PERFORMANCE OF HOT-POUR AND COLD-APPLIED JOINT SEAL MATERIALS

Projects 30-31, C2; 38-7, C5; 46-3, C8
US-127, Relocation South of Jackson

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Highway Research Project 53 G-71(2)

Research Laboratory
Testing and Research Division
Report No. 254
February 20, 1956
PERFORMANCE OF HOT-POUR AND COLD-APPLIED
JOINT SEAL MATERIALS

On February 3, 1956, a joint seal condition survey was made on the new US-127 re-location south of Jackson. This pavement includes projects 30-31, C2, 38-7, C5 and 46-3, C8.

About half of the transverse joints in this pavement were sealed with hot-pour and half with cold-applied sealer. Most of the joints were formed with a mandrel in the usual manner, a few were sawed on the same day the concrete was poured and several were formed by the use of styrofoam or corrugated paper strips. Where styrofoam or paper was used, it was removed just prior to sealing the joint. About four-fifths of the mandrel-formed joints had been caulked with jute rove as soon as the concrete had hardened and the jute was left in place until just prior to sealing. The various combinations of type of transverse joint and type of sealer, together with their locations, are listed in Table I.

All of the hot-pour joint seal had lost adhesion to the joint faces even though some joints appeared well sealed at the surface, (Figure 1-C and 1-D). In mandrel-formed joints that had not been protected with jute rove before sealing there was a considerable amount of sand under the sealer (Figure 1) but in those protected with jute rove before sealing (Figure 2) and in the sawed joints (Figure 3), little or no sand was found.

Joints in which cold-applied sealer had been used appeared to contain only a small amount of the sealer in the bottom of the joint groove while the remainder of the groove was filled to pavement level with sand. This condition existed in both mandrel-formed joints (Figure 4) and in styrofoam or paper formed joints (Figure 5).

The sand in the mandrel-formed joints where jute had not been used before sealing with hot-pour joint seal had apparently been there before the joints were sealed. Examination of Figure 1-C and 1-D will indicate that sufficient sealing material is in the joint to form a mechanical seal by compaction from traffic. This joint was opened close to maximum on the day the picture was taken since the temperature on that day was below freezing. Even at this near maximum opening there is no space through which sand could enter the joint. It is therefore probable that these joints had not been cleaned out before the sealer was poured.

The small quantity of cold-applied sealer found in the joints sealed with that material could be due to loss of sealer through the crack below the joint groove or to insufficient filling of the joint grooves at the time they were sealed.
### TABLE I

**TYPE OF TRANSVERSE JOINT AND JOINT SEAL IN PROJECTS**

30-31, C2, 38-7, C5 and 46-3, C8

**US-127 SOUTH OF JACKSON**

<table>
<thead>
<tr>
<th>Joint Feature</th>
<th>Type of Sealer</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formed</td>
<td>Hot-Pour</td>
<td>76+19 to 83+15</td>
</tr>
<tr>
<td>Formed</td>
<td>Cold-Applied</td>
<td>83+15 to 92+35</td>
</tr>
<tr>
<td>Formed</td>
<td>Hot-Pour</td>
<td>92+35 to 169+12</td>
</tr>
<tr>
<td>Formed - Jute Packed</td>
<td>Hot-Pour</td>
<td>169+12 to 316+20</td>
</tr>
<tr>
<td>Sawed</td>
<td>Hot-Pour</td>
<td>316+20 to 325+11</td>
</tr>
<tr>
<td>Formed - Jute Packed</td>
<td>Hot-Pour</td>
<td>325+11 to 365+00</td>
</tr>
<tr>
<td>Formed - Jute Packed</td>
<td>Cold-Applied</td>
<td>365+00 to 546+45</td>
</tr>
<tr>
<td>Alternate Styrofoam &amp; Paper</td>
<td>Cold-Applied</td>
<td>546+45 to 564+78</td>
</tr>
<tr>
<td>Formed - Jute Packed</td>
<td>Cold-Applied</td>
<td>564+78 to 625+00</td>
</tr>
</tbody>
</table>
FIGURE 1. FORMED CONTRACTION JOINTS IN WHICH JUTE ROVE WAS NOT USED PRIOR TO SEALING WITH HOT-POUR RUBBER-ASPHALT JOINT SEAL. SEALER LACKED ADHESION AND A CONSIDERABLE AMOUNT OF SAND WAS FOUND UNDER JOINT SEAL.
Figure 2. Formed contraction joints protected with jute rove prior to sealing with hot-pour rubber-type joint seal. Sealer lacks adhesion but little or no sand was found under joint seal.
FIGURE 3. STATION 316 + 20 SAWED CONTRACTION JOINTS SEALED WITH HOT-POUR RUBBER-TYPE JOINT SEAL SEALER LACKED ADHESION BUT LITTLE OR NO SAND WAS FOUND UNDER JOINT SEAL.
A. STATION 63 + 15 NO JUTE ROVE
USED PRIOR TO SEALING.

B. STATION 366 + 85 JUTE ROVE USED
TO PROTECT JOINT PRIOR TO
SEALING.

C. STATION 366 + 85 OVERALL VIEW.

FIGURE 4. FORMED CONTRACTION JOINTS SEALED WITH COLD-APPLIED JOINT SEAL.
A SMALL AMOUNT OF SEALER WAS FOUND IN THE BOTTOM OF THESE JOINT
GROOVES AND THE REMAINING SPACE WAS FILLED WITH SAND.
A. CLOSE-UP.
B. OVERALL VIEW.

FIGURE 5. STATION 547 + 45 STYROFOAM CONTRACTION JOINT SEALED WITH COLD-APPLIED JOINT SEAL. A SMALL AMOUNT OF SEALER WAS FOUND IN THE BOTTOM OF THE JOINT GROOVE AND THE REMAINING SPACE WAS FILLED WITH SAND.