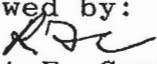



MATERIALS & RESEARCH DIVISION

Reviewed by:


Robert F. Cauley, P.E.
Materials and Research
Engineer



Prepared by:


Amy L. Gamble
May 22, 1991
Page 1 of 2

RESEARCH UPDATE

Number U91-9

THORMA-JOINT BRIDGE JOINT SYSTEM
(Status Report)

REFERENCE: Research Update U90-8

HISTORY:

On July 11, 1990, a Thorma-Joint system was installed at both the north and south abutment joints of I-91 Bridge #16 north of Putney, Vermont. This asphaltic plug system was selected on an experimental basis due to the frequent failure of the bituminous joints commonly used on bridges.

STATUS:

Excessive movement in the north joint had been a concern prior to installation of the new joint, and the joint was designed accordingly. Less than a month after installation, on August 3, 1990, the north joint showed signs of distortion in the wheel tracks. On October 16, 1990, an engineer from the VAOT Materials and Research Division inspected the bridge abutment joints for distress. Six linear feet of cracking between the joint material and the adjacent pavement was noted in the north joint, and there was an area of distortion in the joint material between the center of the joint and the south edge in the travel lane. No distortion was noted in the south joint.

When the joints were re-inspected on December 6, 1990, the distress in the north joint was markedly worse. There were 15.5 linear feet of cracking between the joint material and the adjacent pavement noted, and the distortion in the joint material had given way to 17.3 linear feet of cracking. The joint gap showed a relative movement of 3/4" since the October inspection. The south joint again had no visible signs of distress, probably due to the small (1/16") relative movement in the joint.

The contractor has been notified of the situation, and has verbally agreed to repair the joint as warranted.

BACKGROUND NOTE:

The installation of the Thorma-Joint systems as described in Update Report U90-8 and field notes from the joint installation varies somewhat from the procedures outlined by the contractor's proposal. The procedures call for each layer to be allowed to cool before application of the next layer. During the installation, three lifts were placed in less than one hour, which may not have allowed sufficient cooling time. The procedures call for immediate compaction

of the final lift using a roller. Instead, the lift was water cooled, then compacted with a plate vibrator.

It has recently been observed that despite the fact that the north joint gap is only 1/4" from its position during installation, there are still cracks up to 3/4" wide in the joint material. Thermal shrinkage of the mix after installation could be a factor in explaining this phenomenon.



Thorma-Joint System Failure in North Joint

FOLLOW UP:

These joints will remain under observation, and reports will be issued as significant data is collected.

Distribution A,B,C,D,E,F,G