

## SECTION 05 3113

### STEEL FLOOR DECKING

#### PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS: The General Conditions, any Supplementary General Conditions and Division 1, General Requirements, are hereby made a part of this Section as fully as if repeated herein.
- 1.2 SECTION INCLUDES
- A. Metal Floor Decking for floor construction.
- 1.3 RELATED WORK
- A. Section 05 1200 – Structural Steel Framing
- B. Section 05 4000 – Cold Formed Metal Framing
- 1.4 QUALITY ASSURANCE
- A. Erector/Installer's Qualifications: Experienced in the installation and/or erection of metal decking and accessories; approved for the installation of the decking by the manufacturer of the decking.
- B. Qualification of welding:
1. Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure."
- C. Deck Types and Acceptance Manufacturers:
1. United Steel Deck and Vulcraft for composite metal deck as below listed. Other manufacturers will be acceptable providing they meet specification requirements.
  2. For 3" composite metal floor deck:
    - USD - Section -3" Lok-Floor - 20 Gauge
    - VULCRAFT - Section VLI - 20 Gauge
  3. Composite metal floor deck shall have solid level bearing at steel supports.
- 1.5 REFERENCES
- A. Steel Deck Institute (SDI):
- "Steel Roof Deck Design Manual." (Deck less than 1-1/2 inch depth.)
- B. American Iron and Steel Institute (AISI):
- AISI-02 - "Specifications for Design of Light Gauge Cold-Formed Steel Structural Members."
- C. American Welding Society:

- (AWS) D1.3 - "Structural Welding Code-Sheet Steel"
- D. ASTM – American Society for Testing & Inspection
- A-653 - "Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy-Coated Galvannealed) by the Hot-Dip Process.
  - A-780 – "Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings"
  - A-924 – "Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process"

## 1.6 SUBMITTALS

### A. Manufacturer's Data, Metal Floor Decking:

1. For information only, submit two copies of manufacturer's specifications and installation instructions for each product specified. Include manufacturer's certification as may be required to show compliance with these specifications. Indicate by transmittal form that a copy of each instruction has been distributed to the installer.
- B. Shop Drawings: Show complete erection layouts, connection details, welds, and anchorages. Indicate framing and support locations, dimensions and marking of decking sections to correspond with installation sequence and procedure; show connections with adjoining construction and materials, types of welds and locations of all holes and/or openings in decking.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. The galvanized composite steel floor deck units and all miscellaneous angles and plates shall be formed from steel sheets conforming to ASTM A-653, Structural Quality, Grade 33.
- B. The steel shall have received, before being formed, a metal protective coating of zinc conforming to ASTM A-924, designation G60 for interior floor decks and G90 for exterior floor decks and to Federal Specifications QQ-S-775C, Type 1, Class e.
- C. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with ASTM A780-80.
- D. Shear Connectors: Headed stud type, ASTM A-108, Grade 1015 or 1020, cold finished carbon steel; with dimensions complying with AISC Specifications.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Properties of Sections: Compute the properties of metal floor deck sections on the basis of the effective design width as limited by the provisions of the AISI Specifications,

Section 2.3.1 and 2.3.5. Provide not less than the deck section properties shown, including section modulus and moment of inertia per foot of width.

B. Design Criteria:

1. Allowable Deflection: Design and fabricate deck for maximum deflection of 1/360 of the clear span under the total uniform super-imposed and live load.
2. Reports of test conducted as set forth by AISI Specifications may be submitted in lieu of calculations of strength, safe load carrying capacity, deflection or other properties.
3. Composite floor unit (combined steel and concrete sections) shall be capable of supporting concentrated loadings plus 50% impact factor. Where more than 1' width of composite section is required to carry this loading, the lateral distribution characteristics must be demonstrated by full scale simple span load tests, or by rational analysis associated with subject tests.
4. The ability of the composite floor system to carry repetitive impact loadings shall be demonstrated by tests on sections incorporating the mechanical interlock feature to be used in the construction.

## 2.3 FABRICATION

A. Composite steel floor deck units:

1. Form deck units in lengths to span 3 or more support spacings, with flush ends and interlocking side laps.
2. Floor units shall be formed with integral locking lugs to provide a mechanical lock between concrete and steel.
3. Fabricate open-beam metal floor deck units of steel sheets with a fluted section having interlocking side laps; of the depth and width shown.
4. Fabricate metal cover plates for end-abutting floor deck units of not less than same thickness as decking. Form to match contour of deck units and approximately 6" wide.
5. Layout deck units to maintain a minimum of 3 continuous spans in all areas.

B. Metal closure strips:

1. Fabricate metal closure strips for openings between floor decking and other construction, of sheet steel of the quality as the deck units. Form to the configuration required to provide tight fitting closures at open ends of cells or flutes and sides of the floor decking. Fabricate 16 gauge screed angles as shown on the drawings.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Examine the areas and conditions under which metal decking is to be installed and provide written notification of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

## 3.2 INSTALLATION

- A. General: Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings, and as specified herein. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and 2" minimum bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks. Place deck units flat and square and provide solid level bearing at steel supports and secured to adjacent framing without warp or excessive deflection. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.
1. Do not use floor deck units for storage or working platforms until permanently secured in position.
- B. Fastening deck units: Fasten composite deck units to steel supporting members by not less than 3/4" diameter fusion welds, spaced not more than 12" o.c. at supports. 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. Button punch interlocking side laps of adjacent deck units between supports, at intervals not exceeding 30" o.c.
- C. Cutting and fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking, as shown on the drawings.
- D. Reinforcement at openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking and support of other work shown. Reinforce decking around openings 6" to 12" in size by means of flat galvanized steel sheet placed over opening on top of decking and fusion welded to surface of deck. Provide 18 gauge steel sheet of same quality as deck units at least 12" wider and longer than opening. Space welds at each corner at not more than 12" o.c. along each side.
- E. Install 6" minimum wide sheet steel cover plates, of same thickness as decking where deck changes direction. Puddle weld 12" on center maximum.
- F. Shear connections: Weld shear connectors to supports through decking units in accordance with manufacturer's instructions. Do not weld shear connectors through two layers (lapped ends) of decking units. Weld only on clean, dry deck surfaces.
- G. Hanger slots or clips: Provide UL approved punched hanger slots between flutes of lower element where deck units are to receive hangers for support of ceiling construction, air ducts, diffusers, or lighting fixtures. Hanger clips designed to clip over male side joints of deck units may be used instead of hanger slots. Locate slots or clips at not more than 24" o.c. in both directions, not over 9" from walls at ends, and not more than 12" from walls at sides, unless otherwise shown. Provide manufacturer's standard hanger attachment devices. Location: at suspended ceilings.
- H. Closure strips: Provide metal closure strips at all open uncovered ends and edges of

decking, and in the voids between decking and other construction. Weld into position to provide a complete decking installation. Weld screed angles to spandrel beams for complete perimeter forming.

- I. Touch-up painting: After decking installation, wire brush, clean and paint scarred areas, welds and rust spots on the top and bottom surfaces of decking units and supporting steel members. Touch-up galvanized surfaces with the same type of shop paint used on adjacent surfaces per ASTM A780-80. Touch-up painted surfaces with the same type of shop paint used on adjacent surfaces. In areas where shop-painted surfaces are to be exposed, apply touch-up paint to blend into the adjacent surfaces.

### 3.3 INSPECTION

- A. The Owner shall employ an inspection agency approved by the engineer to inspect the field welding of the metal floor decking to the supporting structure. The cost of all the tests and inspections are to be borne by the Owner.
- B. See spec section 05 1200 for further requirements.

END OF SECTION