MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**ASPHALTIC PLUG EXPANSION JOINT SYSTEM, MODIFIED**

BRG:AJM 1 of 3 APPR:JAB:SCK:05-10-22

**a. Description.** This work consists of furnishing and installing an asphaltic plug expansion joint system above an expansion joint device. Ensure all work is in accordance with the standard specifications, as shown on the plans, and as directed by the Engineer.

**b. Materials.** Furnish materials in accordance with the standard specifications and as specified herein.

1. Asphaltic Plug Expansion Joint System. Furnish a joint system comprised of the following components: thermoplastic polymeric modified asphalt, select aggregates, steel plate, and locating pins (optional). Furnish a joint system capable of accommodating a minimum of 1.5-inch of movement in either expansion or contraction while maintaining a continuous load bearing surface. Ensure all component materials incorporated in this system is in accordance with *ASTM D6297*, the Manufacturer’s requirements, and as stated herein. Furnish one of the following asphaltic plug expansion joint systems or an equal alternative subject to the approval of the Engineer.

Thorma-Joint, supplied by:

Dynamic Surface Application, Ltd.

373 Village Road

Pennsdale, PA 17756

Matrix 501/Matrix 502/Deery FBJ-6297, supplied by:

Crafco, Inc.

6165 W. Detroit St

Chandler, AZ 85226

2. Binder. Furnish a bridge joint binder with a polymer modified asphalt material conforming to *ASTM D6297* and the Manufacturer’s requirements.

3. Aggregate. Furnish aggregate consisting of a hard and durable stone blend meeting a maximum wear of 40 percent when tested by *AASHTO T96* and the aggregate loss not exceeding 10 percent after five cycles, when tested for soundness by *AASHTO T104* with magnesium sulfate solution. Ensure the aggregate is double washed, moisture free and bagged and meets the Manufacturer’s proprietary gradation requirements.

4. Steel Backing Plate and Locating Pins. Furnish a steel backing plate in accordance with *ASTM D6297* and the Manufacturer’s requirements that is mild steel with a minimum thickness of 1/4-inch and a width of 8-inches. For joint openings in excess of 3-inches, furnish a minimum plate thickness of 3/8-inches and a width of 12-inches. Furnish steel locating pins for securing the plates that are 16 times the pin diameter in length (minimum), hot-dip galvanized, and spaced no more than 12 inches apart, in holes pre-drilled to 7/32-inches in diameter.

**c. Acceptance.** Furnish material samples, material detail sheets and certified test reports on a lot by lot basis.

Adhere to Manufacturer’s materials details for preparation, construction, and curing. Submit to the Engineer for approval. The materials details must furnish the following:

1. Product Information.

A. Identify Components.

B. Packing, storage and handling requirements.

2. Surface Preparation.

A. Weather limitations and surface conditions.

B. Preconditioning (removal) of existing joint system.

C. Surface preparation and level of cleanliness.

D. Address any structural repairs needed and method of repair to include compatible materials needed.

3. Application Procedures. Describe all procedures to be followed in preparation, heating, mixing and installation of system.

4. Curing.

A. Describe curing procedure and anticipated cure times vs. temperature (Table recommended).

B. Describe test(s) performed for quality assurance.

Ship all components in appropriate containers bearing the manufacturer's label specifying date of manufacture, batch number, brand name, quantity, and date of expiration or shelf life.

**d. Construction.** Install the asphaltic plug expansion joint system in accordance with the material details furnished by the Manufacturer. Ensure an experienced, trained and certified Manufacture’s technical representative is present during the installation of the asphaltic plug to provide the Contractor aid and instruction as required to achieve an installation satisfactory to the Engineer. The representative may be released at the Engineer’s discretion after the initial installation.

Saw cut the bituminous concrete overlay, without damaging the existing deck surface, and remove it full depth (to the top of the existing deck surface) to the limits of the asphaltic plug joint system or as shown on the plans. Remove waterproof membrane materials, if present. Prepare and treat all concrete, steel and asphalt joint surfaces as recommended by the joint Manufacturer.

Heat the binder material to the supplier's recommended minimum temperature or pouring temperature range. At no time should the binder temperature exceed the recommended safe heating temperature. Use a heating kettle that has a continuous agitation system, temperature controls, calibrated thermometers and that is double steel jacketed with an oil layer between to prevent scorching of the binder. During application, maintain the binder material temperature at the supplier's recommended minimum temperature. Do not allow the temperature of the binder to fall below 350 °F [176 °C]. Pour the binder into the expansion joint opening until it runs over the edges. Remove all binder material that leaks through the joint and is deposited on any bridge component, including underside of slabs and headers, beams, diaphragms, abutments, piers and bearings.

Heat the aggregate in a rotating drum mixer to the Manufacturer’s recommended minimum temperature, but not less than 350 °F (176 °C). Monitor the temperature with a calibrated digital temperature sensor. Add the binder material to the mixer to precoat the aggregate.

Install the asphaltic plug expansion joint components as recommended by the joint Manufacturer. Place a backing plate, if specified on the plans, in the joint within the limits of the staged construction. Abut the backing plates tight to each stage of construction and span from curb to curb or curb to construction joint on the roadway portion of the expansion joint. Center the plate over the expansion joint device. Prevent material from passing through to the expansion joint device and remove as required. Ensure that the plate rests securely on the joint edges so that it cannot rock or otherwise move in a manner which could be detrimental to the final joint system. If recommended by the manufacturer, place a suitable cementitious leveling compound to properly seat the plate. Place locating pins in the pre-drilled holes and hammer in to secure the plates. Do not install asphaltic plug expansion joint below 45 °F (7 °C).

Damage to the expansion joint device below the asphaltic plug expansion joint will be repaired at no cost to the contract.

Do not allow traffic over the joint until it has developed adequate strength in accordance with the Manufacture’s recommendations.

The Manufacturer’s representative must provide written certification to the Engineer that the asphaltic plug expansion joint was installed in accordance with the Manufacturer’s requirements.

**e. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

**Pay Item Pay Unit**

Asphaltic Plug Expansion Joint System, Modified Cubic Foot

**Asphaltic Plug Expansion Joint System, Modified** will be measured in place by volume in cubic feet and includes furnishing, testing, preparing the surface and installing the expansion joint system. No credit will be made for wasted material. **Asphaltic Plug Expansion Joint System, Modified** includes saw cutting and removing bituminous concrete required for this work.