

ORIGINATION FORM

THE INFORMATION BELOW IS TO BE PROVIDED BY THE ORIGINATOR

Modify Specification 458.
Section/File number

New Section N/A.
Section number

Subject: Bridge Deck joints

Origination date: April 14, 2011

Originator: Cheryl Hudson

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Problem statement: ASTM F 1677 and F 1679 have been withdrawn, and replaced with *Florida Method* FM 3-C 1028. Additional change for consistency with Indexes (removed quotes from Dim "A").

Information source: *Dean Perkins*

Background data: *Due to a need for testing methods and values to assure slip resistance of metal surfaces for sidewalk cover plates, FM3-C1028 was written to replace the withdrawn ASTM standard.*

Recommended Usage Note: Sidewalk Cover Plates

Estimated Fiscal Impact, if Implemented: None

Implementation of these changes, if and when approved, will begin with the Jan 2011 letting.



Florida Department of Transportation

RICK SCOTT
GOVERNOR

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ANANTH PRASAD, P.E.
SECRETARY

MEMORANDUM

DATE: May 16, 2011
TO: Specification Review Distribution List
FROM: Rudy Powell, Jr., P.E., State Specifications Engineer
SUBJECT: Proposed Specification: **4580000 Bridge Deck Joints.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

This change was proposed by Cheryl Hudson of the State Structures Design Office to delete references to ASTM F 1677 and ASTM F 1679 and add FM 3-C 1028 as the test method for slip resistance for sidewalk cover plates and for general cleanup and formatting. ASTM F 1677 and ASTM F 1679 have been withdrawn by industry.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965RP or rudy.powell@dot.state.fl.us. Comments received after **June 14, 2011**, may not be considered. Your input is encouraged.

RP/dt
Attachment

BRIDGE DECK JOINTS.

(REV 45-145-11)

SECTION 458 (Pages 591 – 595) is deleted and the following substituted:

SECTION 458 BRIDGE DECK JOINTS

458-1 Description.

Furnish and install bridge deck joints of the types and at the locations shown in the plans. This Section covers the following types of joints:

- Poured Joint
- Poured Joint with Backer Rod System
- Strip Seal Joint System

458-2 Materials.

458-2.1 Poured Joint: Meet the requirements of Section 932 for ~~J~~joint ~~S~~sealer or a Type A, B, or C ~~L~~low ~~M~~modulus ~~S~~silicone ~~S~~sealant material that is on the Qualified Products List (QPL).

458-2.2 Poured Joint with Backer Rod System: Furnish ~~P~~poured ~~J~~joint with ~~B~~backer ~~R~~rod ~~S~~systems consisting of Type D ~~S~~silicone ~~S~~sealant material, ~~F~~foam ~~B~~backer ~~R~~rods, ~~S~~sidewalk ~~C~~cover ~~P~~plates (as required) and all associated miscellaneous components.

The Type D ~~S~~silicone ~~S~~sealant material used in the system shall be listed on the ~~Qualified Products List (QPL)~~ and meet the requirements of Section 932.

458-2.3 Strip Seal Joint System: Furnish ~~S~~strip ~~S~~seal ~~J~~joint ~~S~~systems in accordance with ASTM D 5973 and Design ~~Standards~~, Index No. 21100; ~~that are listed on the Furnish Strip Seal Joint Systems that are on the Qualified Products List (QPL).~~ Manufacturers seeking ~~approval of Strip Seal Joint Systems for inclusion on the QPL-evaluation of their product~~ shall submit an application in accordance with Section 6. Design documentation showing the expansion joint system shall include installation details and temporary or sacrificial support brackets, bolts, clamps, etc. that are compatible with decks constructed with or without block-outs. Furnish joint systems consisting of watertight steel ~~E~~edge ~~R~~rails, ~~E~~elastomeric ~~S~~strip ~~S~~seals, ~~S~~sidewalk ~~C~~cover ~~P~~plates (as required) and all associated miscellaneous components. Obtain the ~~E~~elastomeric ~~S~~strip ~~S~~seals from the ~~E~~edge ~~R~~rail ~~M~~manufacturer.

458-2.4 Sidewalk Cover Plates: Furnish 1/4 inch thick, slip resistant galvanized steel ~~S~~sidewalk ~~C~~cover ~~P~~plates in accordance with ASTM A 36- or ~~ASTM~~ A 709, Grade 36 or 50 and Design ~~Standards~~, Indexes ~~Nos.~~ 21100 and 21110. Sidewalk ~~C~~cover ~~P~~plates shall be an anti-slip steel surface consisting of a random hatch matrix or other suitable pattern. Do not use diamond plate or surface applied slip resistant tapes, films, nonmetallic coatings or other similar materials. Sidewalk ~~C~~cover ~~P~~plates shall have a minimum coefficient of friction on the top galvanized surface of 0.8 in dry condition, ~~as determined by ASTM F 1677 or F 1679,~~ and 0.658 or 0.52 in a wet condition, as determined by ~~ASTM F 1679 or ASTM F 1677 (respectively)~~ ~~FM 3-C 1028~~. After shop fabrication, hot-dip galvanize in accordance with Section 962 and the ~~C~~cover ~~P~~plate manufacturer's recommendations. Furnish flat head ~~S~~stainless ~~S~~steel ~~S~~sleeve ~~A~~anchors in accordance with ASTM F 593 Group 1 Alloy 304 for attaching ~~S~~sidewalk ~~C~~cover ~~P~~plates. Install ~~S~~sleeve ~~A~~anchors in accordance with the ~~anchor~~-manufacturer's instructions. Submit shop

drawings for **S**sidewalk **C**cover **P**Plates showing all materials, project specific details and dimensions. Provide **C**certification from the manufacturer that the **S**sidewalk **C**cover **P**plates meet the minimum coefficient of friction requirements.

458-3 Fabrication and Installation.

458-3.1 General: Install the joint in accordance with the specific requirements of this Article, the plan details and the details shown on the Design Standards for the particular type of expansion joint called for.

458-3.2 Poured Joint: Install the joint at the locations and in accordance with the details shown in the plans and the manufacturer's recommendations.

458-3.3 Poured Joint with Backer Rod System:

458-3.3.1 Casting Expansion Joint Opening When casting the bridge deck, approach slab or raised sidewalk adjacent to the expansion joint at temperatures other than 70°F, adjust the joint opening (Dim. "**A**"**A**) as shown on Design Standards, Index No. 21110 at 70°F by the amount of the adjustment per 10°F shown in *the* Structures Plans, Poured Expansion Joint Data Table. For temperatures above 70°F, decrease the opening. For temperatures below 70°F, increase the opening.

458-3.3.2 Installation of Poured Joint System: After deck profiling, grinding, and grooving operations are complete, install **P**poured **J**joint with **B**backer **R**rod in accordance with the manufacturer's recommendations, when the joint opening is **+plus or minus** 1/4 inch of the design joint opening (Dim "**A**"**A** at 70°F) shown in the Structures Plans, Poured Expansion Joint Data Table. The minimum opening must not be less than 1 inch at the time of installation. Place **P**poured **J**joint **M**material only when the ambient temperature is between 55°F and 85°F and is expected to rise for the next three hours minimum to provide for adequate joint opening and compression of the **P**poured **J**joint **M**material during curing.

458-3.4 Strip Seal System:

458-3.4.1 Elastomeric Seal Fabrication: Furnish continuous heavy duty bridge deck **E**elastomeric **S**seals sized in accordance with the manufacturer's recommendations, to perform satisfactorily for the opening range shown. Minimum movement classification is 4 inches. Shop vulcanization is restricted to use on horizontal turns on skewed bridges at upturn ends where the horizontal turn angle is greater than 35 degrees. Field vulcanization is not permitted.

458-3.4.2 Edge Rail Fabrication:

(a) Furnish extruded, hot rolled or machined solid steel **E**edge **R**rails in accordance with ASTM A 709, Grade 36, 50 or 50(W). Furnish **E**edge **R**rails with a minimum mass of 19.2 lb/ft excluding studs, a minimum height of 8 inches, a minimum thickness of 1/2 inch and a maximum top surface (riding surface) width of 2 inches. Edge **R**rails manufactured from bent plate or built up pieces are not acceptable.

(b) Furnish **A**anchor **S**studs in accordance with ASTM A 108, and electric arc end-weld **A**anchor **S**studs with complete fusion. Anchor **S**studs may be piggy backed to achieve required lengths.

(c) Perform all shop welding in accordance with the Bridge Welding Code ANSI/AASHTO/AWS D1.5. Do not weld to surfaces in contact with the **E**elastomeric **S**seal or the top surface (riding surface) except as shown in the **S**shop **S**splice **D**detail. Do not weld inside seal cavity.

(d) Fabricate **E**edge **R**rail **A**assemblies in one piece including upturns, except where the length or configuration prohibits shipping or proper installation or where phase

construction requires separate assemblies. Shop splice sections of **E**edge **R**rail to obtain the required length by partial penetration double **V**-groove welds on prepared beveled edges and seal welds as shown in the **S**shop **S**splice **D**etail. Weld all around the joint as far as practical to achieve a watertight seal. Do not use short pieces of **E**edge **R**rail less than 6'-0" long unless required at curbs, sidewalks or phase construction locations.

(e) After shop fabrication, hot-dip galvanize **E**edge **R**rail in accordance with Section 962 and the manufacturer's recommendations.

(f) Furnish temporary or sacrificial support brackets, bolts, clamps, etc. that are capable of resisting shipping, handling and construction forces without damage to the **E**edge **R**rail **A**ssemblies or galvanized coating and are adjustable to account for variable temperature settings. Do not use temporary or sacrificial support brackets, bolts, clamps, etc. between the faces of the **E**edge **R**rails.

(g) Clearly match mark corresponding **E**edge **R**rail **A**ssemblies with joint location and direction of stationing.

(h) Submit shop drawings showing all joint materials and project specific details and dimensions. Include name of manufacturer, seal model number, seal movement range and the assigned **Q**ualified **P**roducts **L**ist **Q**PL Number.

458-3.4.3 Installation:

(a) Install the **E**edge **R**rail **A**ssemblies at proper grade and alignment before or after deck planing in accordance with the manufacturer's instructions. When installed after deck planing and grinding, install the **E**edge **R**rail **A**ssemblies in the block-outs on a profile tangent between the ends of the deck and/or approach slab to within a **+plus** 0" and **-minus** 1/4" variation. When installed before deck planing, install the **E**edge **R**rail **A**ssemblies 3/8", **+plus or minus** 1/16", below the top surface of the deck or approach slab to compensate for concrete removal during planing and grinding.

(b) Bolt, weld or clamp **E**edge **R**rail **A**ssemblies in position using temporary or sacrificial brackets as required. For phased construction, install **E**edge **R**rail **A**ssemblies in a given subsequent phase to align with those installed in an adjacent prior phase after deflection and rotation due to deck casting of adjoining spans has occurred.

(c) For installation of **E**edge **R**rail **A**ssemblies at temperatures other than 70°F, adjust the opening of the joint (Dim. **"A"**) as shown on **-Design Standards**, Index No. 21100 by the amount of the adjustment per 10°F shown in **the** Structures Plans, Strip Seal Expansion Joint Data **t**Table. For temperatures above 70°F decrease the opening. For temperatures below 70°F, increase the opening.

(d) After galvanizing, do not weld within 2 inches of **E**edge **R**rail surfaces exposed in the completed structure. Do not weld expansion joint components to or electrically ground to reinforcing steel or structural steel. Seal field butt joints and empty shipping and erection holes with caulk before placing deck concrete.

(e) Protect galvanized **E**edge **R**rail **A**ssemblies during screeding operations per the manufacturer's recommendations. Provide temporary blocking material in the **E**edge **R**rail seal cavities to prevent concrete intrusion during deck pour and finishing.

(f) Loosen any temporary or sacrificial support brackets, bolts, clamps, etc. that span across the joint after initial set of concrete, but not more than two hours after conclusion of concrete placement.

(g) Install **E**lastomeric **S**seal after completion of deck casting. Remove all joint form material and blocking material prior to installing **E**lastomeric **S**seal. Field install

Eelastomeric Sseal in accordance with manufacturer's recommendations. Thoroughly coat all contact surfaces between the Eelastomeric Sseal and the Eedge Rrail seal cavities with an adhesive lubricant before setting Eelastomeric Sseal in place.

458-4 Method of Measurement.

The poured joint without backer rod will be incidental to the concrete work and included in the cost of the concrete. Poured joints with backer rod and strip seal joints will be the plan quantity length of each type of joint constructed and accepted.

458-5 Basis of Payment.

458-5.1 Basic Items of Joints. The Contract unit price per foot for Joints will be full compensation for all work and materials necessary for the complete installation. Such price and payment will include, but not be limited to, the following specific incidental work:

(a) Any work required to clean and prepare the adjacent bridge deck, deck block out or deck joint gap.

(b) Any repairs to the galvanizing on metallic joint components.

(c) Any additional work or materials required for non-standardized or special construction or installation techniques.

(d) Any cost of erection and removal of any temporary supports which may be necessary for ensuring proper alignment and positioning of the joint relative to the bridge deck.

458-5.2 Payment Items: Payment shall be made under:

Item No. 458 - 1- Bridge Deck Expansion Joint – per foot.