

SECTION 05 31 00 - STEEL DECKING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Roof deck.

1.3 RELATED WORK

- A. Related Work of Other Sections:
 - 1. Section 01 45 29 – Testing Laboratory Services: Quality control inspection and testing performed by the Independent Testing Laboratory.
 - 2. Section 05 12 00 – Structural Steel Framing.
 - 3. Section 05 21 00 – Steel Joist Framing.
 - 4. Section 06 10 53 – Miscellaneous Rough Carpentry.
 - 5. Section 09 90 00 – Painting and Coating.
 - 6. Division 21 Sections: Fire protection systems and equipment.
 - 7. Division 22 Sections: Plumbing systems and equipment.
 - 8. Division 23 Sections: Mechanical systems and equipment.
 - 9. Division 26 Sections: Electrical systems and equipment.

1.4 REFERENCES

- A. American Iron and Steel Institute
 - 1. North American Specification for the Design of Cold-Formed Steel Structural Members. 2001 and Errata. 2003.
- B. American Welding Society
 - 1. AWS D1.3-98: Structural Welding Code - Sheet Steel
- C. ASTM International
 - 1. ASTM A 653: Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 2. ASTM A 780-01: Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
 - 3. ASTM A 792: Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
 - 4. ASTM A 1008: Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
 - 5. ASTM C 423-02: Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

6. ASTM E 119-00a: Test Methods for Fire Tests of Building Construction and Materials
 7. ASTM E 329-02: Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction
- D. Department of Defense
1. DOD-P-21035A (SH): Paint, High Zinc Dust Content, Galvanizing Repair
- E. SSPC: The Society for Protective Coatings
1. SSPC-Paint 20 1982 (Revised 1991): Paint Specification No. 20: Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic")
- F. Steel Deck Institute
1. SDI Publication No. 30-00: Design Manual for Composite Decks, Form Decks, and Roof Decks

1.5 SUBMITTALS

- A. Product Data: For each type of deck, accessory, and product indicated.
- B. Shop Drawings: Include deck layout with direction of all spans, types and thicknesses of deck panels, anchorage details, reinforcing channels, pans, deck openings, projections, reinforcements, closures, special jointing, accessories, and attachments to other construction.
- C. Product certificates.
- D. Welding certificates.
- E. Research/evaluation reports.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated.
- B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- C. Fire-Test-Response Characteristics: Where indicated, provide steel deck units conforming to those steel deck units tested for fire resistance per ASTM E 119.
 1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
 2. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.
- D. AISI Specifications: Calculate structural characteristics of steel deck according to AISI's "Specification for the Design of Cold-Formed Steel Structural Members."
- E. FMG Listing: Provide steel roof deck evaluated by FMG and listed in its "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.

- F. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.

1.7 DELIVERY, HANDLING AND STORAGE

- A. Deliver steel decking, miscellaneous items and accessories, store, handle and install in order not to damage or deform.
- B. Store the steel decking at the site, before erection, in stacks on platforms or pallets and cover with tarpaulins or other suitable covering to provide weathertight enclosure while affording proper air circulation.
- C. Do not use the decking for storage or as a working platform until the sheets have been securely fastened in position.
- D. Do not damage or overload during the entire construction period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. BHP Steel Building Products USA Inc.
 - 2. Consolidated Systems, Inc.
 - 3. Epic Metals Corp.
 - 4. Marilyn Steel Products, Inc.
 - 5. Nucor Corp.; Vulcraft Div.
 - 6. Roof Deck, Inc.
 - 7. United Steel Deck, Inc.
 - 8. Verco Manufacturing Co.
 - 9. Wheeling Corrugating Co.; Div. of Wheeling-Pittsburgh Steel Corp.
 - 10. Other as approve by Engineer of Record

2.2 ROOF DECK

- A. Steel Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with "SDI Specifications and Commentary for Steel Roof Deck," in SDI Publication No. 29.
 - 1. Galvanized Steel Sheet: ASTM A 653M, Structural Steel (SS), Grade 33, G60 zinc coating.
 - 2. Deck Profile: Type B flutes.
 - 3. Profile Depth: 1-1/2 inch.
 - 4. Design Uncoated-Steel Thickness: 0.0474 inch.

2.3 ACCESSORIES

- A. Accessories: Steel deck manufacturer's standard accessory materials, including mechanical fasteners, closure strips, pour stops, and closures for deck.

1. Side Lap Mechanical Fasteners: Equivalent to ITW Buildex "Traxx" self-drilling fasteners with "Climaseal" coating over "Spex" polymer primer.
 2. Closure Strips, Flashings, Screeds, Closure Plates, Change Of Direction Plates, Cover Plates, Girder Fillers, And Related Accessories: Minimum 0.1046-inch thick hot-dip galvanized sheet steel; of the required profiles and sizes.
- B. Galvanizing Repair Paint: ASTM A 780 SSPC-Paint 20 or DOD-P-21035, with dry film containing a minimum of 93 percent zinc dust by weight.
- C. Bearing Plates, Angles and Miscellaneous Framing: Refer to Section 05 12 00 – Structural Steel Framing.
- D. Welding Materials: Conform to AWS D1.1 for the materials being welded and deck manufacturer's printed recommendations.

2.4 FABRICATION

- A. Fabricate steel deck as recommended by the SDI. Fabricate to accommodate a maximum working deflection as shown on the Structural General Notes.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 29, manufacturer's written instructions, and requirements in this Section. Refer to General Notes – Structural on the Drawings for additional requirements.
- B. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.
1. Provide minimum 1-1/2" bearing over structural steel members.
 2. Mechanically fasten male/female side laps with No. 10 self-drilling screws at a maximum of 4-inches on center.
- C. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
- D. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to decking.
- E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of decking, and support of other work.
- F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
1. Fasten the deck to the supporting steel by electric arc welding. Exercise care in the selection of electrodes and amperage to provide positive welds and to prevent high amperage blowholes. Make welds from top of deck with welder following closely behind placement crew. Refer to General Notes - Structural on the Drawings for additional requirements.

2. Fasten the deck to the supporting structural steel framework at the ends and at the intermediate supports as required in General Structural Notes on the Drawings.
 3. Make puddle welds and spacings as noted in the Structural Notes – General on the Drawings.
 4. In all locations where the steel deck rests upon or terminates against structural steel members and where flashing members rest upon or terminate against structural steel members, mechanically fasten the side laps of the adjacent units between supports at intervals not exceeding 12-inches.
- G. Roof Deck Accessories: Install sump pans and sump 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.
- H. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations, unless otherwise indicated.
- I. Repairs and Protection:
1. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions. No repairs are necessary at welds to structural steel members or headed metal stud connections to steel deck and structural steel members where the welds will be covered with concrete.
 2. 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.

3.2 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing agency to perform field quality control testing. Notify the Testing Laboratory in a timely manner to permit the inspection of welds prior to cover up by subsequent construction.
- B. Field welds will be subject to inspection.
- C. Shear connector stud welds will be tested and inspected according to AWS D1.1.
- D. Remove and replace work that does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

END OF SECTION 05 31 00