Origination Form

Specifications

Submittal Information			
Name:	Oliver Chung	**Standard Specification Section:**	460
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Date:	2026-05-04T19:52:42Z	**Associated Specs:**	N/A

Summary:

Summary of changes made: 1. Use ASTM methods (ASTM F3125 and F606) to streamline and harmonize with the industry. 2. Add the industrial code for quality improvement and set the acceptance criteria. 3. Move the manufacturer requirements from Division II to MM Volume II. 4. Implement Department research to improve the efficiency. 5. Material requirement changes have been made to align with Materials Bulletin No. 24-02 Revised Procurement And Contractor's Quality Control Plan Requirements Of Specific Structural Materials For Projects Let After July 1, 2024.

Justification:

Changes are made to use the appropriate national standards, provide clearer guidance to the specification users, and improve the efficiency of project delivered. Material requirement changes have been made to align with Materials Bulletin No. 24-02 Revised Procurement And Contractor's Quality Control Plan Requirements Of Specific Structural Materials For Projects Let After July 1, 2024.

Do the changes affect other types of specifications?

Neither

List Specifications Affected:

Other Affected Documents/Offices	Contacted	Yes/No
Other Standard Plans		No
Florida Design Manual		No
Structures Manual		No
Basis of Estimates Manual		No
Approved Product List		No

Construction Office		No
Maintenance Office		No
Materials Manual		No
Traffic Engineering Manual		No

Are changes in line with promoting and making progress on improving safety, enhancing mobility, inspiring innovation, and fostering talent; explain how?

By using the national standards and codes, we streamline the specifications and the materials manual, it will improve the efficiency of department project delivery. Material requirement changes have been made to align with Materials Bulletin No. 24-02 Revised Procurement And Contractor's Quality Control Plan Requirements Of Specific Structural Materials For Projects Let After July 1, 2024.

What financial impact does the change have; project costs, pay item structure, or consultant fees?

N/A

What impact does the change have on production or construction schedules?

Improve the efficiency by updating the references to the latest standards and adopting the department research implementations.

How does this change improve efficiency or quality?

By using the national standards and codes we streamline the specifications and the materials manual, it will improve the efficiency of department project delivery. Materials Bulletin changes improve materials certification efficiency in the field.

Which FDOT offices does the change impact?

State Materials Office, State Design Office, State Construction Office.

What is the impact to districts with this change?

Positive impact by updating the requirement with the latest ASTM requirements.

Does the change shift risk and to who?

N/A

Provide summary and resolution of any outstanding comments from the districts or industry.

Comments and Responses are available on the Track the Status of Revisions hyperlink located on the Specifications landing page: https://www.fdot.gov/specifications/default.shtm

What is the communication plan?

Through the established specification revision process (e.g., Internal and Industry Review)

What is the schedule for implementation?

The Standard Specifications eBook and Workbook are effective July 1st every year.

STRUCTURAL STEEL AND MISCELLANEOUS METALS
(REV 5-4-26)

ARTICLE 460-2 is deleted and the following is substituted:

460-2 Materials.

Provide the materials specified in the Contract Documents in accordance with Sections 6, 105, ASTM A6, and AASHTO/AWS D1.5, Bridge Welding Code. Fabricate all unpainted steel elements using steels with weathering characteristics as defined in ASTM A709 for grades with a "W" suffix.

Structural components designated as a Nonredundant Steel Tension Member (NSTM) shall conform to the provisions of the AASHTO/AWS D1.5, Bridge Welding Code, Clause 12 AASHTO/AWS Fracture Control Plan (FCP) for Non-redundant Members, in addition to the requirements of the Contract Documents.

Meet the additional following requirements:

Structural Steel and Miscellaneous Metal Items.Section 962
~~Material Testing and Certifications .....Section 962~~
Galvanizing ..... Section 962-11
Structural Coatings.....Section 560
~~Structural Coating Materials .....Section 975~~

SUBARTICLE 460-4.2.2 is deleted and the following substituted:

460-4.2.2 Match Marking of Members and Assemblies: Match mark all connecting members or parts that have been reamed or drilled while assembled. The fabricator shall submit a diagram showing all marks and clearly indicate the location of all the marks on the shop drawings.

Use painted marks, attached metal tags, other durable methods which do not degrade the finish of the piece, including plasma etching or low-stress type steel die stamps to identify and match mark pieces. If steel die stamps are used, they must be blunt nosed or interrupted dot dies, manufactured to produce impressions that are rounded at the bottom of the impression. Re-mark coated type markings as necessary to maintain continuity in traceability. Plasma etching using robotic equipment may be used to mark the surface of a steel plate when done at maximum 10 ~~a~~Amps and ~~at~~ between ~~150~~ 140 and 160 inches per minute travel speed. Plasma etching outside of these parameters requires Engineer approval.

Mark splice plates and girders so that upon erection, the mark on the splice plate is located opposite a matching mark on the girder. Place the mark on web splice plates, midway down the long side of the plate, on either the right or left side, to correspond with the girder to which the splice plate will be temporarily attached for shipping to the erection site. Make a matching stamp on the girder web opposite the mark on the splice plate.

Place the mark on top or bottom flange splice plates, on the right or left end of the plate, corresponding to the girder to which the plate will be attached for shipment to the erection site. Place a corresponding mark on the girder flange opposite the mark in the splice plate.

As an alternate location for tub girder bottom flange splice plates, place the mark midway down the long side of the plate, on either the right or left side, to correspond with the girder to which the splice plate will be temporarily attached for shipping to the erection site. Make a matching mark on the girder flange opposite the mark on the splice plate.

Mark girders and beams on the left end, according to the orientation shown in the shop drawings, near the top flange. Mark diaphragms in the middle upper portion of the web. Mark cross-frames in the middle of the top or bottom horizontal member.

When heat numbers and other identification marking are applied by die stamping to NSTMs, low stress dies shall be used.

Low-stress die stamp markings applied to NSTMs shall be placed in locations or zones shown or described in the approved shop drawings. Low-stress or compression areas are preferred.

Ensure that during fabrication, the heat number is maintained on each primary member by paint until the component is permanently joined into a piece marked member or assembly.

SUBARTICLE 460-4.4.2 is expanded by the following:

460-4.4.2.6 Induction Bent Pipes: Induction bent pipes and their final dimensions shall meet Pipe Fabrication Institute Standard ES-24.

SUBARTICLE 460-5.2.1 is deleted and the following substituted:

460-5.2.1 Rotational Capacity (RC) Tests: At the location of and prior to installation of permanent high-strength fasteners in primary member connections, perform RC tests in accordance with ~~Section A2.5 FM 5-581 (for long bolts) or FM 5-582~~Section A2.7 ~~(for short bolts)~~ Annex A2 of ASTM F3125 ~~to ensure that the fasteners are capable of developing the specified strength and that the fasteners are properly lubricated~~. ~~As a minimum, test two assemblies per LOT designation.~~ The bolt, nut and washer shall come from the same LOT and be packed in the same container (or group of containers ~~assigned~~assigned to the same LOT), except in special cases where nuts and washers have only one production LOT number for each size.

Short bolts may also be tested using FM 5-583 with DTIs calibrated with long bolts installed in a Tension Measuring Device.

Washers are required for RC tests even though they may not be required for jobsite installation. Where washers are not required for jobsite installation, LOT identification is not required. The washer coating shall be the same as that for the bolt and nut.

If any of the bolt assemblies ~~required tests~~ fail~~s~~ the RC test, the entire LOT will be rejected.

SUBARTICLE 460-5.4.2 is deleted and the following substituted:

460-5.4.2 Preparation of Faying Surfaces: Provide coated and non-coated faying surfaces in accordance with the Contract Documents. Faying surfaces specified as blast-cleaned must satisfy SSPC SP-5~~10~~ '~~Near~~ White Blast Cleaning.'

When painting of the slip-critical faying surface of bolted connections is required, use only the prime coat. Prepare and coat the faying surfaces prior to installation of the fasteners. Provide certification of the slip critical classification required in the Contract Documents.

Submit certification to the Engineer that galvanized faying surfaces meet or exceed a Class C slip critical classification, unless a different classification is required elsewhere in the Contract Documents. Mechanically roughen galvanized faying surfaces in accordance with the galvanizer's recommendations.

SUBARTICLE 460-5.4.7 is deleted and the following substituted:

460-5.4.7 Bolt Tension: Provide a Skidmore-Wilhelm Calibrator, or other equivalent bolt tension measuring device, wherever final connections are ~~being made~~assembled. Confirm the accuracy of the tension measuring device by having it calibrated by an approved testing agency once a year.

SUBARTICLE 460-5.4.8 is deleted and the following substituted:

460-5.4.8 Turn-of-Nut Tightening: For each work shift, perform tests utilizing a representative sample of five fastener assemblies, from each LOT to be installed that shift. Perform the tests using the tension measuring device, following the same procedure to be used for actual installation of the fastener assemblies, to a snug-tight tension and corresponding torque, which, when the additional turns required in Table 460-6, Nut Rotation from the Snug-Tight Condition are added, will result in at least 1.05 times the minimum required fastener installation tension as shown in Table 460-5. Place a washer under the part turned in the tightening of the bolt. Consider the job inspection snug-tight torque as the average of three test values determined after rejecting the high and low-test values.

For fastener assemblies too short to fit in the tension measuring device, modify the determination of the job inspection snug-tight torque in accordance with ~~FM 5-582~~ASTM F3125 Annex~~Section~~ A2.7.

460-5.4.8.1 Snug-Tight Condition: In the turn-of-nut method, first bring all the fastener assemblies of the connection to a "snug-tight" condition to ensure that all parts of the connection are in firm contact with each other.

For the purposes of this specification, "firm contact" shall mean the condition that exists on a faying surface when the plies are solidly seated against each other, but not necessarily in continuous contact. Regard snug-tight as the tightness required to produce the bolt tension, which following the final applied rotation, produces at least 1.05 times the minimum required bolt tension in accordance with Table 460-5, Minimum Required Fastener Tension. In the presence of the Engineer, and on a daily basis, determine the job inspection snug-tight torque as specified herein.

460-5.4.8.2 Final Tightening: After verification of the snug-tight condition in accordance with 460-5.4.11 by the Engineer, tighten all fastener assemblies in the joint by applying the applicable amount of nut rotation specified in Table 460-6, Nut Rotation from the Snug-Tight Condition. Once snug-tight, bring all fasteners to the required tension within the same work shift.

Table 460-6 Nut Rotation from the Snug-Tight Condition			
Bolt Length Measured from Underside of Head to End of Bolt	Both Faces Normal to Bolt Axis	One Face Normal to Bolt Axis and Other Face Sloped Not More than 20:1. Bevel Washer not Used.	Both Faces Sloped Not More than 20:1 from Normal to Bolt Axis. Bevel Washers not Used.
Up to and Including Four (4) Diameters	1/3 turn	1/2 turn	2/3 turn
Over Four (4) Diameters but not Exceeding Eight (8) Diameters	1/2 turn	2/3 turn	5/6 turn
Over Eight (8) Diameters but Not Exceeding Twelve (12) Diameters	2/3 turn	5/6 turn	1 turn
Notes: 1. Nut rotation is relative to the bolt, regardless of the element being turned. 2. Tolerance for bolts installed by 1/2 turn or less is ± 30 degrees. For bolts installed by 2/3 turn or more, the tolerance is ± 45 degrees. 3. Nut rotations given are only applicable to connections in which all material within the grip of the bolt is steel. 4. For bolt lengths exceeding 12 diameters, establish the required rotation by performing actual tests in a suitable tension device simulating the actual conditions. Submit procedures to the Engineer for review.			

SUBARTICLE 460-6.5 is deleted and the following substituted:

460-6.5 Field Welding: Perform ~~F~~field welding only with the approval of the Engineer or as shown in the Plans. ~~All~~ Perform field welding ~~operations must be conducted~~ in accordance with AWS D1.5 for bridge structures and AWS D1.1 for tubular structures. ~~and~~ Field welding shall be performed in the presence of ~~a~~ the Contractor's Certified Welding Inspector.