Chapter 7: Slurry Seals

4.0 Project Selection

4.1 Distress & Application Considerations

Slurry surfacing may be used for a range of applications, but job selection is critical and often pretreatments such as pothole patching, crack sealing, and dig outs are required. Table 5 lists general job selection criteria for slurry surfacing treatments and typical application rates.

Table 5: Job Selection Criteria

<table>
<thead>
<tr>
<th>Applications</th>
<th>Aggregate Type I</th>
<th>Aggregate Type II</th>
<th>Aggregate Type III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Void Filling</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Wearing Course (AADT) &lt;100</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Wearing Course (AADT) 100-1000</td>
<td>S</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Wearing Course (AADT) 1000-20,000</td>
<td>S</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>Minor Shape Correction 10-20mm (0.4-0.8 inch)</td>
<td>S</td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>Application Rates (kg/m²)</td>
<td>4.3-6.5 (8-12 lb/yd²)</td>
<td>6.5-10.8 (12-20 lb/yd²)</td>
<td>9.8-16.3 (18-30 lb/yd²)</td>
</tr>
</tbody>
</table>

Key: (S = Slurry Seal)

The main use of slurry surfacing materials is for pavement preservation as a part of a program of periodic surfacing before distresses appear. The main criteria for project selection are:

- Sound and well drained bases, surfaces, and shoulders
- Free of distresses, including potholes and cracking

Distress modes that can be addressed using slurry surfacing include:

- Raveling: Loose surfaces or surfaces losing aggregate may be resurfaced using slurry seals.
- Oxidized pavement with hairline cracks: These surfaces may be resurfaced using slurry seals.
- Rutted pavements: Deformation resulting from consolidation of the surfacing only. Rutting due to base failure or significant plastic deformation of the HMA cannot be treated except as a temporary measure.

Distress modes that cannot be addressed using slurry surfacing include:

- Cracking (including reflection cracking)
- Base Failures of any kind
- HMA Layers that exhibit plastic shear deformation

Slurry surfacing will not alleviate the cause of these distresses. As a result, the distresses will continue to form despite the application of a slurry surfacing.

4.2 Life Expectancy of Slurry Surfacing

Slurry seals have been estimated to last around 5 to 7 years (6). Much longer service lives (up to 15 years) have been observed when the seals are placed as true preventive maintenance treatments on suitable roads (6). Traffic is not a limiting factor.

The main failure mechanism is wear. Over time, the surface oxidizes and abrades under traffic. Premature treatment failure occurs from placement on highly deflecting surfaces, cracked surfaces, pavements with base failures, and on dirty or poorly prepared surfaces (resulting in delamination).
4.0 Project Selection

4.1 Distress & Application Considerations

Micro-surfacing may be used for a range of applications, but job selection is critical and often pretreatments such as pothole patching, crack sealing, and dig outs are required. Table 5 lists general job selection criteria for micro-surfacing treatments and typical application rates.

### Table 5: Job Selection Criteria (7)

<table>
<thead>
<tr>
<th>Applications</th>
<th>Aggregate Type II</th>
<th>Aggregate Type III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Void Filling</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Wearing Course (AADT)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>&lt;100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100-1000</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>1000-20,000</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>&gt;20,000</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Minor Shape Correction 10-20mm (0.4 – 0.8 inch)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Rut Filling</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

- **Application Rates**
  - Void Filling: 5.4-10.8 (10-20 lb/yd^2)
  - Wearing Course (AADT): 8.1-16.3 (15-30 lb/yd^2)

The main use of micro-surfacing materials is for pavement preservation as a part of a program of periodic surfacing before distresses appear. The main criteria for project selection are:

- Sound and well drained bases, surfaces, and shoulders.
- Freedom from distresses, including potholes and cracking. These must be repaired before micro-surfacing application. Potholes should be filled and compacted several weeks prior to micro-surfacing. Crack filling should be done from several weeks to several months prior to micro-surfacing.

Distress modes that can be addressed using micro-surfacing include:

- **Raveling**: Loose surfaces or surfaces losing aggregate may be resurfaced using micro-surfacing.
- **Oxidized pavement with hairline cracks**: These surfaces may be resurfaced using micro-surfacing.
- **Rutted pavements**: Deformation resulting from consolidation of the surfacing only. Rutting due to base failure or significant plastic deformation of the HMA cannot be treated except as a temporary measure.
- **Rough pavements with short wavelength**: These irregularities may be treated with micro-surfacing, provided the transverse frequency of the irregularities is shorter than the spreader box width.

Distress modes that cannot be addressed using micro-surfacing include:

- **Cracking** (including reflection cracking)
- **Base Failures** of any kind
- **HMA Layers** that exhibit plastic shear deformation

Micro-surfacing will not alleviate the cause of these distresses. As a result, the distresses will continue to form despite the application of a micro-surfacing.

### 4.2 Life Expectancy of Micro-Surfacings

Micro-surfacing has been estimated to last 7 to 10 years (8), although longer life times have been claimed (9). When applied in ruts, the treatment's life depends on the stability of the micro-surfacing, the traffic level, and the condition of the underlying pavement.
The main mechanism of failure is wear. Through wear the surface oxidizes and is abraded over time. Premature treatment failure occurs from placement on highly deflecting surfaces, cracked surfaces, pavements with base failures, and on dirty or poorly prepared surfaces (resulting in delamination).