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INSTALLATION INSTRUCTIONS
MATRIX 502 ASPHALTIC PLUG BRIDGE JOINT SYSTEM

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READ BEFORE USING THIS PRODUCT

INTRODUCTION These installation instructions detail requirements and procedures to be followed for proper installation of the Matrix 502 Asphaltic Plug Bridge Joint System. Usage, equipment, materials, preparation, cleaning and construction requirements are covered. Installation consists of constructing the joint cutout, preparing the joint surface, installing bridging plates, mixing the aggregate and binder, placing and compacting the mixture and applying surface dressing aggregate. With proper installation, long lasting durable joints are achieved.

USAGE The Matrix 502 Asphaltic Plug Bridge Joint System 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 multi-span and in either new construction or rehabilitative. The joint should not be installed where joint skews exceed 45 degrees. Maximum joint movement should not exceed $\pm 3/4"$ (± 19 mm), and maximum expansion gap width should not exceed 3" (75 mm) at time of installation. The joint should not be installed where traffic induced differential vertical deflections across the joint exceed 1/4" (6 mm) or where there are high volumes of stopped traffic. The Matrix 502 Joint can also be used as a pressure relief joint on bridge approach slabs or as a longitudinal joint that is not in traffic lanes. The design of the Matrix 502 joint can also be slightly modified to use with steel armored or other joint systems.

MATERIALS and QUANTITIES The following materials are required for installation of the Matrix 502 Asphaltic Plug Bridge Joint System. Quantities shown are for estimating purposes for a standard size 2" (5 cm) deep by 20" (51 cm) wide joint based on joint length in feet.

Item	Crafco Part No.	Estimating Quantity
Matrix 502 Binder	34528	8 lb per foot
Matrix Aggregate SBG	33032	29 lb per foot
Matrix Aggregate D	33030	3.3 lb per foot
Bridging Plates	33050, 33051, 33052, 33053	1 section per 5 feet
Locating Pins	Local Availability	1 per foot
Crafco Asphalt Primer	33140	0.025 gal per foot
Backer Rod	34609	1 per 6 feet

All materials required and in sufficient quantities should be present on the jobsite prior to beginning joint installation. All materials should be properly stored and protected from the weather prior to use.

EQUIPMENT The following is a list of suggested equipment that is needed for proper joint installation.

Item	Qty	Item	Qty
Material melter, double jacketed oil, 100/200 gallons	1	Straight edge utility shovel	2
Motor driven rotating drum mixers, 3 CF	3 to 4	Heavy-duty push broom	2
185 CFM air compressor	1	Steel bucket, 5 gallon	2 to 3
Hot compressed air lance or hand held torch	1 to 2	Hand tools:	
50 ft. air hose	1 to 2	3 lb. hammer	2
Concrete saw with diamond asphalt cutting blade	1	50' chalk line	1
Asphalt breaker with chisel attachments	2	50' tape measure	2
Motorized steel drum roller minimum 1 1/2 tons	1	Wire brushes	2
100 lb. LPG cylinders with hoses & fittings	3 to 4	Box cutter utility knife with replacement blades	3
Steel cutting torch	1	Heavy-duty work gloves	6
High pressure air blow pipe	1	Heavy-duty flash lights	4
Steel rakes	3 to 4	Equipped tool box	1
Flat end steel scraper	2 to 3	First-aid kit	1
Fire Extinguisher	1	Hand Held Temperature gauge	1
		Matrix Primer Brush (4" or larger)	1

TEMPERATURE and WEATHER Pavement temperature during installation of the Matrix 502 joint should be a minimum of 40°F or 5°C and weather should be dry with no signs of imminent rain. Cutout, cleaning and preparatory work can be done at lower temperatures.

CUTOUT PREPARATION The Matrix 502 joint shall be centered within 1" (25 mm) over the existing expansion joint gap to the recommended width of 20" (50 cm). Variation in the width of the joint of up to 24" (61 cm) may be necessary to accommodate site conditions as determined by the manufacturer and/or engineer.

Saw cut the pavement transversely at the determined width which is normally 10" (250 mm) on each side of the expansion gap centerline, and parallel to the expansion gap and 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 bridge joint cutout. The cutout must be cut to a minimum depth of 2" (50 mm). In some cases, this may require scarifying of the concrete bridge deck with a small scabbler. Abrasive blasting may be required to obtain intact surfaces. The joint expansion gap shall be cleaned of all loose debris. Care should be taken to yield a level joint base. The cutout base should be intact and sound and be flat without elevation differences across the joint expansion gap. When removing the loosened surfacing, care should be taken to not damage the deck. Quick setting concrete may be required to repair uneven blockout surfaces before placement of the bridging plate.

CLEANING, DRYING and PRIMING The joint cutout shall be further prepared by cleaning and drying all horizontal and vertical surfaces and at least 6" (150 mm) of the road surfacing adjacent to the vertical saw cuts. The use of a hot compressed air (HCA) lance or a hand held torch is recommended. If there is an interruption due to weather or other causes, the cleaning and drying operation is to be repeated immediately before priming. After cleaning and drying, all horizontal and vertical surfaces of the prepared joint cutout shall be brush coated or rolled without puddles with Crafcro Asphalt Primer at an application rate of approximately 0.025 gallons per lineal foot of joint length. This will assist adhesion of the Matrix 502 joint within the cutout. Primer shall be allowed to dry to a tacky condition, which when touched with one's finger, is tacky with no material transfer. This process may take up to half an hour.

SEALING and BRIDGING the JOINT EXPANSION GAP Backer rod capable of withstanding elevated temperature of the binder shall be placed into expansion joint gaps that are 1/8" (3 mm) or wider. Place the backer rod at a minimum depth of 1/2" (12 mm) and not exceeding 1" (25 mm). Heat Matrix 502 Binder in a jacketed double boiler melter with effective agitation that meets requirements of appendix X1.1 of ASTM D6690. Do not use direct fired or air heated machines. Heat transfer oil should not exceed 525°F (274°C). The unit must be capable of safely heating product to 410°F (210°C). CAUTION: Do not agitate when adding product due to splashing. To use, binder is heated to between the recommended installation temperature and the maximum (safe) heating temperature of 380 to 410°F (193 to 210°C).

Additionally, a system for accurately determining the weight of binder dispensed from the melter shall be available on site. Pour the heated Matrix 502 Binder into the expansion gap, overfilling the joint gap to allow the binder to be spread onto the cutout base at least 4" (10cm) on each side of the joint gap. The binder will form a bond breaker between the cutout and the bridging plates. The bridging plates are then centered over the existing expansion gap and butt jointed to cover the entire joint length and is embedded into the hot Matrix 502 Binder. Use centering pins placed through the holes in the bridging plates and down into the expansion joint gap to assure proper centering. Bridging plates shall be cut to the appropriate length as required to extend the full length of the joint and shall be butt jointed without overlap.

SEALING the JOINT CUTOUT All prepared exposed horizontal and vertical surfaces of the joint cutout, including the bridging plates, shall be sealed with Matrix 502 Binder. Pour Matrix 502 Binder into the joint cutout and screed to coat all exposed surfaces. The binder shall achieve a minimum thickness of 1/32" (1 mm) and should not exceed 1/8" (3 mm) throughout. The binder application temperature shall be between 380 and 410°F (193 and 210°C).

MIXING MATRIX 502 BINDER and SBG AGGREGATE The SBG aggregate shall be heated to 325-400°F (162-204°C) in a rotating drum mixer to remove dust and all moisture. The temperature of the aggregate shall be monitored by using a hand held, calibrated, digital temperature sensor. Add Matrix 502 Binder at the installation temperature range of 380-410°F (193-210°C) to the heated SBG aggregate in the mixer in a ratio of approximately 1 gallon (13 lbs.) of binder per 50 lb. bag of SBG aggregate. Minor variation in the amount of Matrix 502 Binder added to the heated SBG aggregate is allowed. The heated SBG aggregate must be completely coated prior to placement.

PLACING the MATRIX 502 MIXTURE The Matrix 502 mixture is placed from the mixture into the joint placement area as quickly as possible. Depending on the depth of the joint, it may require placement in 2 or 3 spots. The 502 mixture is then raked to the desired thickness. Joint depth is the determining factor in how much is placed. Compact the mixture using a roller at least 1½ ton going across the joint to compact the mixture and then lengthwise to smooth it.

INSTALLING SURFACE DRESSING (D-AGGREGATE) The completed joint surface is carefully heated to dry any water left by the roller with the heat lance or hand held torch without burning. Place a thin layer of Binder over the surface, extending 1 inch over the pavement. Duct tape can be used as a guideline. Reapply Binder to any areas that the Binder has soaked through to ensure proper coverage. Put the Dress aggregate on top of the Binder in a uniform way to completely cover the Binder. Roll over the joint to embed the Dress aggregate into the Binder. In colder weather, it may be necessary to warm the top layer of Binder before placing Dress

aggregate. The Matrix 502 joint must be allowed to cool before allowing traffic. Curing time depends on depth of the joint and ambient temperatures. Usual curing time is between 1 and 3 hours.

SAFETY PRECAUTIONS Since joint installation requires products that are heated to elevated temperatures, it is essential that operations be conducted safely. All personnel need to be aware of hazards of using hot applied materials and safety precautions. Before use, the crew should read and understand product use and safety information on the box and the product MSDS. User should check D.O.T. requirements for transportation of product at elevated temperatures above 212°F (100°C).

HAZZARDS ASSOCIATED with HOT APPLIED MATERIALS Skin contact with hot materials causes burns. Over exposure to fumes may cause respiratory tract irritation, nausea, or headaches. Precautions are to be taken to prevent contact with hot material and to avoid inhalation of fumes for everyone in the vicinity. Safety precautions should include:

1. Protective clothing to prevent skin contact with hot material.
2. Care when adding product to melters to reduce splashing.
3. Careful operation of mixing and application equipment.
4. Traffic and pedestrian control measures which meet or exceed local requirements to prevent access to work areas while product is in molten state.
5. Avoidance of material fumes.
6. Proper application configurations with a minimum amount of material excess.
7. Appropriate clean up of excessive applications or product spills.

ADDITIONAL INFORMATION Additional information regarding the Matrix 502 Asphaltic Plug Bridge Joint System is available by contacting your distributor or The D.S. Brown Company. This information includes:

1. Product Data Sheets.
2. Material Safety Data Sheets.