SECTION 05 31 13

STEEL FLOOR DECK

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\*\* NOTE TO SPECIFIER \*\* New Millennium Building Systems; steel floor deck and accessory products.  
.  
This section is based on the products of New Millennium Building Systems, which is located at:  
7575 W. Jefferson Ave.  
Fort Wayne, IN 46804  
Phone: 260-969-3500  
Fax: 260-868-6002  
Web: www.newmill.com   
Email: info@newmill.com  
New Millennium engineers and manufactures standard steel joists, architecturally unique special profile steel joists, and steel decking. The company is a nationwide leader in BIM-based steel joist design and BIM process management. New Millennium has also introduced the Flex-Joist Tension-Controlled Open Web Steel Joist design approach for increased steel joist strength, reliability and ductility. Among the benefits of the new approach is enhanced building safety, providing an early warning in the event of a roof overload condition.  
This specification includes New Millennium steel form deck and steel composite deck that is designed and manufactured nationwide at our six plant locations in accordance with the specifications of the Steel Deck Institute.

1. GENERAL
   1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Steel Floor Deck and Accessories
  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 - Structural Concrete.
    2. Section 05 12 13 - Architecturally Exposed Structural Steel Framing - Structural Steel Framing.
    3. Section 05 21 13 - Deep Longspan Steel Joist Framing - Steel Joists.
    4. Section 05 31 00 - Steel Decking - Steel Roof Deck.
    5. Section 05 50 00 - Metal Fabrications - Metal Fabrications: Framing deck openings with miscellaneous steel shapes.
    6. Section 07 81 00 - Applied Fireproofing - Applied Fireproofing.
    7. Section 09 54 16 - Luminous Ceilings - Acoustical Insulation: Acoustical topside deck insulation.
    8. Section 09 90 00 - Painting and Coating - Painting: Finish painting of exposed deck.
  1. REFERENCES

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

* + 1. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
    2. ASTM A 780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
    3. ASTM A 924/A 924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
    4. ASTM A 1008/A 1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
    5. ASTM E 329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
    6. AISC - North American Specification for the Design of Cold-Formed Steel Structural Members .
    7. AWS D1.3 - Structural Welding Code - Steel.
    8. SDI Code of Standard Practice - 2014
    9. SDI C - Standard for Composite Steel Floor Deck-Slabs
    10. SDI NC - Standard for Non-Composite Steel Floor Deck
    11. SDI FDDM - Floor Deck Design Manual.
    12. SDI MOC2 - Manual of Construction with Steel Deck
    13. UL - Fire Resistance Directory.

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required and applicable to the project requirements. Note that slab loads, structural framing, deck type and thickness, concentrated loads, concrete strength, reinforcing and concrete thickness must be clearly indicated on the Project Drawings.

* 1. DESIGN / PERFORMANCE REQUIREMENTS
     1. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI's North American Specification for the Design of Cold-Formed Steel Structural Members and the SDI FDDM - Floor Deck Design Manual.
     2. Form Decking:
        1. Deck provided shall meet the minimum design gage and yield strength specified on the Drawings, or meet minimum specified section properties at specified yield strength.
        2. Whenever possible, the deck shall be multi-span and not require shoring during the concrete placement procedure.
     3. Composite Decking:
        1. Deck provided shall meet the minimum design gage and yield strength specified on the Drawings, or meet minimum specified section properties at specified yield strength.
        2. Whenever possible, the deck shall be multi-span and not require shoring during the concrete placement procedure.
     4. Fire-Test-Response Characteristics: Where indicated, provide steel deck units that are approved by UL, LLC and listed in the UL and ULC Fire Resistance Directories.
  2. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements - Administrative Requirements.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Deck properties information for deck specified in accordance with Section 5.6 of SDI COSP-2017.
        2. Preparation instructions and recommendations.
        3. Storage and handling requirements and recommendations.
        4. Erection instructions.
     3. Shop Drawings: Show location of connections, bearing on supports, methods of anchoring, attachment of accessories, adjusting plate details and the manufacturer's erection instructions and pertinent details.

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

* + 1. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
       1. Product Data for Credit MR 4.1 and MR 4.2: For products having recycled content, documentation including percentages by weight of post consumer and preconsumer recycled content
          1. Include statement indicating costs for each product having recycled content.
       2. Product Data for Credit MR 5.1 and Credit MR 5.2: Submit data, including location and distance from Project of material manufacturer and point of extraction, harvest or recovery for main raw material.
          1. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.
    2. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.
    3. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Member in good standing of Steel Deck Institute (SDI).

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraph if testing is not required.

* + 1. Testing Agency Qualifications: An independent agency qualified according to ASTM E 329 for testing indicated.

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

* + 1. Welding: Qualify procedures and personnel according to AWS D1.3, Structural Welding Code - Sheet Steel.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Store products in compliance with SDI MOC3.
     2. Separate sheets and store on dry wood sleepers; slope for positive drainage. Cut plastic wrap to encourage ventilation. Protect with a waterproof covering and ventilate to avoid condensation.
  2. SEQUENCING
     1. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraph if acoustical deck is not required.

* + 1. Coordinate installation of sound-absorbing insulation strips and non-corrosive spacers (lath when required) in the topside ribs of cellular acoustical deck as specified in Section 09 54 16 - Luminous Ceilings to ensure protection of insulation strips against damage from effects of weather and other causes.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: New Millennium Building Systems, which is located at:1690 Broadway St.  
         , Bldg. 19, Ste. 160Fort Wayne, IN 46802Tel: 260-321-8080Fax: 260-868-6002Email: [request info (info@newmill.com)](https://arcat.com/rfi?action=email&company=New%252BMillennium%252BBuilding%252BSystems&message=RE%253A%2520Spec%2520Question%2520(05311mil)%253A%2520&coid=35565&spec=05311mil&rep=&fax=260-868-6002);Web: <https://www.newmill.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 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required and applicable to the project requirements. All steel decking is available in lengths ranging from 6 feet 0 inches to 40 feet 0 inches. Extra charges are applied to lengths less than 6 feet 0 inches. Contact New Millennium if lengths exceeding 40 feet 0 inches are required.

* 1. FORM DECK
     1. Steel Form Deck - General: Fabricate deck to comply with SDI NC - Standard for Non-Composite Steel Floor Deck, with the minimum section properties indicated. Deck type and thickness shall be as indicated on the Drawings:

\*\* NOTE TO SPECIFIER \*\* Select the Form Deck type(s) required from the following paragraph and delete those not required.

* + - 1. Type 0.6FD Deck is 9/16 inch deep, 35 inches wide with nested side laps.
      2. Type 0.6FDV Ventilated Deck is 9/16 inch deep, 35 inches wide with nested side laps and slot vents in the bottom flutes. Openings equal 0.5 percent of total surface area.
      3. Type 1.0FD is 1 inch deep, 35 inches wide with nested side laps.
      4. Type 1.0FDV Ventilated Deck is 1 inches deep, 36 inches wide with nested side laps and slot vents in the bottom flutes. Openings equal 0.5 percent of total surface area.
      5. Type EHD-Dek is 1-5/16 inches deep and 32 inches wide with nested side laps.
      6. Type EHD-Dek Vented is 1-5/16 inches deep and 32 inches wide with nested side laps and slot vents in the bottom flutes. Openings range from .25 to .75 percent of total surface area.
      7. Type 1.5FD Deck is 1-1/2 inches deep, 36 inches wide with nested side laps.
      8. Type 1.5FDR Deck is 1-1/2 inches deep, 36 inches wide with nested side laps.

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

* + - * 1. Provide with rolled-in hanger tabs.
      1. Type 1.5FDI Deck is 1-1/2 inches deep, 36 inches wide with interlocking side laps.

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

* + - * 1. Provide with rolled-in hanger tabs.
      1. Type 1.5FDV Ventilated Deck is 1-1/2 inches deep, 36 inches wide with nested side laps and slot vents in the bottom flutes. Openings equal 0.5 percent minimum to 1.5 percent maximum of total surface area.
      2. Type 1.5FDIV Ventilated Deck is 1-1/2 inches deep, 36 inches wide with interlocking side laps and slot vents in the bottom flutes. Openings equal 0.5 percent minimum to 1.5 percent maximum of total surface area.
      3. Type 2.0FD Deck is 2 inches deep, 36 inches wide with interlocking side laps.
      4. Type 3.0FD Deck is 3 inches deep, 36 inches wide with interlocking side laps.
    1. Deck Materials
       1. Sheet steel for galvanized deck shall conform to ASTM A 653/A 653M Structural Steel, with a minimum yield strength of 33 ksi (230 MPa) or other galvanized structural sheet steels or high strength low alloy steels in accordance with AISI S100, Section A2.
       2. Sheet steel for uncoated or phosphatized top/painted bottom deck shall conform to ASTM A 1008 / A 1008M with a minimum yield strength of 33 ksi (230 MPa) or other structural sheet steels or high strength low alloy steels in accordance with AISI S100, Section A2.
       3. Sheet steel for accessories shall conform to ASTM A 653/A 653M, Structural Steel for structural accessories, ASTM A 653/A 653M Commercial Steel for non-structural accessories, or ASTM A 1008 / A 1008M for either structural or non-structural accessories. Other structural sheet steels or high strength low alloy steels shall be permitted in accordance with AISI S100, Section A2. All sheet steel for accessories shall have a minimum specified yield strength of 33 ksi (230MPa).
    2. Deck Finish:

\*\* NOTE TO SPECIFIER \*\* Select the deck finish required from the following paragraphs and delete those not required. Note that the primer-painted finish is intended to protect the steel for a reasonable installation period while exposed to ordinary atmospheric conditions and shall be considered an impermanent and provisional coating.

* + - 1. Galvanized coating shall comply with ASTM A653/A653M with zinc coating as follows:

\*\* NOTE TO SPECIFIER \*\* Select the galvanized coating thickness required from the following paragraphs and delete those not required.

* + - * 1. G30
        2. G40
        3. G60
        4. G90
      1. Primer-painted finish gray on both the top and bottom sides.
      2. Two-coat bright white primer bottom side and a primer-painted topside.
      3. Two-coat bright white primer bottom side and a galvanized topside.
      4. Uncoated top, gray or white bottom.
  1. COMPOSITE DECK
     1. Composite Steel Floor Deck - General: Fabricate deck to comply with SDI C - Standard for Composite Steel Floor Deck-Slabs, with the minimum section properties indicated. Deck type and thickness shall be as indicated on the Drawings:

\*\* NOTE TO SPECIFIER \*\* Select the composite deck type(s) required. Include the minimum thickness required on the Drawings.

* + - 1. Type 1.5CD Deck is 1-1/2 inches deep, 36 inches wide with nested side laps. Deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system.
      2. Type 1.5CDI Deck is 1-1/2 inches deep, 36 inches wide with interlocking side laps. Deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system.
      3. Type CFD1.5C deck is 1-1/2 inches deep, 24-1/2 inches wide with a liner panel attached to the bottom flutes. Deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system. Dek-Knek Sidelap Attachment System provides a finish underside ceiling with self-aligning sidelaps and concealed fasteners.
      4. Type CFD1.5CA deck is 1-1/2 inches deep, 24-1/2 inches wide with a perforated liner panel attached to the bottom flutes. Deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system. Deck achieves an NRC rating of 0.70 under certain design conditions. Fiberglass insulation batts are installed in the deck cells at the factory under controlled conditions. Dek-Knek Sidelap Attachment System provides a finished underside ceiling with self-aligning sidelaps and concealed fasteners.
      5. Type 2.0CD Deck is 2 inches deep, 36 inches wide with interlocking side laps. Deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system.
      6. Type CFD2C deck is 2 inches deep, 24 inches wide with a liner panel attached to the bottom flutes. Deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system. Dek-Knek Sidelap Attachment System provides a finished underside ceiling with self-aligning sidelaps and concealed fasteners.
      7. Type CFD2CA deck is 2 inches deep, 24 inches wide with a perforated liner panel attached to the bottom flutes. Deck has embossments in the vertical ribs that bond with the concrete to develop a composite floor system. Deck achieves an NRC rating of 0.75 under certain design conditions. Fiberglass insulation batts are installed in the deck cells at the factory under controlled conditions. Dek-Knek Sidelap Attachment System provides a finished underside with self-aligning sidelaps and concealed fasteners.
      8. Type 3.0CD Deck is 3 inches deep, 36 inches wide with interlocking side laps. Desk has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system.
      9. Type CFD3 deck is 3 inches deep, 24 inches wide with interlocking side laps. Deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system.
      10. Type CFD3C deck is 3 inches deep, 24 inches wide with a liner panel attached to the bottom flutes. Deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system. Dek-Knek Sidelap Attachment System provides a finished underside ceiling with self-aligning sidelaps and concealed fasteners.
      11. Type CFD3CA deck is 3 inches deep, 24 inches wide with a perforated liner panel attached to the bottom flutes. Deck has embossments in the vertical ribs that bond with the concrete slab to develop a composite floor system. Deck achieves an NRC rating of 0.85 under certain design conditions. Fiberglass insulation batts are installed in the deck cells at the factor under controlled conditions. Dek-Knek Sidelap Attachment System provides a finished underside with self-aligning sidelaps and concealed fasteners.
    1. Deck Materials:
       1. Sheet steel for galvanized deck shall conform to ASTM A 653/A 653M Structural Steel, with a minimum yield strength of 33 ksi (230 MPa) or other galvanized structural sheet steels or high strength low alloy steels in accordance with AISI S100, Section A2.
       2. Sheet steel for uncoated or phosphatized top/painted bottom deck shall conform to ASTM A 1008 / A 1008M with a minimum yield strength of 33 ksi (230 MPa) or other structural sheet steels or high strength low alloy steels in accordance with AISI S100, Section A2.
       3. Sheet steel for accessories shall conform to ASTM A 653/A 653M, Structural Steel for structural accessories, ASTM A 653/A 653M Commercial Steel for non-structural accessories, or ASTM A 1008 / A 1008M for either structural or non-structural accessories. Other structural sheet steels or high strength low alloy steels shall be permitted in accordance with AISI S100, Section A2. All sheet steel for accessories shall have a minimum specified yield strength of 33 ksi (230MPa).
    2. Deck Finish:

\*\* NOTE TO SPECIFIER \*\* Select the deck finish required from the following paragraphs and delete those not required. Note that the primer-painted finish is intended to protect the steel for a reasonable installation period while exposed to ordinary atmospheric conditions and shall be considered an impermanent and provisional coating.

* + - 1. Galvanized coating shall comply with ASTM A653/A653M with zinc coating as follows:

\*\* NOTE TO SPECIFIER \*\* Select the galvanized coating thickness required from the following paragraphs and delete those not required.

* + - * 1. G30
        2. G40
        3. G60
        4. G90
      1. Uncoated both sides.
      2. Uncoated top side, primer-painted finish gray bottom side.
      3. Uncoated top side, two-coat bright white primer bottom side.
      4. Two-coat bright white primer bottom side and a galvanized top side.
  1. ACCESSORIES
     1. Column closures, end closures, side closures and cover plates shall be the standard type provided by the deck manufacturer unless indicated otherwise on the Drawings.
     2. Galvanizing Repair Paint for Floor Decks High-zinc-dust content paint for regalvanizing welds in galvanized steel conforming to ASTM A 780
     3. Fasteners: As manufactured by Hilti, Buildex, Simpson Strong-Tie or approved equal.
     4. Flexible Closure Strips.

1. EXECUTION
   1. EXAMINATION
      1. Do not install floor 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. Clean surfaces thoroughly prior to installation.
      2. Locate deck bundles to prevent overloading of support members.
   3. INSTALLATION - GENERAL
      1. Install deck panels and accessories in accordance with the Contract Documents and approved installation drawings and requirements of this Section.
      2. Install temporary shoring, if required, before placing concrete.
      3. 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.
      4. Cut and neatly fit deck units and accessories around openings and other work projecting through or adjacent to the decking.
      5. Trades that subsequently cut unscheduled openings through the deck are responsible for reinforcing the openings.

\*\* NOTE TO SPECIFIER \*\* Select the form deck and/or composite deck as required from the following paragraphs and delete those not required.

* 1. INSTALLATION - FORM DECK
     1. Install and fasten deck and accessories in accordance with the Contract Documents approved installation drawings and requirements of ANSI/SDI NC.
     2. End Bearing: Install deck ends over supports with a minimum end bearing of 1-1/2 inches (38 mm) for 1-1/2 inch and shallower profiles, 2 inches (51 mm) for 2 inch (profiles, and 2-1/2 inches (63 mm) for 3 inch profiles, unless otherwise shown on approved installation drawings.
     3. Pour Stops, Side Closures and Girder Fillers: Fasten pour stops, side closures and girder fillers to supporting structure and deck in accordance with the Contract Documents, approved installation drawings and requirements of ANSI/SDI NC..
     4. Floor Deck Closures: Fasten column closures, cell closures, and Z closures to deck in accordance with the Contract Documents, approved installation drawings and requirements of ANSI/SDI NC.
  2. INSTALLATION - COMPOSITE DECK
     1. Install and fasten deck and accessories in accordance with the Contract Documents, approved installation drawings and requirements of ANSI/SDI C.
     2. End Bearing: Install deck ends over supports with a minimum end bearing of 1-1/2 inches (38 mm) for 1-1/2 inch and shallower profiles, 2 inches (51 mm) for 2 inch (profiles, and 2-1/2 inches (63 mm) for 3 inch profiles, unless otherwise shown on approved installation drawings.
     3. Pour Stops, Side Closure and Girder Fillers: Fasten pour stops, side closures and girder fillers to supporting structure and deck in accordance with the Contract Documents, approved installation drawings and requirements of ANSI/SDI C.
     4. Floor Deck Closures: Fasten column closures, cell closures, and Z closures to deck in accordance with the Contract Documents, approved installation drawings and requirements of ANSI/SDI C.
     5. Install temporary shoring before placing deck panels if indicated on the Contract Documents or approved installation drawings.
  3. INSPECTION AND REPAIR
     1. Before 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. Replace decking which has been damaged or permanently deflected.
     2. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint.
     3. Repair Painting: Apply repair paint, of same color as adjacent shop-primed deck, to bottom surfaces of deck exposed to view.
  4. PROTECTION
     1. Protect installed products until completion of project.
     2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION