METHOD STATEMENT

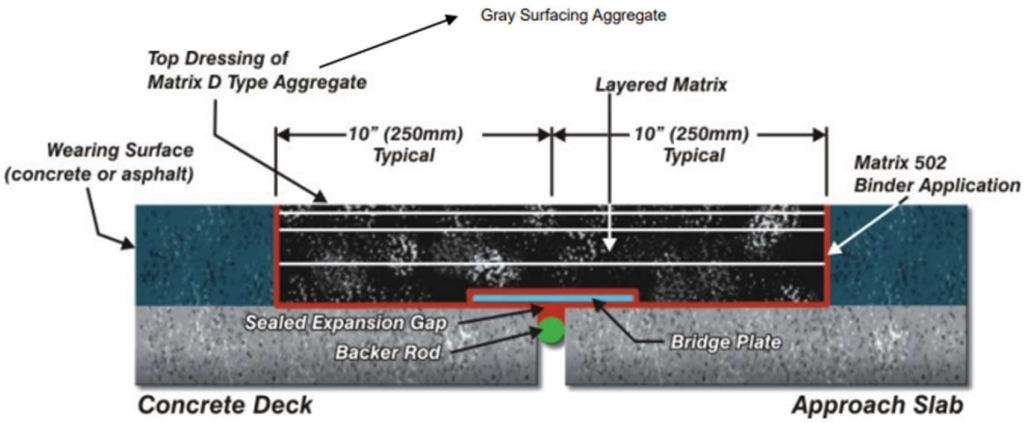
Asphaltic Plug Joint with CRAFCO MATRIX 502HD/502

Marathon Sealing

The **Crafco Matrix 502 HD 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 ± 25 mm of annual joint movement.

The Matrix 502 HD Joint can be used for both expansion and fixed end joints at abutments or piers in many bridge types including concrete slab, concrete beam, pre-stressed concrete and steel beam, either simple or multi-span, in both new construction or 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 inches (5cm). 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 Plug Bridge Joint System meets requirements of ASTM D6297, “Standard Specification for Asphaltic Plug Joints for Bridges”

ASPHALTIC PLUG JOINT SYSTEM COMPONENTS:



1. Binder

Matrix Binders are specially formulated hot-applied polymer modified asphalt products that are mixed with aggregate forming a bonded, flexible, extensible, compressible and traffic resistant joint system. Matrix Binder is provided in 2 grades. Matrix 502 (Part No.34528) is the standard grade used in cool to moderate climates, that meets the polymer modified asphalt requirements of ASTM D6297. Matrix 502 HD (Part No. 34529) is a stiffer formulation for hotter climates and high traffic areas.

2. Aggregates

These are specially selected hard durable igneous aggregates that are screened to specific gradations, double washed, dried and packaged in bags. Structural Aggregate is mixed with the Matrix Binder to produce the Matrix 502 HD Mixture for filling the joint. Gray Surfacing Aggregate is a finer grade, used to surface the completed joint. Gradation requirements are as follows.

STRUCTURAL AGGREGATE
Part No 33033

Screen Size	% Passing
1"	95-100%
3/4"	90-100%
1/2"	20-55%
3/8"	0-15
No 4	0-5%

GRAY SURFACING AGGREGATE
Part No. 33375SA

Screen Size	% Passing
1/4"	100%
No. 4	50 - 90%
No. 8	10 - 45%
No. 16	0-10%

3. Bridging Plates

Steel Bridging Plates are used to span the expansion gap, to function as a bond breaker and to support traffic loads. For expansion gaps up to 7.6 cm wide,6.4 mm thick steel bridging plates that are 20 cm wide shall be used. For joint gaps between 7.6 to 15 cm wide, 10mm thick steel plates which are 30 cm wide shall be used. Plate length shall be between 0.9 to 1.5 m. Plates shall be clean, free from surface rust, oil or other residues and contaminants when installed. Bridging Plates shall be Galvanized Iron or Aluminum.

4. Backer Rod

Closed cell heat resistant backer rod is used to provide back up in the expansion gap opening. Backer Rod 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”.

INSTALLATION PROCEDURE

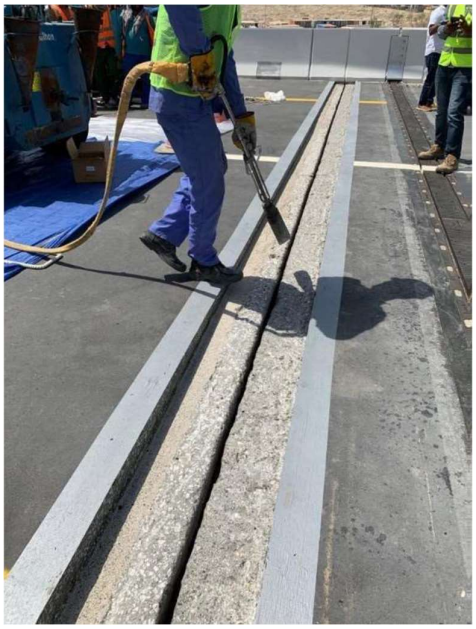
1. **Joint Blockout Preparation:** Saw cutting and removal of existing joint.
2. **Cleaning:** Cleaning of prepared site.
3. **Sealing & Bridging :** Sealing of Joint Gap & Installation of Bridging Plate.
4. **Tanking:** Priming the Joint Blockout with Binder.
5. **Installation of Matrix 502 HD mixture:** Heated Aggregate - Matrix 502 HD Binder mix is installed.
6. **Installation of Topping Aggregate:** Topping Aggregate is installed to provide anti-skid surface.
7. **Curing :** After Proper curing the area is opened to traffic.

1. JOINT BLOCKOUT PREPARATION:

The Matrix 502 Joint shall be centered within 25 mm over the existing expansion gap at the recommended width of 51 cm. If needed, due to site conditions, joint width can be increased to a maximum of 61 cm. Saw cut the pavement transversely at the determined width which is normally 25cm on each side of the expansion gap centerline, and parallel to the expansion gap through the surface and down to the concrete deck.

Remove all material between the saw cuts, including the waterproofing, riser bars, old expansion joint material and loose concrete from the bridge deck. This will form the joint blockout. The blockout must be to a minimum depth of 5 cm. In some cases, this may require scarifying of the concrete bridge deck.

The expansion gap shall be cleaned of all loose debris. Care should be taken to yield a level joint base at the bottom of the blockout. The blockout base shall be clean, intact and sound, and should be flat without elevation differences greater than 3 mm across the expansion gap. If the blockout base surfaces are not level across the expansion gap, the bridging plate may not span the joint correctly and may rock and displace under traffic loadings causing debonding or cracking of the installed joint. A properly installed and cured rapid setting concrete patch material may be used to level the blockout base surfaces. Additional substrate material may also be removed to level the surfaces. When removing loosened surfacing, care should be taken to not damage the deck.



2. CLEANING

The joint blockout shall be prepared by cleaning and drying all horizontal and vertical surfaces and at least 6 inches (15 cm) of the road surfacing adjacent to the vertical saw cuts with a hot compressed air (HCA) lance or Air Compressor or Wind Blowers. If there is an interruption due to weather or other causes, cleaning and drying operations are to be repeated prior to continuing with joint installation.

3. SEALING & BRIDGING:

Backer rod capable of withstanding elevated temperature of the binder shall be placed into expansion gaps that are 3mm or wider. Place the backer rod at a minimum depth of 12mm and not exceeding 25mm.

Heat the Matrix Binder in an indirectly heated oil jacketed melter with effective agitation. To use, binder is heated to the recommended application temperature range of 380 - 400°F (193 - 204°C). Pour heated Matrix Binder into the expansion gap, overfilling, and spreading the binder onto the bottom deck surface of the joint blockout on each side of the expansion gap, at a depth of 1/8 inch (3mm), and to extend just beyond the edges of the bridging plates. The Matrix Binder forms a flexible adhesive bond between the bridging plate and the bottom surface of the joint blockout.

Bridging plates are then immediately placed by centering over the expansion gap and butt jointing to cover the entire joint length and are embedded into the hot Matrix Binder. Use centering pins placed through the holes in the bridging plates and down into the expansion gap to assure proper centering. Bridging plates shall be cut to the appropriate length to cover the entire joint length without overlap.

4. TANKING:

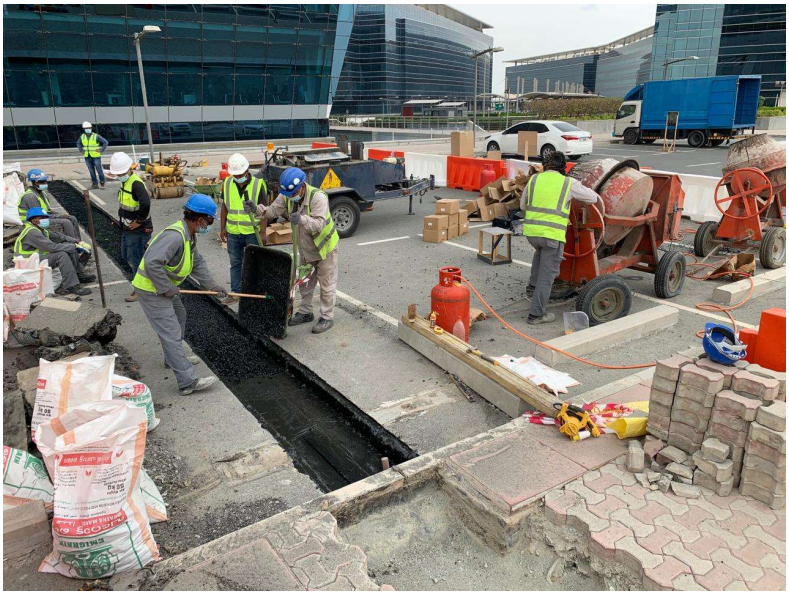
All prepared exposed horizontal and vertical surfaces of the joint blockout, including the bridging plates, shall be tanked (coated) with hot MatrixBinder. Pour MatrixBinder into the joint blockout and spread to coat all exposed surfaces.

5. INSTALLATION OF MATRIX 502 HD MIXTURE :

The Structural Aggregate shall be heated to 135-180°C using an air lance or torch in a rotating drum mixer or using a Crafco Patcher I or II mixer (or other approved indirectly heated unit).

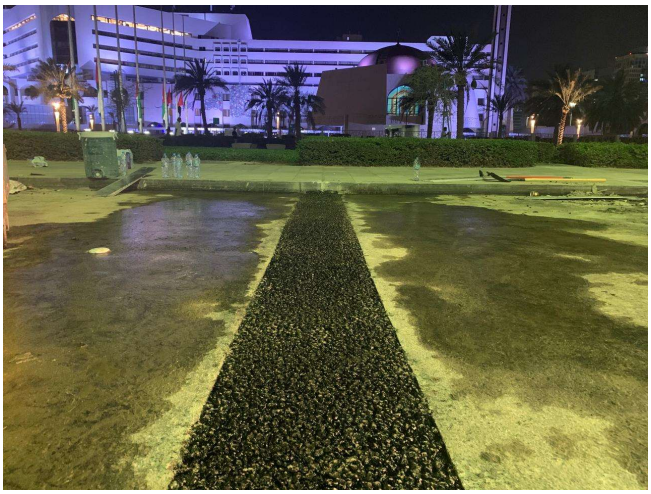
Heated binder is added to the heated Structural Aggregate in the drum mixer or Patcher unit at a ratio of 15 to 20 % Binder. Minor variation in the amount of Matrix Binder added to the heated aggregate is allowed.

The Matrix 502 Mixture is installed in a minimum of 2 layers. The depth of the joint blockout determines the number of layers used for a completed joint. The first layer of Matrix 502 Mixture is applied between 19-38mm thick. The mixture is spread and leveled using hot steel rakes.



After leveling, additional hot Matrix Binder from the indirectly heated oil jacketed melter is applied to the mixture surface to fill voids.

The final top layer of the Matrix 502 Mixture is then installed to approximately 6-12mm above the existing surface to allow for compaction. Compacted Joint is then allowed to cool until the surface temperature reach atmospheric temperature.



6. INSTALLATION OF TOPPING AGGREGATE:

Strips of masking tape are applied to the pavement surface approximately 5 cm from and parallel to the edge of each side of the joint along the entire joint length. A thin layer of Matrix Binder is then uniformly applied and spread over the entire top surface of the joint, extending over the pavement surface out to the masking tape. The masking tape forms straight edges which improve the finished appearance of the joint.

Spread the Binder across joint using a handheld scrapper, immediately remove the masking tape and then immediately apply the Gray Surfacing aggregate.

7. CURING:

The Installed joint is allowed to cure for 2 to 4 hours before opening to traffic.