

## SECTION 053100 – STEEL DECKING

### PART 1 - GENERAL

#### 1.1 SUMMARY

##### A. Section Includes:

1. Roof deck.
2. Composite floor deck.
3. Non-composite form deck.

##### B. Related Sections

1. Section 032000 – Concrete Reinforcing.
2. Section 033000 – Cast-in-Place Concrete.
3. Section 051200 – Structural Steel Framing.
4. Section 099113 – Exterior Painting.
5. Section 099123 – Interior Painting.

##### C. Reference and Industry Standards

1. The following reference standards shall be applicable to this Section:
  - a. New York City Building Code, **current** edition, as amended, inclusive of:
    - Chapter 16 Structural Design.
    - Chapter 17 Structural Tests and Special Inspections.
    - Chapter 22 Steel
  - b. The current Enterprise Green Communities (EGC) Criteria, and the current New York City Overlay.
2. Industry Standards
  - AISI (American Iron and Steel Institute)
  - ASTM (American Society for Testing and Materials)
  - AWS (American Welding Society)
  - SDI (Steel Deck Institute)
  - UL (Underwriters Laboratories)

##### D. The current NYC Overlay of the current Enterprise Green Communities Criteria:

1. Mandatory Requirements: See the NYC Overlay of 2020 EGC reference standard for full specification.
  - a. All projects must achieve compliance with the mandatory criteria measures that are applicable:

- Criterion 6.4: Healthier Material Selection
- Criterion 6.10: Construction Waste Management

## 2. Optional Project Requirements for Certification Points

- a. Additionally, rehab projects are required to achieve **55** optional points. Criteria with optional points related to this Specification Section include, but may not be limited to:

- Criterion 6.1: Ingredient Transparency for Material Health
- Criterion 6.2: Recycled Content and Ingredient Transparency
- Criterion 6.4: Healthier Material Selection
- Criterion 6.5: Environmentally Responsible Material Selection
- Criterion 6.7: Regional Materials
- Criterion 6.10: Construction Waste Management

## 1.2 ACTION SUBMITTALS

### A. Product Data:

1. Roof deck.
2. Composite floor deck.
3. Non-composite form deck.

### B. 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.

## 1.3 INFORMATIONAL SUBMITTALS

### A. Certificates:

1. Welding certificates.
2. Product Certificates: For each type of steel deck.

### B. Test and Evaluation Reports:

1. Product Test Reports: For tests performed by a qualified testing agency, indicating that power-actuated mechanical fasteners comply with requirements.
2. Research Reports: For steel deck, from ICC-ES showing compliance with the building code.

### C. Field Quality-Control Submittals:

1. Field quality-control reports.

### D. Qualification Statements: For **[welding personnel]** **[and]** **[testing agency]**.

## 1.4 QUALITY ASSURANCE

### A. Qualifications:

1. Welding Qualifications: Qualify procedures and personnel in accordance with SDI QA/QC and the following welding code:
  - a. AWS D1.3.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store products in accordance with SDI MOC3. Stack steel deck 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 in accordance with AISI S100.
- B. Fire-Resistance Ratings: Comply with ASTM E119; 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 listings of another qualified testing agency.

## 2.2 ROOF DECK

- A. Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with SDI RD and with the following:
  1. Prime-Painted Steel Sheet: ASTM A1008, Structural Steel (SS), **[Grade 33]** **[Grade 40]** **[Grade 80]** minimum, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
    - a. Color: **[Manufacturer's standard]** **[Gray]** **[White]** **[Gray top surface with white underside]**.
  2. Galvanized-Steel Sheet: ASTM A653, Structural Steel (SS), **[Grade 33]** **[Grade 40]** **[Grade 80]**, **[G60]** **[G90]** zinc coating.
  3. Galvanized- and Shop-Primed Steel Sheet: ASTM A653, Structural Steel (SS), **[Grade 33]** **[Grade 40]** **[Grade 80]**, G60 zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
    - a. Color: **[Manufacturer's standard]** **[Gray]** **[White]** **[Gray top surface with white underside]**.

4. Deck Profile: [As indicated] [Type NR, narrow rib] [Type IR, intermediate rib] [Type WR, wide rib] [Type 3DR, deep rib] [Long span].
5. Profile Depth: [As indicated] [1-1/2 inches] [2 inches] [3 inches] [4-1/2 inches] [6 inches] [7-1/2 inches].
6. Design Uncoated-Steel Thickness: [As indicated] [0.0295 inch] [0.0358 inch] [0.0474 inch] [0.0598 inch] [0.0747 inch].
7. Span Condition: [As indicated] [Simple span] [Double span] [Triple span or more].
8. Side Laps: [Overlapped] [Interlocking seam] [Overlapped or interlocking seam at Contractor's option].

## 2.3 COMPOSITE FLOOR DECK

- A. Composite Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with SDI C, with the minimum section properties indicated, and with the following:
  1. Prime-Painted Steel Sheet: ASTM A1008, Structural Steel (SS), [Grade 33] [Grade 40] [Grade 80] minimum, with top surface phosphatized and unpainted and underside surface shop primed with manufacturers' standard [gray] [or] [white] baked-on, rust-inhibitive primer.
  2. Galvanized-Steel Sheet: ASTM A653, Structural Steel (SS), Grade 33, [G30] [G60] [G90] zinc coating.
  3. Galvanized- and Shop-Primed Steel Sheet: ASTM A653, Structural Steel (SS), Grade 33, [G30] [G60] zinc coating; with unpainted top surface and cleaned and pretreated bottom surface primed with manufacturer's standard [gray] [white] baked-on, rust-inhibitive primer.
  4. Profile Depth: [1-1/2 inches] [2 inches] [3 inches] [As indicated].
  5. Design Uncoated-Steel Thickness: [0.0295 inch] [0.0358 inch] [0.0474 inch] [0.0598 inch].
  6. Span Condition: [As indicated] [Simple span] [Double span] [Triple span or more].

## 2.4 NON-COMPOSITE FORM DECK

- A. Non-composite Form Deck: Fabricate ribbed-steel sheet non-composite deck panels used as a form to comply with SDI NC, with the minimum section properties indicated, and with the following:
  1. Uncoated Steel Sheet: ASTM A1008, Structural Steel (SS), [Grade 33] [Grade 40] [Grade 80] minimum.
  2. Prime-Painted Steel Sheet: ASTM A1008, Structural Steel (SS), [Grade 33] [Grade 40] [Grade 80] minimum, with [top and] underside surface shop primed with manufacturer's standard baked-on, rust-inhibitive primer.

- a. Color: **[Manufacturer's standard]** **[Gray]** **[White]** **[Gray top surface with white underside]**.
3. Galvanized-Steel Sheet: ASTM A653, Structural Steel (SS), **[Grade 33]** **[Grade 40]** **[Grade 80]**, **[G30]** **[G60]** **[G90]** zinc coating.
4. Galvanized- and Shop-Primed Steel Sheet: ASTM A653, Structural Steel (SS), **[Grade 33]** **[Grade 80]**, G60 zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
  - a. Color: **[Manufacturer's standard]** **[Gray]** **[White]** **[Gray top surface with white underside]**.
5. Profile Depth: **[9/16 inch]** **[15/16 inch]** **[1-5/16 inches]** **[1-1/2 inches]**.
6. Design Uncoated-Steel Thickness: **[0.0149 inch]** **[0.0179 inch]** **[0.0239 inch]** **[0.0295 inch]** **[0.0358 inch]** **[0.0474 inch]** **[0.0598 inch]**.
7. Span Condition: **[As indicated]** **[Simple span]** **[Double span]** **[Triple span or more]**.
8. Side Laps: **[Overlapped]** **[Interlocking seam]** **[Overlapped or interlocking seam at Contractor's option]**.

## 2.5 ACCESSORIES

- A. 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 33,000 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. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi, of same material and finish as deck, and of thickness and profile **[indicated]** **[recommended by SDI standards for overhang and slab depth]**.
- G. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.
- H. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, **[0.0598 inch]** **[0.0747 inch]** thick, with factory-punched hole of 3/8-inch minimum diameter.
- I. 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.

- J. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck, with 3-inch-wide flanges and **[level] [sloped]** recessed pans of 1-1/2-inch minimum depth. For drains, cut holes in the field.
- K. Galvanizing Repair Paint: **[ASTM A780] [SSPC-Paint 20 or MIL-P-21035B, with dry film containing a minimum of 94 percent zinc dust by weight]**.
- L. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; 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 in accordance with deck manufacturer's written instructions.

### 3.2 INSTALLATION OF ROOF DECK

- 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: **[5/8 inch] [3/4 inch]**, nominal.
  - 2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds **[18 inches apart, maximum] [12 inches apart in Zone 1 and 6 inches apart in Zones 2 and 3, based on roof-area definitions in FM Global Loss Prevention Data Sheet 1-28] [as indicated]**.

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, at intervals not exceeding the lesser of one-half of the span or **[18 inches] [36 inches]**, and as follows:
  1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.
  2. Mechanically clinch or button punch.
  3. Fasten with a minimum of 1-1/2-inch-long welds.
- 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] [Butted] [Lapped 2 inches minimum or butted at Contractor's option]**.
- D. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and **[weld] [mechanically fasten]** flanges to top of deck. Space **[welds] [mechanical fasteners]** not more than 12 inches apart with at least one **[weld] [fastener]** at each corner.
  1. Install reinforcing channels or zees 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 in accordance with 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 in accordance with manufacturer's written instructions to ensure complete closure.

### 3.3 INSTALLATION OF FLOOR DECK

- 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: **[5/8 inch] [3/4 inch]**, nominal.
  2. Weld Spacing:
    - a. Weld edge ribs of panels at each support. Space additional welds an average of 16 inches apart, but not more than 18 inches apart.
    - b. Space and locate welds as indicated.
  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, at intervals not exceeding the lesser of one-half of the span or 36 inches, and as follows:
  1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.

2. Mechanically clinch or button punch.
  3. Fasten with a minimum of 1-1/2-inch-long welds.
- C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of **[1-1/2 inches]** **<Insert dimension>**, with end joints as follows:
1. End Joints: **[Lapped]** **[Butted]** **[Lapped or butted at Contractor's option]**.
- D. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure in accordance with SDI recommendations unless otherwise indicated.
- E. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, in accordance with SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

### 3.4 REPAIR

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint in accordance with ASTM A780 and manufacturer's written instructions.
- B. Repair Painting:
1. Wire brush and clean rust spots, welds, and abraded areas on **[both surfaces]** **[top surface]** of prime-painted deck immediately after installation, and apply repair paint.
  2. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
  3. Wire brushing, cleaning, and repair painting of bottom deck surfaces are included in *Section 099113 – Exterior Painting* and *Section 099123- Interior Painting*.
  4. Wire brushing, cleaning, and repair painting of rust spots, welds, and abraded areas of both deck surfaces are included in *Section 099113 – Exterior Painting* and *Section 099123 – Interior Painting*.

### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: **[Owner will engage]** **[Engage]** a qualified testing agency to perform tests and inspections.
- B. 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 SDI QA/QC.
    - a. Field welds will be subject to inspection.
  2. Steel decking will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.



**END OF SECTION 053100**