

ITEM 10596.10 M – STEEL GRID DECK

DESCRIPTION

This work shall consist of furnishing and placing steel grid deck as shown on the Contract Plans and as specified herein. This grid deck panels shall include main bars, supplemental cross bars and reinforcing bars of the size and spacing shown on the Plans. The grid deck panels shall also include stringer connection plates as shown on the Plans.

MATERIALS

Steel Grid Deck

Steel grid deck shall conform to the requirements of Section 596 of the Standard Specifications and ASTM A709M Grade 250 except as modified in the Contract Documents. Miscellaneous structural steel shall conform to the requirements of ASTM A709M Grade 250 unless otherwise noted in the Contract Documents.

Fasteners shall conform to the requirements of ASTM A325M, A563M and F436M. All fasteners shall be galvanized in accordance to the requirements of ASTM A153M.

Bar reinforcement shall meet the requirements of Sections 709-01 and 709-04 of the Standard Specifications.

The grid deck and structural steel shall be cleaned and painted in accordance with the requirements of Section 572 of the Standard Specifications (color to be shown on the Plans). Portions of the grid deck that are to bond with concrete shall not be painted.

Working drawings shall be prepared by the Contractor for the Engineer's review and approval in accordance with the New York State Steel Construction Manual. The working drawings shall provide complete details and procedures to complete the assembly and the installation of the grid deck.

CONSTRUCTION DETAILS

Steel Grid Deck

The steel grid deck shall be fabricated and installed in accordance with the New York State Steel Construction Manual and as modified by the Contract Documents.

The fabrication and installation of miscellaneous structural steel items shall be in accordance with the requirements of the New York State Steel Construction Manual and Section 564 of the Standard Specifications.

The Contractor shall verify all dimensions including any modifications to the structure during construction to determine the relative elevations of the deck beams and shall make all necessary adjustments for the fabrication of the grid deck.

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The grid-reinforced concrete deck shall be fabricated as shown on the Contract Drawings. The grid deck shall consist of main rolled bars, secondary cross bars, supplemental bars and reinforcing bars. The secondary cross bars shall intersect and be perpendicular to the main bar. The two supplemental bars shall be parallel and evenly spaced between the main bars. Reinforcing bars shall be shop installed between the main bars and supplemental bars. A pan shall be provided as the form for the half-filled concrete grid reinforced deck. The grid-reinforced concrete deck shall have edge bars as detailed on the Plans. Hold-down plates shall be fabricated and installed as shown on the Plans. The individual diagonal bars, secondary bars, cross bars and main bars of grid deck panels shall be welded at all intersections. The size and type of welds shall be as shown on the Plans.

A. Welding

A welding procedure and a welding sequence shall be submitted for review. Welding procedures shall be submitted for all welds. The welding sequence shall include the sequence and methods to prevent and minimize distortions and residual welding stresses in the completed grid deck. All welding shall be done in accordance with the New York State Steel Construction Manual.

B. Sample Grid Deck Panels

Prior to mass fabrication and production of the grid deck panels, the fabricator shall fabricate a typical grid deck panel of each type. A pre-fabrication meeting shall be held at the fabricator's plant facility for inspection and review of the pre-production grid deck. The Contractor and the Engineer shall attend the meeting. The grid deck fabricator shall not begin fabrication and production of the remaining panels until approval of the sample grid deck by the Engineer. Approved sample grid deck panels may be incorporated into the work.

C. Fabrication

The grid deck shall be fabricated on a level solid surface. The flatness of grid deck panel shall be monitored during the fabrication process. Welding of the grid deck shall be sequenced and controlled to prevent distortions during and after the fabrication process of the grid deck.

D. Tolerances

The grid deck panels shall be fabricated within the following tolerances:

1. Overall Panel Length and Width

Plus zero (+0) to minus 3 mm maximum from the approved shop drawings.

2. Panel Squareness

Diagonal lengths between extreme corners of a panel shall measure within 12 mm

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from each other.

3. **Panel Flatness**

The transverse camber (width) of panel shall be no more than 0.001 times the width of the panel. The longitudinal camber (length) shall be no more than 0.003 times the length of the panel.

4. **Sweep**

The side bow (sweep) shall be no more than plus or minus 2 mm per meter in either direction.

5. **Main Bar Verticality**

The main bar shall be no more than 2 mm out of vertical on the full bar height.

6. **Cross Bar Verticality**

The cross bar shall be no more than 2 mm out of vertical on the full height.

7. **Main Bar Spacing**

Center to center spacing of the main bar shall be no more than plus or minus 2 mm from the detailed bar spacing.

8. **Cross Bar Spacing**

Center to center spacing of the cross bar shall be no more than plus or minus 2 mm from the detailed bar spacing.

The grid deck panels shall be installed within the following tolerances:

Cross bar alignment between adjacent grid deck panels shall be no more than plus or minus 2 mm.

The overall cross bar alignment of grid deck panels from end to end of the draw span leaf shall be no more than plus or minus 6 mm.

E. **Transport and Storage**

The grid deck panels shall be supported in a manner to prevent distortion during transport and storage. Adequate support or dunnage beneath the grid deck panel shall be provided at the ends of the panel and at intermediate points. The intermediate spacing of the supports or dunnage during transport and storage shall be no more than half the maximum stringer spacing. The grid deck shall be fully secured during transport. The flatness of deck panels shall be within the allowable tolerances as noted above after transport or storage.

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F. Handling

The grid deck panels shall be supported in a manner to prevent distortion during handling. Care shall be taken during lifting and placing to avoid overstressing, damaging or distorting the grid deck panels. The panels shall not be placed or dragged over any obstruction that will damage the components of the grid deck.

G. Assembly

The grid deck panels shall be placed and installed in such a manner so that no initial stress is induced into the bridge structure or grid deck panel. No external force shall be applied to the new grid deck panel or bridge structure to fit the component except to close a gap less than 2 mm between the new deck panel and new stringer. There shall be no imposed undue stresses or distortions of the grid deck during installation. If a gap greater than 2 mm exists between the deck panel and stringer, the Contractor shall provide shims to fill the gap.

Any deck panel installed with an undue stress or distortion shall be removed and replaced with a new panel section at no additional cost to the Department. Any deck panel installed that is not in conformance with contract specifications shall be removed and replaced with a new panel at no additional cost to the Department.

H. Repairs

The Contractor shall submit repair procedures for non-conforming grid deck panels or assemblies. The repair procedure shall not be construed as acceptance of the deck panels or assemblies. All repairs shall be documented and submitted to the Engineer.

METHOD OF MEASUREMENT

The quantity shall be measured as the number of square meters of grid deck surface installed in accordance with the plans and this specification.

BASIS OF PAYMENT

The unit price bid per square meter shall include the cost of furnishing all labor, materials and equipment necessary to complete the work. This price shall include, but not be limited to the cost of verification of all dimensions, sample panels, furnishing and installing grid decking, reinforcement, painting, incidental hardware (including connection plates), adjustments and inspection of this work.