DETECTING THERMAL SEGREGATION in ASPHALT PAVEMENTS

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Vice President of Technical Programs
This Should be the Goal
What Are Our Challenges?
Early Detection Warning System
Thermal Segregation can be an Indicator of
- Physical Segregation
- Irregularities
- Low Densities
Classification of Thermal Segregation

None  
0° - 25°

Moderate  
25° - 50°

Severe  
> 50°
PAVE-IR System

- Operand Computer
- Signal Conditioner
- Left IR Bar
- Upright Support
- Signal Conditioner
- Upright Support
- Right IR Bar

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150 ft.
### Thermal Profile Results Summary

<table>
<thead>
<tr>
<th>Number of Profiles</th>
<th>Moderate [25°F;50°F]</th>
<th>Severe &gt;50°F</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>

### Recent Test Result

<table>
<thead>
<tr>
<th>Beginning Location</th>
<th>Ending Location</th>
<th>Temp Differential</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>150</td>
<td>27</td>
<td>✔️</td>
</tr>
</tbody>
</table>
# Thermal Profile Results Summary

<table>
<thead>
<tr>
<th>Number of Profiles</th>
<th>Moderate (25^\circ F &lt; \text{differential} \leq 50^\circ F)</th>
<th>Severe (\text{differential} &gt; 50^\circ F)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Number: 10, Percent: 20</td>
<td>Number: 5, Percent: 10</td>
<td></td>
</tr>
</tbody>
</table>

## Recent Test Result

<table>
<thead>
<tr>
<th>Beginning Location</th>
<th>Ending Location</th>
<th>Temp Differential</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>55+00</td>
<td>56+50</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>
## Thermal Profile Results Summary

<table>
<thead>
<tr>
<th>Number of Profiles</th>
<th>Moderate 25.0°F &lt; differential &lt;= 50.0°F</th>
<th>Severe differential &gt; 50.0°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
</tr>
<tr>
<td>67</td>
<td>1</td>
<td>66</td>
</tr>
</tbody>
</table>
Report for Continuous Paving

<table>
<thead>
<tr>
<th>Number of Profiles</th>
<th>Moderate</th>
<th></th>
<th>Severe</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>25.0°F &lt; differential &lt;= 50.0°F</td>
<td></td>
<td>differential &gt; 50.0°F</td>
</tr>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td>29</td>
<td>11</td>
<td>38</td>
<td>2</td>
<td>7</td>
</tr>
</tbody>
</table>
PRODUCTION

- Consistent Temps
- TPH
- Consistent Mix
- Minimize Segregation
TRUCKING

- Clean Beds
- Use Tarps
- Direct Route
- Correct Amount of Trucks
3 Dump Loading
Mix Transfer

- Pick-up Machines
- MTV
Lay Down

- Proper Dumping of Wings
- Correct Auger Feed
- Head of Material
- Do Not Overheat Screed
- MINIMIZE PAVER STOPS!!!
Temperature has a MAJOR EFFECT

Consistent Temps same Rolling Pattern

Better Density
Ride Quality

- Probable to Improve Numbers
- Have seen as much as 10 Points Lower

No Pave-IR
Pave-IR

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Better Communication

- Paving Foreman
- Crew
- Inspectors
Reduces Discrepancies

- No Multiple Readings from Handheld Infrared Thermometers
Advantages

Numerous