Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

ANANTH PRASAD, P.E.
SECRETARY

June 17, 2011

Monica Gourdine
Program Operations Engineer
Federal Highway Administration
545 John Knox Road, Suite 200
Tallahassee, Florida 32303

Re: Office of Design, Specifications
Section **458**
Proposed Specification: **4580000 Bridge Deck Joints.**

Dear Ms. Gourdine:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

These changes were proposed by Cheryl Hudson 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 ASTM F 1677 and ASTM F 1679 have been withdrawn by industry.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 review and transmit your comments, if any, within two weeks. Comments should be sent via Email to SP965RP or rudy.powell@dot.state.fl.us.

If you have any questions relating to this specification change, please call Rudy Powell, State Specifications Engineer at 414-4280.

Sincerely,

Signature on file

Rudy Powell, Jr., P.E.
State Specifications Engineer

RP/dt
Attachment
cc: Gregory Jones, Chief Civil Litigation
Florida Transportation Builders' Assoc.
State Construction Engineer

BRIDGE DECK JOINTS.
(REV ~~45~~*6*-~~14~~5*17*-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: *Furnish joint sealer or a Type A, B, or C silicone sealant material* ~~M~~*m*eet*ing* the requirements of Section 932 ~~for Jjoint Ssealer or a Type A, B, or C Llow Mmodulus Ssilicone Ssealant material~~ that is *listed* on the Qualified Products List (QPL).

458-2.2 Poured Joint with Backer Rod System: Furnish ~~P~~*p*oured ~~J~~*j*oint with ~~B~~*b*acker ~~R~~*r*od ~~S~~*s*ystems consisting of Type D ~~S~~*s*ilicone ~~S~~*s*ealant material, ~~F~~*f*oam ~~B~~*b*acker ~~R~~*r*ods, ~~S~~*s*idewalk ~~C~~*c*over ~~P~~*p*lates (as required) and all associated miscellaneous components.

The Type D ~~S~~*s*ilicone ~~S~~*s*ealant 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~~*s*trip ~~S~~*s*eal ~~J~~*j*oint ~~S~~*s*ystems 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 for the QPL* 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~~*e*dge ~~R~~*r*ails, ~~E~~*e*lastomeric ~~S~~*s*trip ~~S~~*s*eals, ~~S~~*s*idewalk ~~C~~*c*over ~~P~~*p*lates (as required) and all associated miscellaneous components. Obtain the ~~E~~*e*lastomeric ~~S~~*s*trip ~~S~~*s*eals from the ~~E~~*e*dge ~~R~~*r*ail ~~M~~*m*anufacturer.

458-2.4 Sidewalk Cover Plates: Furnish 1/4 inch thick, slip resistant galvanized steel ~~S~~*s*idewalk ~~C~~*c*over ~~P~~*p*lates in accordance with ASTM A 36~~-~~ or *ASTM* A 709, Grade 36 or 50 and Design *Standards,* Index~~es~~ *Nos.* 21100 and 21110. Sidewalk ~~C~~*c*over ~~P~~*p*lates 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~~*c*over ~~P~~*p*lates 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 0.6~~8 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~~*c*over ~~P~~*p*late manufacturer's recommendations. Furnish flat head ~~S~~*s*tainless ~~S~~*s*teel ~~S~~*s*leeve ~~A~~*a*nchors in accordance with ASTM F 593 Group 1 Alloy 304 for attaching ~~S~~*s*idewalk ~~C~~*c*over ~~P~~*p*lates. Install ~~S~~*s*leeve ~~A~~*a*nchors in accordance with the ~~anchor~~ manufacturer's instructions. Submit shop drawings for ~~S~~*s*idewalk ~~C~~*c*over *p*~~P~~lates showing all materials, project specific details and dimensions. Provide ~~C~~*c*ertification from the manufacturer that the ~~S~~*s*idewalk ~~C~~*c*over ~~P~~*p*lates 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~~*p*oured ~~J~~*j*oint with ~~B~~*b*acker ~~R~~*r*od 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~~*p*oured ~~J~~*j*oint ~~M~~*m*aterial 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~~*p*oured ~~J~~*j*oint ~~M~~*m*aterial during curing.

458-3.4 Strip Seal System:

458-3.4.1 Elastomeric Seal Fabrication: Furnish continuous heavy duty bridge deck ~~E~~*e*lastomeric ~~S~~*s*eals 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~~*e*dge ~~R~~*r*ails in accordance with ASTM A 709, Grade 36, 50 or 50(W). Furnish ~~E~~*e*dge ~~R~~*r*ails 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~~*r*ails manufactured from bent plate or built up pieces are not acceptable.

(b) Furnish ~~A~~*a*nchor ~~S~~*s*tuds in accordance with ASTM A 108, and electric arc end-weld ~~A~~*a*nchor ~~S~~*s*tuds with complete fusion. Anchor ~~S~~*s*tuds 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~~*e*lastomeric ~~S~~*s*eal or the top surface (riding surface) except as shown in the ~~S~~*s*hop ~~S~~*s*plice ~~D~~*d*etail. Do not weld inside seal cavity.

(d) Fabricate ~~E~~*e*dge ~~R~~*r*ail ~~A~~*a*ssemblies 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~~*e*dge ~~R~~*r*ail to obtain the required length by partial penetration double *V*~~v~~-groove welds on prepared beveled edges and seal welds as shown in the ~~S~~*s*hop ~~S~~*s*plice ~~D~~*d*etail. Weld all around the joint as far as practical to achieve a watertight seal. Do not use short pieces of ~~E~~*e*dge ~~R~~*r*ail less than 6'-0" long unless required at curbs, sidewalks or phase construction locations.

(e) After shop fabrication, hot-dip galvanize ~~E~~*e*dge ~~R~~*r*ail 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~~*e*dge ~~R~~*r*ail ~~A~~*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~~*e*dge ~~R~~*r*ails.

(g) Clearly match mark corresponding ~~E~~*e*dge ~~R~~*r*ail ~~A~~*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 ~~Qualified Products List~~*QPL* Number.

458-3.4.3 Installation:

(a) Install the ~~E~~*e*dge ~~R~~*r*ail ~~A~~*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~~*e*dge ~~R~~*r*ail ~~A~~*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~~*e*dge ~~R~~*r*ail ~~A~~*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~~*e*dge ~~R~~*r*ail ~~A~~*a*ssemblies in position using temporary or sacrificial brackets as required. For phased construction, install ~~E~~*e*dge ~~R~~*r*ail ~~A~~*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~~*e*dge ~~R~~*r*ail ~~A~~*a*ssemblies at temperatures other than 70°F, adjust the opening of the joint (Dim. ~~"A"~~*A*) as shown on -Design Standard*s,* Index No. 21100 by the amount of the adjustment per 10°F shown in *the* Structures Plans, Strip Seal Expansion Joint Data ~~t~~*T*able. 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~~*e*dge ~~R~~*r*ail 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~~*e*dge ~~R~~*r*ail ~~A~~*a*ssemblies during screeding operations per the manufacturer's recommendations. Provide temporary blocking material in the ~~E~~*e*dge ~~R~~*r*ail 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~~*e*lastomeric ~~S~~*s*eal after completion of deck casting. Remove all joint form material and blocking material prior to installing ~~E~~*e*lastomeric ~~S~~*s*eal. Field install ~~E~~*e*lastomeric ~~S~~*s*eal in accordance with manufacturer's recommendations. Thoroughly coat all contact surfaces between the ~~E~~*e*lastomeric ~~S~~*s*eal and the ~~E~~*e*dge ~~R~~*r*ail seal cavities with an adhesive lubricant before setting ~~E~~*e*lastomeric ~~S~~*s*eal 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 ~~J~~*j*oints 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.

BRIDGE DECK JOINTS.
(REV 6-17-11)

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: Furnish joint sealer or a Type A, B, or C silicone sealant material meeting the requirements of Section 932 that is listed on the Qualified Products List (QPL).

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

The Type D silicone sealant material used in the system shall be listed on the QPL and meet the requirements of Section 932.

458-2.3 Strip Seal Joint System: Furnish strip seal joint systems in accordance with ASTM D 5973 and Design Standards, Index No. 21100 that are listed on the QPL. Manufacturers seeking evaluation of their product for the QPL 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 edge rails, elastomeric strip seals, sidewalk cover plates (as required) and all associated miscellaneous components. Obtain the elastomeric strip seals from the edge rail manufacturer.

458-2.4 Sidewalk Cover Plates: Furnish 1/4 inch thick, slip resistant galvanized steel sidewalk cover plates in accordance with ASTM A 36 or ASTM A 709, Grade 36 or 50 and Design Standards, Index Nos. 21100 and 21110. Sidewalk cover 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 cover plates shall have a minimum coefficient of friction on the top galvanized surface of 0.8 in dry condition, and 0.65 in a wet condition, as determined by FM 3-C 1028. After shop fabrication, hot-dip galvanize in accordance with Section 962 and the cover plate manufacturer's recommendations. Furnish flat head stainless steel sleeve anchors in accordance with ASTM F 593 Group 1 Alloy 304 for attaching sidewalk cover plates. Install sleeve anchors in accordance with the manufacturer's instructions. Submit shop drawings for sidewalk cover plates showing all materials, project specific details and dimensions. Provide certification from the

manufacturer that the sidewalk cover 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) 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 poured joint with backer 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 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 poured joint 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 poured joint material during curing.

458-3.4 Strip Seal System:

458-3.4.1 Elastomeric Seal Fabrication: Furnish continuous heavy duty bridge deck elastomeric 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 edge rails in accordance with ASTM A 709, Grade 36, 50 or 50(W). Furnish edge 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 rails manufactured from bent plate or built up pieces are not acceptable.

(b) Furnish anchor studs in accordance with ASTM A 108, and electric arc end-weld anchor studs with complete fusion. Anchor 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 elastomeric seal or the top surface (riding surface) except as shown in the shop splice detail. Do not weld inside seal cavity.

(d) Fabricate edge rail 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 edge rail to obtain the required length by partial penetration double V-groove welds on prepared beveled edges and seal welds as shown in the shop splice detail. Weld all around the joint as far as practical to achieve a watertight seal. Do not use short pieces of edge rail less than 6'-0" long unless required at curbs, sidewalks or phase construction locations.

(e) After shop fabrication, hot-dip galvanize edge 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 edge rail assemblies 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 edge rails.

(g) Clearly match mark corresponding edge rail assemblies 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 QPL Number.

458-3.4.3 Installation:

(a) Install the edge rail assemblies 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 edge rail assemblies 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 edge rail assemblies 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 edge rail assemblies in position using temporary or sacrificial brackets as required. For phased construction, install edge rail assemblies 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 edge rail assemblies 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 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 edge 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 edge rail assemblies during screeding operations per the manufacturer's recommendations. Provide temporary blocking material in the edge 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 elastomeric seal after completion of deck casting. Remove all joint form material and blocking material prior to installing elastomeric seal. Field install elastomeric seal in accordance with manufacturer's recommendations. Thoroughly coat all contact surfaces between the elastomeric seal and the edge rail seal cavities with an adhesive lubricant before setting elastomeric seal 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.