**SECTION 05 31 00 – STEEL ROOF AND FLOOR DECKING**

\*NOTE TO SPECIFIER\*

CURRENT VIEW INCLUDES HIDDEN NOTES. YOU MAY TURN THIS OFF IN WORD UNDER FILE-OPTIONS-DISPLAY AND UNCHECKING HIDDEN TEXT

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Please contact CSM Products & Solutions dba CSM Metal Deck at (800) 229-4276; 8660 Lambright Road Houston, TX 77075 or visit [www.metaldecking.com](http://www.metaldecking.com) for more information.

1. GENERAL
	1. SUMMARY
		1. SECTION INCLUDES
			1. Roof Deck
			2. Composite Floor Deck
			3. Non-composite Form Deck
			4. Non-composite Vented Form Deck
		2. RELATED SECTIONS

\*Note to Specifier\* Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

1. Section 033000 "Cast-in-Place Concrete" for normal-weight and lightweight structural concrete fill over steel deck.
2. Section 035216 "Lightweight Insulating Concrete" for lightweight insulating concrete fill over steel deck.
3. Section 051200 "Structural Steel Framing" for shop- and field-welded shear connectors.
4. Section 055000 "Metal Fabrications" for framing deck openings with miscellaneous steel shapes.
	* 1. REFERENCES
			1. American National standards institute (ANSI):
				1. ANSI/SDI-RD - Standard for Steel Roof Deck.
				2. ANSI/SDI-C - Standard for Composite Steel Floor Deck.
			2. American Welding Society (AWS):
				1. AWS D1.3 - Structural Welding Code-Sheet Steel.
			3. ASTM International (ASTM):
				1. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
				2. ASTM A 1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
				3. ASTM C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
				4. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
				5. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
			4. FM Global (FM):
				1. FM - Approval Guide, Building Materials.
				2. FM 4451 - Approval Standard for Class 1 Insulated Steel Roof Decks.
			5. Underwriters Laboratories (UL).
				1. UL 263 Standard for Safety of Fire Tests of Building Construction Materials
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. Product Data: For each type of decking specified, showing profile, gauge, dimensions, and finishes
		3. Shop Drawings: Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.
		4. Product Certificates: Include certification showing deck manufacturer’s current certification with the Steel Deck Institute

\*Note to Specifier\* Retain "Product Test Reports" Subparagraph below if required. List other product test reports if required.

* + 1. Test and Evaluation Reports: For tests performed by a qualified testing agency, indicating that each of the following complies with requirements:
			1. Power-actuated mechanical fasteners

\*Note to Specifier\* Retain "Field quality-control reports" Subparagraph below if Contractor is responsible for field quality-control testing and inspecting.

* + 1. Field Quality Control Submittals:
			1. Field quality-control reports.
		2. LEED Submittals: Provide product data to document recycled content.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: All primary products specified in this section shall be supplied by a single manufacturer with a minimum of five years' experience in the manufacture of steel deck.
			1. Manufacturer offering deck products must be a member of the Steel Deck Institute.
		2. Installer Qualifications: Minimum two years experience installing similar products.

\*Note to Specifier\* Retain "Welding Qualifications" Paragraph below if shop or field welding is required. If retaining, also retain "Welding certificates" Paragraph in "Informational Submittals" Article.

* + 1. Welding Qualifications:
			1. Per AWS D1.1/D1.1M "Structural Welding Code - Sheet Steel."
			2. Per AWS D1.3/D1.3M "Structural Welding Code - Sheet Steel."

\*Note to Specifier\* Retain "FM Approvals' RoofNav Listing" Paragraph below if FM Approvals compliance is required for roof deck.

* + 1. FM Global Listing: provide steel roof deck evaluated by FM Approvals and listed in its "RoofNav" for Class 1 fire rating and [**Class 1-60**] [**Class 1-75**] [**Class 1-90**] windstorm ratings. Identify materials with FM Approvals Certification markings
	1. DELIVERY, STORAGE, AND HANDLING
		1. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.
		2. Store products in accordance with SDI MOC3. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
1. PRODUCTS

	1. ACCEPTABLE MANUFACTURERS
		1. Approved Manufacturer: CSM Metal Deck located at 8660 Lambright Road Houston, TX 77075; Email: info@metaldecking.com; website: [www.metaldecking.com](http://www.metaldecking.com)
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.
	2. PERFORMANCE REQUIREMENTS
		1. AISI Specifications: Comply with calculated structural characteristics of steel deck in accordance with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

\*Note to Specifier\* Retain "Fire-Resistance Ratings" Paragraph below only if products specified are part of a fire-resistance-rated assembly. Indicate rating, testing agency, and testing agency's design designation on Drawings.

* + 1. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency
			1. Manufacturer’s steel deck must be approved by UL and listed in the UL Fire Resistance Directory

\*Note to Specifier\* Retain "Recycled Content of Steel Products" Paragraph below to specify recycled content if required. An alternative method of requiring recycled content is to retain requirement in Project's Division 01 sustainable design requirements Section that gives Contractor the option and responsibility to determine how recycled content requirements will be met.

* + 1. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than [**25**] <**Insert value**> percent.

\*Note to Specifier\* Retain this article if roof deck is required. Insert minimum section properties here or indicate on Drawings.

* 1. ROOF DECK

\*Note to Specifier\* Retain "Basis-of-Design Product" Paragraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed.

* + 1. Basis-of-Design Product: Subject to compliance with requirements, provide **CSM Metal Deck; [B-Deck] [N-Deck] [N-Deck Interlocking] [1” Roof Deck] [B-Deck Vented] [1” Roof Deck Vented]** or comparable product by one of the following:
			1. **<Insert other approved manufacturers’ name>**
		2. Fabrication of Roof Deck: Provide deck type, gage, span condition, and panel length as indicated on drawings. Fabricate panels, without top-flange stiffening grooves, to comply with SDI and with the following:

\*Note to Specifier\* Retain one or more steel sheet subparagraphs below to suit Project.

\*Note to Specifier\* Retain steel grade and zinc-coating weight from options in "Galvanized-Steel Sheet" Subparagraph below.

* + - 1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), **[Grade 33] [Grade 40] [Grade 80]**, with a **[G60] [G90]** zinc coating.

\*Note to Specifier\* Retain steel grade from options in "Prime-Painted Steel Sheet" Subparagraph below.

* + - 1. Prime-Painted Steel Sheet: ASTM A1008/A1008M, Structural Steel (SS), Cold Rolled Full Hard, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
				1. Color: Manufacturer's standard **[Gray] [White] [Gray top surface with white underside].**

\*Note to Specifier\* Retain steel grade from options in "Galvanized and Primed Steel Sheet" Subparagraph below.

* + - 1. Galvanized and Primed Steel Sheet: ASTM A653/A653M, Structural Steel (SS), **[Grade 33] [Grade 40] [Grade 80]**, with a **[G30] [G60]** zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
				1. Color: Manufacturer's standard **[Gray] [White] [Gray top surface with white underside].**

\*Note to Specifier\* Retain roof-deck category and profile type from "Deck Profile" subparagraphs below. Categories and profiles are based on SDI nomenclature; manufacturers may identify same categories and profiles with other designations. Insert different proprietary profiles, if required, to suit Project.

* + 1. Deck Profile: **[As indicated] [1.5B] [3N] [1.0RD]**

\*Note to Specifier\* Retain one option in "Profile Depth" Subparagraph below or revise to suit Project. Indicate locations on Drawings if various depths are required. FM Approvals approval, if required, is limited to roof deck 1-1/2 inches (38 mm) or 3” (76mm) deep.

* + 1. Profile Depth: **[As indicated] [1 inch] [1-1/2 inches] [3 inches]**

\*Note to Specifier\* Retain one steel thickness in "Design Uncoated-Steel Thickness" Subparagraph below or revise to suit Project.

* + 1. Design Uncoated-Steel Thickness: **[As indicated] [0.0179 inch] [0.0238 inch] [0.0295 inch] [0.0358 inch] [0.0474 inch] [0.0598 inch]**

\*Note to Specifier\* Retain span used in design from "Span Condition" Subparagraph below.

* + 1. Span Condition: [**As indicated**] [**Simple span**] [**Double span**] [**Triple span or more**].

\*Note to Specifier\* Retain side-lap configuration from "Side Laps" Subparagraph below. Interlocking seams may be fastened by welding or button punching.

* + 1. Side Laps: [**Overlapped**] [**Interlocking seam**] [**Overlapped or interlocking seam at Contractor's option**].

\*Note to Specifier\* Retain paragraph below if rolled-in hanger tabs are required for accessory attachment to bottom flute of deck.

* + 1. Hanger Tabs: Rolled-In Hanger Tabs

\*Note to Specifier\* Retain this section if composite floor deck is required. Insert minimum section properties here or indicate on Drawings.

* 1. COMPOSITE FLOOR DECK

\*Note to Specifier\* Retain "Basis-of-Design Product" Paragraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed.

* + 1. Basis-of-Design Product: Subject to compliance with requirements, provide **CSM Metal Deck; 1 ½” Composite Deck, 2” Composite Deck****, 3” Composite Deck** or comparable product by one of the following:
			1. <Insert manufacturer's name>
		2. Fabrication of Composite Floor Deck: Fabricate panels, with integrally embossed or raised pattern ribs and interlocking side laps, to comply with SDI C, with the minimum section properties indicated, and with the following:

\*Note to Specifier\* Retain one or more steel sheet subparagraphs below to suit Project.

\*Note to Specifier\* Retain zinc-coating weight from options in "Galvanized-Steel Sheet" Subparagraph below.

* + - 1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), **Grade 50**, with a **[G60] [G90]** zinc coating.

\*Note to Specifier\* Retain zinc-coating weight and color, if applicable, from options in "Galvanized and Primed Steel Sheet" Subparagraph below.

* + - 1. Galvanized and Primed Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 50, **[G30] [G60]** zinc coating; with unpainted top surface and cleaned and pretreated bottom surface primed with manufacturer's standard **[gray]** **[white]** baked-on, rust-inhibitive primer.

\*Note to Specifier\* Retain one option in "Profile Depth" Subparagraph below, indicate locations on Drawings if various depths are required.

* + - 1. Profile Depth: **[1.5 inches] [2 inches] [3 inches]**

\*Note to Specifier\* Retain one steel thickness in "Design Uncoated-Steel Thickness" Subparagraph below or revise to suit Project.

* + - 1. Design Uncoated-Steel Thickness: **[As indicated] [0.0295 inch] [0.0358 inch] [0.0474 inch] [0.0598 inch]**

\*Note to Specifier\* Retain span used in design from "Span Condition" Subparagraph below.

* + - 1. Span Condition: **[As indicated] [Simple span] [Double span] [Triple span or more].**

\*Note to Specifier\* Retain side-lap configuration from "Side Laps" Subparagraph below. Interlocking seams may be fastened by welding or button punching.

* + - 1. Side Laps: **[Overlapped] [Interlocking seam] [Overlapped or interlocking seam at Contractor's option].**

\*Note to Specifier\* Retain this article if noncomposite form deck is required. Noncomposite deck may be used as roof deck, floor deck, or both. Insert minimum section properties here or indicate on Drawings.

* 1. NONCOMPOSITE FORM DECK

\*Note to Specifier\* Retain "Basis-of-Design Product" Paragraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed.

* + 1. Basis-of-Design Product: Subject to compliance with requirements, provide **CSM Metal Deck; [9/16” Form Deck] [1” Form Deck] [1 ½” Form Deck]** or comparable product by one of the following:
			1. <Insert manufacturer's name>
		2. Fabrication of Noncomposite Form Deck: Fabricate ribbed-steel sheet noncomposite deck panels used as a form to comply with SDI NC, with the minimum section properties indicated, and with the following:

\*Note to Specifier\* Retain one or more steel sheet subparagraphs below to suit Project.

\*Note to Specifier\* Retain steel grade and zinc-coating weight from options in "Galvanized-Steel Sheet" Subparagraph below.

* + - 1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 80, with a **[G60] [G90]** zinc coating.

\*Note to Specifier\* Retain steel grade from options in "Galvanized Primed Steel Sheet" Subparagraph below.

* + - 1. Galvanized- and Shop-Primed Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 80, with a **[G30] [G60]** zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
				1. Color: **[Manufacturer's standard] [Gray] [White] [Gray top surface with white underside].**

\*Note to Specifier\* Retain one option in "Profile Depth" Subparagraph below or revise to suit Project. Indicate locations on Drawings if various depths are required.

* + - 1. Profile Depth: **[9/16”] [1”] [1 ½”]**

\*Note to Specifier\* Retain one steel thickness in "Design Uncoated-Steel Thickness" Subparagraph below or revise to suit Project.

* + - 1. Design Uncoated-Steel Thickness: [As indicated] [**0.0179 inch**] [**0.0238 inch**] [**0.0295 inch**] [**0.0358 inch**] [**0.0474 inch**] [**0.0598 inch**]

\*Note to Specifier\* Retain span used in design from "Span Condition" Subparagraph below.

* + - 1. Span Condition: **[As indicated] [Simple span] [Double span] [Triple span or more].**
			2. Side Laps: **Overlapped**.

\*Note to Specifier\* Retain this article if noncomposite vented form deck is required. Noncomposite vented deck can be used for Light Weight Concrete Roof Systems. The venting allows for excess mix to drain from the slurry and improve drying time on the concrete. Insert minimum section properties here or indicate on Drawings.

* 1. NONCOMPOSITE VENTED FORM DECK

\*Note to Specifier\* Retain "Basis-of-Design Product" Paragraph and list of manufacturers below to identify a specific product or a comparable product from manufacturers listed.

* + 1. Basis-of-Design Product: Subject to compliance with requirements, provide **CSM Metal Deck; [1”] [1 ½”]** **Vented Form Deck** or comparable product by one of the following:
			1. <Insert manufacturer's name>
		2. Fabrication of Noncomposite Form Deck: Fabricate ribbed-steel sheet noncomposite deck panels used as a form to comply with SDI NC, with the minimum section properties indicated, and with the following:

\*Note to Specifier\* Retain one or more steel sheet subparagraphs below to suit Project.

\*Note to Specifier\* Retain steel grade and zinc-coating weight from options in "Galvanized-Steel Sheet" Subparagraph below.

* + - 1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 80, with a **[G60] [G90]** zinc coating.

\*Note to Specifier\* Retain steel grade from options in "Galvanized Primed Steel Sheet" Subparagraph below.

* + - 1. Galvanized- and Shop-Primed Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 80, with a **[G30] [G60]** zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer.
				1. Color: **[Manufacturer's standard] [Gray] [White] [Gray top surface with white underside].**

\*Note to Specifier\* Retain one option in "Profile Depth" Subparagraph below or revise to suit Project. Indicate locations on Drawings if various depths are required.

* + - 1. Profile Depth: **[1”] [1 ½”]**

\*Note to Specifier\* Retain one steel thickness in "Design Uncoated-Steel Thickness" Subparagraph below or revise to suit Project.

* + - 1. Design Uncoated-Steel Thickness: [As indicated] [**0.0179 inch**] [**0.0238 inch**] [**0.0295 inch**] [**0.0358 inch**] [**0.0474 inch**] [**0.0598 inch**]

\*Note to Specifier\* Retain span used in design from "Span Condition" Subparagraph below.

* + - 1. Span Condition: **[As indicated] [Simple span] [Double span] [Triple span or more].**
			2. Side Laps: **Overlapped**.
	1. ACCESSORIES
		1. 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.

\*Note to Specifier\* Retain one diameter for required sidelap fastner

* + 1. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No.**[10] [12]** minimum diameter.
		2. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.
		3. Miscellaneous Sheet Metal Deck Accessories: Steel sheet of same material gauge and finish as deck; of profile indicated or required for application.

\*Note to Specifier\* Revise "Pour Stops and Girder Fillers" Paragraph below to suit Project. Pour-stop thickness and profile guidelines are presented in standards SDI C, SDI NC, and SDI RD.

* + 1. Pour Stops and Girder Fillers: Steel sheet, minimum yield strength of 33ksi, of same material and finish as deck, and of thickness and profile [**indicated**] [**recommended by SDI standards for overhang and slab depth**].
		2. Column Closures, End Closures, Z-Closures, and Cover Plates: Steel sheet, of same material, finish, and thickness as deck unless otherwise indicated.

\*Note to Specifier\* Usually, retain washers in "Weld Washers" Paragraph below if weld-fastening deck with an uncoated minimum steel thickness of less than 0.028 inch (0.71 mm). Retain weld washer thickness.

* + 1. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, **[0.0598 inch] [0.0747 inch]** thick, with factory-punched hole of 3/8-inch minimum diameter.

\*Note to Specifier\* Retain "Shear Stud Connectors" Paragraph if field-welding shear studs through deck is required.

* + 1. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

\*Note to Specifier\* Retain "Flat Sump Plates" or "Recessed Sump Pans" Paragraph below if required. Recessed sump pans are seldom used. Coordinate with choice of roof drain if recessed sump pans are required.

* + 1. Flat Sump Plates: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck. For drains, cut holes in the field.
		2. Recessed Sump Pans: Single-piece steel sheet, 0.0747 inch thick, of same material and finish as deck, with 3 inch wide flanges and [**level**] [**sloped**] recessed pans of 1 ½” inch minimum depth. For drains, cut holes in the field.
		3. Galvanizing Repair Paint: [ASTM A780/A780M] [SSPC-Paint 20 or MIL-P-21035B, with dry film containing a minimum of 94 percent zinc dust by weight].
		4. Repair Paint: Manufacturer's standard rust-inhibitive primer of same color as primer.
1. EXECUTION
	1. EXAMINATION
		1. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
		2. Proceed with installation only after unsatisfactory conditions have been corrected.
	2. INSTALLATION, GENERAL
		1. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; manufacturer's written instructions; and requirements in this Section.
		2. Install temporary shoring before placing deck panels if required to meet deflection limitations.
		3. Locate deck bundles to prevent overloading of supporting members.
		4. 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.
		5. Place deck panels flat and square and fasten to supporting frame without warp or deflection.
		6. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

\*Note to Specifier\* Coordinate reinforcing requirements of openings in first paragraph below with applicable 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.

\*Note to Specifier\* 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 in accordance with deck manufacturer's written instructions.

\*Note to Specifier\* Retain "Shear Stud Connectors" Paragraph below if shear connectors are field installed through steel deck.

* + 1. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.
	1. INSTALLATION OF ROOF DECK

\*Note to Specifier\* This article includes installation requirements for classes of roof deck and noncomposite form deck used in roof applications. Revise first paragraph below and insert requirements if mechanical fastening to supports is permitted.

* + 1. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:

\*Note to Specifier\* Retain one option in "Weld Diameter" Subparagraph below or revise to suit Project.

* + - 1. Weld Diameter: [**5/8 inch**] [**3/4 inch**], nominal.

\*Note to Specifier\* Retain one option in "Weld Spacing" Subparagraph below. First option is based on SDI RD; second, on FM Global Loss Prevention Data Sheet 1-29 recommendations for roof deck securement. Retain third if indicating requirements on Drawings. Revise if diaphragm design or FM Approvals approval requires closer weld spacings.

* + - 1. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of two welds per deck unit at each support. Space welds **[18 inches apart, maximum] [12 inches apart in Zone 1 and 6 inches apart in Zones 2 and 3, based on roof-area definitions in FM Global Loss Prevention Data Sheet 1-28] [as indicated].**

\*Note to Specifier\* Retain "Weld Washers" Subparagraph below if minimum uncoated steel thickness is less than 0.028 inch. See installation considerations in the Evaluations.

* + - 1. Weld Washers: Install weld washers at each weld location.

\*Note to Specifier\* SDI requires side-lap and perimeter edge fastening if deck spans exceed 5 ft. Revise fastener spacing in "Side-Lap and Perimeter Edge Fastening" Paragraph below 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 one-half of the span or [**18 inches**] [**36 inches**], and as follows:

\*Note to Specifier\* Retain acceptable fastening method(s) from three subparagraphs below. Coordinate with choice of side lap.

* + - 1. Mechanically fasten with self-drilling, No. **[10] [12]** diameter or larger, carbon-steel screws.
			2. Mechanically clinch or button punch.

\*Note to Specifier\* FM Approvals accepts welding of side laps to deck that is a minimum of 0.0474 inch thick.

* + - 1. Fasten with a minimum of 1-1/2-inch- long welds.
		1. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:

\*Note to Specifier\* Retain one of three options in "End Joints" Subparagraph below. SDI allows lapped or butted ends for roof deck. FM Approvals recommends that ends lap a minimum of 2 inches.

* + - 1. End Joints: [Lapped **2 inches** minimum] [Butted] [Lapped **2 inches** minimum or butted at Contractor's option].
		1. Roof Sump Pans and Sump Plates: Install over openings provided in roof deck and [**weld**] [**mechanically fasten**] flanges to top of deck. Space [**welds**] [**mechanical fasteners**] not more than 12 inches apart with at least one [**weld**] [**fastener**] at each corner.
			1. Install reinforcing channels or zees in ribs to span between supports and [**weld**] [**or**] [**mechanically fasten**].
		2. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels in accordance with deck manufacturer's written instructions. [**Weld**] [**or**] [**mechanically fasten**] to substrate to provide a complete deck installation.
			1. Weld cover plates at changes in direction of roof-deck panels unless otherwise indicated.

\*Note to Specifier\* Retain "Flexible Closure Strips" Paragraph below if flexible closures are required or permitted. Usually, delete if fire-resistance-rated partitions are required.

* + 1. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive in accordance with manufacturer's written instructions to ensure complete closure.

\*Note to Specifier\* Retain "Sound-Absorbing Insulation" 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. Sound-Absorbing Insulation: Installation into topside ribs of deck as specified in <**Insert Section number and title**>.
	1. REPAIR

\*Note to Specifier\* Retain "Galvanizing Repairs" or "Repair Painting" Paragraph below, or both, 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 in accordance with ASTM A780/A780M and manufacturer's written instructions.
		2. Repair Painting:

\*Note to Specifier\* Retain first subparagraph below if prime-painted deck is required and on-site paint repair is included in this Section. Because shop primer protects for a limited time, repair painting is best applied during or immediately after deck installation.

* + - 1. Wire brush and clean rust spots, welds, and abraded areas on [**both surfaces**] [**top surface**] of prime-painted deck immediately after installation, and apply repair paint.

\*Note to Specifier\* Retain one of first two subparagraphs below if appearance is important. Retain first subparagraph if retaining first option in subparagraph above. Retain second subparagraph if preparation and repair painting of bottom surface are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

* + - 1. Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
			2. Wire brushing, cleaning, and repair painting of bottom deck surfaces are included in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

\*Note to Specifier\* Retain subparagraph below if repair-painting requirements are included in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting." Coordinate field-painting requirements with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

* + - 1. Wire brushing, cleaning, and repair painting of rust spots, welds, and abraded areas of both deck surfaces are included in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
	1. FIELD QUALITY CONTROL

\*Note to Specifier\* Retain first option in "Testing Agency" Paragraph below if Owner hires an independent testing agency.

* + 1. Testing Agency: [**Owner will engage**] [**Engage**] a qualified testing agency to perform tests and inspections.
		2. Tests and Inspections:

\*Note to Specifier\* See Section 014000 "Quality Requirements" for retesting and reinspecting requirements and Section 017300 "Execution" for requirements for correcting the Work.

* + - 1. Special inspections and qualification of welding special inspectors for cold-formed steel floor and roof deck in accordance with quality-assurance inspection requirements of SDI QA/QC.

Field welds will be subject to inspection

* + - 1. Steel decking will be considered defective if it does not pass tests and inspections.

\*Note to Specifier\* Retain "Shear Stud Connectors" Subparagraph below if field-welded shear stud connectors are required.

* + - 1. Shear Stud Connectors: In addition to visual inspection, test and inspect field-welded shear connectors in accordance with requirements in AWS D1.1/D1.1M for stud welding and as follows:

Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.

\*Note to Specifier\* Revise subparagraph below if an actual amount or percentage of shear connectors requires testing.

Conduct tests in accordance with requirements in AWS D1.1/D1.1M on additional shear connectors if weld fracture occurs on shear connectors that are already tested.

* + 1. Prepare test and inspection reports.

END OF SECTION 05 31 00