Bump Formation in Asphalt Overlays

Guide to Minimizing and Preventing These Defects

Root Causes

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

- Uniformity of the base pavement
- Shape/type of the overlay aggregate
- Overlay temperature
- Type of tack coat used
- Compaction equipment design, rolling patterns and speed of rollers
- 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 existing cracks will 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 and potentially cause bumps in the overlay.

In order to reduce the potential for bumps in an asphalt overlay on crack sealed pavements, you must reduce the chance that the crack sealant will adhere to the overlay.

- ♦ It is good practice, when possible, to wait one or more years after crack sealing before applying an asphalt overlay. When 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, having been exposed to traffic, the aged crack sealant will have eroded slightly. This also decreases its chances of coming into contact with the overlay.
- ♦ Sealant that is freshly applied will have a higher chance of adhering to the overlay. The best practice in this scenario is to route the cracks and use a recessed fill 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 may be soft enough to not effect the overlay during the rolling/compaction process. Also, sealants that reharden 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 decrease the likelihood of bumps in the overlay.

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7-2021

472 Industrial Parkway, Sandusky, Ohio 44870

(419) 621-1966 • Fax (419) 621-1988 • (877) 690-4093 • www.pntproducts.com