TH-60: ELYSIAN, MINNESOTA
MASTIC OPERATIONS
SEPTEMBER, 2003

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Mn/DOT Office of Materials

INTRODUCTION – 2003 MASTIC OPERATION: TH-60, ELYSIAN, MN

On September 15 and 16, 2003, TH-60 had transverse cracks leveled with Deery’s Level-N-Go mastic and Crafco PolyPatch – Fine Mix Type 3 material. For study purposes, the full-width transverse cracks were filled with both materials. One material was placed in the eastbound lane and the other material was placed in the westbound lane of the same transverse crack. See Appendix # 1 for the layout of each material. The portion of TH-60 that received the mastics began at milepost 125, just west of Elysian, and proceeded west.

Highway Improvements, Inc., of South Dakota, performed the work. The original intent of the study was to place approximately 4,700 pounds of both materials in as many cracks as possible. The final amount of material was less than the 4,700 pounds. Highway Improvements stopped work at the point of traffic control, which was provided by Mn/DOT District 7 personnel.

The intent of this study is to determine the mastic’s effectiveness in leveling cupped transverse cracks for improved ride. Other factors that will be monitored include the durability of the material, how soon cracks appear in the material, the maintenance of these cracks should they appear, the cost of the material, the productivity rate of applying the material, and the material’s ability to accept a future HMA overlay.

Mn/DOT hopes to partner with Minnesota State University (MSU) at Mankato and Dr. Jim Wilde in a study to determine acceptability of mastic materials with HMA overlays. This work will be similar in nature to LRRB 802 currently underway between MSU & Mn/DOT where crack sealants and HMA overlays are being studied.

TH-60: HISTORY

According to Mn/DOT’s roadway history information, TH 60 from R.P. 123+00.763 to R.P. 126+00.00600 was graded in 1940. Its last surface treatment was in 1988 when it received a 4” bituminous overlay, bringing the total depth of bituminous to 11 ½”. Traffic data includes average daily traffic (ADT) of 4,150 with heavy commercial at 400.
### ROADWAY HISTORY

Table 1 ROADWAY HISTORY

<table>
<thead>
<tr>
<th>Route</th>
<th>Year</th>
<th>PSR</th>
<th>SR</th>
<th>PQI</th>
</tr>
</thead>
<tbody>
<tr>
<td>TH 60</td>
<td>2000</td>
<td>3.4</td>
<td>3.7</td>
<td>3.5</td>
</tr>
<tr>
<td>TH 60</td>
<td>2002</td>
<td>3.0</td>
<td>3.2</td>
<td>3.1</td>
</tr>
</tbody>
</table>

According to District 7, this segment of TH-60 has a high water table in the sub-soils and therefore has always had significant transverse cracks at 20 to 40-ft on center. The pavement in between the transverse cracks is generally good, indicating that if the transverse cracks can be effectively controlled, the overall maintenance dollars spent on the pavement would be significantly less.

Various methods of treating (patching) the transverse cracks have been tried and have failed. District 7 has tried rout and seal, but with the high water table the crack tended to move too much, therefore failing the sealant. This lead to continued deterioration at the crack. The district also tried slurry leveling, which proved too brittle and stiff for active, moving cracks, and they tended to fail after one winter season. Other methods, including Dur-A-Fill, have been tried, but they too have failed.

Portions of TH-60 had their transverse cracks filled with a sand mix (patching mix). This can be seen just east of Elysian. That portion of the highway is not part of this study.

**DAY ONE: September 15, 2003; Level-N-Go Repair Mastic (Deery Corp.)**

Prep work included the cleaning of the cracks with minimal air blowing using a high-pressure air hose, and applying pre-treatment spray to the cracks prior to placing the material. Prep work began around 10:55 AM. The application of the Level-N-Go material did not begin until 11:10 AM at MP 125 in the WBL of TH-60. Highway Improvements was working with a 5-person crew, one person was working the kettle, one pushing the material with the open-ended applicator, one person with a shovel for taking excess material and placing it back into the kettle, one person for keeping kettle full, and a driver.

The air temperature was approximately 64°F and the pavement temperature was approximately 80°F at the time the material was being placed. The weather conditions are sunny, slight breeze with no rain in the forecast.

Highway Improvements installed Level-N-Go in 35 transverse cracks between MP 125 and County Road 70 in the WBL of TH-60. The last (western most) crack in the WBL lane was filled at 12:41 PM. The air temperature at this time was about 70°F.

After the westbound lane was complete, traffic control had to re-direct traffic off the eastbound lane. While this was taking place, Highway Improvements was heating more material in the kettle.
Work began in the EBL at 2:10 PM, starting with a crack just to the west of County Road 70. Pavement temperature at this time was about 100°F. Highway Improvements filled cracks until 2:30 PM; at this time they re-stocked the kettle with material and waited for it to return to the proper application temperature. They also stocked the Crafo kettle with Polypatch for tomorrow’s work. At 2:53 PM, the Level-N-Go work re-started. The air temperature at that time was about 76°F and the pavement temperature was recorded at 100°F.

Highway Improvements installed Level-N-Go in 67 transverse cracks from County Road 70 heading west in the EBL of TH-60. The last (western most) crack in the EBL lane was filled around 4:00 PM. One-half of a pallet of Level-N-Go remained on the truck.

For the purposes of tracking specific cracks, Mn/DOT located twelve (12) cracks along the project with GPS coordinates. These twelve cracks will be monitored for performance of the material and their condition will be recorded by taking pictures during the study period. See Appendix B for pictures of the cracks during the mastic operation.

<table>
<thead>
<tr>
<th>CRACK</th>
<th>WAYPOINT ID</th>
<th>NORTH</th>
<th>WEST</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>First (east) crack</td>
<td>TH60START</td>
<td>N44°12.020</td>
<td>W093°42.070</td>
<td>MP 125</td>
</tr>
<tr>
<td>Crack # 05</td>
<td>TH60CRK5</td>
<td>N44°12.031</td>
<td>W093°42.132</td>
<td>large hole</td>
</tr>
<tr>
<td>Crack # 10</td>
<td>TH60CRK10</td>
<td>N44°12.041</td>
<td>W093°42.174</td>
<td></td>
</tr>
<tr>
<td>Crack</td>
<td>TH60CRKCO</td>
<td>N44°12.068</td>
<td>W093°42.298</td>
<td>near co-op</td>
</tr>
<tr>
<td>Last WBL Deery</td>
<td>TH60CTY70</td>
<td>N44°12.089</td>
<td>W093°42.407</td>
<td>near co rd 70</td>
</tr>
<tr>
<td>First EBL Deery</td>
<td>TH60EBL01</td>
<td>N44°12.089</td>
<td>W093°42.419</td>
<td>west of co rd 70</td>
</tr>
<tr>
<td>Crack # 09 EBL</td>
<td>TH60EBL09</td>
<td>N44°12.107</td>
<td>W093°42.509</td>
<td>large hole</td>
</tr>
<tr>
<td>Crack # 18 EBL</td>
<td>TH60EBL18</td>
<td>N44°12.132</td>
<td>W093°42.629</td>
<td>@ no passing sign</td>
</tr>
<tr>
<td>Crack</td>
<td>TH60JCTCR</td>
<td>N44°12.157</td>
<td>W093°42.766</td>
<td>@ JCT co rd sign</td>
</tr>
<tr>
<td>Crack</td>
<td>TH60POLE</td>
<td>N44°12.175</td>
<td>W093°42.865</td>
<td>@ bare pole</td>
</tr>
<tr>
<td>Crack</td>
<td>TH60EBLSEND</td>
<td>N44°12.197</td>
<td>W093°43.008</td>
<td>Last (west) crack</td>
</tr>
<tr>
<td>Last EBL Poly</td>
<td>TH60EBPPEN</td>
<td>N44°12.085</td>
<td>W093°42.404</td>
<td>Last PolyPatch</td>
</tr>
</tbody>
</table>

**DAY TWO: September 16, 2003; PolyPatch (Crafco, Inc.)**

Prep work included the cleaning of the cracks with minimal air blowing using a high-pressure air hose. The application of the PolyPatch material began at 8:40 AM at MP 125 in the EBL of TH-60, opposite of the Deery material placed the day before. Highway Improvements was working with the same 5-person crew, using the same equipment and the Crafo kettle.

The air temperature was approximately 60°F and the pavement temperature was approximately 67°F at the time the material was being placed. The weather conditions were sunny, slight breeze with no rain in the forecast.

Highway Improvements installed PolyPatch in 35 transverse cracks between MP 125 and County Road 70 in the EBL of TH-60. The last (western most) crack in the EBL lane was filled at approximately 9:30 AM. The air temperature at this time was about 70°F.
After the eastbound lane was complete, traffic control had to re-direct traffic off the westbound lane. While this was taking place, Highway Improvements was heating more material in the kettle. It was Highway Improvement’s opinion that the PolyPatch required more time to set before opening traffic to it, and that was the primary reason for the delay in beginning work in the WBL.

Work began in the WBL at 11:04 AM, starting opposite the crack filled with Level-N-Go yesterday. Pavement temperature at this time was about 90°F. Highway Improvements filled cracks until 11:30 AM, at this time they opened another pallet of material and re-stocked the kettle, then waited for the material to return to the proper application temperature. Work restarted around 12:00 PM, and was completed around 2:30 PM.

**MATERIAL TAKE-OFF**

**Table 3 MATERIAL**

<table>
<thead>
<tr>
<th>Material</th>
<th>No. of cracks filled EBL</th>
<th>No. of cracks filled WBL</th>
<th>Total # of cracks filled</th>
<th>Amount of Material Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level-N-Go</td>
<td>67</td>
<td>35</td>
<td>102</td>
<td>4,104 lbs.</td>
</tr>
<tr>
<td>PolyPatch</td>
<td>35</td>
<td>72</td>
<td>107</td>
<td>3,090 lbs.</td>
</tr>
</tbody>
</table>

**POST MASTICS PAVEMENT MANAGEMENT DATA**

The following information was gathered by Mn/DOT’s Pavement Management Department using the Pathways Video Inspection Van.

<table>
<thead>
<tr>
<th>Road</th>
<th>Description</th>
<th>PSR&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Average PSR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>left wheelpath</td>
<td>right wheelpath</td>
</tr>
<tr>
<td>TH-60 EB</td>
<td>MP 123</td>
<td>3.4</td>
<td>3.4</td>
</tr>
<tr>
<td>TH-60 EB</td>
<td>Control T &amp; G&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3.2</td>
<td>3.2</td>
</tr>
<tr>
<td>TH-60 EB</td>
<td>Level-N-Go</td>
<td>2.9</td>
<td>2.6</td>
</tr>
<tr>
<td>TH-60 EB</td>
<td>PolyPatch</td>
<td>3.0</td>
<td>2.9</td>
</tr>
<tr>
<td>TH-60 EB</td>
<td>Control Skid Steer</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>TH-60 EB</td>
<td>MP 125</td>
<td>3.1</td>
<td>3.0</td>
</tr>
<tr>
<td>TH-60 WB</td>
<td>MP 125</td>
<td>3.1</td>
<td>3.0</td>
</tr>
<tr>
<td>TH-60 WB</td>
<td>Control Skid Steer</td>
<td>3.0</td>
<td>2.9</td>
</tr>
<tr>
<td>TH-60 WB</td>
<td>Level-N-Go</td>
<td>3.0</td>
<td>2.9</td>
</tr>
<tr>
<td>TH-60 WB</td>
<td>PolyPatch</td>
<td>3.0</td>
<td>2.9</td>
</tr>
<tr>
<td>TH-60 WB</td>
<td>Control T &amp; G&lt;sup&gt;2&lt;/sup&gt;</td>
<td>3.5</td>
<td>3.3</td>
</tr>
<tr>
<td>TH-60 WB</td>
<td>MP 123</td>
<td>3.3</td>
<td>2.9</td>
</tr>
</tbody>
</table>

1) PSR = Present Serviceability Rating and is an indication of the roughness, or ride, of a pavement. It is calculated from the International Roughness Index (IRI) measured by the Pathways Van. PSR values below 2.50 indicate
“failure” of the pavement with some remedial action required to improve the ride.

2) T & G = Throw & Go method of crack leveling with hot mix asphalt.
POST MASTIC RIDE RANKING – OCTOBER 2003 DATA

<table>
<thead>
<tr>
<th>Rank - EB</th>
<th>Road</th>
<th>Description</th>
<th>Average PSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TH-60 EB</td>
<td>MP 123</td>
<td>3.40</td>
</tr>
<tr>
<td>2</td>
<td>TH-60 EB</td>
<td>Control T &amp; G</td>
<td>3.20</td>
</tr>
<tr>
<td>3</td>
<td>TH-60 EB</td>
<td>MP 125</td>
<td>3.05</td>
</tr>
<tr>
<td>4</td>
<td>TH-60 EB</td>
<td>Control Skid Steer</td>
<td>3.00</td>
</tr>
<tr>
<td>5</td>
<td>TH-60 EB</td>
<td>PolyPatch</td>
<td>2.95</td>
</tr>
<tr>
<td>6</td>
<td>TH-60 EB</td>
<td>Level-N-Go</td>
<td>2.75</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rank - WB</th>
<th>Road</th>
<th>Description</th>
<th>Average PSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TH-60 WB</td>
<td>Control T &amp; G</td>
<td>3.40</td>
</tr>
<tr>
<td>2</td>
<td>TH-60 WB</td>
<td>MP 123</td>
<td>3.10</td>
</tr>
<tr>
<td>3</td>
<td>TH-60 WB</td>
<td>MP 125</td>
<td>3.05</td>
</tr>
<tr>
<td>4</td>
<td>TH-60 WB</td>
<td>Control Skid Steer</td>
<td>2.95</td>
</tr>
<tr>
<td>4</td>
<td>TH-60 WB</td>
<td>PolyPatch</td>
<td>2.95</td>
</tr>
<tr>
<td>4</td>
<td>TH-60 WB</td>
<td>Level-N-Go</td>
<td>2.95</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rank - BOTH</th>
<th>Road</th>
<th>Description</th>
<th>Average PSR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TH-60 EB &amp; WB</td>
<td>Control T &amp; G</td>
<td>3.30</td>
</tr>
<tr>
<td>2</td>
<td>TH-60 EB &amp; WB</td>
<td>MP 123</td>
<td>3.25</td>
</tr>
<tr>
<td>3</td>
<td>TH-60 EB &amp; WB</td>
<td>MP 125</td>
<td>3.05</td>
</tr>
<tr>
<td>4</td>
<td>TH-60 EB &amp; WB</td>
<td>Control Skid Steer</td>
<td>2.975</td>
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<tr>
<td>5</td>
<td>TH-60 EB &amp; WB</td>
<td>PolyPatch</td>
<td>2.95</td>
</tr>
<tr>
<td>6</td>
<td>TH-60 EB &amp; WB</td>
<td>Level-N-Go</td>
<td>2.85</td>
</tr>
</tbody>
</table>

GENERAL OBSERVATIONS

LEVEL-N-GO OBSERVATIONS:

The rate of production was not as fast as expected. Highway Improvement filled the 35 eastbound lane cracks in 90 minutes, for an average of 2.6 minutes/crack. Production did pick-up in the westbound lane. Assuming that Highway Improvements finished around 4:30 PM on the 15th, they filled 67 cracks in 140 minutes, averaging 2.1 minutes/crack.

The Level-N-Go material appears to do an acceptable job in filling the larger cracks and small potholes that were present in the transverse cracks. It does not ‘self-level’ very well and tends to stiffen (or set) quite quickly. Because of this, the crack is left with a bump of material instead of a cupped crack. Time will tell if traffic will compress the material down and become smoother. Time will also tell whether or not this material will survive the snowplows this winter.

The Level-N-Go material has larger aggregate in it than the PolyPatch material, and that is why it fills the larger cracks and small potholes better. It is also why it does not feather-out as nicely and tends to leave a definite edge at each crack.

Traffic can be applied to the Level-N-Go quickly. On a cool day like September 15th, traffic was placed on Level-N-Go in about 15 minutes with no adverse affects.
Level-N-Go ranked last (6th) in average PSR for combined eastbound and westbound lanes with a 2.85. This indicates that the bumps formed over the transverse cracks tended to make the ride worse after the application of Level-N-Go. It is thought that these bumps may smooth out with traffic. The next PSR rating will be performed in the spring of 2004.

POLYPATCH OBSERVATIONS:

The author was not present when the PolyPatch material was placed in the eastbound lane of TH 60 opposite of the Level-N-Go. From the information I gathered, it appears that Highway Improvements filled the 35 cracks in the eastbound lane in 50 minutes, averaging 1.4 minutes/crack. The PolyPatch material is more fluid than the Level-N-Go material, which leads to easier placement of the material across the joint and hence, the higher rate of production.

I was not present when Highway Improvements completed the westbound lane of traffic, in which 72 cracks were filled. I did document that work began in the westbound lane at 11:04 AM, then stopped at for at least one-half hour between 11:30 AM and noon. Traffic control pulled off the job at approximately 2:30 PM. Therefore, assuming Highway Improvement worked the entire time, they filled the 72 cracks in no more than 180 minutes, or an average of 2.5 minutes/crack. (Based on what I saw during the PolyPatch installation, I am inclined to say the average time is nearer the 1.4 minutes/crack as documented for the morning installation).

Because the PolyPatch material is more fluid, it does ‘self-level’ better than the Level-N-Go, but it still leaves a small lip at the edges of the crack. The PolyPatch material will flow downhill when filling a small pothole (see pictures in appendix), where the Level-N-Go did not flow downhill. It was also observed that the PolyPatch material was boiling when it was applied to the cracks, leaving small holes in the surface of the material as it cooled.

PolyPatch leaves a small ‘bump’ in the road at the crack, but not nearly as severe as the Level-N-Go material. As with the Level-N-Go material, PolyPatch will be observed to see how it withstands the snowplows this winter.

PolyPatch ranked 5th out of 6 in average PSR for combined eastbound and westbound lanes with a 2.95. This indicates that the bumps formed over the transverse cracks tended to make the ride worse after the application of PolyPatch. It is thought that these bumps may smooth out with traffic. The next PSR rating will be performed in the spring of 2004.

MATERIAL PERFORMANCE CRITERIA

The material will be rated for the following criteria:
  • Ride: how much more smoother is the pavement after the material’s installation?
  • Production: how fast can the material be applied?
• Durability: how long will the material remain in the crack?
• Reflective Cracking: how long until reflective cracking occurs through the material?
• Maintenance: how much maintenance effort is required to maintain the material’s integrity?
• Cost: how much per crack does it cost to level each crack?
• Overlay Compatibility: can the material be easily overlaid with HMA? Will it cause ‘bumps’ in the overlay as joint sealants do?

The Office of Materials will monitor the performance of the mastic material by visual observations in the spring and fall for at least a year after its installation. The Office of Materials will work closely with D-7 Maintenance in documenting the material’s performance and cost data. Final recommendations over the product’s implementation into a maintenance program will be made in the fall of 2004.

The Office of Pavement Management will collect ride data with the Pathways van, which will record the pavement’s ride in IRI (International Roughness Index). Ride data will be requested for the spring and fall of 2004.

An interim report will be issued in the spring of 2004 and the final report will be issued in the fall of 2004. The final report will include the district’s recommendations for the potential uses of these products.

Disclaimer regarding mastic materials, Level-N-Go and PolyPatch
The opinions, findings and conclusions expressed in this publication are that of the author and not necessarily those of the Minnesota Department of Transportation.
APPENDIX 1

PROJECT LOCATION
TH-60: ELYSIAN, MINNESOTA
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PROJECT LOCATION
APPENDIX 2
PROJECT PICTURES
TH-60: ELYSIAN, MINNESOTA
MASTIC OPERATIONS
SEPTEMBER, 2003

TH 60: Mastics - Brett Meadors of Highway Improvements, Inc. 9/15/03

9/15/03
TH 60: Mastics – Highway Improvement crew preparing to install Level & Go. Begin at MP 125 in westbound lane. 9/15/03

TH 60: Mastics – Highway Improvement crew unpackaging Level & Go (40# blocks). 9/15/03
TH 60:
Mastics – Highway Improvement truck.  
9/15/03

Mastics – Highway Improvement truck with air hose used to clean cracks prior to install.  
9/15/03

TH 60 Mastic Operations: Zerfas 2003
TH 60: Mastics – Eastern most crack on TH60 study site, at MP 125. (BEFORE) 9/15/03
Waypoint; N 44° 12.020’ W 093° 41.070’
TH 60: Mastics – Pavement temperature at crack #1 ≈ 80 °F (MP 125). Air temperature ≈ 64 °F. 9/15/03
Waypoint; N 44°12.020’ W 093°41.070’

TH 60: Mastics – Applying pre-treatment to first crack (MP 125) prior to Level & Go install. Air temperature ≈ 64 °F Pavement temperature ≈ 80 °F at crack. 9/15/03
Waypoint; N 44°12.020’ W 093°41.070’
TH 60: Mastics – Getting equipment in place at crack #1 (MP 125). 9/15/03
Waypoint: N 44°12.020’ W 093°41.070’

TH 60: Mastics – Opening the chute on the Deery kettle for Level & Go installation on crack #1 (MP 125). 9/15/03
Waypoint: N 44°12.020’ W 093°41.070’
TH 60 Mastics – Start with Level & Go in westbound lane at MP 125.
Waypoint; N 44°12.020’ W 093°41.070’
TH 60: Mastics – Dumping Level & Go material on crack #1 (MP 125).  
Waypoint; N 44°12.020’ W 093°41.070’ 

9/15/03

TH 60: Mastics – Installing Level & Go in crack #1 (MP 125).  
Waypoint; N 44°12.020’ W 093°41.070’ 

9/15/03
TH 60: Mastics – Crack #1 after Level & Go.  9/15/03
Waypoint; N 44°12.020’ W 093°41.070’

TH 60: Mastics – Texture of Level & Go after installation at first crack (MP 125).  9/15/03
Waypoint; N 44°12.020’ W 093°41.070’

TH 60 Mastic Operations: Zerfas 2003
TH 60: Mastics – First crack at MP 125 after Level & Go. 9/15/03
Waypoint: N 44°12.020’ W 093°41.070’
TH 60: Mastics – Eastern most transverse crack after mastics (near MP 125). 9/16/03
Waypoint; N 44°12.020’ W 093°41.070’

TH 60: Mastics – Crack #5, westbound TH 60. Note pothole in transverse crack. 9/15/03
Waypoint; N 44°12.031’ W 093°42.132’
TH 60: Mastics – Crack #5, installation of Level & Go in westbound lane.  9/15/03
Waypoint; N 44°12.031’ W 093°42.132’

TH 60: Mastics – Crack #5 approximately 15 minutes after Level & Go has been installed.  Note – pothole area is still ‘hot’.  9/15/03
Waypoint; N 44°12.031’ W 093°42.132’
TH 60: Mastics – Transverse crack after mastics. Crack #9 – from MP 125.
No GPS coordinates.

9/16/03

TH 60: Mastics – Transverse crack after mastics. Waypoint; N 44°12.031’ W 093°42.132’

9/16/03
25

TH 60: Mastics – Crack 10 westbound lane, install with Level & Go. Note Pothole. 9/15/03
Waypoint; N 44°12.041’ W 093°42.174’

TH 60: Mastics – Transverse crack after mastics. 9/16/03
Waypoint; N 44°12.041’ W 093°42.174’
TH 60: Mastics – Crack at Co-Op, before mastics.       9/15/03
Waypoint; N 44°12.068’ W 093°42.298’
TH 60: Mastics – Installing Level & Go in westbound lane in transverse crack near Co-Op.  9/15/03
Waypoint; N 44°12.068’ W 093°42.298’

TH 60: Mastics – Continuation of Level & Go in crack near Co-Op.  9/15/03
Waypoint; N 44°12.068’ W 093°42.298’
TH 60: Mastics – Transverse crack after Level & Go install.  9/15/03
Waypoint; N 44°12.068’ W 093°42.298’
TH 60: Mastics – Last westbound lane crack filled with Level & Go, TIME = 12:40PM. Traffic was allowed on joint in 15 minutes without problem.

Waypoint; N 44°12.089’ W 093°42.404’
TH 60: Mastics – Last crack in westbound lane being filled with Level & Go near Co. Rd. 70.
Waypoint; N 44°12.089’ W 093°42.404’

9/15/03

TH 60: Mastics – First crack filled with Polypatch in the westbound lane. Note that crack stops at CL of the road.
Waypoint; N 44°12.089’ W 093°42.407’

9/16/03
TH 60: Mastics – At Jct. Co. Rd. 70. Last Level & Go crack in westbound lane (N 44°12.089’ W 093°42.404). First Polypatch in the westbound lane (N 44°12.089’ W 093°42.407). 9/23/03

TH 60: Mastics – Transverse crack after mastics near Co. Rd. 70. 9/16/2003
TH 60: Mastics – First crack in eastbound lane being filled with Level & Go near Co. Rd. 70. Waypoint; N 44°12.089’ W 93°42.419’

TH 60: Mastics – First crack in eastbound lane after Level & Go. Waypoint; N 44°12.089’ W 93°42.419’
TH 60: Mastics – Transverse crack at Co. Rd. 70 One week after mastics.  9/23/2003
Waypoint; N 44°12.089’ W 093°42.419’

TH 60: Mastics – Transverse crack after mastics.     9/23/2003
Waypoint; N 44°12.089’ W 093°42.419’
TH 60: Mastics – Looking west down TH-60 at Jct. Co. Rd. 70.  9/23/2003
Waypoint; N 44°12.089’ W 093°42.419’

TH 60: Mastics – Transverse crack prior to mastic, note pothole in EBL  9/15/2003
Waypoint; N 44°12.107’ W 093°42.509’
TH 60: Mastics – Filling crack with Level & Go, EBL 9/15/2003
Waypoint: N 44°12.107’ W 093°42.509’

TH 60: Mastics – Transverse crack filled with Level & Go, EBL 9/15/2003
Waypoint: N 44°12.107’ W 093°42.509’

TH 60 Mastic Operations: Zerfas 2003
TH 60: Mastics – Transverse crack prior to Polypatch, WBL  
Waypoint; N 44°12.107’ W 093°42.509’

TH 60: Mastics – Transverse crack after mastics  
Waypoint; N 44°12.132’ W 093°42.509’

9/16/2003
TH 60: Mastics – Transverse crack prior to Polypatch
Waypoint; N 44°12.132’ W 093°42.629’
9/16/2003

TH 60: Mastics – Installing Polypatch in WBL
Waypoint; N 44°12.132’ W 093°42.629’
9/16/2003

TH 60 Mastic Operations: Zerfas 2003
TH 60: Mastics – Transverse crack after mastics
Waypoint; N 44°12.132’ W 093°42.629’
9/16/2003

TH 60: Mastics – Transverse crack one week after mastics
Waypoint; N 44°12.132’ W 093°42.629’
9/23/2003
TH 60: Mastics – Polypatch material immediately after install, the material is boiling 9/16/2003
Waypoint; N 44°12.132' W 093°42.629'

No Waypoint
TH 60: Mastics – Transverse crack prior to mastics 9/15/2003
Waypoint; N 44°12.157' W 093°42.766'

TH 60: Mastics – Transverse crack prior to mastics 9/15/2003
Waypoint; N 44°12.157' W 093°42.766'

TH 60 Mastic Operations: Zerfas 2003
TH 60: Mastics – Installation of Polypatch in transverse crack 9/16/2003
Waypoint; N 44°12.107’ W 093°42.509’

TH 60: Mastics – Transverse crack prior to mastics 9/15/2003
Waypoint; N 44°12.132’ W 093°42.629’
TH 60: Mastics – Installing Level & Go in crack EBL 9/15/2003
Waypoint; N 44°12.132’ W 093°42.629’

TH 60: Mastics – Transverse crack after Level & Go has been placed in the EBL. 3:02 PM ~air temp 76 °F ~material temp 385 °F 9/15/2003
Waypoint; N 44°12.132’ W 093°42.629’
TH 60: Mastics – Transverse crack after Level & Go
Waypoint; N 44°12.157’ W 093°42.766’

TH 60: Mastics – Transverse crack prior to Polypatch
Waypoint; N 44°12.157’ W 093°42.766’

9/16/2003
TH 60: Mastics – Transverse crack after mastics
Waypoint; N 44°12.157' W 093°42.766'

TH 60: Mastics – Transverse crack after mastics
Waypoint; N 44°12.157' W 093°42.766'
TH 60: Mastics – Transverse crack prior to mastics  9/15/2003
Waypoint; N 44°12.175’ W 093°42.865’

TH 60: Mastics – Transverse crack after Level & Go  9/16/2003
Waypoint; N 44°12.175’ W 093°42.865’
TH 60: Mastics – Transverse crack after mastics

Waypoint; N 44°12.175’ W 093°42.865’

9/23/2003
TH 60: Mastics – Transverse crack after mastics 9/23/2003
Waypoint; N 44°12.175’ W 093°42.865’

TH 60: Mastics – Western-most (last) transverse crack, EBL after Level & Go 9/16/2003
Waypoint; N 44°12.197’ W 093°42.008’
TH 60: Mastics – Western-most (last) transverse crack, EBL after mastics  9/23/2003
Waypoint; N 44°12.197’ W 093°42.008’

TH 60: Mastics – Western-most (last) transverse crack, WBL after mastics  9/23/2003
Waypoint; N 44°12.197’ W 093°42.008’
TH 60 Mastic Operations: Zerfas 2003

TH 60: Mastics ~ Temperature gage on Deery kettle ~ 11:00 AM

TH 60: Mastics ~ Temperature gage on Deery kettle ~ 12:14 PM
TH 60: Mastics – Deery kettle, note temperature gage ~ 2:30 PM 9/15/2003

Burner – Used to keep tools clean

TH 60: Mastics – Deery kettle 9/15/2003
TH 60: Mastics – Highway Improvements crew installing Level & Go in WBL.
Crew: Applicator, Kettle Operator, Sealant Operator, Shovel (not seen), Driver (not seen) 9/15/2003

TH 60: Mastics – Highway Improvements installing Level & Go ~ 2:30 PM 9/15/2003
TH 60: Mastics – Highway Improvements shovel operator placing excess Level & Go back into the kettle 9/15/2003

TH 60: Mastics – Left over mastic (Level & Go) in EBL, from 9/15/2003 work.

9/16/2003
TH 60: Mastics – Highway Improvements truck. Note ~ 1/2 pallet of Level & Go in left over from 9/15/2003.

TH 60: Mastics – Kettle for Polypatch. Capacity 200 gallon. 9/16/2003
TH 60: Mastics – Temperature gages on Polypatch (Crafco) kettle   9/16/2003

TH 60: Mastics – Preparing to install Polypatch in transverse crack   9/16/2003
TH 60: Mastics – Polypatch material ~ time 8:40 AM. Air temperature 60 °F Pavement temperature 67°F 9/16/2003
TH 60: Mastics – Polypatch material flowing in transverse crack (EBL TH 60) 9/16/2003

Bottom: Material has ‘set’, some material flowed out of crack.

TH 60: Mastics – Transverse crack (#33 from west) 1/2 lane only, Polypatch 9/23/2003

TH 60: Mastics – Transverse crack, 1/2 lane only, filled with Level & Go (located between polypatch cracks # 28 & 29, from west) 9/23/2003
TH 60: Mastics – Transverse crack (#20 from west), Polypatch in 1/2 lane  9/23/2003

TH 60: Mastics – Transverse crack (#11 from west) after mastics. Note Level & Go in 1/2 lane.  9/23/2003
TH 60: Mastics – Transverse crack (#4 from west) after mastics. 9/23/2003