

IDENTIFYING BEST PAVEMENT PRACTICE FOR MAJOR PROJECTS



Exploring opportunities for expanding the range of pavement types and material options available for use in Main Roads WA Type D road projects.

Due to the forecast high capital investment by Main Roads WA in construction of new heavy-duty pavements, WARRIP reviewed current pavement engineering practices for large-scale/complex road projects, actively seeking input from both the design and construction industry.

Approach

- Workshop with contractors and pavement designers to identify issues regarding contracting forms and requirements, project scoping documents (SWTC), design guides, pavement materials and other relevant issues
- Review of major project pavement types and construction specifications used across Australia
- Review of alternative pavement material technologies identified in workshops and the current use of these materials nationally

Workshop with Contractors and Pavement Designers

These workshops highlighted that open discussion and background information improve collaboration, which could be done via various knowledge transfer activities. Contractors are also looking for different forms of contract that reallocate risk, enabling more innovative solutions. After further analysis, WARRIP identified the primary issues to be investigated were:

- What pavements are permitted and used?
- How are they are designed?
- What warranty/defects liability processes are appropriate?

Review of Heavy-Duty Pavement Types across Australia

Pavement type	WA	NSW	Qld	Vic	SA
Full depth asphalt	Commonly used	Commonly used	Commonly used	Commonly used	Commonly used
Deep strength asphalt	Not used	Commonly used	Selectively used, previously most common type >10 years ago	Commonly used	Rarely used, previously common type >8 years ago
Thin asphalt on granular	Commonly used	Not permitted as a heavy-duty pavement type	Not permitted as a heavy-duty pavement type	Not permitted as a heavy-duty pavement type	Not permitted as a heavy-duty pavement type
Thick asphalt over lean mix concrete (composite pavement)	Not used	Commonly used	Rarely used	Not used	Not used
Hydrated cement-treated crushed rock base (HCTCRB)	Selectively used if prerequisites satisfied	Not used	Not used	Not used	Not used
Concrete pavements – PCP, CRCP, JCRP, SFRC	Limited use	Commonly used	Selectively used, particularly in tunnels and busways	Rarely used	Rarely used, but first major use underway





Pavement type	WA	NSW	Qld	Vic	SA
Spray seal on granular	Commonly used on rural highways; not permitted on urban projects	Commonly used on rural highways; not permitted on urban projects	Commonly used on rural highways; not permitted on urban projects	Commonly used on rural highways; not permitted on urban projects	Commonly used on rural highways; not permitted on urban projects

Emerging Technologies and Future Innovations

Emerging technologies and future innovations cited during the workshops included:

- EME2 Asphalt (see WARRIP 2016-001)
- Increased Reclaimed Asphalt Pavement (RAP) Utilisation (see WARRIP 2017-002)
- Crumb Rubber Asphalt (see WARRIP 2016-012)
- Stone Mastic Asphalt (SMA) (see WARRIP 2016-002)
- Performance Based Specifications for Road Construction Materials
- Foam Bitumen Stabilisation
- Potential Use of Nanotechnology (see WARRIP 2018-005)

As indicated, some of these emerging technologies were or are currently under investigation by WARRIP.



Investigate opportunities to increase use of recycled materials, other potential heavy-duty asphalt technologies and BSL as a low-cost alternative for FDA pavements



Monitor Austroads project TT1825 *Improving the design and performance of foamed bitumen stabilised pavements* and NACoE project 49 *Quantifying the benefits of geosynthetics for the mechanical stabilisation of subgrade soils*



Monitor and participate in the development of performance-based specification

FUTURE CONSIDERATIONS

WOLCC considerations to close the gap between Main Roads WA long-term performance and Contractor's warranty/defects liability requirements.

Regular knowledge transfer in open forums to ensure Contractors and Designers understand Main Roads WA considerations when designing and building pavements.

