

Hot-Applied Crack Sealing & Filling Of Bituminous Concrete Pavement

DRAFT ENGINEERING BRIEF

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Crack sealing and filling of bituminous concrete pavement is utilized to prevent water intrusion into the pavement base and sub-base through working and non-working cracks in the pavement surface. Crack sealing and filling retards further deterioration of the roadway by closing cracks by means of a treatment material. Untreated pavement surface cracks result in future pavement deterioration over time including block cracking, high-density cracking, rutting, raveling and pothole formation. Crack sealing and filling is a pavement maintenance application that is intended to preserve the structural integrity of the existing pavement and extend the existing pavement service life.

Crack sealing is normally identified with the maintenance of transverse surface cracks subject to movement (working cracks). Such cracks experience horizontal and/or vertical movement due to the expansion and contraction of the pavement that is caused by temperature cycling of the pavement as well as freeze/thaw effects. Crack filling is normally identified with longitudinal surface cracks. These cracks experience very little or no movement (non-working cracks). To simplify pavement evaluation relative to surface cracks and to optimize field maintenance operations, the higher standard of crack sealing is to be applied to all pavement surface cracks meeting the crack sealing and filling maintenance specification.

Crack sealing and filling are utilized as stand-alone, crack maintenance and pavement preservation techniques. Crack sealing and filling are also employed as bituminous concrete pavement preparation activities prior to hot-mix asphalt structural paving and pavement surface treatments including chip seals, microsurfacing, cape seals, fog seals, and thin, hot-mix asphalt maintenance overlays. When combined in this manner, crack sealing and filling are intended to retard reflective cracking through the wearing surface in the new overlay in addition to preventing water intrusion into the pavement base and sub-base.

Crack sealing and filling are not appropriate for cracks smaller than $\frac{1}{4}$ " in width, for cracks larger than $\frac{1}{2}$ " in width or for high severity fatigue cracking. High severity fatigue cracking is defined by The Distress Identification Manual (2) as "*an area of moderately or severely spalled interconnected cracks forming a complete pattern; pieces may move when subjected to traffic.*" Sealer performance is compromised outside these parameters due to the physical characteristics of current treatment materials. Cracks smaller than $\frac{1}{4}$ "

do not have a sufficient reservoir for treatment material. Cracks larger than ½” create adhesion problems for working cracks. A review of national best practices applicable to the Connecticut climate indicates:

1. Pavement surface cracks to be sealed and filled range from ¼” up to ½” in width.
2. Cracks are cleaned and heated using a hot, compressed air lance designed for this purpose immediately prior to sealing and filling operations.
3. A hot-applied, rubberized asphalt treatment material is applied directly into the crack until refusal and then struck flat to the pavement surface.
4. Traffic is prohibited from the pavement work areas until treatment material does not track on tires and is not subject to deformation in the crack.

Crack sealing and filling of bituminous concrete pavement is a maintenance application that can be placed as long as the pavement is dry and ambient temperature is a minimum of 40°F during field operations. The months of April, May, September, October and November in Connecticut provide optimum surface crack contraction and field weather conditions for crack sealing and filling operations.

Contract payment is determined by the linear lane-mile of work performed and includes the cost of all materials, equipment, tools, and labor to complete the work in a satisfactory manner. This linear lane-mile unit of payment requires that the specific pavement be identified for contract bidder review and that daily inspection of contracted work be conducted to insure compliance to the bid specifications.

Workers must adhere to all safety protocols relative to traffic control and work zone safety for this maintenance operation.