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 in the text by the basic designation only.

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI SG-673	(1989; Errata 1990) Cold-Formed Steel Design Manual

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 611	(1994) Steel, Sheet, Carbon, Cold-Rolled, Structural Quality
ASTM A 653	(1998) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 780	(1993; Rev. A) Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A 792	(1997; Rev. A) Steel Sheet, 55 Percent Aluminum-Zinc Alloy-Coated by the Hot-Dip Process

AMERICAN WELDING SOCIETY, INC. (AWS)

AWS D1.1	(1998) Structural Welding Code Steel
AWS D1.3	(1998) Structural Welding Code – Sheet Steel

FACTORY MUTUAL ENGINEERING AND RESEARCH CORPORATION (FM)

FM DS/1-28	(1996) Wind Loads to Roof Systems and Roof Deck
FM P7825	(1999) Approval Guide

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(1999) National Electrical Code

STEEL DECK INSTITUTE (SDEI)

SDEI DMCDFDRD	(1995; Number 29) Design Manual for Composite Decks, Form Decks and Roof Decks
SDEI MCSD	(1992) Manual of Construction with Steel Deck
SDEI P1	(1987) Deck Damages and Penetration

UNDERWRITERS LABORATORIES INC. (UL)

UL BMD (1997) Building Materials Directory

UL 580 (1994; R 1998) Uplift Resistance of Roof Assemblies

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

1.2.1 SD-02, Shop Drawings

a. Layout

1.2.2 SD-03, Product Data

a. Accessories

1.2.3 SD-05, Design Data

a. Deck units

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

1.2.4 SD-07, Certificates

a. Qualification of welders

1.3 QUALITY ASSURANCE

1.3.1 Steel Deck

Deck and accessories shall be products of a manufacturer regularly engaged in manufacture of steel decking.

1.3.2 Qualification of Welders

Provide welder qualification procedures, welder qualifications, and duration of qualification period in accordance with AWS D1.1 and AWS D1.3.

1.3.3 Regulatory Requirements

1.3.4 Layout Drawings

Show 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, and other pertinent details.

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver, 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. The maximum uniform distributed storage load shall not exceed the design live 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. Replace damaged material.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Steel Sheet

Flat rolled carbon steel sheets of structural quality, thickness not less than .0358 inch before coating, meeting the requirements of AISI SG-673, except as modified herein.

2.1.2 Steel Coating

ASTM A 653 designation G60 galvanized. Apply coating to both sides of sheet.

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 of same thickness and configuration as decking. 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 edges of floors, parapets, end walls, and openings through deck.

2.2.3 Cover Plates

Sheet metal. Polyethylene-coated, self-adhesive, 2 inch wide joint tape may be provided in lieu of cover plates on flat-surfaced decking.

2.2.4 Column Flashing

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

2.2.5 Access Hole Covers

Sheet metal, minimum 0.0474 inch thick.

2.2.6 Hanger

Provide clips or loops for suspended ceilings of one or more of the following types:

a. Lip tabs or integral tabs where noncellular decking or flat plate of cellular section is 0.0474 inch thick or more, and a structural concrete fill is used over deck.

b. Slots or holes punched in decking for installation of pigtails.

c. Tabs driven from top side of decking and arranged so as not to pierce electrical cells.

d. Decking manufacturer's standard as approved by the Contracting officer.

2.3 FABRICATION

2.3.1 Deck Units

SDEI DMCDFDRD. Form non-cellular decking and accessories from ASTM A 653, SQ, grade 33; ASTM A 611 coated carbon steel sheets, Grade C, 33,000 psi minimum yield strength; or ASTM A 792 coated steel sheets, Grade 33. Provide deck units having the depth and the minimum structural properties indicated. Floor and Roof deck system design is based on un-shored construction.

2.3.2 Composite Steel Decking

In addition to resisting shear, devices shall provide resistance to vertical separation between the steel deck and the concrete. Provide one of the following types of shear devices:

a. Mechanically fixed shear devices such as embossments, holes, or welded buttons.

b. Mechanically fixed shear devices such as inverted, triangular-shaped ribs.

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 approved shop drawings. Place units on structural supports, properly adjusted, leveled, and aligned at right angles to supports. 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. Ends of floor deck may be lapped or butted. Lap roof deck a minimum of 2 inches. 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.

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. Clamp or weight deck units to provide firm contact between deck units and structural supports while performing welding. 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 and AWS D1.3 make welds. Location, size, and spacing of fastening shall be as indicated. Immediately clean welds by chipping and wire brushing. Heavily coat welds, cut edges and damaged portions of coated finish with zinc-dust paint conforming to ASTM A 780. Immediately recertify, or replace with qualified welders, welders that have passed qualification tests but are producing unsatisfactory welding. Welded shear studs through deck may be used in place of deck welds.

3.2.2 Openings

Reinforce and frame openings through the roof in conformance with SDEI P1. Cut or drill holes or other openings required for work of other trades. Deck manufacturer shall approve holes or openings larger than 6 inches in diameter prior to drilling or cutting.

3.2.3 Deck Damage

SDEI MCSD, 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 Cover Plates

Where concrete leakage would be a problem, provide metal cover plates, or joint tape, at joints between decking sheets, to be covered with concrete fill.

3.2.4.4 Column Flashing

Provide for spaces between floor decking and columns which penetrate the deck. Field cut flashing to fit column in the field and tack weld to decking and columns.

3.2.4.5 Access Hole Covers

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

3.2.4.6 Hangers

Provide as indicated to support suspended ceilings. Space devices so as to provide one device per 6.25 square feet.

3.2.5 Concrete Work

Prior to placement of concrete, inspect installed decking to ensure that there has been no permanent deflection or other damage to decking. Replace decking which has been damaged or permanently deflected as approved by the Contracting Officer. Place concrete on metal deck in accordance with Construction Practice of SDEI DMCDFDRD. Concrete fill over metal deck is specified in Section 03300, "Cast-In-Place Concrete."

END OF SECTION