SECTION 05 31 23

STEEL ROOF DECKING

PART 1 – GENERAL

1.1 PURPOSE

A. This guideline is intended to provide useful information to the Professional Service Provider (PSP) to establish a basis of design. PSP is to apply the principles of this section such that the University of Texas at Arlington (UTA) may achieve a level of quality and consistency in the design and construction of their facilities. Deviations from these guidelines must be approved by UTA and may require justification through Life Cycle Cost (LCC) analysis and submitted to UTA for approval.

1.2 LESSONS LEARNED AND DESIGN CONSIDERATIONS

A. Protect work in place during construction.

B. Replace damaged work caused by heavy equipment.

1.3 REFERENCED DOCUMENTS

A. The Drawings and General Provisions of the Contract, including the General and Supplementary Conditions and Division 1 Specification Sections, apply to work specified in this Section.

1.4 DESCRIPTION OF WORK

A. Work Included: Furnish all materials, supplies, equipment, tools, transportation and facilities, and perform all labor and services required in connection with or incidental to steel roof decking, as described in this Section of Specifications, shown on Drawings, or reasonably implied therefrom. Include all reinforcing plates, sump pans, edge closures, pour stops, and related accessories.
   1. Metal floor deck installed.
   2. Field welded shear studs installed.
   3. Sheet metal flashing around columns.
   4. Sheet metal end closures.
   5. Inserts to attach ceiling hangers.
   6. Cleaning top flange of all supporting steel beams.
   7. Sheet metal edge forms.

B. Related Work Specified Elsewhere:
   1. Open web steel joists: Section 05 21 00
   2. Structural steel: 05 12 00
   3. Miscellaneous metal: Section 05 50 00.
   4. Permanent steel form deck: Section 05 31 33
   5. Testing laboratory inspection for verification of quality: Division 01.
   6. Sustainable construction for LEED requirements: Division 01.

1.5 QUALIFICATIONS

A. Steel deck installer shall have a minimum of 5 years successful experience, 2 successful projects of a comparable size and scope to this project and be approved by the steel deck supplier.

1.6 QUALITY ASSURANCE

A. Refer to Division 01 for testing laboratory services.

B. Contractor is responsible for quality control, including workmanship and materials furnished by his subcontractors and suppliers.

C. Codes and Standards: Comply with provisions of the following codes and standards, except as otherwise indicated or specified:
   1. "Design Manual for Composite Decks, Form Decks, and Roof Decks," by the Steel Deck Institute (SDI).
   2. "Specifications for the Design of Cold Formed Steel Structural Members," by American Iron and Steel Institute (AISI).
   3. "Structural Welding Code - Sheet Steel," by the American Welding Society (AWS D1.3).

D. Qualification of Field Welding: Qualify welding processes and operators in accordance with AWS D1.3 procedures. Each welder must pass the welder qualification test for metal deck.

E. Underwriters Label: Provide steel deck units which are listed and conform to UL "Fire Resistance Directory," with each deck unit bearing the UL label and marking for specific system detailed. Provide units and construction which are found in UL "Building Materials Directory" and conforming to UL Uplift Class 90 construction.
F. ICC: Provide deck units rated by the International Code Council.

1.7 SUBMITTALS
A. See Division 01 for submittal procedures.
B. Product Certification: Submit specifications and installation instructions for each type of deck specified. Also, submit a certificate of product compliance with SDI, UL, and ICC standards, as specified. Manufacturer's data shall include cross-sectional and material properties, uplift resistance, and diaphragm strength.
C. Shop Drawings: Submit detailed shop drawings showing type of deck, complete layout, attachment details, closures, edge strips, supplementary framing, and all other accessories. Show supporting members, splices, lap lengths, openings, and deck dimensions on layout. Indicate deck gauge, coating, swaging, and type of side lap. Show attachment using standard AWS welding symbols and weld washer requirements. Show methods of installing hangers, flashing and accessories, including reinforcement at openings.
D. Insurance Certification: Assist Architect and Owner in preparation and submittal of roof installation acceptance certification as necessary in connection with fire, windstorm, and extended coverage insurance.

1.8 PRODUCT HANDLING
A. Deliver, store, handle and install steel deck and accessories so as not to damage or deform. Failure to wirebrush and paint rusted areas immediately upon detection shall be cause for rejection. Stack deck, stored at site, on platforms or pallets and cover with tarpaulins or other suitable covering to provide weathertight enclosure, while affording proper air circulation. Do not use deck for storage or as a working platform until sheets have been securely fastened in position. Do not damage or overload during entire construction period. Any deck damaged in shipping, unloading, or erection is cause for rejection.

1.9 INSPECTION
A. Welded decking in place is subject to inspection and testing by Owner's testing laboratory. Expense of removing and replacing portions of decking for testing purposes will be borne by Owner if welds are found to be satisfactory. Remove work found to be defective and replace with new acceptable work. Cost of such removal and replacement shall be borne by Contractor.

PART 2 – PRODUCTS

2.1 MATERIALS
A. Roof Deck: Shall be steel deck of type, depth, and gauge shown on Drawings and shall conform to Steel Deck Institute's Roof Deck Specifications. Provide deck units with nested side laps. Sheet steel for galvanized roof deck and accessories shall conform to ASTM A653, structural quality, grade 33 or higher. Galvanizing shall conform to ASTM A653 with a minimum coating class of G90.
B. Deck Acceptable Manufacturers Include:
1. Epic Metals Corp.
2. Vulcraft/Division Nucor Corp.
3. Wheeling Corrugating Co.
4. CMC Joist and Deck (United Steel Deck)
5. CSI Metal Dek Group
C. Other manufacturers may be used only with Architect/Engineer approval.
D. Provide 18 gauge steel plates at vents and other openings in deck and 14 gauge sump pans at roof drains. Provide 18 gauge metal closures where indicated or required.
E. Welding rods shall conform to American Welding Society "Specification for Iron and Steel Arc-Weld Electrodes." Use welding electrodes recommended by deck manufacturer.
F. Screws shall be self-drilling "TEKS" screws, by Illinois Tool Works, Inc., Buildex Div., of size indicated on Drawings

PART 3 – EXECUTION

3.1 ERECTION

A. The General: Do not undertake laying of deck units until supporting members are completely in place. Lay and align units so as to maintain required number of units shown on shop drawings and to prevent stretching or contracting of sidelaps. Weld deck units to structural supports. End laps shall be a minimum of 2" and shall occur over supports.
B. Deck units shall be installed continuous over 3 or more spans.

3.2 CONNECTIONS

A. Size, spacing, and location of welds and side lap connections shall be as indicated on Structural Drawings.
B. Welding sequence and procedure shall be coordinated with placing of units, and shall be shown on shop drawings prior to proceeding with work.
C. Weld metal fillers, sump pans, and closure pieces to deck.
D. Deck metal surrounding welds shall be completely intact after welding. Blow holes will be cause for rejection of work. Weld metal shall penetrate all plies of deck material at end laps and side joints and fuse to supporting steel. Weld through weld washers where required by note on the Drawings.
E. Field Painting: After erection, scarred areas on both sides of deck, including welds, weld scars, bruises, and rust spots, shall be wire brushed and touch-up painted. Touch-up deck with same type of coating as specified for deck.

3.3 WORKMANSHIP

A. Piecing and patching deck shall be avoided. Do not install deck units which are kinked, bent, torn, rusted or significantly damaged in any way.
B. Improper nesting along sides or ends shall not be permitted. Swaged ends, if used, must be placed on the correct side of non-swaged ends, so that units nest tightly.
C. Plan and lay out units so there is adequate contact bearing at all perimeter supports. Check frequently for squareness at intermediate strips, to assure proper fitting and connection of the last strip adjacent to walls, parapets, eaves and ridges. Where a rib occurs at an exterior side support, carefully bend the rib down to bear flat on the support and weld as specified.
D. Deck units having excessive penetrations shall be removed and replaced or have additional support angles installed.
E. Install all necessary accessories and provide a finished surface suitable for application of insulation and roofing. Deck units or installation deemed by Architect to be unsatisfactory shall be immediately removed and replaced or otherwise corrected, as directed by Architect, at no additional cost to Owner.

3.4 MISCELLANEOUS

A. Ceilings, lights, ducts and miscellaneous equipment shall not be hung directly from metal roof deck.

END OF SECTION