

**SECTION 05 36 00  
COMPOSITE METAL DECKING**

SPEC WRITER NOTES:

1. Use this section only for NCA projects.
2. Delete between // ---- // if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section specifies material and services required for installation of composite steel decking including // shear connector studs and // miscellaneous closures required to prepare deck for concrete placement as shown and specified.

**1.2 RELATED WORK**

- A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES.

**1.3 DESIGN REQUIREMENTS**

- A. Design steel decking in accordance with American Iron And Steel Institute publication "Specifications for the Design of Cold Formed Steel Structural Members", except as otherwise shown or specified.
- B. Design all elements with the latest published version of applicable codes.

**1.4 SUSTAINABILITY REQUIREMENTS**

- A. Materials in this section may contribute towards contract compliance with sustainability requirements. See Section 01 81 11, SUSTAINABLE DESIGN REQUIRMENTS, for project // local/regional materials, // low-emitting materials, // recycled content, // \_\_\_\_\_// requirements.

**1.5 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings: Prepare shop and erection drawings showing decking unit layout, connections to supporting members, and information necessary to complete the installation as shown and specified, including supplementary framing, cant strips, cut openings, special jointing or other accessories. Show welding, side lap, closure, deck reinforcing and closure reinforcing details. Show openings required for work of other trades, including openings not shown on structural drawings.

Indicate where temporary shoring is required to satisfy design criteria.

- C. Manufacturer's Literature and Data: Indicate steel decking section properties and specifying structural characteristics as specified herein.
- D. Manufacturer's written recommendations for:
  - 1. Shape of decking section to be used.
  - 2. Cleaning of steel decking prior to concrete placement.
- E. Test Report: Verify structural characteristics of composite concrete and steel decking system.
- F. Test Report: Verify stud base qualification.
- G. Submit welding power setting recommendation by shear stud manufacturer.
- H. Shear Stud Layouts: Submit drawings showing the number, pattern, spacing and configuration of the shear studs for each beam and girder.
- I. Certification: For each type and gauge of metal deck supporting concrete slab or fill, furnish certification of the specified fire ratings. Certify that the units supplied are U.L. listed as a "Steel Floor and Form Unit".

#### **1.6 QUALITY ASSURANCE**

##### SPEC WRITER NOTES:

- 1. Delete below when UL listed floor deck units not required. Review required ratings with Architect. Confirm locations for ratings and where deck will need spray applied fireproofing.
- A. Underwriters' Label: Provide metal floor deck units listed in Underwriters' Laboratories "Fire Resistance Directory", with each deck unit bearing the UL label and marking for specific system detailed.
- B. Pre-Installation Conference: Convene a meeting on site, after submittals are received and approved but before any work, to review drawings and specifications, submittals, schedule, manufacturer instructions, site logistics and pertinent matters of coordination, temporary protection, governing regulations, tests and inspections; participants to include RE/COR and all parties whose work is effected or related to the work of this section.

#### **1.7 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

## SPEC WRITER NOTES:

1. Remove reference citations that do not remain in Part 2 or Part 3 of edited specification.
2. Verify and make dates indicated for remaining citations the most current at date of submittal; determine changes from date indicated on the TIL download of the section and modify requirements impacted by the changes.

## B. American Iron and Steel Institute (AISI):

Specification and Commentary for the Design of Cold-Formed Steel Structural Members (Latest Edition)

## C. American Society of Testing and Materials (ASTM):

A36/A36M-12 Carbon Structural Steel

A108-07 Steel Bars, Carbon, Cold Finished, Standard Quality

A653/A653M-11 Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process

A780/A780M-09 Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings

## D. American Institute of Steel Construction (AISC):

Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design (Latest Edition)

Load and Resistance Factor Design Specification for Structural Steel Buildings (Latest Edition)

## E. American Welding Society (AWS):

D1.1 Structural Welding Code - Steel

D1.3 Structural Welding Code - Sheet Steel

## F. Military Specifications (Mil. Spec.):

MIL-P-21035B Paint, High Zinc Dust Content, Galvanizing Repair

**PART 2 - PRODUCTS**

## SPEC WRITER NOTES:

1. For galvanizing treatment use coating class G60 for normal conditions, and G90 for extreme exposure (salt air, etc.)

**2.1 MATERIALS**

A. Steel Decking and all Flashings: ASTM A653.

B. Galvanizing: ASTM A653, G60, Grade 33.

- C. Shear connector studs: ASTM A108, Grades 1015-1020.
  - 1. Yield: Minimum 350 Mpa (50,000 psi).
  - 2. Tensile strength: Minimum 400 Mpa (60,000 psi)
  - 3. Reduction of area: 50 percent minimum
  - 4. Studs of uniform diameter; heads concentric and normal to shaft; stud after welding free from any substance or defect which would interfere with its function as a shear connector.
  - 5. Do not paint or galvanize studs.
  - 6. Provide stud size(s) as shown on drawings.
  - 7. Studs must be manufactured by a company normally engaged in the manufacturer of shear studs and installation equipment.
- D. Galvanizing Repair Paint: Mil. Spec. MIL-P-21035B.
- E. Miscellaneous Steel Shapes: ASTM A36.
- F. Welding Electrode: E60XX minimum.
- G. Sheet Metal Accessories: ASTM A653, galvanized, unless noted otherwise. Provide accessories of every kind required to complete the installation of metal decking in the system shown. Finish sheet metal items to match deck including, but not limited to, the following items:
  - 1. Metal Cover Plates: Provide for end-abutting deck units, to close gaps at changes in deck direction, columns, walls and openings; same quality as deck units but not less than 1.3 mm (18 gauge) sheet steel.
  - 2. Continuous Sheet Metal Edging: Provide at openings; same quality as deck units but not less than 1.3 mm (18 gauge) steel.
  - 3. Metal Closure Strips: Provide for openings between decking and other construction, of not less than 1.3 mm (18 gauge) sheet steel of the same quality as the deck units. Form to the configuration required to provide tight-fitting closures at open ends of flutes and sides of decking.
  - 4. Seat Angles for Deck: Provide where a beam does not frame into a column.

## 2.2 REQUIREMENTS

- A. Steel decking depth, gage, and section properties to be as shown. Provide edges of deck with vertical interlocking male and female lip providing for a positive mechanical connection.

### SPEC WRITER NOTES:

- 1. For high seismic area, consider using wedge anchors or slot anchors instead of light duty hanger.

- B. Steel decking units to include an integral system which provides a simple point of attachment for light duty hanger devices for flexibility for attaching hangers for support of acoustical, lathing, plumbing, heating, air conditioning and electrical items.

**PART 3 - EXECUTION**

**3.1 ERECTION**

- A. Do not start installation of metal decking until corresponding steel framework has been plumbed, aligned and completed and until temporary shoring, where required, has been installed. Remove any oil, dirt, paint, ice, water and rust from steel surfaces to which metal decking will be welded.
- B. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.
- C. Erect steel deck in accordance with manufacturer's printed instructions.
- D. Ship steel deck units to project in standard widths and cut to proper length.
- E. Provide steel decking in sufficient lengths to extend over 3 or more spans, except where structural steel layout does not permit.
- F. Place steel decking units on supporting steel framework and adjust to final position before being permanently fastening. Bring each unit to proper bearing on supporting beams. Place deck units in straight alignment for entire length of run of flutes and with close registration of flutes of one unit with those of abutting unit. Maximum space between ends of abutting units is 13 mm (1/2 inch). If space exceeds 13 mm (1/2 inch), install closure plates at no additional cost to Government.
- G. Ceiling hanger loops, if used, must be flattened or removed to obtain bearing of units on structural steel.

SPEC WRITER NOTES:

- 1. All UL fire tests for rated floors are run with welded side laps (not screws). Welded side laps may be mandatory in seismic areas.

H. Fastening Deck Units:

- 1. Fasten floor deck units to steel supporting members by not less than 16 mm (5/8 inch) diameter puddle welds.

2. Tack weld or use self-tapping No. 8 or larger machine screws located as indicated for fastening end closures. Only use welds to attach longitudinal end closures.
  3. Weld side laps and perimeter edge as indicated.
- I. Welding to conform to AWS D1.3 and done by competent experienced welding mechanics.
- J. Areas Scarred during Erection - Galvanizing Repairs: Comply with ASTM A780.
- K. Cutting and Fitting:
1. Cut all metal deck units to proper length in the shop prior to shipping.
  2. Field cutting by the metal deck erector is restricted to bevel cuts, notching to fit around columns and similar items, and cutting openings that are located and dimensioned on the structural drawings.
  3. Other penetrations shown on the approved metal deck shop drawings but not shown on the structural drawings are to be located, cut and reinforced by the trade requiring the opening.
  4. Make all cuts neat and trim using a metal saw, drill or punchout device; cutting with torches is expressly prohibited.
  5. Do not make any cuts in the metal deck that are not shown on the approved metal deck drawings. If an additional opening not shown on the approved shop drawings is required, submit a sketch, to scale, locating the required new opening and any other openings and supports in the immediate area. Do not cut the opening until the sketch has been reviewed and accepted by the RE/COR. Provide any additional reinforcing or framing required for the opening at no cost to the Government. Failure to comply with these requirements is cause for rejection of the work and removal and replacement of the affected metal deck.
  6. Reinforcement at Openings: Provide additional metal reinforcement and closure pieces as required for strength, continuity of decking and support of other work shown.
- L. Installation of shear connector studs through previously installed metal deck to conform to AWS D1.1, Section 7, except all studs will be installed with automatically timed welding equipment and as specified below:

1. Do not place reinforcing steel temperature mesh or other materials and equipment which will interfere with stud installation on steel deck until shear connector studs are installed.
2. Steel deck sheets must be free of oil, rust, dirt, and paint. Release water in deck's valley so that it does not become entrapped between deck and beam. Surface to which stud is to be welded must be clean and dry.
3. Rest metal deck tightly upon top flange of structural member with bottom of deck rib in full contact with top of beam flange.
4. Weld studs only through a single thickness of deck. Place decking so that a butt joint is obtained. Place studs directly over beam web, where one row of studs are required.
5. Ferrules specially developed for the weld-through technique must be used; provide ferrules appropriate for size of studs used; remove ferrules after welding.
6. Submit report of successful test program for stud base qualification as required by AWS D1.1, Appendix K.

### **3.2 CLEANING**

- A. Clean deck in accordance with manufacturer's recommendation before concrete placement.

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