

## **SECTION 053100**

### **STEEL DECKING**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. This section pertains to steel deck for floors and roofs.
- B. Requirements for field painting, fireproofing, roof sumps, roof flashings, drains, collars, gutters, downspouts, insulation, and other miscellaneous items are specified elsewhere.

##### **1.2 ACTION SUBMITTALS**

- A. Product Data:
  - 1. For each type of steel deck specified including dimensions and finishes.
- B. Approval Drawings:
  - 1. Include layout and types of deck panels, deck attachment details, accessories specified on the contract documents and other information required for a thorough review.

##### **1.3 INFORMATIONAL SUBMITTALS**

- A. Welding certificates: If field welding is performed, welder certificates signed by the Contractor certifying that welders comply with requirements specified under "Quality Assurance" Article 1.4.
- B. Test and Evaluation Reports:
  - 1. Steel Deck: Product Evaluation Reports from IAPMO showing compliance with the specified requirements.
  - 2. Product Test Reports or Evaluation Reports: Reports from a qualified testing or evaluation agency, indicating that each of the following complies with specified requirements:
    - a. Mechanical fasteners: If mechanical fasteners are used, independent test reports or evaluation reports shall be provided by the fastener manufacturer.
    - b. Acoustical deck performance.
    - c. Approval reports by Factory Mutual demonstrating that the products provided meet the loss-prevention requirements if specified.

## 1.4 QUALITY ASSURANCE

- A. Codes and Standards: Comply with applicable provisions of the following specifications:
1. ANSI/AISI S100-16 w/S2-20, North American Specification for the Design of Cold-Formed Steel Structural Members
  2. ANSI/AISI S310-20, North America Standard for the Design of Profiled Steel Diaphragm Panels
  3. ANSI/SDI RD-2017 Standard for Roof Deck
  4. ANSI/SDI C-2017 Standard for Composite Steel Floor Deck-Slabs
  5. ANSI/SDI NC-2017 Standard for Non-Composite Steel Floor Deck
- B. Welding Qualifications: Qualify procedures and personnel in accordance with and the following welding codes:
1. AWS D1.3/D1.3M:2018, Structural Welding Code – Sheet Steel.
- C. Mechanical Fasteners: If required by the fastener manufacturer, certify that each mechanical fastener installer has satisfactorily passed certification tests as required by the fastener manufacturer.
- D. Fire Resistance Assemblies: Provide steel deck units classified by Underwriters Laboratories (UL) in the “Fire Resistance Directory” if a fire rated assembly is required. Identify steel deck bundles with labels bearing the UL mark.

## 1.5 SUSTAINABILITY

- A. Environmental Product Declarations (EPD): Submit steel floor or roof deck manufacturer’s EPD per the following:
1. All EPDs are to be third-party verified in accordance with the current version of ISO 14025 (validated by a date that has not yet expired) and indicate the following Impact Categories:
    - a. Global Warming Potential (GWP): All GWP information submitted shall be in the form of kgCO<sub>2</sub>eq/kg.
    - b. Ozone Depletion Potential (ODP): All ODP information shall be in the form of kgCFC-11/kg.
    - c. Acidification Potential (AP): All AP information shall be submitted in the form of kgSO<sub>2</sub>/kg.

- d. Eutrophication Potential (EP): All EP information submitted shall be in the form of kgN/kg.
  - e. Smog Formation Potential (SFP): All SFP information shall be submitted in the form of kgO3/kg.
  - f. Energy Consumption: All energy consumption information shall be submitted in the form of MJ.
2. Manufacturer-specific GWP information will be one of the decision criteria when awarding this scope. The manufacturer EPD must indicate GWP information from the specific mill or plant facility from which the material is procured. EPDs including GWP information for more than one facility are acceptable as long as each facility's GWP information is reported separately. EPDs reporting GWP values as averages from multiple facilities only or industry-wide EPDs are not acceptable.
  3. EPDs must clearly indicate the Product Flow Diagram disclosing if product fabrication is included within the "cradle-to-gate" life cycle scope (product stages A1-A3) of the EPD.
- B. Recycled Content of Steel Products: Provide documentation in accordance with the current version of ISO 14021 from the manufacturer of steel floor and roof decking products. For each product, both the post-consumer and preconsumer recycled content percentage by weight must be indicated.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store products in accordance with SDI Manual of Construction (MOC). Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
  1. Protect acoustical roof deck batt insulation to maintain insulation free of moisture.
  2. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.
- C. Locate deck bundles to prevent overloading of supporting members.

## **PART 2 - PRODUCTS**

### **2.1 STEEL DECKS**

- A. A manufacturer offering deck products to be incorporated into the work must have an evaluation report from an accredited 3rd party evaluation agency such as IAPMO and be a member of the Steel Deck Institute.

- B. A manufacturer offering deck products to be incorporated into the work must have product EPDs in accordance with the sustainability requirement listed in this specification.
- C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Verco Decking
  - 2. Vulcraft
- D. Fabrication:
  - 1. Steel Deck Panels: Fabricate panels to comply with ANSI/SDI RD-2017, C-2017, or NC-2017. Deck profile, design uncoated-steel thickness, steel grade and finish, and side-lap configuration as indicated on the structural drawings:
  - 2. Acoustical Steel Deck:
    - a. Provide deck units with manufacturer's standard perforations.
    - b. Non-cellular steel deck: Provide manufacturer's standard glass or mineral fiber sound-absorbing insulation. Provide pre-molded strips or rolls for field installation by the roofing installer.
    - c. Cellular steel deck: Provide factory installed acoustical insulation and optional spacers (if indicated in structural drawings).
  - 3. Composite Steel Deck: Fabricate composite deck panels with integral embossments or configurations to comply with ANSI/SDI C-2017.
- E. Materials
  - 1. Sheet Steel:
    - a. Uncoated Steel Sheet Shop Primed: ASTM A1008, Structural Steel (SS), Grade 40, 50, or 80 as indicated on structural drawings.
    - b. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 40, 50, or 80, and G30, G60, or G90 zinc coating as indicated on structural drawings.
- F. Finishes
  - 1. Shop applied primer: Apply manufacturer's standard baked-on, rust-inhibitive primer to top and/or bottom side(s) as indicated on structural drawings. Do not prime top side of composite decks.
    - a. Color: Manufacturer's standard gray or white as indicated.

## 2.2 ACCESSORIES

- A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

- B. Mechanical Support Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws. Size and fastening pattern as indicated.
- C. Screws for Side-Lap Fastening: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, diameter and spacing or quantity as indicated on structural drawings.
- D. Flexible Closure Strips: synthetic rubber.
- E. Column Closures, End Closures, Z-Closures, Cover Plates, and other Miscellaneous Sheet Metal Deck Accessories: Galvanized steel sheet, minimum yield strength of 33,000 psi, not less than 0.0358-inch (20 gage) design uncoated thickness of profile indicated or required for application.
- F. Pour Stops and Girder Fillers: Galvanized Steel sheet, minimum yield strength of 33,000 psi, and of thickness and profile recommended by SDI for overhang and slab depth.
- H. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch (16 gauge) thick, with factory-punched hole of 3/8-inch minimum diameter.
- I. Sump Pans: Single-piece steel sheet, 0.0747 inch (14 gauge) thick galvanized steel sheet. For drains, cut holes in the field.

## **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 of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION OF DECKS**

- A. Install deck panels and accessories in accordance with ANSI/SDI RD-2017, C-2017, or NC-2017, SDI MOC, structural drawings, installation drawings marked for field use, and requirements in this section.
- B. Place deck panels on structural supports and adjust to final position with ends aligned. Bring deck into contact with the bearing surface as required by the fastening system and attach firmly to the supports immediately after placement to form a safe working platform.
- C. Install temporary shoring before pouring concrete if required to meet strength or deflection limitations.
- D. Fasten deck panels to steel supporting members, side-laps between supports, and at perimeter edges by the means indicated.
  - 1. Locate welds as indicated and comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

2. Locate mechanical fasteners as indicated and install in accordance with fastener manufacturer's written instructions.
  3. Install PunchLok II side-lap connections using the PunchLok II tool as indicated.
- E. End Bearing: Install deck ends over supports with a minimum end bearing of 2 inches, or as indicated on the approved installation drawings with end joints as follows:
- F. End Joints: Lapped or butted per the approved installation drawings. Laps shall be 3 inches minimum at open-web steel joists or 2" at other structural supports.
- G. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
- H. Install additional reinforcement and closure pieces as specified on the structural drawings.

### **3.3 INSTALLATION OF ACCESSORIES**

- A. Deck Accessories: Install and fasten steel sheet accessories in accordance with ANSI/SDI RD-2017, C-2017, NC-2017, or SDI MOC the approved installation drawings.
- B. Roof Sump Pans: Install where indicated in architectural details in openings cut in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches apart with at least one fastener at each corner.
1. Install reinforcing members as indicated to span between supports and weld or mechanically fasten.
- C. Flexible Closure Strips: Install flexible closure strips over partitions, walls, where indicated. Install with adhesive in accordance with closure manufacturer's written instructions to ensure complete closure.
- D. Sound-Absorbing Insulation for non-cellular acoustical decks: Install into topside ribs of deck before roofing insulation is applied.

### **3.4 FIELD QUALITY CONTROL**

- A. Tests and Inspections:
1. Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck in accordance with quality-assurance inspection requirements of ANSI/SDI QA/QC.
    - a. Perform inspection of field welds and other inspections as indicated on structural drawings.
    - b. Perform inspection of PunchLok II connections to ensure that the sidelap material has been sheared and offset so the sheared surface of the male leg is visible in the cut.
    - c. Perform inspection of the sidelap screw connections to ensure that the proper size and number of screw attachments per span have been installed

between supports.

- d. Perform inspection of the support connections to ensure that the proper size and number of attachments per deck sheet have been installed. Ensure that the fasteners are installed per the manufacturer's instructions and quality assurance requirements.
- e. Inspect other attachments of deck and accessories according to manufacturer's instructions and quality assurance requirements, or per industry standards.

**END OF SECTION 053100**