SECTION 05 31 00

STEEL DECKING

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\*\* NOTE TO SPECIFIER \*\* Vulcraft/Verco Group; Steel Joists, Decking and Bar Grating.
This section is based on the products of Vulcraft/Verco Group, which is located at:
6610 CR 60
St. Joe, IN 46785
Email: [request info (dave.bjork@nucor.com)](https://arcat.com/rfi?action=email&company=Vulcraft%252FVerco%252BGroup&message=RE%253A%2520Spec%2520Question%2520(05312vrc)%253A%2520&coid=36399&spec=05312vrc&rep=&fax=)
Web: <http://www.vulcraft.com> | <http://www.vercodeck.com>
 [ [Click Here](https://arcat.com/company/vulcraft-verco-group-36399) ] for additional information.
Nucor Vulcraft and Verco is North America's leading manufacturer of steel joists, decking, and steel bar grating. Our core values prioritize quality, innovation, and service, with a firm commitment to reducing our carbon footprint. As part of Nucor Corporation, we use Electric Arc Furnace (EAF) technology to produce steel products made from an average of 77.3 percent recycled content. We also measure the sustainability of our products with industry-leading Environmental Products Declarations (EPDs). Our team of experts is always available to help create sustainable solutions for your next project.
Learn more about the Nucor Vulcraft and Verco advantages:
Range of innovative and sustainable solutions.
Technical expertise.
Production and delivery flexibility.
Convenient sales offices.
Nucor Vulcraft and Verco.
Powerful Partnerships. Powerful Results.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Requirements for field painting, fireproofing, roof sumps, roof flashings, drains, collars, gutters, downspouts, insulation, and other miscellaneous items are specified elsewhere.

* + 1. Steel decking for floors and roofs.
	1. RELATED SECTIONS

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

* + 1. Section 03 30 00 - Cast-in-Place Concrete. For normal-weight and lightweight structural concrete fill over steel deck.
		2. Section 03 52 16 - Lightweight Insulating Concrete. For lightweight insulating concrete fill over steel deck.
		3. Section 05 12 13 - Architecturally-Exposed Structural Steel Framing. For shop and field welded shear connectors.
		4. Section 05 12 00 - Structural Steel Framing. For shop and field welded shear connectors.
		5. Section 05 50 00 - Metal Fabrications. For framing deck openings with miscellaneous steel shapes.
	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 Iron and Steel Institute (AISI).
		2. American National Standards Institute (ANSI):
			1. ANSI/AISI S100-16 w/S2-20, North American Specification for the Design of Cold-Formed Steel Structural Members
			2. ANSI/AISI S310-20, North America Standard for the Design of Profiled Steel Diaphragm Panels
			3. ANSI/SDI RD-2017 Standard for Roof Deck
			4. ANSI/SDI C-2017 Standard for Composite Steel Floor Deck-Slabs
			5. ANSI/SDI NC-2017 Standard for Non-Composite Steel Floor Deck
			6. ANSI/SDI RD-2017 Standard for Roof Deck
		3. American Welding Society (AWS):
			1. AWS D1.3/D1.3M:2018, Structural Welding Code - Sheet Steel.
		4. ASTM International (ASTM):
			1. ASTM A1008 - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable.
			2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
		5. Steel Deck Institute (SDI):
			1. SDI Manual of Construction (MOC).
		6. Underwriters Laboratories (UL):
			1. Fire Resistance Directory.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00.
		2. Product Data: For each type of steel deck specified including dimensions and finishes.
			1. Manufacturer's data sheets on each product to be used.
			2. Preparation instructions and recommendations.
			3. Storage and handling requirements and recommendations.
			4. Typical installation methods.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern, and color.
		2. Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.
			1. Include layout and types of deck panels, deck attachment details, accessories specified on the contract documents and other information required for a thorough review.
		3. Welding certificates: If field welding is performed, welder certificates signed by the Contractor certifying that welders comply with requirements specified under "QualityAssurance" Article in this specification.
		4. Test and Evaluation Reports:
			1. Steel Deck: Product Evaluation Reports from IAPMO showing compliance with the specified requirements.
			2. Product Test Reports or Evaluation Reports: Reports from a qualified testing or evaluation agency, indicating that each of the following complies with specified requirements:
				1. Mechanical fasteners: If mechanical fasteners are used, independent test reports or evaluation reports shall be provided by the fastener manufacturer.
				2. Acoustical deck performance.
				3. Approval reports by Factory Mutual demonstrating that the products provided meet the loss-prevention requirements if specified.
		5. Sustainability:
			1. Environmental Product Declarations (EPD): Submit steel floor or roof deck manufacturer's EPD per the following:
				1. All EPDs are to be third-party verified in accordance with the current version of ISO 14025 (validated by a date that has not yet expired) and indicate the following Impact Categories:

Global Warming Potential (GWP): All GWP information submitted shall be in the form of kgCO2eq/kg.

Ozone Depletion Potential (ODP): All ODP information shall be in the form of kgCFC-11/kg.

Acidification Potential (AP): All AP information shall be submitted in the form of kgSO2/kg.

Eutrophication Potential (EP): All EP information submitted shall be in the form of kgN/kg.

Smog Formation Potential (SFP): All SFP information shall be submitted in the form of kgO3/kg.

Energy Consumption: All energy consumption information shall be submitted in the form of MJ.

* + - * 1. Manufacturer-specific GWP information will be one of the decision criteria when awarding this scope. The manufacturer EPD must indicate GWP information from the specific mill or plant facility from which the material is procured. EPDs including GWP information for more than one facility are acceptable as long as each facility's GWP information is reported separately. EPDs reporting GWP values as averages from multiple facilities only or industry-wide EPDs are not acceptable.
				2. EPDs must clearly indicate the Product Flow Diagram disclosing if product fabrication is included within the "cradle-to-gate" life cycle scope (product stages A1-A3) of the EPD.
			1. Recycled Content of Steel Products: Provide documentation in accordance with the current version of ISO 14021 from the manufacturer of steel floor and roof decking products. For each product, both the post-consumer and preconsumer recycled content percentage by weight must be indicated.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience.
			1. Manufacturers offering deck products to be incorporated into the work:
				1. Must submit evaluation reports from an accredited 3rd party evaluation agency such as IAPMO and be a member of the Steel Deck Institute.
				2. Must submit product EPDs in accordance with the sustainability requirement listed in this specification.
		2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
		3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
			1. The intent of a mock-up is to demonstrate quality of workmanship and visual appearance.
			2. If the mock-up is not acceptable, rebuild the mock-up until satisfactory results are achieved.
			3. Retain mock-up during construction as a standard for comparison with completed work.
			4. Do not alter or remove mock-up until work is completed or removal is authorized.
	1. PRE-INSTALLATION CONFERENCE
		1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
	2. 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 Manual of Construction (MOC). Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.
			1. Protect acoustical roof deck batt insulation to maintain insulation free of moisture.
			2. Protect and ventilate acoustical cellular roof deck with factory-installed insulation to maintain insulation free of moisture.
		3. Locate deck bundles to prevent overloading of supporting members.
	3. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	4. WARRANTY
		1. Manufacturer's standard limited warranty unless indicated otherwise.
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://arcat.com/rfi?action=email&company=Vulcraft%252FVerco%252BGroup&message=RE%253A%2520Spec%2520Question%2520(05312vrc)%253A%2520&coid=36399&spec=05312vrc&rep=&fax=);Web: <http://www.vulcraft.com> | <http://www.vercodeck.com>
			1. Subject to compliance with requirements, provide products by one of the following:

\*\* NOTE TO SPECIFIER \*\* Delete decking supplier not required.

* + - * 1. Verco Decking.
				2. Vulcraft.

\*\* 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 the provisions of Section 01 60 00.
	1. PERFORMANCE AND DESIGN REQUIREMENTS
		1. Codes and Standards: Comply with applicable provisions of the following specifications:
			1. ANSI/AISI S100-16 w/S2-20, North American Specification for the Design of Cold-Formed Steel Structural Members.
			2. ANSI/AISI S310-20, North America Standard for the Design of Profiled Steel Diaphragm Panels.
			3. ANSI/SDI RD-2017 Standard for Roof Deck.
			4. ANSI/SDI C-2017 Standard for Composite Steel Floor Deck-Slabs.
			5. ANSI/SDI NC-2017 Standard for Non-Composite Steel Floor Deck.
		2. Welding Qualifications: Qualify procedures and personnel in accordance with and the following welding codes:
			1. AWS D1.3/D1.3M:2018, Structural Welding Code - Sheet Steel.
		3. Mechanical Fasteners: If required by the fastener manufacturer, certify that each mechanical fastener installer has satisfactorily passed certification tests as required by the fastener manufacturer.
		4. Fire Resistance Assemblies: Provide steel deck units classified by Underwriters Laboratories (UL) in the "Fire Resistance Directory" if a fire rated assembly is required. Identify steel deck bundles with labels bearing the UL mark.

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

* 1. STEEL DECKS
		1. Steel Deck Panels: Comply with ANSI/SDI RD-2017, C-2017, or NC-2017. Deck profile, design uncoated-steel thickness, steel grade and finish, and side-lap configuration as indicated on the structural drawings.
		2. Acoustical Steel Deck:
			1. Deck units with manufacturer's standard perforations.
			2. Non-Cellular Steel Deck: Manufacturer's standard glass or mineral fiber sound-absorbing insulation.
				1. Pre-molded strips or rolls for field installation by the roofing installer.
			3. Cellular Steel Deck: Factory installed acoustical insulation and optional spacers; if indicated in structural drawings.
		3. Composite Steel Deck Panels: With integral embossments or configurations.
			1. Comply with ANSI/SDI C-2017.
		4. Materials: Sheet steel.

\*\* NOTE TO SPECIFIER \*\* Delete steel sheet option not required. Then delete grade and coatingoptions not required.

* + - 1. Uncoated Steel Sheet Shop Primed: ASTM A1008, Structural Steel.
				1. Grade: 40.
				2. Grade: 50.
				3. Grade: 80.
				4. Grade: As indicated on structural drawings.
			2. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel.
				1. Grade: 40.
				2. Grade: 50.
				3. Grade: 80.
				4. Grade: As indicated on structural drawings.
				5. Zinc Coating: G30.
				6. Zinc Coating: G60.
				7. Zinc Coating: G90.
				8. Zinc Coating: As indicated on structural drawings.
		1. Finishes:
			1. Shop Applied Primer: Manufacturer's standard baked-on, rust-inhibitive primer to top and/or bottom sides as indicated on structural drawings.
				1. Composite Decks: Do not prime top side of composite decks.

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

* + - * 1. Color: Manufacturer's standard gray.
				2. Color: Manufacturer's standard white.
	1. ACCESSORIES
		1. Manufacturer's standard accessory materials for decking complying with requirements indicated.
			1. Miscellaneous Sheet Metal Deck Accessories: Galvanized steel sheet.
				1. Yield Strength: 33,000 psi (2217527 kPa).
				2. Material Thickness: No less than 0.0358 inch (0.909 mm), 20 ga uncoated thickness of profile indicated or required for application.
				3. Items include but are not limited to the following:

Column Closures

End Closures

Z-Closures

Cover Plates

\_\_\_\_\_\_\_\_.

* + 1. Mechanical Support Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
			1. Size and fastening pattern as indicated.
		2. Screws for Side-Lap Fastening: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, diameter and spacing or quantity as indicated on structural drawings.
		3. Flexible Closure Strips: Synthetic rubber.
		4. Pour Stops and Girder Fillers: Galvanized steel sheet.
			1. Yield Strength: 33,000 psi (227527 kPa)
			2. Thickness and Profile: Recommended by SDI for overhang and slab depth.
		5. Weld Washers: Uncoated steel sheet, shaped to fit deck rib, 0.0598 inch (1.519 mm), 16 ga thick, with factory-punched hole of 3/8 inch minimum diameter.
		6. Sump Pans: Single-piece steel sheet, 0.0747 inch (1.897 mm), 14 gauge, thick galvanized steel sheet. For drains, cut holes in the field.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until the substrates have been properly constructed and prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION OF DECKS
		1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
		2. Install deck panels and accessories in accordance with ANSI/SDI RD-2017, C-2017, or NC-2017, SDI MOC, structural drawings, installation drawings marked for field use, and requirements in this section.
		3. Place deck panels on structural supports and adjust to final position with ends aligned. Bring deck into contact with the bearing surface as required by the fastening system and attach firmly to the supports immediately after placement to form a safe working platform.
		4. Install temporary shoring before pouring concrete if required to meet strength or deflection limitations.
		5. Fasten deck panels to steel supporting members, side-laps between supports, and at perimeter edges by the means indicated.
			1. Locate welds as indicated and comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.
			2. Locate mechanical fasteners as indicated and install in accordance with fastener manufacturer's written instructions.
			3. Install PunchLok II side-lap connections using the PunchLok II tool as indicated.
		6. End Bearing: Install deck ends over supports with a minimum end bearing of 2 inches (51 mm), or as indicated on the approved installation drawings with end joints as follows:
		7. End Joints: Lapped or butted per the approved installation drawings. Laps shall be 3 inches (76 mm) minimum at open-web steel joists or 2 inches (51 mm) at other structural supports.
		8. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.
		9. Install additional reinforcement and closure pieces as specified on the structural drawings.
		10. Accessories:
			1. Deck Accessories: Install and fasten steel sheet accessories in accordance with ANSI/SDI RD-2017, C-2017, NC-2017, or SDI MOC the approved installation drawings.
				1. Roof Sump Pans: Install where indicated in architectural details in openings cut in roof deck and mechanically fasten flanges to top of deck. Space mechanical fasteners not more than 12 inches (305 mm) apart with at least one fastener at each corner.
				2. Install reinforcing members as indicated to span between supports and weld or mechanically fasten.
			2. Flexible Closure Strips: Install flexible closure strips over partitions, walls, where indicated. Install with adhesive in accordance with closure manufacturer's written instructions to ensure complete closure.
			3. Sound-Absorbing Insulation for non-cellular acoustical decks: Install into topside ribs of deck before roofing insulation is applied.
	4. FIELD QUALITY CONTROL
		1. Tests and Inspections:
			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 ANSI/SDI QA/QC.
				1. Field Weld Inspection and Other Inspections: As indicated on structural drawings.
				2. PunchLok II Connections: Inspect to ensure the sidelap material has been sheared and offset so the sheared surface of the male leg is visible in the cut.
				3. Sidelap Screw Connections: Inspect to ensure the proper size and number of screw attachments per span have been installed between supports.
				4. Support Connections: Inspect to ensure the proper size and number of attachments per deck sheet have been installed. Verify fasteners are installed per the manufacturer's instructions and quality assurance requirements.
				5. Other Attachments of Deck and Accessories: Inspect according to manufacturer's instructions and quality assurance requirements, or per industry standards.
	5. CLEANING AND PROTECTION
		1. Clean products in accordance with the manufacturers recommendations.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION