NCAT Pavement Test Track

2015 Track Benefits for the Paving Community

Content

- 2015 Track overview
- Implementable findings
- Takeaways for practice

2015 Track Research Focus

- Safe, sustainable, & cost effective pavements
- Optimizing the use of both RAP & RAS
- Cold recycle (CR) construction & performance
- Durability of surplus sand thinlains
- Improved longitudinal joint performance
- Asphalt based enhanced friction surfaces
- Asphalt mix cracking performance test (CG)
- Pavement preservation (PG).

Enhanced Friction Surfaces

- Lightweight chip seals
- Bauxite blend micro
- Bauxite blend thinlains

Thin Surfaces

- Epoxy surfaces with bauxite vs local
- Enhanced friction thinlains, micro, chip seal
- Micro mill/inlay with friction optimized OGFC
- Surplus stockpile thinlains (up to 1⅛” thick)
- Many benefits of smaller/finer (richer) mixes.
Reflective Crack Prevention

- Single coarse RAP chip
- Single virgin chip
- Dry Arizona Rubber
- OGI + UltraFuse
- Fabric Grid

Cold Recycle Base Sections

Higher RAP and Polymer Binders

- Higher RAP mix can outperform low RAP/virgin mix
- Proven for all layers in the pavement structure; but
- Need for performance optimized design/construction.

Quest for a Practical Cracking Test

Cracking Group (CG) Experiment

Southern Cracking Group (CG)
Southern Cracking Group (CG)

Indirect Tension Testing (TSR)

Peak Load

Fracture Energy

Index = Energy / Rate

Construction Quality Testing

Bennert 2018

Performance
Optimized
Construction Quality Testing
& Mix Design Approval

Hot Climate Research

Cold Climate Research

<table>
<thead>
<tr>
<th>Category</th>
<th>% Cracking</th>
<th>Rutting, mm</th>
<th>IRI, in/mi</th>
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<td>Good</td>
<td>&lt; 5</td>
<td>&lt; 5</td>
<td>&lt; 5</td>
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<tr>
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<td>5 – 20</td>
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<td>55 – 170</td>
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<tr>
<td>Poor</td>
<td>&gt; 20</td>
<td>&gt; 10</td>
<td>&gt; 170</td>
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Cracking test
Thinlays
Micro surface
Chip seals
Crack seals
Fog sealing
Combinations
Implementation Takeaways

- Recycle mixes can outperform virgin mixes, but...
- Volumetrics alone are not enough for mix quality
- Simple unaged tests for construction quality (3 hrs)
- Historic opportunity for sustainable innovation!
- Achieving the needed “healthy” residual tack rate
- Performance potential of 100% RAP cold recycle
- Practical alternatives to epoxy bauxite surfaces
- Preservation alternatives by life cycle cost (PG)
