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March 13, 2012

CALL NO. 424
CONTRACT ID NO. 122650
ADDENDUM # 1

Subject: Henderson County, 051GR12M03-FE02
Letting March 23, 2012

(1)Added - Note - Pages 39(a)-39(c) of 118

Proposal revisions are available at http://transportation.ky.gov/Construction-Procurement/.

If you have any questions, please contact us at 502-564-3500.

Sincerely,

Ryan Griffith

Ryan Griffith
Director
Division of Construction Procurement

RG:ks
Enclosures

MATRIX 502 ASPHALTIC PLUG BRIDGE JOINT SYSTEM

General

The Matrix 502 Asphaltic Plug Bridge Joint System is a hot applied field molded and constructed expansion joint system that is primarily composed of a uniquely formulated polymer modified asphalt binder that is mixed with specially selected and processed aggregate. The Matrix 502 Joint provides a watertight, smooth riding joint that can accommodate up to a maximum of ± 3/4" (19 mm) of annual joint movement and can be used for expansion joint gaps up to 3" (75 mm) wide. The joint is installed in cutouts in the deck surfacing ranging from 2 to 6 inches deep (5 to 15 cm) and 20 to 24 inches (51 to 61cm) wide. The Matrix 502 Joint can be used for both expansion and fixed end joints at abutments or piers in many bridge types including concrete slab, concrete beam, prestressed concrete and steel beam, either simple or mulitspan, in both new construction and rehabilitation projects. The joint is placed in the deck-surfacing layer of either asphalt concrete or portland cement concrete to a minimum depth of 2 (5 cm). Completed joints are black in color. The Matrix 502 Joint can also be used as a pressure relief joint on bridge approach slabs. Compared to conventional anchored bridge joint systems, Matrix 502 Joints are low cost, quick and easy to install and easy to maintain. The Matrix 502 Asphaltic Bridge Joint System meets requirements of ASTM D6297, Standard Specification for Asphaltic Plug Joints for Bridges.

Components

The Matrix 502 Asphaltic Plug Bridge Joint System is primarily composed of Matrix 502 binder and two grades of Matrix 502 aggregate. Additional components include primer, backer rod, bridging plates and locating pins. Details and specifications for these components follow.

Matrix 502 Binder, Part No.

A specially formulated hot applied polymer modified asphalt binder that is mixed with aggregate forming a bonded, flexible, extensible, compressible and traffic resistant joint system. Matrix 502 Binder meets the polymeric modified asphalt requirements of ASTM D6297 when sampled and heated in accordance with ASTM D5167.

Test	ASTM D6297 Limits
Softening Point (ASTM D36)	182°F (83°C) min.
Tensile Adhesion (ASTM D5329)	700% min.
Ductility, 77°F (25°C) (ASTM D113)	400 mm min.
Cone Penetration, 77°F (25°C) (ASTM D3407, D5329)	7.5 mm max.
Low Temperature Cone Penetration 1.0 mm min. 0°F (-18°C) 200g, 60s (ASTM D6297, sec 9.1)	1.0 mm min.
Flow 140°F (60°C), 5 hr. (ASTM D3407, D5329)	3.0 mm max.
Resilience, 77°F (25°C) (ASTM D3407, D5329)	40-70%
Asphalt Compatibility (ASTM D3407, D5329)	Pass
Recommended Installation Temp. Range	360-390°F (182-199°C)
Safe Heating Temp. Range	390-421°F (199-216°C)
Bond, +20°F (-7°C), 100% extension (ASTM D3405, D5329)	Pass 3 cycles
Flexibility at -10°F (-23°C) (ASTM D5329)	Pass

Additional specific properties of Matrix 502 Binder are as follows.

Test	ASTM D6297 Limits
Bond, 0°F (-18°C), 50% Extension (ASTM D5329)	Pass 5 cycles
Brookfield Viscosity, 400°F (204°C) (ASTM D4402)	4000 cp max.
Installation Temperature	380°F (193°C).
Safe Heating Temperature	410°F (210°C).
Unit Weight at 60°F (15°C)	9.3 lbs/gal (1.12 kg/l)

MATRIX 502 ASPHALTIC PLUG BRIDGE JOINT SYSTEM

MATRIX 502 AGGREGATE SBG, Part No. 33032 and AGGREGATE D, Part No. 33030
Specially selected igneous aggregates that are screened to specific gradations, double washed, dried and packaged in 50 lb (22.7 kg) bags. SBG aggregate is mixed with the Matrix 502 Binder to produce the mastic to fill the joint cutout. D aggregate is a finer grade, used as surface dressing for the completed joint. Gradation requirements are as seen in Table 1.

Table 1. Matrix 502 Aggregate

SBG Aggregate		D Aggregate	
Screen Size	**% Passing**	**Screen Size**	**% Passing**
1"	95-100%	3/16"	100%
3/4"	90-100%	NO 6	90-100%
1/2"	50-70%	NO 8	25-40%
3/8"	25-40%	NO 10	0-10%
1/4"	0-15%		

BRIDGING PLATES, Part Nos. 33050, 33051, 33052, 33053
Bridging plates are used to span the expansion joint opening, to function as a bond breaker and to support traffic loads. Four different plates are available for different specifications. All bridging plates are 8 (20.3 cm) wide and 60 (1.52 m) long, and have 3/16 (4.8 mm) diameter holes at the centerline of the plate at 1' (30.5 cm) intervals for centering over the joint. Plate details are as seen in Table 2.

LOCATING PINS
16D galvanized common nails are placed through the holes in the bridging plates and down into the expansion joints opening to center the plate over the opening.

CRAFCO ASPHALT PRIMER, Part No. 33140
A specially formulated solvent-based asphalt primer used to treat all bonding surfaces to improve adhesion. Supplied in 5 gal (17.9 l) pails. Primer exceeds requirements of ASTM D41, Type II.

BACKER ROD, Part No. 34609
A closed cell heat resistant backer rod used to provide back up in the expansion joint opening. Backer rod is 2" (5 cm) diameter and supplied in 6' (1.8 m) lengths. Meets requirements of ASTM D5249, "Standard Specification for Backer Material for Use with Cold and Hot Applied Joint Sealants in Portland Cement Concrete and Asphalt Joints, Type 1". If required, other diameters can be supplied.

TYPICAL INSTALLATION
Figure 1 shows a typical installation of the Matrix 502 Asphaltic Plug Bridge Joint System. Locations of each of the components are shown in Figure 1.

OVERVIEW OF INSTALLATION PROCEDURES
Following is an overview of installation procedures for the Matrix 502 Joint. For complete detailed installation procedures, refer to the"Installation Procedures for Matrix 502 Asphaltic Plug Bridge Joint System".

1. Transversely saw cut the surfacing layer full depth to the

Table 2. Bridging Plates

Part Number	Material	Thickness	Specification	Typical Uses
33050	Aluminum	18 gauge	ASTM B209/3003-H14	Light traffic, narrow joints, corrosion resistance
33051	Steel	1/8" (3.2mm)	ASTM A36 (36m)	Standard
33052	Steel	1/4" (6.4mm)	ASTM A36 (36m)	Heavy traffic, wide joints
33053	Galvanized Steel	1/4" (6.4mm)	ASTM A36 (36m), ASTM A123	Heavy traffic, wide joints, corrosion resistance

MATRIX 502 ASPHALTIC PLUG BRIDGE JOINT SYSTEM

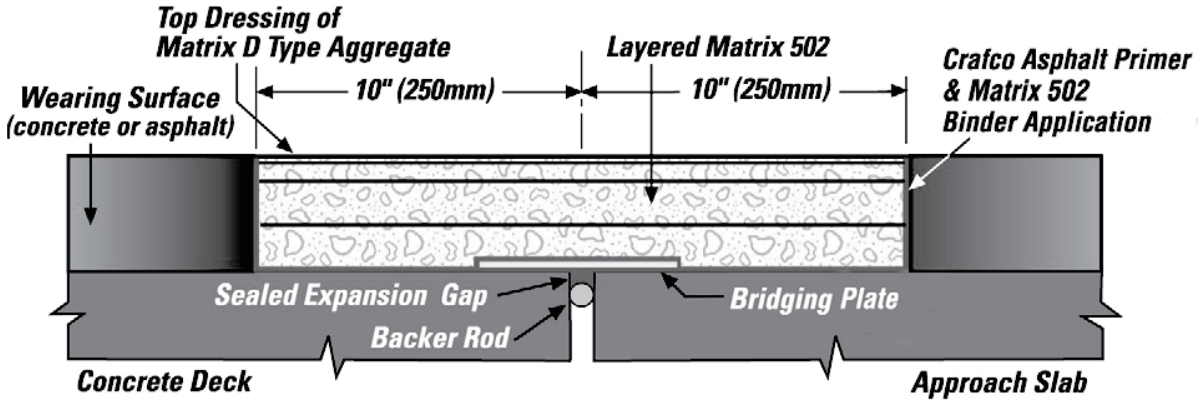

Figure 1. Typical Matrix 502 Asphaltic Plug Bridge Joint System

deck surfacing on each side of the joint. Width between cuts is 20 to 24 inches (51 to 61 cm) and centered over the joint gap. Minimum saw cut depth is 2" (50 mm).

2. Break out and remove all material between the saw cuts, including any waterproofing if present, to the concrete deck surface.

3. Clean the cutout area and thoroughly dry with a hot air lance.

4. Prime all vertical and horizontal surfaces with Crafco Asphalt Primer and allow to cure.

5. Place backer rod into the expansion gap to the appropriate depth.

6. Fill the expansion gap with heated Matrix 502 Binder and overfill onto the deck surface.

7. Place bridging plates into the hot Matrix 502 and center over the expansion gap using centering pins. Butt the plates at ends.

8. Coat all vertical and horizontal surfaces, including the bridging plate with hot Matrix 502 Binder.

9. Heat the Matrix SBG aggregate to 275-375°F (135-163°C) in an appropriate rotating drum mixer. Heat Matrix 502 Binder to 380-410°F (193-210°C) in a double-jacketed melter.

10. Add the appropriate quantity of Matrix 502 Binder to the hot aggregate and mix in the mixer to thoroughly coat the aggregate.

11. Place the hot aggregate-binder mixture in the joint cutout in layers between 3/4" and 1 1/2" (19-38 mm) thick. Rake the mixture to level in the cutout.

12. Flood the bonded mixture surface with Matrix 502 Binder to fill voids before placing the next layer.

13. For the last layer, slightly overfill the joint cutout by approximately 1/4" to 1/2" (6 – 12 mm) and compact to surface level.

14. Carefully heat the top surface of the compacted mixture with a heat lance and spread a thin layer of Matrix 502 Binder over the mixture surface.

15. Immediately apply a layer of D aggregate onto the hot binder and compact the aggregate into the surface.

16. Allow the joint to cool, sweep any loose aggregate, clean up the job site and open to traffic.

WARRANTY

The D.S. Brown Company warrants that D.S. Brown products meet applicable ASTM, AASHTO, Federal or State specifications at time of shipment. Techniques used for the preparation and installation are beyond our control as are the use and application of the products; therefore, D.S. Brown shall not be responsible for improperly applied or misused products. Remedies against The D.S. Brown Company, as agreed to by D.S. Brown, are limited to replacing nonconforming product or refund (full or partial) of purchase price from The D.S. Brown Company. All claims for breach of this warranty must be made within three (3) months of the date of use or twelve (12) months from the date of delivery by D.S. Brown whichever is earlier. There shall be no other warranties expressed or implied. For optimum performance, follow D.S. Brown recommendations for product installation.