Session 10: Joint Resealing and Crack Sealing
Joint Resealing & Crack Sealing

• Definition

Placement of an approved sealant material in an existing joint or crack to reduce moisture infiltration and prevent intrusion of incompressibles
PCC Pavement Deterioration

Influence of Moisture Infiltration

Cracks/Joints + Moisture Infiltration → Base/Subbase Softening → Transverse Joint Faulting
PCC Pavement Deterioration
Influence of Moisture Infiltration

Cracks + Moisture Infiltration

↓

Breakdown of Existing Cracks

Deteriorated Cracks
PCC Pavement Deterioration
Influence of Incompressibles

Cracks/Joints + Incompressible Material

Joint Spalling
Blow-Ups
Joint Resealing
Joint Resealing
Guidelines and Project Selection

- Reseal when existing sealant no longer functional
- Pavement not severely deteriorated
- In conjunction with other preservation activities

If joints were originally sealed, continue to keep those joints sealed
## Joint Sealing Materials

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Specs</th>
<th>Description</th>
</tr>
</thead>
</table>
| Polymerized/Rubberized Asphalt| ASTM D6690, Type I-IV (AASHTO M324) | Thermoplastic I: Mod climates  
II-III: Most climates  
IV: Very cold climates |
| Silicone                      | ASTM D5893, Type NS or SL     | Thermosetting NS: Non-sag  
SL: Self leveling |
| Polysulfides, polyurethane    | Fed Spec SS-S-200E, type M or H | Thermosetting |
| Preformed                     | ASTM D2628                    | Polychloroprene |
| Backer Rod                    | ASTM D5249                    | For hot- or cold-applied sealants |

Table 10.1 on p. 10.4
Backer Rod

• Purpose:
  – Achieves shape factor
  – Prevents 3-sided adhesion
• Use closed-cell products
• Must be compatible with sealant type
• Diameter 25% greater than joint width
• Use with caution in some cases
Example Joint Reservoir

Shape Factor = W:D

Fig. 10.4 on p. 10.8
## Joint Reservoir Design

### Recommended Shape Factors

<table>
<thead>
<tr>
<th>Sealant Material Type</th>
<th>Typical Shape Factor (W:D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubberized Asphalt</td>
<td>1:1</td>
</tr>
<tr>
<td>Silicone</td>
<td>2:1</td>
</tr>
<tr>
<td>Polysulfide and Polyurethane</td>
<td>1:1</td>
</tr>
</tbody>
</table>

Table 10.2 on p. 10.10
Sealant Material Selection
Factors

- Climatic conditions
- Joint/crack characteristics and spacing/density
- Traffic level and percent trucks
- Material availability and cost

Tool for estimating joint movement:
http://apps.acpa.org/apps/
Joint Reservoir Design

Sealant Configurations

- Recessed
- Flush-Filled
- Overbanded

Fig. 10.7 on p. 10.11
Construction: Joint Resealing

Procedures

1. Old sealant removal
2. Joint refacing
3. Joint reservoir cleaning
4. Backer rod installation
5. New sealant installation
Construction: Joint Resealing

Joint Plow

Sealant Removal

Joint Sawing
Construction: Joint Resealing

Joint Refacing
Construction: Joint Resealing

Sandblasting
Construction: Joint Resealing
Final Cleaning (Airblasting)
Construction: Joint Resealing

Backer Rod Installation
Construction: Joint Resealing

Installed Backer Rod
Construction: Joint Resealing

Sealant Installation

Hot-Poured Sealant

Silicone Sealant
Longitudinal Joint Resealing
Construction: Joint Resealing

Longitudinal PCC/PCC Joints

- Lane/lane or lane/shoulder joint
- Tied non-working joint
- Shape factor not needed
- Hot-applied thermoplastic sealant
Construction: Joint Resealing

Longitudinal PCC/HMA Joints

• Very difficult joint to seal
  – Vertical movements
  – Horizontal movements

• Major entry point for water infiltration
Construction: Joint Resealing

Longitudinal PCC/HMA Joints

• Joint reservoir:
  – Minimum width and depth of 19 mm (0.75 in)
  – No backer rod required
• Hot-applied and silicone sealants
• Some agencies may simply overband
Construction: Joint Resealing

Longitudinal Sawcutting
Construction: Joint Resealing
Sealing Longitudinal PCC/HMA Joint
Construction: Joint Resealing
Sealed Longitudinal PCC/HMA Joints
Crack Sealing
Guidelines for Sealing Cracks

- Leave tight, narrow cracks alone
- Seal working transverse cracks
- Can seal cracks $\leq 13$ mm (0.5 in) wide
- Use special crack sawing blades
- Same general *joint* resealing procedures apply to *crack* sealing
Construction: Crack Sealing

Crack Sawing
Construction: Crack Sealing

Sawed Crack
Construction: Crack Sealing

Completed Crack Seal
Key Factors For Success
Joint Resealing/Crack Sealing

- Selection of candidate projects
- Selection of proper material
- Proper reservoir design and joint shape factor
- Proper reservoir preparation
- Proper sealant application techniques
- Monitor opening to traffic