanizing Repair Paint: ASTM A 780.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Beginning installation constitutes Contractor's acceptance of substrates and conditions.

### 3.2 INSTALLATION, GENERAL

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 31, manufacturer's written instructions, approved deck placement shop drawings and requirements in this Section.
- B. Locate deck bundles to prevent overloading of structural members.
- C. Do not use deck units for storage or working platforms until permanently secured in position.
- D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened.
- E. Place deck panels flat and square and fasten to supporting frame without warp or excessive deflection. Do not stretch or contract side lap interlocks.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck. Provide neat, square and trim cuts.
- G. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work. Welding shall be in accordance with AWS D1.1 and D1.3.

### 3.3 ROOF-DECK INSTALLATION

- A. Permanently fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:
  - 1. Weld Diameter: 5/8 inch, nominal.
- B. Fastening Spacing: Provide fasteners at no greater than maximum spacing listed in the table below. Weld intermediate and end supports of deck units with a minimum of two welds per deck unit at each support. Fasten side-laps at intervals not exceeding the lesser of 1/2 of the span or per the table below.



Deck Designation	Intermediate Supports (inches)	End Supports (inches)	* Edge Supports (inches)	Side Laps (inches)
1. WR.....	6	6	24	12

- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:

1. End Joints: Lapped 2 inches minimum for WR deck.

- D. Miscellaneous Roof-Deck Accessories: Install butt strips, finish strips, end closures, and all other miscellaneous shapes as shown on plans according to deck manufacturer's written instructions, and as required to provide suitable surface for application of roof insulation and roof covering. Fasten with No. 10 screws at 12 inches maximum to provide a complete deck installation.

- E. Roof Insulation Support: Provide and install metal accessories to provide suitable surface for application of insulation.

### 3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

- B. Field Inspections:

1. Fastening Inspection: Inspect welds and side lap fasteners over entire deck area for size and spacing and weld quality.
2. Roof Deck Conditions Inspection: Before installation of roof insulation and roof covering, inspect the deck for tears, dents or other damage that may prevent the deck from supporting the required loads, or be visually objectionable in exposed deck areas. Report suspect areas to Architect to determine need for repair or replacement.

- C. Testing agency will report inspection results promptly and in writing to Contractor and Architect.

- D. Remove and replace work that does not comply with specified requirements.

- E. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

### 3.5 PROTECTION

- A. Hanging Loads (All Contractors): Do not hang any concentrated loads from metal deck unless otherwise noted and detailed on Drawings.

- B. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

- C. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.
- D. Do not use deck units for storage or working platforms until permanently secured.

END OF SECTION 05 31 00

## **SECTION 05 50 00 - METAL FABRICATIONS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:

- 1. Steel framing and supports for mechanical and electrical equipment.
- 2. Steel framing and supports for applications where framing and supports are not specified in other Sections.
- 3. Metal ladders.
- 4. Loose bearing and leveling plates for applications where they are not specified in other Sections.

- B. Products furnished, but not installed, under this Section:

- 1. Loose steel lintels.
- 2. Anchor bolts indicated to be cast into concrete or built into unit masonry.

#### **1.3 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Design ladders, including comprehensive engineering analysis by a qualified professional engineer (licensed in the State of New York), using performance requirements and design criteria indicated and certifying that the design complies with the Building Code of New York.
- B. Structural Performance of Aluminum Ladders: Aluminum ladders shall withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

#### **1.4 SUBMITTALS, GENERAL**

- A. General: Submit all action submittals required by this Section concurrently.

## 1.5 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Slotted channel framing.
  - 2. Grout.
- B. Shop Drawings: Show fabrication and installation details for metal fabrications.
  - 1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
- C. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

## 1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

## 1.7 COORDINATION

- A. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

## PART 2 - PRODUCTS

### 2.1 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

### 2.2 FERROUS METALS

- A. Steel Channels and Angles: ASTM A 572/A 572M, Grade 50.
- B. Steel Plates and Bars: ASTM A36/A36M.

C. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.

1. Size of Channels: 1-5/8 by 1-5/8 inches or as indicated on drawings.
2. Material: Galvanized steel, ASTM A 653/A 653M, structural steel, Grade 33, with G90 coating; 0.108-inch nominal thickness.
3. Fasteners and Fittings: Appropriate to situation and as recommend by manufacturer.

## 2.3 NONFERROUS METALS

- A. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.
- B. Aluminum Bar and Rod: ASTM B211, Alloy 6061-T6.
- C. Aluminum Extrusions: ASTM B221, Alloy 6061-T6.

## 2.4 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
- B. Post-installed Anchors: chemical anchors.
  1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5 unless otherwise indicated.
  2. Material for Exterior Locations and Where Stainless Steel is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F 593, and nuts, ASTM F 594.
  3. Chemical Anchor Adhesives: Heavy duty, two component injectable adhesive designed to be dispensed using double chamber gun with mixing nozzle. Adhesives in capsule form will not be accepted.
    - a. Products for anchoring into concrete and grout-filled masonry: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      - 1) DeWalt; AC200+.
      - 2) Hilti, Inc.; HIT-HY 200R; HIT-HY 200A; HIT-ICE.
      - 3) ITW Redhead; A7+.
    - b. Products for anchoring into masonry other than grout-filled masonry: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
      - 1) DeWalt; AC200+.
      - 2) Hilti, Inc.; HIT-HY 270.
      - 3) ITW Redhead; A7+.

## 2.5 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Primer:
  - 1. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.
  - 2. Provide primers that comply with Division 09 Section “High Performance Coatings” and the following:
    - a. Interior Structural Steel: Refer to First Coat for Steel, Structural Steel in Interior High-Performance Coating Schedule: General Use.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with ASTM A780/A780M and compatible with paints specified to be used over it.
- D. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Isolation Barrier Membrane: Self-adhering, high-temperature sheet, minimum 15 mils thick, consisting of cross-laminated polyethylene-film top surface laminated to layer of butyl adhesive, with release-liner backing; cold applied, in roll width to match or exceed width of area to be protected. Provide primer when recommended by membrane manufacturer.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Grace Construction Products, a unit of W. R. Grace & Co.; “Vycor Pro”.
    - b. Equivalents meeting requirements of specified products.

## 2.6 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.

- E. Weld corners and seams continuously to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
  - 1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

## 2.7 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
  - 1. Fabricate units from slotted channel framing where indicated.
  - 2. Furnish inserts for units installed after concrete is placed.

## 2.8 METAL LADDERS

- A. General:
  - 1. Comply with ANSI A14.3 unless otherwise indicated.
  - 2. For elevator pit ladders, comply with ASME A17.1.

B. Aluminum Ladders:

1. Fabricators: Subject to compliance with requirements, available fabricators offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Roof Lines, waterfrontdocks@gmail.com
2. Space siderails 24 inches or 18 inches apart unless otherwise indicated.
3. Siderails: Continuous extruded-aluminum tubes, not less than 2-1/2 inches deep, 3/4 inch wide, and 1/8 inch thick.
4. Rungs: Solid knurled aluminum round bars, 1" inch in diameter.
5. Fit rungs in centerline of siderails; fasten by welding.
6. Support each ladder at top and bottom and not more than 48 inches o.c. with welded aluminum brackets. Brackets are to be 1/4 inch thick by 3 inches wide.
7. Top grab rails (for exterior): Extruded aluminum tube, not less than 1 inch in diameter, fully welded. Miter or radius all corners.
8. Top grab rails (for interior): Extend siderails past walking surface 42 inches at pits and 8 inches at roof hatches.
9. All connections to be fully welded continuous and ground smooth.
10. All open tube ends to be capped/sealed closed.

2.9 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

2.10 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span but not less than 8 inches unless otherwise indicated.



## 2.11 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

## 2.12 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.
- C. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

## 2.13 STEEL AND IRON FINISHES

- A. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to Division 09 Section "High Performance Coatings".
  - 1. For galvanized surfaces noted to be painted, comply with ASTM D6386, "Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting".
- B. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
  - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- C. Shop prime iron and steel items unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
  - 1. Metal Fabrications: For all iron and steel items (except those noted below), shop prime with alkyd primer.
  - 2. Exterior Wall Metal Fabrications: For all iron and steel items occurring in exterior walls, shop prime with urethane primer.
- D. Shop Priming: Immediately after surface preparation, apply one coat of primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness as listed below. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
  - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
  - 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

## 2.14 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. As-Fabricated Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Beginning installation constitutes Contractor's acceptance of substrates and conditions.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- D. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- E. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- F. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- G. Corrosion Protection: Protect concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
  - 1. Isolation barrier membrane.

### 3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Install slotted channel framing with manufacturer recommended fasteners and fittings and follow manufacturer recommended instructions.

### 3.3 INSTALLING BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
  - 1. Use non-shrink, nonmetallic grout in exposed locations unless otherwise indicated.
  - 2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

### 3.4 ADJUSTING AND CLEANING

- A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 Section "High-Performance Coatings."
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and restore galvanizing to comply with ASTM A780.

END OF SECTION 05 50 00