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SECTION 05310 - STEEL DECK

This Section uses the term "Architect." Change this term to match that used to identify the design professional as defined in the General and Supplementary Conditions.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
   * + 1. RELATED DOCUMENTS
          1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
       2. SUMMARY
          1. This Section includes the following:

Adjust list below to suit Project.

Composite floor deck.

* + - * 1. Related Sections include the following:

List below only products and construction that the reader might expect to find in this Section but are specified elsewhere.

Section 033000 "Cast-in-Place Concrete" for normal-weight and lightweight structural concrete fill over steel deck.

Section 051200 "Structural Steel Framing" for shop- and field-welded shear connectors.

* + - 1. SUBMITTALS
         1. Product Data: For each type of deck, accessory, and product indicated.
         2. Shop Drawings: Show layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction. Shop drawings to indicate date of reference structural drawings.

Retain paragraph below if required.

* + - * 1. Product Certificates: For each type of steel deck, signed by product manufacturer.

Retain paragraph below if procedures for welder certification are retained in "Quality Assurance" Article.

* + - * 1. Welding certificates. Copies of certificates for welding procedures and personnel.

Retain paragraph below if Contractor is responsible for field quality-control testing and inspections.

Delete paragraph and subparagraphs below if not required. List other product test reports if required.

* + - 1. QUALITY ASSURANCE
         1. 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.I

Delete paragraph below if not using electrified cellular floor deck.

Delete paragraph below if no welding. Retain "Welding certificates" Paragraph in "Submittals" Article if retaining below. AWS states that welding qualifications remain in effect indefinitely unless welding personnel have not welded for more than six months or there is a specific reason to question their ability.

* + - * 1. Welding: Qualify procedures and personnel according to AWS D1.3, "Structural Welding Code - Sheet Steel."
      1. DELIVERY, STORAGE, AND HANDLING
         1. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
         2. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

Retain subparagraph below if acoustical cellular roof deck with insulation is required.

1. PRODUCTS
   * + 1. MANUFACTURERS

See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products.

Retain above for nonproprietary or below for semiproprietary specification. Refer to Division 1 Section "Product Requirements."

* + - * 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

Steel Deck:

Canam Steel Corp.; The Canam Manac Group.

Consolidated Systems, Inc.

Epic Metals Corporation.

Marlyn Steel Decks, Inc.

Nucor Corp.; Vulcraft Division.

Roof Deck, Inc.

United Steel Deck, Inc.

Valley Joist; Division of EBSCO Industries, Inc.

Verco Manufacturing Co.

Wheeling Corrugating Company; Div. of Wheeling-Pittsburgh Steel Corporation.

* + - 1. COMPOSITE FLOOR DECK

Retain this Article if composite floor deck is required. Insert minimum section properties here or indicate on Drawings.

* + - * 1. Composite Steel Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with "SDI Specifications and Commentary for Composite Steel Floor Deck," in SDI Publication No. 30, with the minimum section properties indicated, and with the following:

Select one or more of first three subparagraphs below to suit Project.

Select steel grade and color, if applicable, from options in subparagraph below.

Select one of two subparagraphs below for galvanized steel sheet. A lightweight coating, G30 (Z90), is the minimum recommended by SDI for composite deck because it is the positive bending reinforcement for slab and must last the life of the structure.

Select zinc-coating weight from options in subparagraph below.

Galvanized Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grade 33 (230), [G60 (Z180)] zinc coating.

Select zinc-coating weight and color, if applicable, from options in subparagraph below.

Select span used in design from subparagraph below.

Span Condition: [Triple span].

* + - 1. ACCESSORIES
         1. General: Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
         2. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
         3. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 (4.8-mm) minimum diameter.
         4. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), not less than 0.0359-inch (0.91-mm) design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

Pour-stop thickness and profile guidelines are presented in SDI Publication No. 30. Revise first paragraph below to suit Project.

* + - * 1. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33,000 psi (230 MPa), of same material and finish as deck, and of thickness and profile.
        2. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck, unless otherwise indicated.

Piercing hanger tabs in paragraph below are designed for embedment in deck slab; delete if not permitted or required. See Evaluations for discussion. Rolled-in hanger tabs are available for floor deck but improper use could result in overstressing the tabs or overloading the deck slab. If allowed, insert rolled-in hanger tabs here; verify load limits, availability, limitations, and recommendations with deck manufacturers.

Usually retain weld washers in first paragraph below if weld-fastening deck with an uncoated minimum steel thickness of less than 0.028 inch (0.71 mm). Select weld washer thickness.

Retain paragraph above or first paragraph below if required. Select level or sloped sump pans. Recessed sump pans are seldom used. Coordinate with choice of roof drain if recessed sump pans are required. Delete above and retain below if flat sump plates are required.

* + - * 1. Flat Sump Plate: Single-piece steel sheet, 0.0747 inch (1.90 mm) thick, of same material and finish as deck. For drains, cut holes in the field.
        2. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B with dry film containing a minimum of 94 percent zinc dust by weight. [ASTM A 780].

1. EXECUTION
   * + 1. EXAMINATION
          1. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance.
          2. Proceed with installation only after unsatisfactory conditions have been corrected.
       2. INSTALLATION, GENERAL
          1. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 30, manufacturer's written instructions, and requirements in this Section.
          2. Locate deck bundles to prevent overloading of supporting members.
          3. 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.

Retain subparagraph below if either long-span cellular roof deck or electrified cellular floor deck is required.

* + - * 1. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
        2. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

Coordinate reinforcing requirements of openings in first paragraph below with other Division 5 Sections.

* + - * 1. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
        2. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

Retain paragraph below if mechanical fastening is permitted.

* + - * 1. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

Delete paragraph below if flexible closures are not required or permitted. Usually delete if fire-resistance-rated partitions are required.

Retain paragraph below if installation of sound-absorbing insulation is specified in applicable low-slope roofing Section. Coordinate with roofing installation to prevent exposure to weather.

* + - 1. FLOOR-DECK INSTALLATION

This Article includes installation requirements for classes of floor deck and form deck used in floor applications. Revise paragraph below and insert requirements if mechanical fastening to supports is permitted.

* + - * 1. Fasten floor-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated and as follows:

Select one weld diameter from subparagraph below or revise to suit Project.

Weld Diameter: [5/8 inch (16 mm)] , nominal.

Retain one of two subparagraphs below. First subparagraph is based on SDI specifications. Select second subparagraph if showing requirements on Drawings.

Weld Spacing: Weld edge ribs of panels at each support. Space additional welds an average of 12 inches (305 mm) apart, but not more than 18 inches (457 mm) apart.

Weld Spacing: Space and locate welds as indicated.

Retain subparagraph below if minimum uncoated steel thickness is less than 0.028 inch (0.71 mm). See installation considerations in the Evaluations.

SDI requires side-lap and perimeter edge fastening if deck spans exceed 60 inches (1524 mm). Revise fastener spacing if required.

* + - * 1. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of half of the span or 36 inches (910 mm), and as follows:

Select acceptable fastening method(s) from subparagraphs below. Welding may be mandatory for diaphragm deck. Revise fastening requirements as required.

Mechanically fasten with self-drilling, No. 10 (4.8-mm-) diameter or larger, carbon-steel screws.

Mechanically clinch or button punch.

Fasten with a minimum of 1-1/2-inch- (38-mm-) long welds.

* + - * 1. End Bearing: Install deck ends over supporting frame with a minimum end bearing of [1-1/2 inches (38 mm)] with end joints as follows:

Select one of three options in subparagraph below or indicate locations of each choice on Drawings. SDI requires butted end joints for composite floor deck and allows lapped or butted ends for noncomposite floor deck.

End Joints: [Lapped or butted at Contractor's option].

* + - * 1. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations, unless otherwise indicated.

Revise paragraph below to suit Project. Sealing cellular deck openings, butt joints, and junctions with trench headers with tape is not included in this Section. Coordinate with Division 16 Sections.

* + - * 1. Floor-Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of deck.

Delete paragraph below unless electrified cellular floor-deck units are required.

* + - 1. FIELD QUALITY CONTROL

Delete this Article if not required. Retain first option in first paragraph below if Owner engages agency; retain second option if Contractor engages agency. If retaining second option, retain requirement for field quality-control test and inspection reports in Part 1 "Submittals" Article.

* + - * 1. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
        2. Field welds will be subject to inspection.
        3. Testing agency will report inspection results promptly and in writing to Contractor and Architect.
        4. Remove and replace work that does not comply with specified requirements.
        5. Additional inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.
      1. REPAIRS AND PROTECTION

Retain one or more of first three paragraphs and associated subparagraphs below if repairs to galvanized or painted surfaces are required. If limiting repairs to roof deck, revise below accordingly.

* + - * 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.

Usually retain paragraph below for prime-painted deck and select surface(s) requiring repair painting. Because shop primer protects for a limited time, repair painting is best applied during or immediately after deck installation.

Delete paragraph and subparagraphs above and retain first paragraph below if repair-painting requirements are included in Division 9. Coordinate field-painting requirements with applicable Division 9 Section.

* + - * 1. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05310