

SECTION 05 31 23  
METAL ROOF DECK

PART 1 - GENERAL

1.1 SCOPE

- A. Perform all work required to complete the metal roof deck work indicated by the Contract Documents and furnish all supplementary items necessary for its proper installation.
- B. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.
- C. Alternate Bids: Refer to other Sections for description.

1.2 CODES AND STANDARDS

- A. The work described in this section, unless otherwise noted on the Drawings or herein specified, shall be governed by the latest editions of the following codes or specifications:
  - 1. "Specification for the Design of Cold-Formed Steel Structural Members" - AISI.
  - 2. "Structural Welding Code" - AWS D1.3.
  - 3. "Roof Deck Specifications" - Steel Deck Institute.
  - 4. "Code of Recommended Standard Practice, Roof Deck Construction" - Steel Deck Institute.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed steel deck similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Qualifications of welders and welding operators, filler metal, welding techniques and procedures shall be in accordance with AISC Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings, and the AWS Structural Welding Code.
- C. Certifications shall be no more than six (6) months old during the time of welding

in the erection period.

- D. Powder Driven or Pneumatic Tool operators shall be trained by the tool manufacturer's representative, (not distributor or agent), in accordance to American National Standards Institute. Powder-actuated Fastening Systems - Safety Requirements (ANSI A10.3). New York, New York.

#### 1.4 SUBMITTALS

##### A. Shop Drawings:

1. Submit shop drawings in accordance with Specifications.
2. Shop Drawings shall indicate decking plan, deck profile dimensions, anchorage requirements, projection, openings and reinforcement, finishes, applicable details and accessories.
3. Submit calculations for alternate power driven fasteners if used.

- B. Manufacturer's Data: Submit two copies of manufacturer's specifications and installation instructions for Metal Roof Deck. Include manufacturer's certification as may be required to show compliance with these specifications.

- C. Product Test Reports: From a qualified testing agency indicating that each of the following complies with requirements, based on comprehensive testing of current products:

1. Mechanical fasteners as required.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
- C. Architect may reject any material that has become damaged because of improper storage.

#### 1.6 SEQUENCING/SCHEDULING

- A. Coordinate Work of this Section with work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the work of other Sections.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Steel Roof Deck:
    - a. Nucor Corp.; Vulcraft Div. or equal.

### 2.2 MATERIALS

- A. Metal Roof Deck: Deck type and gauge shall be as shown on the Drawings and shall conform to the requirements adopted by the Steel Deck Institute. Metal Roof Deck to receive light weight insulating cementitious fill shall be vented.
- B. Primer/Paint: Shop applied standard Vulcraft, light gray primer. Performance test standards shall meet or exceed requirements of Federal Specification TT-P-8GG, Types I and II.  
  
Galvanized Steel Sheet: ASTM A 653/A653M, Structural Steel, Grade 33, G60 (Z180) zinc coating.
- C. Welding Electrodes: Shall conform to AWS A5.1 and AWS A5.5.
- D. Screws and Deck Fasteners: As an alternate for attachment of deck.
- E. Powder Driven and Pneumatic Fasteners: Fasteners shall have knurled shank; minimum 1/2" diameter steel washer; electroplated zinc conforming to ASTM B633, Sc. 1, Type III; meet SDI design requirements; Factory Mutual approval, such as Hilti ENP2-21-L15, ENP2H-21-L15, ENP2K-20-L15, X-EDN19-THQ12HSN, XEDNK22 THQ12 HSN or SDM22 THS12 FDN.
- F. Accessories: Provide all accessories necessary to complete the entire installation, including cover plates required to cover all gaps where deck units abut or change direction, around columns, to cover access holes used for welding, and closures where required.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Deck units shall be placed on supporting steel framework and adjusted to final position before being permanently fastened. Each unit shall lap a minimum of

two inches (2") over supports.

- B. Unless noted on the contract documents metal deck units shall be fastened to the steel framework at ends, side supports, and at intermediate supports by puddle welds not less than 5/8" diameter or mechanical fasteners spaced per drawings. Provide weld washers for welding all material lighter than 22 gage. Above noted weld pattern is minimum connection. Reference drawings for required weld pattern.
- C. Install fasteners using a low velocity powder actuated tool such as the Hilti DX 750, DXA 70R, DXA 41SM or a pneumatic tool such as the Hilti R4 - X12.
  - 1. The nail head stand off shall be according to the manufacturer's recommendations and verified with an inspection gauge. The power level shall be determined by jobsite testing.
  - 2. Installation of fasteners shall be in accordance to design requirements and installed by an operator licensed by the manufacturer.
- D. Side joints of the deck unit shall be fastened by tack welding or mechanical fastening not to exceed the lesser of ½ the span or 36" apart. This shall be minimum side lap connection requirements. Reference structural drawings for actual connection requirements. Acceptable mechanical fasteners for sidelaps are as follows:
  - 1. Self-Drilling Screws: #10 or #12 TEK.
- E. Tack weld or sheet metal screw all accessory cover plates adequately into place.
- F. Weld metal shall penetrate all layers of deck material and shall have good fusion to the supporting members.
- G. Deck fastenings indicated above are minimum requirements. Deck attachment shall be sufficient to develop diaphragm shear capacity indicated on Drawings, and shall be in accordance with manufacturer's recommendations.
- H. Roof Sump Pans and Sump Plates: Install over openings provided in roof decking and weld flanges to top of deck. Space welds not more than 12 inches (305 mm) apart with at least 1 weld at each corner.
- I. Miscellaneous Roof Deck Accessories: Install ridge and valley plates, finish strips, cover plates, end closures, and reinforcing channels according to deck manufacturer's written instructions. Weld to substrate to provide a complete deck installation.
- J. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive according to manufacturer's written

instructions to ensure complete closure.

### 3.2 OPENINGS

- A. Openings shall be provided where shown on the Drawings, along with any reinforcing required to strengthen the metal deck. Provide light gauge deck closures where required but not specifically noted on the Contract Documents.
- B. Other openings and reinforcing not shown on Drawings will be made and reinforced by other trades and are subject to review by the Architect.
- C. The Architect shall be immediately notified of any openings where supplemental framing is required but is not provided.

### 3.3 HANGING LOADS

- A. Mechanical equipment or other loads shall not be hung from metal deck unless shown on the Drawings. Method of attachment subject to review by the Architect.

### 3.4 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damage galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.
  - 1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.

### 3.5 FIELD QUALITY CONTROL

- A. Testing Laboratory services shall be in accordance with Section 01 45 29. Provide all inspections and testing as required by the 2006 International Building Code.
- B. A testing laboratory shall perform field inspection of metal deck for proper type, gage, finish, installation and attachment. Testing Laboratory shall provide a written report of their inspection.
- C. Remove and replace work that does not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

END OF SECTION