

Bump Formation & Prevention in Asphalt Overlays

The cause of the bumps in asphalt overlay surfaces have been studied by many agencies, contractors, and manufacturers. Many causes have been found to play role in the overlay bump formation. Contributing factors may include:

- The uniformity of the base pavement.
- The shape / type of the overlay aggregate.
- The overlay temperature.
- The type of tack coat used.
- Compaction equipment design, rolling patterns, and speed of rollers.
- And the presence of cracks and crack treatment

Crack Sealant and Bump Formation

The presence of crack sealant does not mean bumps will occur and not all bumps are caused by crack sealant.

When a hot overlay is placed on the base pavement, the base will absorb the heat and expand. During this pavement expansion, the cracks narrow. This causes crack sealant to be pushed upward. When the crack sealant is pushed upward, it can adhere to the overlay, especially in the case of newly applied crack sealant. This can effect the rolling / compaction process of the overlay and potentially cause bumps in the overlay.

In order to reduce the potential for bumps in an asphalt overlay on pavements with crack sealant, it is beneficial to reduce the likelihood that the crack sealant will adhere to the overlay.

- ◆ It is good practices, when possible, to wait one or more years after crack sealing before applying an asphalt overlay. While crack sealant ages, it oxidizes and a non tacky surface forms. If pushed upward, the aged surface of the crack sealant will resist adhering to the overlay. Further, aged crack sealant has been exposed to traffic that has eroded sealant off the pavement surface. Thus reducing its chances of coming into contact with the overlay.
- ◆ Sealant that is freshly applied will have a higher chance of adhering to the overlay. It is good pavement design to route these cracks and use a recessed fill in order to reduce the chances of the sealant coming in contact with the overlay. A 3/8 inch / 1cm recessed fill is generally sufficient. Sealant should not be applied to the pavement surface and excess sealant must be removed.
- ◆ Often a blotting agent on the crack sealant such as limestone, clay, sand, or other coatings will help prevent adherence.
- ◆ Soft crack sealants with low softening points when heated by the overlay material may be soft enough to not restrain the overlay during the rolling/compaction process. Or, sealants that re harder at higher temperatures may not readily adhere to an overlay.
- ◆ Using aggregate in the asphalt overlay mix that is larger than the width of the cracks in the base pavement is another step to allow for proper compaction and reduce the likelihood of bumps in the overlay.

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2/2014

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