SECTION 05 31 23

DOVETAIL STEEL ROOF AND DOVETAIL FORMLOK COMPOSITE STEEL FLOOR DECK

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\*\* NOTE TO SPECIFIER \*\* Vulcraft/Verco Group; dovetail steel roof decking.  
  
This section is based on the products of Vulcraft/Verco Group:  
Visit our website for manufacturing locations and sales office information.   
Web: www.vulcraft.com and www.vercodeck.com  
  
[ [Click Here](https://www.arcat.com/arcatcos/cos36/arc36399.html) ] for additional information.  
  
We are the SAFEST, highest quality, lowest cost, most productive and most profitable steel and steel products company in the world. We are committed to this while being cultural and environmental stewards in our communities where we live and work. We are succeeding by working together.  
  
One of Vulcraft/Verco Group's values is the commitment to safety. Safety is in the forefront of our minds when it comes to fabricating, loading and delivering our products to the site. Safety is also foremost when it comes to our products themselves. Our commitment to safety extends to those who use our products, whether they know it or not.  
  
Along with the other values noted in our mission statement, Vulcraft/Verco Group also has a strong commitment to the communities and the environment where our facilities are located. We strive to be 'good neighbors' to those who live and work within our communities, both human and nonhuman.  
  
Vulcraft/Verco Group has a long history of success in the joist and deck business. Vulcraft/Verco Group has the capability to provide a quality product on time and also a product that fits the first time.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete types below not required.

* + 1. Roof deck with DoveTail fluted profile.
       1. 2.0D (2 in. (51 mm) DoveTail deck).
       2. 3.5D (3.5 in. (89 mm) DoveTail deck).
    2. Acoustical roof deck with DoveTail fluted profile.
       1. 2.0DA (2 in. (51 mm) DoveTail acoustical deck).
       2. 3.5DA (3.5 in. (89 mm) DoveTail acoustical deck).
    3. Composite deck with DoveTail fluted profile.
       1. 2.0D FORMLOK (2 in. (51 mm) DoveTail Composite deck).
       2. 3.5D FORMLOK (3.5 in. (89 mm) DoveTail Composite deck).
  1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 03 31 00 - Structural Concrete.
    2. Section 03 34 00 - Low Density Concrete.
    3. Section 03 50 00 - Cast Decks and Underlayment.
    4. Section 05 12 13 - Architecturally-Exposed Structural Steel Framing.
    5. Section 05 50 00 - Metal Fabrications.
    6. Section 09 90 00 - Painting and Coating.
  1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. American National standards institute (ANSI):
       1. ANSI/SDI-RD - Standard for Steel Roof 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 A1063/A1063M - Standard Specification for Steel Sheet, Twin-Roll Cast, Zinc-Coated (Galvanized) by the Hot-Dip Process.
       3. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
       4. ASTM C1513 - Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections.
       5. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
       6. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
       7. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests.
       8. ASTM E90 - Standard Test Method for Laboratory measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
       9. ASTM E492 - Standard Test Method for Laboratory measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine
    4. FM Global (FM):
       1. FM - Approval Guide, Building Materials.
       2. FM 4451 - Approval Standard for Class 1 Insulated Steel Roof Decks.
    5. International building Code (IBC):
       1. IBC 1705 - Statement of Special Inspections.
       2. IBC 1704 - Structural Tests and Special Inspections.
    6. International Association of Plumbing and Mechanical Officials - Uniform Evaluation Service (IAPMO-UES).
    7. Underwriters Laboratories (UL):
  1. SUBMITTALS
     1. Submit under provisions of Section 01 30 00.
     2. Shop Drawings: Layout of decks, anchoring, reinforcing, openings, joints, accessories, and attachments details.

\*\* NOTE TO SPECIFIER \*\* Delete welding certificates if not required.

* + 1. Welding certificates.

\*\* NOTE TO SPECIFIER \*\* Delete product certificates if not required.

* + 1. Product certificates.

\*\* NOTE TO SPECIFIER \*\* Delete product certificates if not required.

* + 1. Product Test Reports: Tested by qualified testing agency, showing compliance with specified requirements.
       1. Acoustical roof deck.
    2. Evaluation Reports from IAPMO-UES: For steel deck.

\*\* NOTE TO SPECIFIER \*\* Retain "Field quality-control reports" Paragraph below if Contractor is responsible for field quality-control testing and inspecting.

* + 1. Field quality-control reports.

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraph if LEED is not applicable.

* + 1. 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 ten 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 2 years experience installing similar products.

\*\* NOTE TO SPECIFIER \*\* Delete if contractor is not responsible for acquiring testing agency.

* + 1. Testing Agency Qualifications per ASTM E 329: For testing indicated.

\*\* NOTE TO SPECIFIER \*\* Delete if welding is not required.

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

\*\* NOTE TO SPECIFIER \*\* Delete if FM Global listing is not required.

* + 1. FM Global Listing: Listed steel roof deck in FM Global's "Approval Guide, Building Materials" for Class 1 fire rating and Class 1-90 windstorm ratings.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Deliver products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
     2. Store products in clean, dry, sheltered area off the ground until ready for use.
     3. Protect products from exposure to direct sunlight and rain.

\*\* NOTE TO SPECIFIER \*\* Retain subparagraph below if acoustical roof deck with insulation is required.

* + - 1. Protect steel deck from exposure to sunlight and rain. Store steel deck on the jobsite off of the ground and covered with waterproof material to prevent exposure to rain or condensation.
      2. Protect and ventilate acoustical insulation to maintain insulation free of moisture.
    1. Handle materials to avoid damage.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Vulcraft/Verco Group, which is located at: 6610 CR 60; St. Joe, IN 46785; Email: [request info (dave.bjork@nucor.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Vulcraft/Verco+Group&coid=36399&rep=&fax=&message=RE:%20Spec%20Question%20(05310vul):%20%20&mf=); Web: <http://www.vulcraft.com> | <http://www.vercodeck.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
    2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.
  1. PERFORMANCE REQUIREMENTS
     1. Structural Characteristics: Calculated per AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."

\*\* NOTE TO SPECIFIER \*\* Delete paragraph if decking is not part of s fire-resistance rated assembly.

* + 1. Fire-Resistance Ratings per ASTM E 119: By qualified testing agency.

\*\* NOTE TO SPECIFIER \*\* Delete design designation option not required. For fire resistance rating designs, see dovetaildeck.com/fire.

* + - 1. Indicate design designations from UL's "Fire Resistance Directory.
         1. Indicate rating and design designation on the Drawings.
      2. Indicate design designations from a qualified testing agency.
         1. Indicate rating and design designation on the Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete if meeting Factory Mutual requirements are not required.

* + 1. Factory Mutual Approval Ratings per FM Standard 4451:

\*\* NOTE TO SPECIFIER \*\* Delete ratings not required.

* + - 1. Class I fire.
      2. Class I-60, wind uplift rating.
      3. Class I-75, wind uplift rating.
      4. Class I-90, wind uplift rating.
      5. Live load deflections.
      6. Traffic resistance.
    1. Manufactured tolerances:
       1. Length: Plus or minus 1/2 in. (13 mm).
       2. Coverage Width: minus 3/8 in. (10 mm) to plus 3/4 in. (19 mm).
       3. Sweep: 1/4 in. (6 mm) per 120 in. (3048 mm) length.
       4. Square: 1/8 in. (3 mm) per 12 in. (305 mm) width.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. ROOF DECK
     1. Basis of Design: Dovetail Steel Roof Deck as manufactured by Vulcraft/Verco Group.

\*\* NOTE TO SPECIFIER \*\* Delete profile option not required.

* + - 1. Profile: 2.0 in. (51 mm) depth.

\*\* NOTE TO SPECIFIER \*\* Delete gage options not required.

* + - * 1. Gage: 22; 0.0295 in. (0.750 mm).
        2. Gage: 20; 0.0358 in. (0.910 mm).
        3. Gage: 19; 0.0418 in. (1.06 mm).
        4. Gage: 18; 0.0474 in. (1.20 mm).
        5. Gage: 16; 0.0598 in. (1.52 mm).
      1. Profile: 3.5 in. (89 mm) depth.

\*\* NOTE TO SPECIFIER \*\* Delete gage options not required.

* + - * 1. Gage: 20; 0.0358 in. (0.910 mm).
        2. Gage: 19; 0.0418 in. (1.06 mm).
        3. Gage: 18; 0.0474 in. (1.20 mm).
        4. Gage: 16; 0.0598 in. (1.52 mm).
      1. Material: Galvanized steel per ASTM A653/653M. Galvanized steel conforming to ASTM A653/653M or A1063 SS Grade 40 minimum.

\*\* NOTE TO SPECIFIER \*\* Delete finish option not required.

* + - 1. Finish: Galvanized. G90 coating designation.
      2. Finish: Primer painted over galvanized. Provisional coating with intent for short term exposure to environmental conditions.

\*\* NOTE TO SPECIFIER \*\* Delete color options not required.

* + - * 1. Color: White.
        2. Color: Gray.
      1. Span Condition: As indicated on the Drawings.
      2. Side Laps: Overlapped.

\*\* NOTE TO SPECIFIER \*\* Minimum deck panel length is 6 feet (1.829 m). Maximum panel length is 42 feet (12.802 m).

* + - 1. Deck Panel Length (feet/meters): \_\_\_\_\_\_.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. ACOUSTICAL ROOF DECK
     1. Basis of Design: Acoustical Dovetail Steel Roof Deck as manufactured by Vulcraft/Verco Group.

\*\* NOTE TO SPECIFIER \*\* Delete profile option not required.

* + - 1. Profile: 2.0 in. (51 mm) depth.

\*\* NOTE TO SPECIFIER \*\* Delete gage options not required.

* + - * 1. Gage: 22; 0.0295 in. (0.750 mm).
        2. Gage: 20; 0.0358 in. (0.910 mm).
        3. Gage: 19; 0.0418 in. (1.06 mm).
        4. Gage: 18; 0.0474 in. (1.20 mm).
        5. Gage: 16; 0.0598 in. (1.52 mm).
      1. Profile: 3.5 in. (89 mm) depth.

\*\* NOTE TO SPECIFIER \*\* Delete gage options not required.

* + - * 1. Gage: 20; 0.0358 in. (0.910 mm).
        2. Gage: 19; 0.0418 in. (1.06 mm).
        3. Gage: 18; 0.0474 in. (1.20 mm).
        4. Gage: 16; 0.0598 in. (1.52 mm).
      1. Galvanized steel conforming to ASTM A653/653M or A1063 SS Grade 40 minimum.

\*\* NOTE TO SPECIFIER \*\* Delete finish option not required.

* + - 1. Finish: Galvanized. G90 coating designation.
      2. Finish: Primer painted over galvanized. Provisional coating with intent for short term exposure to environmental conditions.

\*\* NOTE TO SPECIFIER \*\* Delete color options not required.

* + - * 1. Color: White.
        2. Color: Gray.
      1. Span Condition: As indicated on the Drawings.
      2. Side Laps: Overlapped.

\*\* NOTE TO SPECIFIER \*\* Minimum deck panel length is 6 feet (1.829 m). Maximum panel length is 42 feet (12.802 m).

* + - 1. Deck Panel Lengths (feet/meters): \_\_\_\_\_\_.
      2. Acoustical Perforations: Factory installed In bottom flanges of roof deck panels.

\*\* NOTE TO SPECIFIER \*\* Acoustical insulation is supplied by the deck manufacturer, but installed by the roofing contractor prior to installation of roof insulation.

* + - 1. Acoustical Insulation Tested per ASTM C423-09a and ASTM E795.

\*\* NOTE TO SPECIFIER \*\* Delete insulation options not required.

* + - * 1. Fiberglass insulation board. Plain.

NRC; 2 in. (51 mm): 1.15.

NRC; 3.5 in. (89 mm): 1.15.

* + - * 1. Fiberglass insulation board. Encapsulated.

NRC; 2 in. (51 mm): 1.05.

NRC; 3.5 in. (89 mm): 1.15.

* + - * 1. Polyisocyanurate insulation boards. Plain.

NRC; 2 in. (51 mm): 0.95.

NRC; 3.5 in. (89 mm): 1.00.

* + - * 1. Polyisocyanurate insulation boards. Encapsulated.

NRC; 2 in. (51 mm): 1.00.

NRC; 3.5 in. (89 mm): 1.00.

* 1. COMPOSITE DECK
     1. Basis of Design: Dovetail FORMLOK Steel Deck as manufactured by Vulcraft/Verco Group.

\*\* NOTE TO SPECIFIER \*\* Delete profile option not required.

* + - 1. Profile: 2.0 in. (51 mm) depth.

\*\* NOTE TO SPECIFIER \*\* Delete gage options not required.

* + - * 1. Gage: 22; 0.0295 in. (0.750 mm).
        2. Gage: 20; 0.0358 in. (0.910 mm).
        3. Gage: 19; 0.0418 in. (1.06 mm).
        4. Gage: 18; 0.0474 in. (1.20 mm).
        5. Gage: 16; 0.0598 in. (1.52 mm).
      1. Profile: 3.5 in. (89 mm) depth.

\*\* NOTE TO SPECIFIER \*\* Delete gage options not required.

* + - * 1. Gage: 20; 0.0358 in. (0.910 mm).
        2. Gage: 19; 0.0418 in. (1.06 mm).
        3. Gage: 18; 0.0474 in. (1.20 mm).
        4. Gage: 16; 0.0598 in. (1.52 mm).
      1. Material: Galvanized steel per ASTM A653/653M. Galvanized steel conforming to ASTM A653/653M or A1063 SS Grade 40 minimum.

\*\* NOTE TO SPECIFIER \*\* Delete finish option not required.

* + - 1. Finish: Galvanized. G60 minimum coating designation.
      2. Span Condition: As indicated on the Drawings.
      3. Side Laps: Overlapped.

\*\* NOTE TO SPECIFIER \*\* Minimum deck panel length is 6 feet (1.829 m). Maximum panel length is 42 feet (12.802 m).

* + - 1. Deck Panel Length (feet/meters): \_\_\_\_\_\_.
  1. DECK SIDELAP ATTACHMENT:

Self-drilling screws are the most common, easiest to install, and aesthetic method of connecting the sidelap of DoveTail deck. Delete if not required.

* + 1. Self Drilling Corrosion Resistant Hex Washer Head Screws: Deck may be installed with short leg on the top or underside. The minimum edge distance for screw must be 1-1/2 times the shank diameter of the screw.

\*\* NOTE TO SPECIFIER \*\* Delete screw size options not required.

* + - 1. No 8 screws spaced as designated on the Drawings.
      2. No 10 screws spaced as designated on the Drawings.
      3. No 12 screws spaced as designated on the Drawings.
      4. No 14 screws spaced as designated on the Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete if sidelaps are not to be welded.

* + 1. Arc Seam Welds: 3/8 x 1 in (10 x 25 mm) spaced as designated on the Drawings.
    2. Fillet Weds: 1 or 1-1/2 in. (25 or 37.5 mm) spaced as designated on the drawings.
  1. DECK TO SUPPORT ATTACHMENT

\*\* NOTE TO SPECIFIER \*\* Delete deck attachment paragraphs not required.

* + 1. Hilti Fasteners:

\*\* NOTE TO SPECIFIER \*\* Delete substrate thickness option not required.

* + - 1. Substrate Thickness: 1/8 in. (3 mm) minimum, to 3/8 in. (10 mm) maximum.
    1. Hilti X-HSN 24 Fastener: Dome style head, red guidance washer and 0.472 in. (11.99 mm) diameter steel silver-colored top-hat washer.
       1. Substrate Thickness: 1/4 in. (6 mm) minimum.
    2. Hilti X-ENP-19 Fastener: Fully knurled tip and tapered shank fitted with two 0.590 in. (14.99 mm) diameter steel cupped washers.
    3. Pneutek Fasteners:
       1. Pneutek fasteners have 1/2 in. (13 mm) diameter heads and must be driven with the Pneutek Air/Safe fastening system to ensure tight contact between the fastener head and attached deck.

\*\* NOTE TO SPECIFIER \*\* Delete substrate thickness options not required.

* + - 1. Substrate Thickness: 0.113 in. (2.87 mm) minimum, 0.155 in. (3.94 mm) maximum.
    1. Pneutek SDK61.
       1. Substrate Thickness: 0.155 in. (3.94 mm) minimum, 0.250 in. (6.35 mm) maximum.
    2. Pneutek SDK63.
       1. Substrate Thickness: 0.187 in. (4.75 mm) minimum, 0.312 in. (7.92 mm) maximum.
    3. Pneutek K64.
       1. Substrate Thickness: 0.281 in. (7.14 mm) minimum.
    4. Pneutek K66.
    5. Self-Drilling Screws compliant with ASTM C1513:
       1. No. 12 self-drilling, self-tapping screws.
       2. Minimum Support Attachment Thickness: 0.109 in. (2.77 mm); the minimum thickness used on top chord of Vulcraft/Verco Group joists.

\*\* NOTE TO SPECIFIER \*\* Support material thickness impacts the pull-out capacity of a screw subjected to tension loads. To evaluate diaphragms utilizing screws into supports other than 0.109" (7/64") thick, please contact the manufacturer or manufacturer representative.

* + - 1. Minimum Support Attachment Thickness (in/mm): \_\_\_\_\_\_.
    1. Arc Spot Welding:
       1. Decking Welded to Supports: Visible weld diameter, 3/4 in. (19 mm) minimum for arc spot (puddle) welds.
       2. Acoustical Decking Welded to Supports: Visible weld diameter, 7/8 in. (22 mm) for arc spot (puddle) welds.
  1. ACCESSORIES:
     1. Manufacturer's accessory materials complying with indicated requirements.
        1. Elastomeric closure strips.
        2. Miscellaneous sheet metal items:
           1. Column and end closures, z-closures, cover plates, sump plates or pans, pour stops, girder fillers.

\*\* NOTE TO SPECIFIER \*\* Furnished for 2.0DA and 3.5DA fluted acoustical deck. Delete paragraph if not required.

* + 1. Acoustical batts and plastic mesh per section 09 84 00.

1. EXECUTION
   1. EXAMINATION
      1. Do not install deck until supporting construction is in place.
      2. Examine support framing and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of work of this section.
      3. If supporting construction is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. PREPARATION
      1. Verify that surfaces to receive deck are free of debris.
      2. Locate deck bundles to prevent overloading of support members.
   3. INSTALLATION
      1. Install and fasten deck and accessories in accordance with the Contract Documents, approved installation drawings, manufacturer's documented instructions and requirements of ANSI/SDI-RD, ANSI/SDI-NC, or ANSI/SDI-C as applicable.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Welds shall comply with AWS D1.3.
    1. Place deck panels on structural supports and adjust to final position with ends aligned. Attach firmly to the supports immediately after placement in order to form a safe working platform.
    2. Cut and neatly fit and reinforce deck units and accessories around openings and other work projecting through or adjacent to the decking.
    3. End Bearing: Install deck ends over supports with a minimum end bearing of 1-1/2 in. (38 mm) unless otherwise shown on approved installation drawings.
    4. Side Closures: Fasten to supporting structure and deck in accordance with the Contract Documents, approved installation drawings and requirements of ANSI/SDI RD, ANSI/SDI C, and ANSI/SDI NC.
    5. Ridge and valley plates, flat plates at changes of deck direction and sump pans, shall be fastened to the deck in accordance with the Contract Documents, approved installation drawings and requirements of ANSI/SDI RD, ANSI/SDI C, and ANSI/SDI NC.
    6. Trades that subsequently cut unscheduled openings through the deck are responsible for reinforcing the openings.
    7. Acoustical insulation is supplied by the deck manufacturer and will be installed by the roofing contractor prior to installation of roof insulation.
  1. INSPECTION AND REPAIR
     1. Before roof insulation or concrete placement, the deck shall be inspected for tears, dents, or other damage that may prevent the deck from acting as a tight and substantial form.
     2. Inspections:

\*\* NOTE TO SPECIFIER \*\* Delete inspection options not required.

* + - 1. In accordance IBC 1705.2.2, 2012.
      2. In accordance IBC 1705.2.2, 2015.
      3. In accordance IBC 1704.3, 2009.
  1. PROTECTION
     1. Protect installed products until completion of project.

END OF SECTION