Foamed Asphalt Road Rehabilitation

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Outline

• What is Foamed Asphalt?
  • Construction
  • Mix Design

• Projects in Minnesota
  • Construction experience
  • FWD Data & Results
What is Foamed Asphalt?

- **FDR and CIR**
  - Cold recycling processes
  - Mostly in-situ
What is Foamed Asphalt?

- **Pavement Recycling**
  - Reduce energy use
    - Trucking RAP
- **Reuse resources**
  - Aggregate and Bituminous
- *****Performance***

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Annual U.S. Use (millions of tons)</th>
<th>Annual Cost (billions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virgin Aggregate</td>
<td>1,300</td>
<td>10</td>
</tr>
<tr>
<td>Asphalt</td>
<td>40</td>
<td>13</td>
</tr>
<tr>
<td>Portland Cement</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Hot-Mix Asphalt</td>
<td>600</td>
<td>36</td>
</tr>
<tr>
<td>Portland Cement Concrete</td>
<td>60</td>
<td>6</td>
</tr>
</tbody>
</table>
What is Foamed Asphalt?

**Benefits**

- Uses standard PG grade bit.
- Increased coating of fines
  - Reduced viscosity & Increased surface area
- Large minus #200 range
  - 5-20% (8-15% ideal)
- Short time to apply traffic
  - 2 - 4 days
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- **Mix Design**
  - Optimum foaming characteristics

![Diagram showing the relationship between expansion ratio, half life, and water content.](image-url)
What is Foamed Asphalt?

Mix Design

- Optimal foaming characteristics
  - Water 2-4%
  - Temp. 320°, 340°, 360°
- Optimal bit. content
  - Compact specimen
  - Maximize saturated ITS
- Optimum moisture =
  - Residual + added A/C
What is Foamed Asphalt?

- Mix Design
Projects in Minnesota
Projects in Minnesota

- Cores
Projects in Minnesota

- Pavement Surface
- Bottom of HMA
- Bottom of Foamed Asphalt
- Probable Bottom of Old Bit.
Projects in Minnesota
Projects in Minnesota
Projects in Minnesota
Questions?