

SPECIFICATION FOR OPEN GRID DECK SYSTEMS

[Note: Highlighted regions require input from the author or provide guidance. Highlighting should not be visible on the completed document]

1. DESCRIPTION

- 1.01 Contractor shall furnish, deliver, and install the steel grid panels as shown in the contract drawings and in accordance with the manufacturers' recommendations.

2. MATERIALS

- 2.01 The materials for this work shall meet the quality requirements of [the relevant portions of the owner's Standard Specifications], unless the same are altered by any specific requirements under any Special Provision, or by notes shown on the contract drawings, or in the Proposal.

Within 10 days after the contract is awarded, the contractor shall notify the Engineer of the name, address, telephone number, and contact person of the fabricator of all deck panels to be manufactured, supplied, and installed.

- 2.02 The steel grid deck system must be purchased from one of the following AISC certified fabricators and participating BGFMA members:

Frontier Gratings	(256) 845-9556
Mission Critical Solutions	(412) 551-9506

Further information may be obtained from:

BGFMA
Attn: Mike Riley
Tel: (724) 355-1878
bgfma@bgfma.org

- 2.03 The steel grid deck shall be fabricated using ASTM A36/A709 Grade 36 [A36M/A709M Grade 250] steel [A588/A709 Grade 50W [A588M/A709M Grade 345W] or A572/A709 Grade 50 [A572M/A709M Grade 345] may also be specified as an alternate]. Welding shall be in conformance with established grid industry practice, including the permitted use of Gas Metal Arc Welding (MIG).

Weld qualification and weld procedures in accordance with AWS D1.5 [or per the relevant portions of the owner's Standard Specifications] shall be approved prior to deck panel fabrication.

Cambered tables may be used to offset distortion caused by the welding process. Puddle welds at the top of the panel shall join each intersection of main bars, cross bars, and supplemental/diagonal bars. The electrode shall follow a spiral pattern engaging all intersecting bars. The resulting weld shall be visually inspected to ensure the weld engages all intersecting bars; there are no signs of porosity; there is no undercutting from the weld; and that the resulting weld is visually neat and workmanlike.

- 2.04 Unless otherwise specified, bolts, nuts and washers shall conform to the specifications of ASTM A325, ASTM A563, and ASTM F436 respectively. All fasteners shall be galvanized in accordance with ASTM A153/A153M.
- 2.05 The panel layout shown on the Contract plans is suggested. The fabricator shall develop the layout and detail it on the shop drawings.
- 2.06 If required, galvanized coatings shall conform to ASTM A123/A123M. Any defects in galvanizing shall be repaired as specified in ASTM A780.
- 2.07 If required, paint shall comply with [relevant portions of the owner's Standard Specifications and Approved Materials List] and shall be applied in accordance with [relevant portions of the owner's Standard Specifications OR the manufacturer's recommendations].

3. CONSTRUCTION DETAILS

3.01 **Steel Grid Deck**

- A. The steel grid deck shall be fabricated to the dimensions and properties as shown on the plans, shop drawings, and in accordance with [the relevant portions of the owner's Standard Specifications]. Weld sizes shall be in conformance with established grid industry practice unless otherwise indicated on the contract plans. It shall be the contractor's responsibility to field verify all dimensions in order to make necessary changes prior to fabrication.
- B. After the attachment of plates, and other components as described in the plans and specifications, the grid panels shall be galvanized in accordance with ASTM A123/A123M.

[Or]

- B. After attachment of plates, and other components as described in the plans and specifications, the grid panels shall be cleaned and shop [or field] painted in accordance with the requirements of [relevant portions of the owner's Standard Specifications] (color to be shown on the Plans). Surfaces which are to be welded shall not be painted until all welding is complete. Steel grid deck intended to be

filled with concrete shall be painted only on the exposed surfaces. Top surfaces of flush-filled grid decks exposed to tire wear shall not be painted.

- C. The dimensional tolerances for each steel grid panel shall be in accordance with the most recent version of BGFMA TS-01, “Fabrication Tolerances for Grid Decks,” published by the Bridge Grid Flooring Manufacturers Association.

[Or]

- C. The steel grid deck panels shall be fabricated within the following tolerances:

Panel Length (L)	$\pm 0.25''$ [6.4mm] (in the direction of main bar)
Panel Width (W)	+0, -0.125'' [-3.2mm] (in the direction of cross bar)
Squareness (Diagonals ‘D1’ and ‘D2’)	$ D1-D2 \leq 0.5''$ [12.7mm]
Longitudinal Camber	$0.003 * L$
Transverse Camber	$0.004 * W$
Sweep (side bow) (‘L’ in feet, tolerance in inches) (See Note 1)	$0.025 * L$ (for $L \leq 40' - 0''$) $0.00065 * L^2$ (for $L > 40' - 0''$)
[‘L’ in meters, tolerance in millimeters) (See Note 1)]	[$20.83 * L$ (for $L \leq 12.192m$)] [$0.178 * L^2$ (for $L > 12.192m$)]
Main Bar Verticality	$0.04 * H$ (‘H’ = full bar height) (See Note 2)
Cross Bar Verticality	$0.04 * H$ (‘H’ = full bar height) (See Note 2)
Bar Spacing (Main Bar & Cross Bar)	$\pm 0.125''$ [3.2mm] center to center (See Note 2)

Note 1: Sweep tolerances applicable for galvanized panels with standard puddle welds connecting components and diagonal grids less than 25’ [7.62m] in length. Galvanized diagonal open grid panels not recommended over 25’ [7.62m] in length.

Note 2: No more than 1% of all locations can violate specified tolerance.

- D. Lifting locations and procedures shall be included on the shop drawing submission. Care shall be taken to avoid twisting of the panels or bending of the panels in the weak (perpendicular to main bar) direction. [Use of multiple pick points is recommended.] Steel grid panels must be properly blocked with wood (with due regard to built-in panel camber) during transportation and storage in order to avoid distortion or other damage.

3.02 Field Installation

- A. Installation and installation tolerances shall be in accordance with this specification and the most recent version of BGFMA TS-02, “Installation Tolerances and Guidelines for Open Grid Decks,” published by the Bridge Grid Flooring Manufacturers Association.

[Or]

- A. Installation shall be in accordance with this specification and the most recent version of BGFMA TS-02, "Installation Tolerances and Guidelines for Open Grid Decks," published by the Bridge Grid Flooring Manufacturers Association. The steel grid deck panels shall be installed within the following tolerances:
- 1.) Alignment: Main bearing bar and cross bar misalignment between adjacent grid deck panels shall be no more than 1/4" [6.4mm].
 - 2.) Gap: Distance between main bearing bars and cross bars between adjacent grid deck panels shall be between 0 and 1/2" [12.7mm]
- B. Panels will be delivered to the job site free from any defects and bearing the proper identifying marks. Check the panels for defects and identification. Repair or replace the grid panels or metal forms damaged during shipment and storage, to the satisfaction of the Engineer.
- C. Position panels on the beams and align with adjacent panels. Measure from fixed points to avoid cumulative error. Adjustment to proper elevation shall be made through the use shims or other means. Square up panels as necessary.

4. METHOD OF MEASUREMENT

- 4.01 Steel grid deck panels shall be measured as the total gross square footage of the grid deck area installed and inspected in accordance with the plans and specifications. Measurements will be taken from the outside edge to outside edge of the grid area in both directions. No deduction will be made for joints or openings.

5. BASIS OF PAYMENT

- 5.01 The unit bid price shall include the cost of furnishing all labor, materials, and equipment necessary to complete the work, including the furnishing and installation of all grid panels, which also includes the cost of transportation, storage, and protection from damage to the deck panels.

COMMENTARY TO SPECIFICATION FOR OPEN GRID DECK SYSTEMS

- C2.06 ASTM A780 allows for three methods of repair: Zinc-Based Solders (Hot-Stick), Paints Containing Zinc Dust, or Sprayed Zinc (Metalization). Although some states include repair procedures within construction specifications, fabricators should have the ability to select which method of repair in accordance with A780 is most convenient.
- C2.07 All grid deck panels are subject to distortion during the galvanization process and may require field straightening. Heavily welded grid decks, e.g. diagonal open grid, are difficult to straighten and risk the possibility of breaking the welds. Utilizing a paint system for protective coating prevents the distortion and is recommended for diagonal open grid panels over 25' [7.62m].
- C3.01.B Grid deck panels with a width over 9'-0" exceed the depths of galvanization tanks and cannot be hot-dipped. Oversized panels should be specified as painted.