

## **SECTION 05 3100 - STEEL DECKING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Roof deck.
  - 2. Floor deck.
- B. Related Requirements:
  - 1. Section 03 3000 "Cast-in-Place Concrete" for normal-weight and lightweight structural concrete fill over steel deck.
  - 2. Section 05 1200 "Structural Steel Framing" for shop- and field-welded shear connectors.
  - 3. Section 05 5000 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.

#### **1.3 ACTION SUBMITTALS**

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Sustainable Design Submittals:
  - 1. Product Data: For recycled content, indicating postconsumer and preconsumer recycled content and cost.
- C. Shop Drawings:
  - 1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

#### **1.4 INFORMATIONAL SUBMITTALS**

- A. Welding certificates.
- B. Product Certificates: For each type of steel deck.

- C. 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.
- D. Evaluation Reports: For steel deck.
- E. Field quality-control reports.

#### 1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
- C. FM Global Listing: Provide steel roof deck evaluated by FM Global and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
  - 1. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.

### 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."
- B. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

- C. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

## 2.2 ROOF DECK

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. ASC Profiles, Inc.; a Blue Scope Steel company.
  2. Nucor Corp.; Vulcraft Group.
  3. Verco Manufacturing Co.
- B. Roof Deck: 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, Structural Steel (SS), Grade 50, G60 zinc coating.
    - a. Color: Manufacturer's standard.
  2. Deck Profile: See General Structural Notes.
  3. Profile Depth: See General Structural Notes.
  4. Design Uncoated-Steel Thickness: As indicated per the General Structural Notes.
  5. Span Condition: Triple span or more.
  6. Side Laps: Overlapped or interlocking seam at Contractor's option.

## 2.3 COMPOSITE FLOOR DECK

- A. Manufacturers: Subject to compliance with requirements, **available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following**:
1. ASC Profiles, Inc.; a Blue Scope Steel company.
  2. Nucor Corp.; Vulcraft Group.
  3. Verco Manufacturing Co.
- B. Composite Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 31, with the minimum section properties indicated, and with the following:
1. Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade **50** minimum, with top surface phosphatized and unpainted and underside surface shop primed with manufacturers' standard gray or white baked-on, rust-inhibitive primer.
  2. Deck Profile: See General Structural Notes.
  3. Profile Depth: See General Structural Notes.
  4. Design Uncoated-Steel Thickness: As indicated per the General Structural Notes.
  5. Span Condition: Triple span or more.

## 2.4 ACCESSORIES

- A. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
- B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
- C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, **No. 10** minimum diameter.
- D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
- E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of **50,000 psi**, not less than **0.0359-inch** design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.
- F. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- G. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, **0.0747 inch** thick, with factory-punched hole of **3/8-inch** minimum diameter.
- H. Flat Sump Plates: Single-piece steel sheet, **0.0747 inch** thick, of same material and finish as deck. For drains, cut holes in the field.
- I. Recessed Sump Pans: Single-piece steel sheet, **0.0747 inch** thick, of same material and finish as deck, with **3-inch**-wide flanges and sloped recessed pans of **1-1/2-inch** minimum depth. For drains, cut holes in the field.
- J. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

## 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.

### 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, and requirements in this Section.
- B. Install temporary shoring before placing deck panels if required to meet deflection limitations.
- C. Locate deck bundles to prevent overloading of supporting members.
- 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. Do not stretch or contract side-lap interlocks.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
- H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
- I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

### 3.3 ROOF-DECK INSTALLATION

- A. 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: **3/4 inch**, nominal.
  - 2. Weld Spacing: As indicated per the General Structural Notes.
  - 3. Weld Washers: Install weld washers at each weld location.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, as indicated in the General Structural Notes.
- C. End Bearing: Install deck ends over supporting frame as indicated in the General Structural Notes.
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and weld or mechanically fasten flanges to top of deck. Space welds or mechanical fasteners not more than **12 inches** apart with at least one weld or fastener at each corner.

1. Install reinforcing channels or zeos in ribs to span between supports and weld or mechanically fasten.
- E. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.
  1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.
- F. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written instructions to ensure complete closure.

### 3.4 FLOOR-DECK INSTALLATION

- A. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:
  1. Weld Diameter: 3/4 inch, nominal.
  2. Weld Spacing: Space and locate welds as indicated in the General structural Notes.
  3. Weld Washers: Install weld washers at each weld location.
- B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, as indicated in the General Structural Notes.
- C. End Bearing: Install deck ends over supporting frame as indicated in the General Structural Notes.
- D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations unless otherwise indicated.
- E. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Field welds will be subject to inspection.
- 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.

3.6 PROTECTION

- A. 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.
- B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repairpaint.
- C. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

**END OF SECTION 05 3100**