

SECTION 053100

STEEL DECK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Steel roof deck and accessories.
- B. Steel floor deck and accessories.
- C. Erection of steel roof deck and accessories.
- D. Erection of steel floor deck and accessories.
- E. Formed steel cant strips.
- F. Formed steel deck end forms to contain wet concrete.

1.02 RELATED SECTIONS

- A. Section 033000 - Concrete slab on grade and structural concrete slabs.
- B. Section 051200 - Structural Steel.
- C. Section 052100 - Steel Joists and Joist Girders.

1.03 REFERENCES

- A. AISI - Specification for the Design of Cold-Formed Steel Structural Members.
- B. ASTM A36 - Structural Steel.
- C. ASTM A611 - Steel, Cold-Rolled Sheet, Carbon, Structural.
- D. AWS D1.1 - Structural Welding Code.
- E. SDI - Design Manual for Composite Decks, Form Decks, Roof Decks.
- F. SSPC - Steel Structures Painting Council.

1.04 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate deck plan; gravity, wind, and shear load capacities; support locations, anchorage details, welding patterns, projections, openings and reinforcement, closure angles, and accessories. Indicate temporary shoring of deck where required for construction loads.
- C. Product Data: Submit for approval; provide deck profile characteristics and dimensions, structural properties, and finishes. Provide manufacturer's load tables for each type of deck specified.
- D. Manufacturer's Installation Instructions: Submit for record only, Indicating specific installation sequence, and special instruction.

1.05 QUALITY ASSURANCE

- A. Comply with the provisions of the following codes and standards, except as otherwise shown or specified:
 - 1. AISI "Specifications for the Design of Cold-Formed Steel Structural Members."
 - 2. AWS D1.1 "Structural Welding Code."
 - 3. SDI "Steel Deck Institute Design Manual for Composite Decks, Floor Decks and Roof Decks" and "Diaphragm Design Manual."
 - 4. Factory Mutual Engineering Loss Prevention Data Sheets 1-28 and 1-29.
 - 5. Roof Deck shall be Factory Mutual approved as qualifying for Class I Insulated Steel Roof Deck.
 - 6. Recycled Content of steel products: post-consumer recycled content not less than 25 percent.

1.06 QUALIFICATIONS

- A. Installer: Company specializing in performing the work of this Section with minimum of five years experience.
- B. Welding Work: Qualify welding processes and welding operators in accordance with the AWS "Standard Qualification Procedure."
 - 1. Deck welding in place is subject to inspection and testing. Expense of removing and replacing any portion of deck for testing purposes will be borne by the Owner if welds are found to be satisfactory. Remove work found to be defective and replace with new acceptable work.

1.07 DELIVERY, 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 deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel for Painted Finish: ASTM A611, Grade C (Deck to be painted gray).
- B. Miscellaneous Steel Shapes: ASTM A36.
- C. Deck Accessories: Minimum 20-gage galvanized sheet steel.
- D. Welding Materials: AWS D1.1.
- E. Touch-up primer: Red oxide type with gray paint for repair of damaged surfaces.

2.02 FABRICATION

- A. General: Form deck units in lengths to span 2 or more support spacings, with nested 2 inch end laps and nested side laps, unless otherwise shown or specified. Minimum end bearing is 4 inches unless otherwise noted. Provide deck configurations complying with SDI "Basic Design Specifications," and as specified.
- B. Metal roof deck shall be wide rib, Type B, 20-gauge, 1-1/2 inch deep, 36 inches wide (min.) painted sheet carbon steel with a minimum yield point of 33,000 psi. Maximum top opening in deck shall be 2-1/2 inches. Ribs shall be a maximum of 6 inches on center. Deck shall have a minimum section modulus of $(0.234) \text{ in}^3$ and minimum moment of inertia of $(.201) \text{ in}^4$ and have a shear capacity greater than 225 plf. Fasten decking to steel beams, bar joists and edge support in a 36/5 pattern of 5/8" puddle welds. Provide #12 TEK at 12" on-center spacing at edges.
- C. Floor deck shall be non-composite wide rib 24-gauge, 9/16 inch deep painted sheet carbon steel with a minimum yield point of 60,000 psi. Deck shall have minimum section modulus of $.057 \text{ in}^3$ and minimum moment of inertia shall be $.010 \text{ in}^4$. Sections shall have male and female interlocking side joints that can be crimped from the top. Average widths of metal deck ribs to receive concrete shall not be less than 4 inches. Elevated slab reinforcement to be WWM 6x6xW1.4xW1.4. Fasten decking to steel beams, bar joists and edge support in a 36/5 pattern of 5/8" puddle welds with welded washers.

- D. Provide all necessary special metal plates, closures and stops. Fabricate metal closure strips of not less than 20 gauge sheet metal of the same quality and finish as the deck. Form to the configuration required to provide tight fitting closures at edges of roof deck to provide for uniform support of blocking; and as required for a complete job.
- E. Provide continuous galvanized screed angles at perimeter of all concrete filled deck, unless otherwise indicated. The gauge shall be sufficient to support the concrete during the concreting operation, but not thinner than 14 gauge, and of the same quality as the deck units.
- F. Metal Deck shall be supplied free of amounts of lubricants or oils which would significantly impair the adhesion of spray applied fireproofing.

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 deck and accessories in accordance with SDI Design Manual for Composite Decks, Form Decks, Roof Decks; manufacturer's instructions and shop drawings.
- B. Bear deck on steel supports with 3 inch minimum bearing. Align and level.
- C. Position deck on supporting steel framework and adjust to final position with ends bearing on supporting members and accurately aligned end-to-end before being permanently fastened. Lap ends 2 inches minimum.
- D. Do not stretch nor contract the side lap interlocks.
- E. Roofs with a slope of 1/4 inch or more per foot shall be erected beginning at the low side to insure that end laps are shingle fashion.
- F. Fastening Deck Units: Permanently fasten deck units to steel supporting members by not less than 5/8" diameter puddle welds or elongated welds of equal strength, see design drawings for spacing.
 - 1. Comply with AWS requirements and procedures for manual shielded metal-arc welding, the appearance and quality of welds, and the methods used in correcting welding work.
 - 2. Lock side laps between adjacent deck units as shown on design drawings.

3. Use weld washers for form deck for decking less than 20 gage.
- G. Install 6 inch minimum wide sheet steel cover plates, of same thickness as deck, where deck changes direction. Weld 12 inches o.c. maximum.
- H. To contain wet concrete, install stops at slab edge upturned to top surface of slab. Provide stops of sufficient strength to remain stationary under wet concrete without distortion.
- I. Cutting and Fitting: Deck erector shall cut all openings in roof deck which are shown on the erection drawings. Cut and fit deck units and accessories around other work projecting through or adjacent to the decking. Provide neat, square and trim cuts. Openings not shown on the erection drawings shall be cut (and reinforced, if necessary) by the trades requiring the openings.
- J. Do not use cutting torches.
- K. Closure Strips:
 1. Install sheet steel closure strips and angle flashings at all open uncovered ends and edges of deck, and in voids between deck and walls, columns, openings and other construction.
 2. Weld into position to provide complete deck installation.
- L. Place metal cant strips in position and weld.

3.03 TOUCH-UP PAINTING

- A. Wire brush, clean, and paint scarred areas, welds, rust spots on top and bottom surfaces of units and supporting steel members.
- B. Touch-up shop painted surfaces with the same paint used in the shop, as recommended by the deck manufacturer.
- C. In areas where touch-up painted surfaces are to be exposed, apply the paint to blend into the adjacent surfaces in a manner that will minimize visual discontinuity in the coatings.

3.04 PROTECTION

- A. Coordinate and cooperate with structural steel erector in locating deck bundles to prevent overloading of structural members.
- B. Do not use deck for storage nor working platforms until permanently secured in position.
- C. Do not exceed load capacity of deck with construction loads.
- D. Before roofing, check welds and reweld all broken and damaged welds.

END OF SECTION