

DIVISION 400 - STRUCTURES

SECTION 417 - BRIDGE DECK REHABILITATION

417.02 MATERIALS

The following is added:

Asphaltic Plug Joints:

Elastomeric asphaltic plug joint systems shall be any or all of the following:

*Koch BJS Joint System as manufactured by
Koch Materials Company
Hwy. 66 East of Stroud
Stroud, Oklahoma 74079
Telephone: 800-654-9182*

*Wabo Expandex Joint System as manufactured by
Watson Bowman ACME Corp.
95 Pineview Drive
Amherst, New York 14228
Telephone: 716-691-7566
<http://www.wbacorp.com>*

*Matrix 502 as manufactured by
Pavetech International, Inc.
12066 Montgomery Road
Cincinnati, Ohio 45249
Telephone: 513-583-8081*

*Thorma Joint System as manufactured by
Dynamic Surface Applications, Ltd.
373 Village Road
Pennsdale, PA 17736
Telephone: 800-491-5663
<http://www.dsa-ltd.com/thormajoint.htm>*

*Linear Dynamics, Inc.
79 Montgomery Street
Montgomery, Pennsylvania 17752
Telephone: 717-547-1621*

No substitutes for the systems or components of the systems are permitted for the above proprietary deck joint systems.

The elastic joint sealer for the open joints in barrier curbs, parapets and sidewalks adjacent to asphaltic plug joints shall be:

*Dow Corning 888 Silicone Joint Sealant as supplied by:
Kenseal Construction Products Corporation*

1702 Industrial Highway
Cinnaminson, NJ 08077
Telephone: 877-849-9400

~~Koch 2000 NS Sealant for vertical and inclined joints, Koch 2000 NS Sealant or Koch 2000 SL Sealant for horizontal joints as manufactured by:~~

~~R.J. Watson, Inc.
E. Amherst, NY 14051
Telephone: 716-741-2166~~

or approved equal.

To be considered for approval, an alternate elastic joint sealer must be compatible with the asphaltic plug joints, bond to asphaltic plug joints, and be capable of accommodating thermal movements of two (2) inches between temperatures of 120 degrees F and -30 degrees F.

417.07 JOINT RECONSTRUCTION

(4) ~~Asphaltic Plug Joints~~

(H) JOINT RECONSTRUCTION TYPE I P.

The following is added to the beginning of this paragraph:

All procedures for the removal of the existing joints, including staged construction, shall be as directed by the Engineer and as recommended by the manufacturer of the asphaltic plug joint system. The joint system shall be installed in strict accordance with the following specifications and the manufacturer's instructions. In the event that there are discrepancies between these specifications and the manufacturer's instructions, with the approval of the Engineer, the manufacturer's requirements shall govern. Two weeks prior to the first scheduled installation, two copies of written installation procedures and material certifications shall be submitted to the Engineer.

The Contractor shall arrange with the manufacturer of the joint system to assign a representative to the Project. The representative shall be completely knowledgeable and competent in all aspects with the joint systems materials and installation procedures.

The representative shall be present during each joint systems installation to assure proper preparation, mixing, installation and curing. The representative shall be responsible to advise the Engineer and the Contractor that the correct installation methods are being followed; certify to the Engineer that all materials are being used in accordance with the manufacturer's requirements; train assigned personnel in the correct methods of installation; and certify to the Engineer that the joint system has been properly installed.

All certifications from the manufacturer's representative to the Engineer shall be in writing.

The asphaltic plug joints shall not be installed when the temperature is below 55

degrees F.

The joint installation shall be centered over the existing expansion joint gap to the width determined by the manufacturer and approved by the Engineer. Variation in the width of the joint may be necessary to accommodate site conditions as determined by the manufacturer and/or the Engineer.

Saw cut the pavement transversely at the determined width along the joint. Remove all material, including wearing surface, waterproof membrane, concrete header, and any old joint material between the saw cuts and to a depth which will allow the new joint system to be properly installed. The trench shall be cut to a minimum depth of two (2) inches. This will form the blockout for the asphaltic plug joint. The bottom surface of the blockout, called the joint table, shall be parallel with the plane of the roadway surface (true and flat).

Concrete removal shall be by means of hand held tools only. Care shall be taken when removing existing materials so as to prevent damaging existing sound concrete to remain. Damage to sound concrete shall be repaired by the Contractor in accordance with Section 401, as directed by the Engineer, at no additional cost to the Authority.

The joint blockout area shall be prepared by cleaning free of dust and drying the blockout area and a minimum 6 inches on either side of the blockout. To accomplish this, use a hot compressed air lance capable of producing 3,000 degrees F and a directional velocity of 3,000 fps.

Heat the bridge joint binder to a minimum of 350 degrees F in a double oil jacketed melter. The melter must be equipped with a continuous agitation system, temperature controls, and calibrated thermometers to maintain the binder at the manufacturer's recommended temperature.

Coated hemp or backer rod shall be placed into the joint opening at a minimum depth of one (1) inch. Pour the binder into the bridge joint gap, overfilling the joint opening to allow the binder to be spread onto the joint table. The binder will form a bond breaker between the joint table and the closure plate.

The closure plate shall be mild steel plate, minimum 1/4 inch thick by eight (8) inch wide, cut in four (4) foot lengths. Actual plate dimensions shall be as per manufacturer's recommendations. Spike holes shall be drilled, on a longitudinal centerline, at one (1) foot intervals.

The closure plate shall be centered and placed over the entire length of joint opening. The plate shall be secured by placing spikes through the pre-drilled plate sections or locating plugs (for openings greater than two (2) inches), or by welding as detailed on plans and/or recommended by manufacturer. Welding shall conform to the ANSI/AASHTO/AWS D1.5-88, Bridge Welding Code. The closure plate shall sit flush on the bottom of the joint blockout effectively preventing joint material from entering the joint opening.

All exposed areas of the blockout area shall be coated on the horizontal, vertical and closure plate surfaces with binder to form a monolithic waterproofing membrane.

The manufacturer's recommended aggregate shall be heated to a minimum of 300 degrees F in a rotating drum mixer until all visible signs of dust and moisture are removed. The temperature of the aggregate shall be controlled by using a hand held, calibrated, digital temperature sensor. Blend the binder into the aggregate at the manufacturer's specified ratio. The specified aggregate must be totally pre-coated prior to installation.

~~The Koch BJS Joint system shall be installed in three layers using the manufacturer's specified aggregate, precoated with BJS binder. Layers one and two (from bottom to top) shall include 3/4 inch aggregate and layer three shall include 1/2 inch aggregate. When the final 1/2 inch aggregate layer is installed, the surface shall be left high enough above the existing pavement to allow for compaction (approximately 1/2 inch). Using a two (2) ton roller, or larger, the Contractor shall compact the aggregate layers perpendicular to the joint. The compacted joint surface must be heated with a heat lance to a tack consistency. A final thin membrane of binder shall be installed followed immediately by a broadcast application of clean, dry sand.~~

~~For installing the Expandex Joint System the Contractor shall use the manufacturer's specified aggregate premixed with the modified elastomeric binder (EBJ material). The joint blackout shall be filled with precoated mix and shall be compacted level with the roadway to the satisfaction of the Engineer. Sand or small aggregate shall be broadcast over the top to eliminate tackiness.~~

~~Prior to installing the Matrix 502 system, all horizontal and vertical surfaces of the prepared joint blackout shall be brush coated with Matrix Primer. The Matrix 502 system shall be proportionately layered using the precoated aggregate mix specified by the manufacturer. The number and thickness of the layers shall be determined by the average depth of the joint to be installed. A 1/2 inch of the average joint depth shall be reserved for the top layer of precoated aggregate. The remaining joint depth shall be proportionately layered according to the following joint depth table.~~

Matrix 502 System Joint Depth			
Depth of Joint (after deducting 1/2" for top layer)	1.5" – 2.5"	2.5" – 4.0"	4.0" – 6.0+ "
Bottom Layer	40%	25%	18%
Intermediate Layers	60%	33%	22%
	-	42%	27%
	-	-	33%
Top Layer	1/2"	1/2"	1/2"

~~Each layer shall be placed into the blackout and raked level to the specified thickness. When placing the top layer, build the precoated aggregate mix high enough above the existing pavement (approximately 1/4" to 1/2") to allow for compaction. With a vibratory plate or a minimum 1 1/2 ton roller, compact the layered aggregate mix perpendicular and parallel to the joint until the joint is made flush with the existing pavement. Heat the joint surface with a heat lance or hand held torch to a tack consistency, apply a thin membrane of binder and broadcast Matrix D Type Aggregate over the joint. Partially~~

~~imbed aggregate by compacting.~~

~~For installing the LDI Thorma Joint System the Contractor shall use the manufacturer's specified aggregate premixed with the BJ200 binder. The joint blockout shall be filled with precoated mix in one layer for joints up to a three (3) inch depth, or two (2) or more layers as required for deeper joints. Compaction should take place after the joint has cooled to 160 degrees F using a vibratory plate or roller and the joint made flush with the existing road surface. The compacted joint surface must be heated with a heat lance to a tack consistency. A final thin membrane of binder shall be installed followed immediately by a broadcast application of clean, dry sand.~~

The time after completion of the joint material placement that the joint can be opened to traffic shall be as recommended by the joint manufacturer.

The preparation and installation of the elastic joint sealer (including primers) at barrier curbs, parapets and sidewalks shall conform to the manufacturers installation procedures and recommendations.

(1) Thorma Joint System.

The following is added:

For installing the Thorma Joint System the Contractor shall use the manufacturer's specified aggregate premixed with the BJ200 binder. The joint blockout shall be filled with precoated mix in one layer for joints up to a three (3) inch depth, or two (2) or more layers as required for deeper joints. Compaction should take place after the joint has cooled to 160 degrees F using a vibratory plate or roller and the joint made flush with the existing road surface. The compacted joint surface must be heated with a heat lance to a tack consistency. A final thin membrane of binder shall be installed followed immediately by a broadcast application of clean, dry sand.

Subparagraph (2) is deleted and replaced with the following:

(2) Wabo Expandex Joint System.

For installing the Wabo Expandex Joint System the Contractor shall use the manufacturer's specified aggregate premixed with the modified elastomeric binder (EBJ material). The joint blockout shall be filled with precoated mix and shall be compacted level with the roadway to the satisfaction of the Engineer. Sand or small aggregate shall be broadcast over the top to eliminate tackiness.