Key Findings and Outcomes from the Asphalt Harmonisation Project”

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Why Change?

TMR Drivers

- TMR 2012 Restructure – from 82 laboratory staff to 36
- Unable to resource asphalt mix designs
- Government requirement to be enabler rather than doer
- Desire to improve asphalt quality and reduce costs
- Desire for longer defects liability period than 90 days.

AAPA Drivers

- Concerns that TMR specification was “too tight” and difficult to meet
- Desire for more freedom in mix design
- Desire to adopt industry best practice
- Desire to reduce costs to improve viability of industry

The Journey begins

- TMR explored options with AAPA
- AAPA Chairman suggested that TMR assess the RMS system
- TMR staff visited NSW, and spoke to RMS staff and asphalt suppliers.
- Conclusion - RMS system attractive and worthy of investigation.

Advantages for TMR

- Higher compaction standards, with less permeability and interconnected voids – less rutting
- No requirement for intermediate sealing layer
- 12 month defect liability, and 24 months warranty
- Staff not involved in mix designs.

Approach from Hyder

- Hyder keen to assist TMR with some projects to save costs
- Project agreed as “review of harmonisation with RMS on asphalt procurement”
- One of several ICDCS projects
What is ICDCS?
Independent – exemption from reliance on, or control by others
Catalyst – someone that encourages progress or change; creates a reaction without being consumed in the process
Differential – making a distinctive difference
Cost Savings – through innovation, revised TPSGs or cost avoidance

ICDCS Project 3.1 – Asphalt Procurement

Description
Hyder Catalyst
Greg Wright
Principal Engineer
DTMR Project Lead
Peter Evans
DCE Pavements, Materials & Geotechnical

Cost Savings
NSW typically 10% less. More than $20m (estimated) over three years.
Ownership of mix design passes from DTMR to supplier
Reduced pavement permeability
Harmonisation between QLD & NSW specifications

Key Elements
Agreement with AAPAQ by June 2013
1. Extended warranty on asphalt (90 days -> up to 2 yrs)
2. Incentives/penalties for increased compaction
3. Paving efficiencies through removal of waterproofing seal

Approach
Hyder compared the RMS system with the TMR system, and prepared a comprehensive report
Hyder presented the findings in July at a workshop with TMR and AAPA

Major findings
• RMS does not register asphalt manufacturers
• The asphalt manufacturer certifies the design mix conforms to specification
• The principal considers and approves the nominated mix design
• Asphalt pavers must be prequalified to class A
• Pavers must warrant their work from the date the work is completed for the period stipulated in the contract.

Essential differences with RMS
RMS asphalt specification:
• Has higher compaction standards than TMR
• Has higher penalties for non compliance with voids
• Has higher minimum binder content
• Allows RAP in surface layers
• Does not require waterproofing intermediate seal

RMS VS TMR DEDUCTIONS FOR REDUCED LEVEL OF SERVICE
Differences (cont)

- TMR allows pre-treatment of combined fillers with lime, prior to wet/dry strength testing.
- This addresses plastic fines in basalt quarries, and allows 50% of Qld registered quarries to supply for asphalt
- RMS does not allow pre-treatment.

Possible Project Outcomes

- Alignment of DTMR procedures with current resource constraints
- Increase in Defects Liability period from 90 days to 12 months
- Introduction of 24 month warranty period
- Lower in situ air void content of dense graded asphalt
- A sustainable improvement in the quality and durability of asphalt paving
- A sustainable reduction in the cost of maintaining the asphalt pavements
- Possible deletion of the waterproof seal below DGA wearing courses
- A first step to future opening up of the asphalt supply markets, as the harmonisation agenda progresses.

Possible risks

- Suppliers may charge for warranty.
- Higher binder content may lead to rutting if Class 450 binder is not adopted
- Some asphalt companies may not make the change and withdraw from Queensland
- Others may delay implementation

Possible Project Outcomes (cont’d)

- Possible use of lower cost binders than the polymer modified binders currently routinely used in Queensland.
- Increased ability to use warm mix asphalt
- Increased ability to use Recycled Asphalt
- Improved savings through consistent testing methods between states – as harmonisation agenda is adopted by other states
- Opening up of the asphalt supply markets as harmonisation progresses.

Possible risks (cont)

- Costs could increase if less competition in market
- Savings may not be realised
- Continuing to pre-treat with lime to allow basalts may compromise durability.
DTMR’s Volumetric Mix Design Criteria:

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Specification</th>
<th>Mix Design</th>
<th>Binder Type</th>
<th>Effective Binder Content</th>
<th>Sample Preparation</th>
<th>Air Voids in Design Mix</th>
<th>VMA in Design Mix</th>
<th>VBF in Design Mix</th>
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</thead>
<tbody>
<tr>
<td>DTMR</td>
<td>MRTS31A</td>
<td>DG14HP</td>
<td>A5S</td>
<td>≥ 10% by volume</td>
<td>Q305 (50 blows)</td>
<td>3.5% to 4.5%</td>
<td>13% to 17%</td>
<td>63% to 83%</td>
</tr>
</tbody>
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Let’s compare the above volumetric criteria with RMS’s

<table>
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</tr>
<tr>
<td>RMS</td>
<td>R116</td>
<td>AC14 Binder Course</td>
<td>AR450</td>
<td>≥ 10% by volume</td>
<td>T662 (120 cycles)</td>
<td>3.0% to 6.0%</td>
<td>≥ 15%</td>
<td>Not specified</td>
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</table>

What does this slide and the previous suggest?

Issue: Design Mix Grading

DG14 Grading Envelopes

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<th>Particle Size (mm)</th>
<th>Percent finer than this particle size</th>
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</tr>
<tr>
<td>0.5</td>
<td>80%</td>
</tr>
<tr>
<td>1</td>
<td>100%</td>
</tr>
</tbody>
</table>

Issue: Mix Design Criteria

Venn Diagram of Mix Designs

All Feasible Mix Designs

Outcomes

• Hyder presented findings at workshop with TMR E&T and Regional staff, and AAPA Managers and Technical staff
• TMR and AAPA have agreed to progress harmonisation
• RMS specification to be default unless sound technical reasons to change
• Target is draft specification by end 2013.