SECTION 05 30 00

STEEL DECKS
07/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI SG-913	(1991) LRFD Cold-formed Steel Design Manual
AISI SG03-3	(2002) Cold-Formed Steel Design Manual Set

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2008) Structural Welding Code - Steel
AWS D1.3	(1998) Structural Welding Code - Sheet Steel

ASTM INTERNATIONAL (ASTM)

ASTM A 1008/A 1008M	(2008a) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardened
ASTM A 653/A 653M	(2007) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 780	(2009) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A 792/A 792M	(2008) Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

STEEL DECK INSTITUTE (SDI)

SDI 30	(2001) Design Manual for Composite Decks, Form Decks, and Roof Decks
SDI DDMO3	(3rd Edition) Diaphragm Design Manual
SDI DDP	(1987; R 2000) Deck Damage and Penetrations
SDI MOC2	(2006) Manual of Construction with Steel Deck

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 20	(2002; E 2004) Paint Specification No. 20 Zinc-Rich Coating Type I Inorganic and Type II Organic

UNDERWRITERS LABORATORIES (UL)

UL 209	(2005; Rev thru May 2007) Cellular Metal Floor Raceways and Fittings

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fabrication Drawings; A/E

SD-03 Product Data

Accessories; A/E

Deck Units; A/E

SD-04 Samples

Metal Roof Deck Units; A/E

SD-05 Design Data

Deck Units; A/E

Submit manufacturer's design calculations, or applicable published literature for the structural properties of the proposed deck units.

SD-07 Certificates

Deck Units; A/E

Welder Qualifications; A/E

1.3 QUALITY ASSURANCE

1.3.1 Deck Units

Furnish deck units and accessory products from a manufacturer regularly engaged in manufacture of steel decking. Provide manufacturer's certificates attesting that the decking material meets the specified requirements.

1.3.2 Qualifications for Welding Work

Submit qualified Welder Qualifications in accordance with AWS D1.1/D1.1M and AWS D1.3.

1.3.3 Regulatory Requirements

1.3.4 Fabrication Drawings

Show type and location of units, location and sequence of connections, bearing on supports, methods of anchoring, attachment of accessories, adjusting plate details, size and location of holes to be cut and reinforcement to be provided, the manufacturer's erection instructions and other pertinent details.

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver deck units to the site in a dry and undamaged condition. Store and handle steel deck in a manner to protect it from corrosion, deformation, and other types of damage. Do not use decking for storage or as working platform until units have been fastened into position. Exercise care not to damage material or overload decking during construction. Must not exceed the design live load. The maximum uniform distributed storage load. Stack decking on platforms or pallets and cover with weathertight ventilated covering. Elevate one end during storage to provide drainage. Maintain deck finish at all times to prevent formation of rust. Repair deck finish using touch-up paint. Replace damaged material.

1.5 DESIGN REQUIREMENTS FOR ROOF DECKS

1.5.1 Properties of Sections

Properties of metal roof deck sections must comply with engineering design width as limited by the provisions of AISI SG-913.

1.5.2 Allowable Loads

Indicate total uniform dead and live load for detailing purposes.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Steel Sheet

Flat rolled carbon steel sheets of structural quality, of gage as indicated on the drawings, meeting the requirements of AISI SG03-3.

2.1.2 Steel Coating

ASTM A 653/A 653M designation G90 galvanized, or ASTM A 792/A 792M designation AZ55, aluminum-zinc alloy. Apply coating to both sides of sheet. Conform to UL 209 for coating on decking provided as wire raceways.

2.1.3 Galvanizing Repair Paint for Roof Decks

Provide a high zinc-dust content paint for regalvanizing welds in galvanized steel and shall conform to ASTM A 780.

2.2 ACCESSORIES

Provide accessories of same material as deck, unless specified otherwise. Provide manufacturer's standard type accessories, as specified.

2.2.1 Adjusting Plates

Provide adjusting plates, or segments of deck units, of same thickness and configuration as deck units in locations too narrow to accommodate full size units. Provide factory cut plates of predetermined size where possible.

2.2.2 End Closures

Fabricated of sheet metal by the deck manufacturer. Provide end closures minimum 0.028 inch thick to close open ends at parapets, end walls, eaves, and openings through deck.

2.2.3 Sheet Metal Collar

Where deck is cut for passage of pipes, ducts, columns, etc., and deck is to remain exposed, provide a neatly cut sheet metal collar to cover edges of deck. Do not cut deck until after installation of supplemental supports.

2.2.4 Cover Plates

Sheet metal to close panel edge and end conditions, and where panels change direction or butt. Polyethylene-coated, self-adhesive, 2 inch wide joint tape may be provided in lieu of cover plates on flat-surfaced decking butt joints.

2.2.5 Roof Sump Pans

Sump pans must be provided for roof drains and must be minimum 0.075 inch thick steel, recessed type. Shape sump pans to meet roof slope by the supplier or by a sheet metal specialist. Provide bearing flanges of sump pans to overlap steel deck a minimum of 3 inch. Shape, size, and reinforce the opening in bottom of the sump pan to receive roof drain.

2.2.6 Column Closures

Sheet metal, minimum 0.0358 inch thick or metal rib lath.

2.2.7 Access Hole Covers

Sheet metal, minimum 0.0474 inch thick.

2.2.8 Mechanical Fasteners

Provide mechanical fasteners, such as powder actuated or pneumatically driven fasteners, for anchoring the deck to structural supports and adjoining units that are designed to meet the loads indicated. Provide positive locking-type fasteners standard with the Steel Deck Institute and the steel deck manufacturer, as approved by the Contracting Officer.

2.2.9 Miscellaneous Accessories

Furnish the manufacturer's standard accessories to complete the deck installation. Furnish metal accessories of the same material as the deck and with the minimum design thickness as follows: saddles, 0.0474 inch;

welding washers, 0.0598 inch cant strip, 0.0295 inch other metal accessories, 0.0358 inch unless otherwise indicated. Accessories must include but not be limited to saddles, welding washers, fasteners, cant strips, butt cover plates, underlapping sleeves, and ridge and valley plates.

2.3 FABRICATION

Furnish one sample of each type of Metal Floor Deck Units used to illustrate the actual cross section dimensions and configuration.

Furnish sample of Metal Roof Deck Units used to illustrate actual cross section dimensions and configurations.

Furnish one sample of each type Flexible Closure Strips, 12 inch long.

2.3.1 Deck Units

2.3.2 Length of Floor Deck Units

Provide floor deck units of sufficient length to span three or more spacings where possible.

2.3.3 Roof Deck

Conform to ASTM A 792/A 792M or ASTM A 1008/A 1008M for deck used in conjunction with insulation and built-up roofing. Fabricate roof deck units of the steel design thickness required by the design drawings and shop painted.

2.3.4 Shop Priming

Shop prime accessories and underside of deck at the factory after coating. Clean surfaces in accordance with the manufacturer's standard procedure followed by a spray, dip or roller coat of rust-inhibitive primer, oven cured.

2.3.5 Touch-Up Paint

Provide touch-up paint for shop-painted units of the same type used for the shop painting. Touch-up welds with paint conforming to SSPC Paint 20 in accordance with ASTM A 780. Maintain finish of deck units and accessories by using touch-up paint whenever necessary to prevent the formation of rust.

After roof decking installation, wire brush, clean, and touchup paint the scarred areas on top and bottom surfaces of metal roof decking. The scarred areas include welds, weld scars, bruises, and rust spots. Touchup galvanized surfaces with galvanizing repair paint. Touchup painted surfaces with repair paint of painted surfaces.

PART 3 EXECUTION

3.1 EXAMINATION

Prior to installation of decking units and accessories, examine worksite to verify that as-built structure will permit installation of decking system without modification.

3.2 INSTALLATION

Install steel deck units in accordance with the approved shop drawings. Place units on structural supports, properly adjusted, leveled, and aligned at right angles to supports before permanently securing in place. Damaged deck and accessories including material which is permanently stained or contaminated, deformed, or with burned holes shall not be installed. Extend deck units over three or more supports unless absolutely impractical. Report inaccuracies in alignment or leveling to the Contracting Officer and make necessary corrections before permanently anchoring deck units. Locate deck ends over supports only. Do not use unanchored deck units as a work or storage platform. Permanently anchor units placed by the end of each working day. Do not support suspended ceilings, light fixtures, ducts, utilities, or other loads by steel deck unless indicated. Distribute loads by appropriate means to prevent damage.

3.2.1 Attachment

Immediately after placement and alignment, and after correcting inaccuracies, permanently fasten steel deck units to structural supports and to adjacent deck units by welding with normal 5/8 inch diameter puddle welds or fastened with screws, powder-actuated fasteners, or pneumatically driven fasteners as indicated on the design drawings and in accordance with manufacturer's recommended procedure and SDI 30. Clamp or weight deck units to provide firm contact between deck units and structural supports while performing welding or fastening. Attachment of adjacent deck units by button-punching is prohibited.

3.2.1.1 Welding

Perform welding in accordance with AWS D1.3 using methods and electrodes recommended by the manufacturers of the base metal alloys being used. Ensure only operators previously qualified by tests prescribed in AWS D1.1/D1.1M and AWS D1.3 make welds. Immediately recertify, or replace qualified welders, that are producing unsatisfactory welding. Location, size, and spacing of fastening shall be as indicated on drawings. Do use welding washers at the connections of the deck to supports. Do not use welding washers at sidelaps. Holes and similar defects will not be acceptable. Lap 2 inch deck ends. Attach all partial or segments of deck units to structural supports in accordance with Section 2.5 of SDI DDMO3. Immediately clean welds by chipping and wire brushing. Heavily coat welds, cut edges and damaged portions of shop primed finish with the manufacturer's standard touch-up paint.

3.2.2 Openings

Cut or drill all holes and openings required and be coordinated with the drawings, specifications, and other trades. Frame and reinforce openings through the deck in conformance with SDI DDP. Reinforce holes and openings 6 to 12 inch across by 0.0474 inch thick steel sheet at least 12 inch wider and longer than the opening and be fastened to the steel deck at each corner of the sheet and at a maximum of 6 inch on center. Reinforce holes and openings larger than 12 inch by steel channels or angles installed perpendicular to the steel joists and supported by the adjacent steel joists. Install steel channels or angles perpendicular to the deck ribs and fasten to the channels or angles perpendicular to the steel joists. Openings must not interfere with seismic members such as chords and drag struts.

3.2.3 Deck Damage

SDI MOC2, for repair of deck damage.

3.2.4 Accessory Installation

3.2.4.1 Adjusting Plates

Install as shown on shop drawings.

3.2.4.2 End Closures

Provide end closure to close open ends of cells at columns, walls, and openings in deck.

3.2.4.3 Access Hole Covers

Provide to seal holes cut in decking to facilitate welding of decking to structural supports.

3.3 JOINT SEALING FOR ROOF DECKS

Seal sidelaps and endlaps with manufacturer's recommended joint sealing material. Shop or field apply the material. Before applying the sealing material, completely remove dust, dirt, moisture, and other foreign material from the surfaces to which the sealing material is to be applied. Apply sealing material in strict accordance with the sealing material manufacturer's printed instructions.

3.4 ROOF SUMP PANS

Place sump pans over openings in roof decking and fusion welded to top surface of roof decking. Do not exceed spacing of welds of 12 inch with not less than one weld at each corner. Field cut opening in the bottom of each roof sump pan to receive the roof drain as part of the work of this section.

3.5 CLEANING AND PROTECTION FOR ROOF DECKS

Upon completion of the deck, sweep surfaces clean and prepare for installation of the roofing.

3.6 FIELD QUALITY CONTROL

3.6.1 Decks Not Receiving Concrete

Inspect the decking top surface for distortion after installation. For roof decks not receiving concrete, verify distortion by placing a straight edge across three adjacent top flanges. The maximum allowable gap between the straight edge and the top flanges is 1/16 inch; when gap is more than 1/16 inch, provide corrective measures or replacement. Reinspect decking after performing corrective measures or replacement.

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