SECTION 05 53 00

METAL GRATINGS

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\*\* NOTE TO SPECIFIER \*\* Nucor Vulcraft/Verco Group; Steel Joists, Decking and Bar Grating.
This section is based on the products ofNucor Vulcraft/Verco Group, which is located at:
6610 CR 60
St. Joe, IN 46785
Email: \_\_\_\_\_\_\_.
Web: www.vulcraft.com
Web: www.vercodeck.com
[Click Here] 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.
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Powerful Partnerships. Powerful Results.

1. GENERAL
	1. SECTION INCLUDES

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

* + 1. Metal bar gratings.
	1. RELATED SECTIONS

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

* + 1. Section 05 12 00 - Structural Steel Framing. For structural-steel framing system components.
		2. Section 05 51 00 - Metal Stairs. For grating treads and landings of steel-framed stairs.
		3. Section 05 52 13 - Pipe and Tube Railings. For metal pipe and tube handrails and railings.
	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 International (ASTM):
			1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
			2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
			3. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60[UNICODE CHAR NOT COVERED: 8201]000 PSI Tensile Strength.
			4. ASTM A510/A510M - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel.
			5. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric).
			6. ASTM A780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
			7. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
			8. ASTM D1187 - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
			9. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
			10. ASTM F594 - Standard Specification for Stainless Steel Nuts.
		2. American National Standards Institute (ANSI):
			1. ANSI/NAAMM MBG 533 - Welding Standards for Fabrication of Steel, Stainless Steel, and Aluminum Bar Grating.
		3. American Society of Mechanical Engineers (ASME):
			1. ASME B18 - Standardization of Bolts, Nuts, Rivets, Screws, Washers, and Similar Fasteners
		4. American Welding Society (AWS):
			1. AWS- D1/1 - Structural Welding Code, Steel.
		5. National Association of Architectural Metal Manufacturers (NAMM):
			1. NAAMM Metal Bar Grating (MGB).
		6. Society for Protective Coatings (SSPC):
			1. SSPC-20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic).
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00.
		2. Product Data:
			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.
		3. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
			1. Provide templates for anchors and bolts specified for installation under other Sections.
			2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
		4. Mill Certificates: Available upon request
		5. Welding certificates.
		6. Qualification Data: For professional engineer.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience.
		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.
		4. Field Measurements: Verify actual locations of walls and other construction contiguous with gratings by field measurements before fabrication and indicate measurements on Shop Drawings.
			1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating gratings without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
			2. Provide allowance for trimming and fitting at site.

\*\* 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. COORDINATION
		1. Coordinate installation of anchorages for gratings, grating frames, and supports. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
	3. DELIVERY, STORAGE, AND HANDLING
		1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
		2. Protect from damage due to weather, excessive temperature, and construction operations.
	4. 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.
	5. 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 60St. Joe, IN 46785Email: [request info (dave.bjork@nucor.com)](https://arcat.com/rfi?action=email&company=Vulcraft%252FVerco%252BGroup&message=RE%253A%2520Spec%2520Question%2520(05530vrc)%253A%2520&coid=36399&spec=05530vrc&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 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. Structural Performance of Gratings: Provide gratings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
			1. Floors: Uniform load of 100 psf (4.79 kPa) or concentrated load of 300 lbf (136 kg), whichever produces the greater stress.
			2. Walkways and Elevated Platforms Used as Exits: Uniform load of 100 psf (4.79 kPa).
			3. Limit deflection to L/240 or 1/4 inch (6 mm), whichever is less.
		2. Metal Bar Grating Standards: Comply with current NAAMM Metal Bar Grating (MGB) standards.
	2. FERROUS METALS
		1. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
		2. Wire Rod for Grating Crossbars: ASTM A510/A510M.
	3. FASTENERS
		1. General: Unless otherwise indicated, provide Type 316 stainless-steel fasteners for exterior use or zinc-plated fasteners with coating complying with ASTM B633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.
		2. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.
		3. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts, and, where indicated, flat washers;ASTM F593 for bolts and ASTM F594for nuts, Alloy Group 1.
		4. Plain Washers: Round,ASME B18.22.1.
		5. Lock Washers: Helical, spring type, ASME B18.21.1.
	4. MISCELLANEOUS MATERIALS
		1. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy that is welded.
		2. Shop Primers: Provide primers that comply with SSPC-20.
		3. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing steel welds, complying with SSPC-Paint 20.
		4. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.
	5. FABRICATION
		1. Shop Assembly: Fabricate grating sections in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
		2. Cut, drill, and punch material cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (0.8 mm), unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
		3. Form from materials of size, thickness, and shapes indicated, but not less than that needed to support indicated loads.
		4. Fit exposed connections accurately together to form hairline joints.
		5. Welding: Comply with ANSI/NAAMM MBG 533. High stress structural welds comply with AWS- D1/1.
		6. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space the anchoring devices to secure gratings, frames, and supports rigidly in place and to support indicated loads.
			1. Toeplate Height: 4 inches (102 mm) above surface, unless otherwise indicated.
	6. METAL BAR GRATINGS
		1. Welded Steel Grating:
			1. Bearing Bar Spacing: As indicated on drawings.
			2. Bearing Bar Depth: As indicated on drawings.
			3. Bearing Bar Thickness: As required to comply with structural performance requirements.
			4. Crossbar Spacing: As required to comply with structural performance requirements.
			5. Grating Mark: As indicated.
			6. Traffic Surface: As indicated.
			7. Steel Finish: As indicated
		2. Removable Grating Sections: Fabricate with banding bars attached by welding to entire perimeter of each section. Include anchors and fasteners of type indicated or, if not indicated, as recommended by manufacturer for attaching to supports.
			1. Provide not less than 4 saddle clips for each grating section composed of rectangular bearing bars 3/16 inch (5 mm) or less in thickness with each clip designed and fabricated to fit over 2 bearing bars.
			2. Furnish threaded bolts with nuts and washers, self-drilling fasteners with washers, or galvanized malleable-iron flange clamp with galvanized bolt for securing grating to supports.
		3. Fabricate cutouts in grating sections for penetrations indicated. Arrange cutouts to permit grating removal without disturbing items penetrating gratings.
			1. Edge-band openings in grating that interrupt four or more bearing bars with bars of same size and material as bearing bars.
		4. Do not notch bearing bars at supports to maintain elevation.
	7. STEEL FINISHES
		1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
		2. Finish gratings, frames, and supports after assembly.
		3. Galvanizing: For those items indicated for galvanizing, apply zinc coating by the hot-dip process complying with ASTM A123/A123M.
		4. Apply shop primer to uncoated surfaces of gratings, frames, and supports, except those with galvanized finishes and those to be embedded in concrete or masonry, unless otherwise indicated. Comply with SSPC-20, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
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
		1. General:
			1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
			2. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing gratings. Set units accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
			3. Fit exposed connections accurately together to form hairline joints.
				1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
		2. Install gratings to comply with recommendations of referenced metal bar grating standards that apply to grating types and bar sizes indicated, including installation clearances and standard anchoring details.
		3. Attach removable units to supporting members with type and size of clips and fasteners indicated or, if not indicated, as recommended by grating manufacturer for type of installation conditions shown.
		4. Attach nonremovable units to supporting members by welding where both materials are same; otherwise, fasten by bolting as indicated above.
	4. FIELD QUALITY CONTROL
		1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection, or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
	1. ADJUSTING, CLEANING AND PROTECTION
		1. Clean products in accordance with the manufacturers recommendations.
		2. Touchup Painting: Field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 painting Sections.
		3. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

END OF SECTION