EME demonstration project Q – March 2014

Background to the EME demonstration project
Peter Evans – TMR
Rob Vos – AAPA
Strategic Alliance Managers

Overview
1. Where it all started
2. Why does Queensland need EME2?
3. History of EME
4. Challenges and what’s possible
5. Collaboration & opportunities
6. The time line
7. Queensland team work
8. How it was done

Where it all started
- 1980s French company mixes for “urban” use
- 1990’s into state roads with standard specs
- Solutions → EME1 → EME2 modulus & fatigue
- 20+ years of experience → performance & 13t axle
- Airbus A380 very heavy loads → EME2

Question?
What does the Airbus 380 and Channel Tunnel have in common?

Answer: EME2
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Why does Queensland need EME2?

- Conventional structural asphalt risk at becoming uncompetitive for heavy duty pavement
  - Reduce layer thickness of EME2 vs DG20 by 30%
- EME2 allows you to build road pavements that
  - can carry heavier axle loadings
  - reduce freight cost & GHG per tonne of freight
  - last longer without structural maintenance
  - reduced user delays during in-service life
  - are more sustainable
  - Consume less non-renewable materials, transport and energy
  - performance not affected by global warming

AAPA 2011 South Africa

South African EME demo

History of EME

Colas obtained Avi Technique for EME in 1988
  - \( E^* = 16000 \text{ MPa (15°C 10 Hz)} \)
  - \( \varepsilon_6 = 160 \mu s @ 10^6 (10°C 25 Hz) \)
French standard in 1992 (updated 1999)
  - \( E^* > 14000 \text{ MPa (15°C 10 Hz)} \)
  - \( \varepsilon_6 > 130 \mu s @ 10^6 (10°C 25 Hz) \)
Mainly used in new construction and pavement strengthening of highways and airports
Incorporated into European Highways specs 2000
Has been used in projects in Southern Hemisphere
  - Reunion highway 2009 (200kt)
  - Entrance road to Durban Port, South Africa 2011
  - Mauritius airport 2012

AAPA 2012 Europe

Drivers for EME

- Technical
  - Improved asphalt performance (stiffer, rut resistant, fatigue)
- Economic
  - Reduced pavement thickness or
  - Longer lasting pavements
- Sustainability
  - Savings in raw materials, less maintenance and related traffic disruption
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Challenges and what’s possible ➔ Australia

1. Speaking French, understanding Frenchmen
2. Prejudice & comfort zone vs performance
3. Transferring the knowledge & outcomes

Challenges and what’s possible ➔ Bitumen & Asphalt people

4. Getting the right binder – not just harder
5. Getting the mix design right ➔ performance
6. Demonstrating Manufacture / Placement / Performance properties

Challenges and what’s possible ➔ Partnership

7. Data collection & analysis ➔ pavement design
8. Local test methods = French test results
9. Australian Specification for EME2

Collaboration and opportunities

◆ Queensland ➔ makes the bitumen
◆ ARRB/BCC/QTMR/AAPA/Binder & Asphalt
  ➔ work together ➔ strong teams ➔ track record
◆ NSW also on track ➔ team challenge

Collaboration and opportunities

❖ Innovation permitted in Q ➔ opportunity
❖ Thick asphalt ➔ v-f-m EME alternative
❖ Maintenance ➔ Strengthen existing pavements without changing final levels
❖ Projects available ➔ Brisbane airport / Toowoomba crossing etc

The time line - Australia

A: Austroads Project – ARRB EME Technology Transfer report
B: AAPA 2011 & 2012 Study Tour recommendations
C: AAPA Master Classes Melbourne ➔ Brisbane & Sydney
D: AAPA members – binders & demonstration mix design
E: Demonstration projects ➔ Qld & NSW
F: Supplementary specification – Qld (technical & mix design)
G: Testing using Australian test methods & equipment
H: Spec limits/values for Australian test methods & equipment
I: Draft interim design procedure / alternative
J: Introduction into Q TMR Pavement Design Supplement
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Queensland team work

How it was done . . .

Program for the day
  • Getting the mix design to work
  • What makes the EME binder so different
  • Delivering the job – trials & tribulations
  • What we need to learn from the demo
  • Why BCC was prepared to be involved
  • Feedback on the national EME project & future Qld and other developments
  • Wrap up
  • AAPA Awards