# FIBER-MODIFIED CRACK SEALING

Revised on: 3/2/2023

Filling Cracks (All Pavement). This work consists of routing (unless identified otherwise in the contract plans), cleaning and filling transverse and longitudinal joints and cracks in existing hot mix asphalt pavement with fiber modified asphalt cement as shown in the plan details, as directed by the Engineer, and as described herein. Either Jobsite Mixed Filler material or Pre-Mixed Filler material may be used in this contract, in accordance to the specifications found here within.

Materials. Materials shall meet the requirement of the following Articles of Section 1000 – Materials:

1. **Jobsite Mixed Filler**

Fiber-modified asphalt crack filler mixed at the jobsite shall contain the following materials and be proportioned according to the following requirements:

1. Asphalt Binder – asphalt cement shall be PG 58-28, PG 58-22, or PG 64-22 (per Article 1032.01-1032.05).
2. Fibers – fibers shall be short cut polypropylene fibers meeting the properties listed below:

|  |  |  |
| --- | --- | --- |
| Length, | mm: | 8 - 12 |
| Denier | : | 13 - 16 |
| Crimps | : | None |
| Tensile Strength, minimum, | MPa (psi): | 275 (40,000) |
| Specific Gravity (typical) | : | 0.91 |
| Moisture Regain @ 21 °C (70 °F) and 65% RH (typical) | %: | 0.1 |

1. Percent Fibers – the fiber-asphalt mixture shall contain a minimum of 8.0% by weight of fibers.
2. Heating Temperature – the fiber-asphalt filler shall be heated in the kettle at temperatures between 255 and 285 ˚F (124 and 141 ˚C). The temperature shall never exceed 290 ˚F (143 ˚C).

The fiber may be accepted on certification from the manufacturer that it meets the specified requirements. ***The Contractor shall submit Samples of proposed material for testing and approval prior to work.***

All fiber shall be delivered to the work site in the original, sealed, manufacturer’s packaging. Each bag to be incorporated into the finished product shall be properly identified with the name of the manufacturer, plant location, product name and type, date of manufacture, product weight, batch and lot number.  ***The Contractor shall purchase a sufficient amount of material for the project, with the same batch and lot number.*** This information is to be clearly marked at the point of manufacture, by the manufacturer not by the Contractor’s forces. Loose unmarked bags from a shipping box or open and partial bags of materials with or without the aforementioned identifying information will not be acceptable. Shipping paperwork confirming this information shall accompany the bags and be delivered to the Engineer prior to any incorporation of the fiber into the finished product.

1. **Pre-Mixed Filler**

Fiber-modified asphalt crack filler that is pre-mixed and packaged shall consist of fibers, asphalt binder, and other modifiers. The filler and its components shall be accepted on certification from the manufacturer that it meets the following requirements.

1. Asphalt Binder – the asphalt binder shall be PG 64-22
2. Fibers – fibers shall be short cut polyester fibers meeting the properties listed below.



1. Percent Fibers – the fiber-asphalt mixture shall contain 5.0 ± 0.5% by weight of fibers.

The crack filler, in its final form, shall meet the following requirements when sampled and heated to the manufacturer’s recommended maximum heating temperature according to ASTM D 5167.



Equipment. An oil jacketed double wall kettle equipped with an agitator (reversing rotary auger action) and separate thermometers for the oil bath and mixing chamber will be required. The unit shall also be equipped with a reversible hydraulic hot asphalt pump and a recirculating pump to circulate the oil bath. The equipment must be capable of pumping a minimum of an 8% fiber content blend, for Jobsite Mixed material, in a consistent and acceptable manner, as decided by the Engineer. An air compressor capable of producing a minimum 620 kPa (90 psi) at the end of the discharge hose will be required. All equipment shall be, and shall be kept, in proper working order.

The routing machine shall have a steel circular, cutting head with carbide tipped cutters mounted radially. The machine shall be capable of routing a uniform, square shape approximately ¾” x ¾” in either a straight or irregular line. All equipment shall be, and shall be kept, in proper working order.

Preparation of Mixture for Jobsite Mixed Filler. The fiber modified asphalt cement or fiber-asphalt shall consist of a minimum of 8.0% by weight fiber in the fiber-asphalt mixture. Operating temperatures in the kettle shall be between 124 and 141 °C (255 and 285 °F). The temperature shall never exceed 143 °C (290 °F) as the fibers will melt into the asphalt cement.

The fiber-asphalt mixture shall be prepped and mixed on-site, at the Kane County Division of Transportation office located at 41W011 Burlington Road, St. Charles, within the presence of the Engineer’s supervision, unless otherwise specified by the Engineer.

All materials shall be placed in the kettle and allowed to mix for a minimum of one half hour, or to the satisfaction of the Engineer, before material shall be prepped for placement.

***All fiber-asphalt material mixed and prepped shall be used that same day. Excess material shall not be reheated and used the following day, unless approved by the Engineer in writing.***

Construction Methods. All cracks greater than 1/8 inch are to be filled within the project limits to the satisfaction of the Engineer.

Cracks measuring up to ¾ inch wide shall be routed and sealed to a depth of ¾ inch. Cracks greater than ¾ inch shall not require routing, just blown clean and clear of debris and moisture then sealed.

Cracks requiring routing shall be routed following the crack as nearly as possible, approximately ¾” wide by ¾” deep as close to a one to one ratio as possible.

***Material from routing shall be picked up and properly disposed of. This material shall not be blown onto the shoulder (or within the ditch) or into traffic. Material found in the ROW or in traffic shall result in a deficiency of $1000 per each location and/or occurance.***

The fiber-asphalt filler shall be applied only when the joints and cracks are dry and free of dirt, organic material (ie vegetation), debris and loose filler. Organic material may either be removed physically or burned and removed, to the satisfaction of the Engineer. Filler shall be applied to a clean void. The joints and cracks shall be blown out with the 620 kPa (90 psi) compressed air. The blowing out operations shall be kept close to the filling operations to prevent debris being carried back into the cracks before filling. For such cracks that are greater than ¾ inch where the cracks are blown out, routing will not be required. A compressed air lance meeting the approval of the engineer may be used to clean the cracks.

The fiber-asphalt filler shall be applied using a pressurized wand delivery system with such devices as necessary to fill the cracks and form a nominal 3 mm (0.125 inch) thick by 75 mm (3 inch) wide overseal band centered so that the center of the 75 mm (3 inch) wide band is within 25 mm (1 inch) of the crack. The fiber-asphalt filler shall be applied taking care to not use excessive material in either thickness or location. The Engineer will approve the proposed extents that the Contractor suggests for filling of fine cracks. Care should be taken to not place filler on top of pavement markings, manholes and drainage castings.

The Contractor shall delegate one (or two; in case of absence) person from his crew who will operate the wand throughout the duration of the project. This person shall complete the contract unless approved in writing by the Engineer. This will help in providing a uniform and consistent result to the County’s requirements.

Material will be applied in one continuous, uniform band, and shall not be overlapped or applied in layers. Material overlapped, applied in layers, or found to be non-compliant will be removed and replaced at the Contractors expense.

The ambient temperature during filling shall be above 4 °C (40 °F) and below 29 °C (85 °F). The filler must cure before being opened to traffic. The contractor may use approved fine sand, mineral filler or portland cement to dust the filler if necessary to more quickly open the road to traffic. Dusting will be considered incidental.

The crack fill material for Jobsite Mixed material placement will be tested during this contract to determine percentage of fiber in mixture. Any amount of material with a fiber content below 8% will be removed and reapplied with a minimum of 8% by contractor at no additional cost to the County.

A technical representative, from the fiber manufacturer who is familiar with the field placement of the product, shall be available for initial filling work. Any suggestions or recommendations shall be submitted to the Engineer for approval.

Any material placed in routed cracks identified as unacceptable by the Engineer shall be totally removed in full cross section the ***same day*** the notification has been conveyed from the Engineer to the Contractor. The failing area shall be inspected by the Engineer and any portions or remnants of material remaining shall be removed by the Contractor prior to placement of new material. New virgin material will then be applied in the rejected areas to the satisfaction of the Engineer. Removal and re-application of material to non-routed areas will be at the discretion of the Engineer.

Method of Measurement. This work will be measured for payment by the centerline –foot. A centerline-foot is defined as a 1-foot segment measured along the centerline of the roadway and includes all lanes of traffic in both directions. Random cracking within the limits of the improvement to be repaired includes cracks in the traffic lanes, acceleration lanes, deceleration lanes, widened medians, median cross-over lanes, turning lanes, paved shoulders, ramps and all auxiliary lanes, unless shown otherwise on the plans. ***For divided highways, the centerline-foot will be measured in each direction separately.***

Basis of Payment. This work shall be paid for at the contract unit price per centerline-foot for FIBER-MODIFIED ASPHALT CRACK SEALING.