BRIDGE DECK PRESERVATION
PRODUCT MATRIX

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Project Contributors

- Mike Gehring - ODOT
- Josh Sletten – UDOT
- Mike Johnson – Caltrans
- Todd Fraker – Dayton
- Sheila Cherry – Kwikbond
- Dick Dunne – Michael Baker
- Quinn McGuire – Euclid
- Steve Frank – E-Bond
- James High – E-Chem
- Doug Gray - BASF
- Gregg Freeman - Kwikbond
- Eric Hill – Amer. Concrete Cutting
- Debbie Steiger – BASF
- Mike Stenko – Transpo
- Mike Geist – Polycarb
- Ed Nagle – Nagel and Assoc.
- Brad Kamin – Sika
- David Minor – Dayton
- Scott Issac - Sika
Project Objectives

- Identify the common field conditions that may require deck preservation treatments.
- Poll the WBPP States to see what products were being used.
- Identify key attributes for each treatment
- Develop product matrices that could be used by the States to select appropriate products.
Field Observed Conditions

- The following field situations were identified where deck treatments may be warranted:
  - Deck Cracking
  - Deck Spalling
  - Deck Delaminations
  - Soffit Efflorescence
  - Abrasion/Chain wear or loss of cover in general
  - Loss of Friction
  - Need for Grade Adjustment
Deck Seal Product Manufactures used by WBPP States

- Liquid Concrete
- Euclid
- Sika
- Transpo
- E-Bond

- Dayton Superior
- Kwikbond Polymers
- E-Chem
- Polycarb
- Unitex
Seal Selection Considerations

- How wide are my cracks?
- How much crack penetration is expected?
- How quickly do I need to restore traffic?
- What deck preparation is required?
- Is the product sensitive to moisture?
- Do I need strength or stiffness gains?
- How long will the treatment last?
- How much will it cost?
Deck Seal Attributes Collected

- Cost
- Expected Life
- Viscosity
- Time to Traffic

- Cold Weather Application
- Moisture Insensitivity
- Modulus
- Bond Strength
Deck Seal Key Attributes

- Viscosity - Lower viscosity products may be able to penetrate finer cracks.
- Gel Time – How long will the product have to penetrate into the crack before it sets.
- Bond Strength – capacity across the product concrete interface.
- Modulus of Elasticity
Deck Seal Product Matrix

Available at www.tsp2.org
Deck Seal Matrix Components

- Recommended deck preparation
- Recommended mixing and application methods.
- Recommended application rates
- Listing of attributes for 20 deck seal products
- Detailed description of attribute criteria
- Links to product web pages
- Manufacturer contact name and contact info
## Deck Seal Matrix Sample

<table>
<thead>
<tr>
<th>Bridge Deck Crack Sealing Products</th>
<th>Cost Range</th>
<th>Self Reported Expected Life (Years)</th>
<th>Viscosity (Low, Super low)</th>
<th>Set Time (Time to Traffic) (E,G,F,P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid Concrete Ure-Kote R-60</td>
<td>$0.65 - 0.92 Sq ft</td>
<td>15</td>
<td>15 cps</td>
<td>20 minutes</td>
</tr>
<tr>
<td>Euclid Chemical Company Dural 335</td>
<td>$0.54 Sq ft</td>
<td>3-5</td>
<td>90 cps</td>
<td>3-5 hours</td>
</tr>
<tr>
<td>Euclid Chemical Company Dural 50 LM</td>
<td>$0.54 Sq ft</td>
<td>3-5</td>
<td>90 cps</td>
<td>3-5 hours</td>
</tr>
<tr>
<td>Sika Corporation - Sikadur 55 SLV</td>
<td>$0.75 - $1.00 Sq ft</td>
<td>10</td>
<td>105 cps</td>
<td>6 hours</td>
</tr>
<tr>
<td>Transpo Sealate T-Sealate T70-MX30 HMWM</td>
<td>$1.00-2.00 Sq Ft</td>
<td>10</td>
<td>25</td>
<td>6 hours</td>
</tr>
<tr>
<td>Transpo T-78 MMA</td>
<td>$1.00-2.00 Sq Ft</td>
<td>10</td>
<td>10</td>
<td>1 hour</td>
</tr>
<tr>
<td>Transpo Sealate T-70</td>
<td>$1.00-2.00 Sq Ft</td>
<td>10</td>
<td>25</td>
<td>5 hours</td>
</tr>
<tr>
<td>E-Bond 310 Penetrating Concrete Flood coat Sealer</td>
<td>$1.10-5.19 Sq ft</td>
<td>Unknown</td>
<td>66 cps</td>
<td>4 hours</td>
</tr>
<tr>
<td>E-Bond 523 Penetrating Sealer - Crack Healer Epoxy Primer</td>
<td>$0.17-0.34 Sq ft</td>
<td>Unknown</td>
<td>92 cps</td>
<td>5.5 hours</td>
</tr>
<tr>
<td>E-Bond 120 Epoxy Penetrating Sealer for Concrete Surfaces</td>
<td>$1.10-5.19 Sq ft</td>
<td>Unknown</td>
<td>48 cps</td>
<td>4.5 hours</td>
</tr>
<tr>
<td>Unitex Pro Poxy Bridge Seal 75%</td>
<td>$0.29 - 0.45 Sq Ft</td>
<td>5-7</td>
<td>40 cps</td>
<td>4 hours</td>
</tr>
<tr>
<td>Unitex Pro-Poxy 40 LV LM</td>
<td>$0.29 - 0.45 Sq Ft</td>
<td>5-7</td>
<td>85 cps</td>
<td>4 hours</td>
</tr>
<tr>
<td>Increased Structural Stiffness (E,G,F,P)</td>
<td>Crack Penetration (E,G,F,P)</td>
<td>Freeze/Thaw Durability (E,G,F,P)</td>
<td>Permeability Reduction (E,G,F,P)</td>
<td>Western Rep Name</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-----------------------------</td>
<td>----------------------------------</td>
<td>----------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Poor</td>
<td>Excellent</td>
<td>Excellent</td>
<td>NA</td>
<td>KC</td>
</tr>
<tr>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td>NA</td>
<td>Quinn McGuire</td>
</tr>
<tr>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
<td>NA</td>
<td>Quinn McGuire</td>
</tr>
<tr>
<td>Poor</td>
<td>Fair</td>
<td>Fair</td>
<td>NA</td>
<td>Brad Kamin</td>
</tr>
<tr>
<td>Poor</td>
<td>Excellent</td>
<td>Excellent</td>
<td>NA</td>
<td>Mike Stenko</td>
</tr>
<tr>
<td>Excellent</td>
<td>Excellent</td>
<td>NA</td>
<td>Mike Stenko</td>
<td><a href="http://www.transpo.com/T-78.html">Link</a></td>
</tr>
<tr>
<td>Excellent</td>
<td>Excellent</td>
<td>NA</td>
<td>Mike Stenko</td>
<td><a href="http://www.transpo.com/T-70.html">Link</a></td>
</tr>
<tr>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
<td>NA</td>
<td>Steve Frank</td>
</tr>
<tr>
<td>Poor</td>
<td>Good</td>
<td>Good</td>
<td>NA</td>
<td>Steve Frank</td>
</tr>
<tr>
<td>Poor</td>
<td>Good</td>
<td>NA</td>
<td>Todd Fraker</td>
<td><a href="http://www.daytonsuperior.com/Artifacts/Unitex%20Bridge%20Seal.pdf">Link</a></td>
</tr>
</tbody>
</table>
Deck Overlay
Product Matrix

Available Soon
## Overlay Matrix Sample

<table>
<thead>
<tr>
<th></th>
<th>Typical Thickness Range Min - Max</th>
<th>Min Ambient Temp at Application (°F)</th>
<th>Max Ambient Temp at Application (°F)</th>
<th>Moisture Insensitive at Application</th>
<th>Time required from placement to traffic (hrs @ min temp)</th>
<th>Time required from placement to traffic (hrs @ +/- 70°F)</th>
<th>Expected Life (years)</th>
<th>Cost Range, Furnished and placed ($/sq ft)</th>
<th>Compresive Strength @ 24 hrs (ASTM C579) (psi)</th>
<th>Tensile Strength (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kwikbond Polyester Polymer Concrete 1121</td>
<td>0.75 - 12</td>
<td>40</td>
<td>100</td>
<td>dry</td>
<td>2 hours</td>
<td>2 hours</td>
<td>30</td>
<td>$8 - 12</td>
<td>7000 composite</td>
<td>800 composite</td>
</tr>
<tr>
<td>Kwikbond Polyester Polymer Concrete 1121 - MM</td>
<td>0.75 - 13</td>
<td>40</td>
<td>100</td>
<td>dry</td>
<td>2 hours</td>
<td>2 hours</td>
<td>30</td>
<td>$8 - 12</td>
<td>7000 composite</td>
<td>800 composite</td>
</tr>
<tr>
<td>Kwikbond PPC - MLS</td>
<td>0.375</td>
<td>40</td>
<td>120</td>
<td>Fair</td>
<td>6 - 7</td>
<td>6</td>
<td>10 - 15</td>
<td>$5 - 7</td>
<td>7000 composite</td>
<td>&gt; 2500</td>
</tr>
<tr>
<td>Poly-Carb Mark 163 - Flexogrid</td>
<td>0.25 - 0.388</td>
<td>50</td>
<td>120</td>
<td>Good</td>
<td>4 - 5</td>
<td>10 - 15</td>
<td>8000</td>
<td>$3 - 5</td>
<td>5500</td>
<td>&gt; 2700</td>
</tr>
<tr>
<td>Poly-Carb Mark 163 FC - Fast Cure</td>
<td>0.25 - 0.388</td>
<td>40</td>
<td>90</td>
<td>Good</td>
<td>2 - 3</td>
<td>3</td>
<td>5 - 7</td>
<td>$2 - 3</td>
<td>5500</td>
<td>&gt; 2700</td>
</tr>
<tr>
<td>Poly-Carb Mark 154</td>
<td>0.25</td>
<td>40</td>
<td>120</td>
<td>Good</td>
<td>4 - 5</td>
<td>3</td>
<td>5 - 7</td>
<td>$2 - 3</td>
<td>5500</td>
<td>&gt; 2700</td>
</tr>
<tr>
<td>Poly-Carb Mark 154 Safe-T-Grid</td>
<td>0.25</td>
<td>40</td>
<td>120</td>
<td>Good</td>
<td>4 - 5</td>
<td>3</td>
<td>5 - 7</td>
<td>$2 - 3</td>
<td>5500</td>
<td>&gt; 2700</td>
</tr>
</tbody>
</table>
## Overlay Matrix Sample

<table>
<thead>
<tr>
<th>Expected Life (years)</th>
<th>Cost Range, Furnished and placed ($/sq ft)</th>
<th>Compressive Strength @ 24 hrs (ASTM C579) (psi)</th>
<th>Tensile Strength (psi)</th>
<th>Bond Strength (psi)</th>
<th>Elongation at Break (ASTM D638) (%)</th>
<th>Permeability</th>
<th>Western Rep Name</th>
<th>Product Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 to 15</td>
<td>$5</td>
<td>&gt;5000</td>
<td>3,900</td>
<td>&gt;300</td>
<td>35</td>
<td>&lt;100 coulombs</td>
<td>Gregg Freeman</td>
<td><a href="http://www.poly-carb.com/products/details/overlay-900">Website</a></td>
</tr>
<tr>
<td>10-15</td>
<td>$5-7</td>
<td>7000</td>
<td>&gt;2500</td>
<td>&gt;250</td>
<td>35</td>
<td>No permeability</td>
<td>Mike Geist</td>
<td><a href="http://www.poly-carb.com/products/details/overlay-900">Website</a></td>
</tr>
<tr>
<td>5-7</td>
<td>$5.50-7.50</td>
<td>8000</td>
<td>&gt;2500</td>
<td>&gt;250</td>
<td>35</td>
<td>No permeability</td>
<td>Mike Geist</td>
<td><a href="http://www.poly-carb.com/products/details/overlay-900">Website</a></td>
</tr>
<tr>
<td>5-7</td>
<td>$3-5</td>
<td>5500</td>
<td>&gt;2700</td>
<td>&gt;250</td>
<td>50</td>
<td>No permeability</td>
<td>Mike Geist</td>
<td><a href="http://www.poly-carb.com/products/details/overlay-900">Website</a></td>
</tr>
<tr>
<td>5-10 years</td>
<td>$3.50-$4.50</td>
<td>5500</td>
<td>6525 psi</td>
<td>&gt;536</td>
<td>30</td>
<td>No permeability</td>
<td>Doug Gray</td>
<td><a href="http://construction.basf.com/">Website</a></td>
</tr>
</tbody>
</table>

*Note: Website links are placeholders and are not actual links.*
Next Steps

- Complete deck overlay matrix
- Develop similar patch product matrix
- Combine with other partnership efforts
- Looking for volunteers
Longer Term Initiatives

- Develop national specification repository
- Industry developed training videos
- Develop deck curing best practices
- Develop deck research library
- Standardize testing/approval process