SECTION 05315

METAL FLOOR DECK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes
   1. Metal floor deck and accessories as shown or specified.

B. Related Sections
   1. Welded steel stud shear connectors - Section 05120.
   2. Field painting of metal deck - Division 9.
   3. Core drilling of deck, providing of inserts, taping of abutting end cells, grounding of deck and providing of electrical fittings – Division 16.

1.2 SUBMITTALS

A. Furnish submittals for items that are identified in this Section by a different typeface and a bracketed code (e.g., *Item [L]*). Refer to Section 01340 for definition of codes for types of submittals and administrative requirements governing submittal procedure. Additional submittal requirements pertaining to this Section are specified under this Article.

B. *Detailed Shop Drawings [D]:* Submit to show unit sheet layout with openings, cut outs, closures and reinforcing, finish or paint and shear stud layout.
   1. Manufacturer's Product Data: Submit for deck unit profile, gage, section properties, and allowable diaphragm shear for specific deck and fastening method proposed. Include certification of minimum thickness of each sheet used.

1.3 DELIVERY, STORAGE AND HANDLING

A. Properly store, handle and erect material. Replace damaged material before erection, at no additional cost to Owner.

B. Properly store and transport galvanized steel per American Galvanizers Association's recommended procedures to prevent wet storage stain.

1.4 PROJECT CONDITIONS

A. Do not use placed units as storage or working surface until after units have been permanently fastened in position. Do not damage or overload floor deck during construction period.

PART 2 PRODUCTS

2.1 MATERIALS

A. Wherever specific gage of steel sheet is specified in this Section, followed by minimum thickness in inches, minimum inch thickness shall govern based on bare, uncoated sheet. There shall be no tolerance under specified minimum inch thickness. Use the following:
   1. Galvanized steel sheet, ASTM A 446, Grade A, hot-dipped galvanized to coating designation G-60, minimized spangle, chemical treatment per ASTM A 525.
      a. Shop paint bottom surface with manufacturer's standard gray primer of minimum 0.5 mil dry film thickness.
      b. Acoustic deck, composite deck, and deck receiving fireproofing shall be galvanized.

B. Steel angles shall be hot rolled carbon steel ASTM A 36.
   1. Hot-dipped galvanized with minimum zinc coating of 2 ounces per square foot per ASTM A 123.

C. Fasteners: For securement of metal floor decks:
   1. Powder-actuated, drive pin type adequate to penetrate into steel members. Fasteners and low-velocity powder-actuated tools by:
      a. Hilti Fastening Systems, Inc.
      b. Ramset Fastening System.
   2. Self-drilling, self-tapping, 12-24 support fasteners with hex washer head.
      a. ITW Buildex.
   3. Stitch, 10-16 side fasteners with hex washer head and pilot point:
      a. ITW Buildex.
   4. Air-actuated, adequate to penetrate into steel members. Fasteners and low-velocity air-activated tools by:
      a. Pneutek, Inc.
      b. Hilti, Inc.

2.2 FABRICATION AND MANUFACTURE

A. Provide floor deck units to span at least three span lengths. Where not practical, provide units of length to span two spans, but only where so approved on shop drawings. Fabricate deck and accessories per AISI "Specifications for Design of Cold-Formed Steel Structural Members", except where specific requirements are specified.

B. Floor Deck Units
   1. 1-1/2 Inch Deep Deck. Fabricate of 18 gage (design thickness is .0478 inch) specified steel sheet.
      a. Non-Composite Type decks specified below are referred to by their normal, upright, trade name. Deck shall be installed in inverted position and prime paint shall not be in contact with concrete.
         1) Bowman Metal Deck, Cyclops Corporation "B".
         2) Consolidated Systems Inc. "B".
         3) Epic Metals Corporation "B".

4) Roll Form Products, RFP Inc. “B16RD”.
5) United Steel Deck Inc. “B”.
6) Vulcraft, Nucor Corporation “1.5B”.
7) Wheeling Corrugating Company, Wheeling-Pittsburgh Steel Corporation “BW”.

C. Accessories
1. Metal closures for openings between floor deck and other construction shall be of same metal and finish as floor deck units, 18 gage for end closures and 20 gage for other conditions. Fabricate to profile to provide tight-fitting closures.
2. Tape closures shall be pressure-sensitive tape as standard with floor deck manufacturer, for sealing abutting ends of units.
3. Hanger tabs shall not be permitted.

D. Shear Studs
1. Install per Section 7 of AWS D1.1 for “Stud Welding”; of length and diameter noted.
a. Erico Products, Inc. “Blue Arc Shear Connector Studs”.
b. KSM “Shear Connectors”.
c. Nelson “Fluxed Shear Connector Studs”.
d. Tru-Fit Products Corporation “Tru-Weld Type CA”.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install metal floor deck in accordance with manufacturer’s published instructions and this Section.

B. Supporting members shall be properly installed and fastened before placing floor deck units. Adjust to final position with ends bearing on supporting members, ends of adjacent units staggered, and accurately aligned end to end, before fastening permanently. Lap end joints 2 inches minimum over support. Lap side joints by nesting with adjacent units. Place and align floor deck units to maintain required number of units shown on approved shop drawings, and to prevent stretching or contracting of side-laps. Butt end joints.

C. Wire-brush tops of structural members to remove rust and scale, before placing deck, to prevent rust and scale from interfering with secure welding of shear connectors.

D. Lay out floor deck units so that bottom of deck bears on supporting steel to receive shear stud connectors. At composite girders, deck flute shall bear and be aligned parallel to girder web or deck shall be discontinued each side of web (but still bearing minimum of 2 inches on girder flange) to allow welding of shear stud connectors.

E. Secure floor deck units to framing by electric arc welding, per AWS D1.1. Provide one inch long fillet welds, 5/8 inch diameter puddle welds, or equivalent, spaced 12-inches maximum on centers at each supporting member. Provide one inch long welds to secure rib edges together at each support, at mid-point between supports, but at not more than 3 feet on center. Do not

combine deck welds and overlap rib welds. Use true fusion welds, not burning or sticking type welds.

F. Alternately, at Contractor's option, secure roof deck to framing by specified fasteners, spaced 12 inches maximum on center at each supporting member. Provide No. 12 self-tapping screws to secure nested rib edges together, or use specified fasteners; plate at each support and at mid-point between supports but at not more than 3 feet on center between supports.

G. Apply pressure-sensitive tape over joints of abutting floor deck units, to prevent flow of mortar through joints.

H. Provide holes in floor deck for passage of pipes, duct and structural supports, equipment and other openings, and similar construction. Furnish and install steel angle framing at two sides of openings where structural capacity of floor deck is impaired by cutting of deck, where building framing is not provided. Use angles 18 inches longer than opening width, placed at right angles to deck ribs, welded to bottom of each rib.

I. Provide metal closures at open, uncovered ends and edges of floor deck, welded in place, to provide rigid installation. In addition, provide metal closures in voids between metal floor deck units and top of walls and partitions where shown on Drawings.

J. Install floor deck to provide an even top surface, ready to receive concrete fill. Trim deck to fit closely to adjacent construction, and force lap joints into tight contact. Installation shall prevent flow of concrete mortar through floor deck joints.

K. SHEAR STUDS: Install per Section 7 of AWS D1.1 for "Stud Welding". Provide and install shear studs on steel members by welding through floor deck, of sizes and in locations shown. Install shear studs using an electric stud welding system, and equipment, recommended by stud manufacturer, modified as follows. Minimum power for welding shall be 2000 amperes. System shall permit only one stud gun to operate at one time from power source, shall allow power source to regain full power between welds, and shall time each welding cycle automatically.

L. Clean surfaces to receive shear studs, free from dirt, loose rust, oil, excessive mill scale, paint and other materials or contaminants that would cause defective welds. Use wire brushing, sand blasting, grinding or other suitable cleaning methods.
   1. Install shear studs under conditions conducive to formation of sound welds. Do not weld to steel shapes when steel is less than 20 degF, nor when steel surface is wet or exposed to rain or snow. Preheat steel surfaces to 100 degF minimum.

3.2 REPAIR / RESTORATION

A. Wire-brush, clean and touch-up-paint scarred areas on top and bottom surfaces of deck to leave deck in good condition ready for later construction. Scarred areas include welds, weld scars, abraded surfaces, bruises and rust spots. Use zinc-rich paint on galvanized surfaces. Use rust-inhibitive prime paint, on painted surfaces, of same kind as used in the shop. At phosphatized finished surfaces, wire-brush and leave ready for concrete placement.

3.3 FIELD QUALITY CONTROL

A. All field quality control requirements shall be completed prior to placement of concrete.

B. Examine placed deck for tears, dents or other damage that may compromise structural integrity of slab system. Report damage to Registered Design Professional for determination of any required repairs.

C. Examine air-actuated fasteners to insure steel floor deck is properly clamped to support steel. Verify fastener nail head standoff is within manufactures accepted tolerance. Replace under-driven and over-driven fasteners with adjacent properly installed fasteners.

D. Shear connector welds shall be inspected and tested according to AWS D1.1. Bend tests shall be performed on all studs where visual inspection reveals less than 360-degree flash around base of stud. Remove and replace all work not in conformance with code provisions.

3.4 CLEANING

A. Upon completion of floor deck installation, clean top and bottom surfaces of deck to be free from mud, dirt, weld spatters and other contaminants to leave deck in good condition ready for later construction.

END OF SECTION

Revision History	
Date	**Rev. No.**
A	0
B	0
C	0
D	0
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