Background to the EME demonstration project

Peter Evans – TMR
Rob Vos – AAPA
Strategic Alliance Managers
EME Demonstration Partners

The road forward

Speedie Contractors Pty Ltd
South East Profiling Pty Ltd

Dedicated to a better Brisbane
Strategic Alliance Workshop

EME Demonstration Project in Q201

Background – Peter Evans & Rob Vos

EME demonstration

V-for-M to Australia

International Knowledge Transfer

Enrobés à Module Elevé
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
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
South African EME demo
History of EME

Colas obtained Avi Technique for EME in 1988
  - $\varepsilon^* = 16000 \text{ MPa} (15^\circ\text{C} 10 \text{ Hz})$
  - $\varepsilon_6 = 160 \mu\text{s} @10^6 (10^\circ\text{C} 25 \text{ Hz})$

French standard in 1992 (updated 1999)
  - $\varepsilon^* > 14000 \text{ MPa} (15^\circ\text{C} 10 \text{ Hz})$
  - $\varepsilon_6 > 130 \mu\text{s} @10^6 (10^\circ\text{C} 25 \text{ Hz})$

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
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EME Demonstration project in Q

Background – Peter Evans & Rob Vos

AAPA 2012 Europe

Donna James
UK Highways Agency

Yves Brosseauad
LCPC/IFSTTAR

Evolution of HMA for road structure

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Evolution of EME in France

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
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

2011

A      Austroads Project – ARRB EME Technology Transfer report

B      AAPA 2011 & 2012 Study Tour recommendations

2012

C      AAPA Master Classes Melbourne → Brisbane & Sydney

D      AAPA members – binders & demonstration mix design

2013

E      Demonstration projects – Qld + & NSW

2014

F      Supplementary specification - Qld (French tests & mix design)

G      Testing using Australian test methods & equipment

H      Spec limits/values for Australian test methods & equipment

2015

I      Draft-Interim design procedure / alternative

2016

J      Introduction into Q TMR Pavement Design Supplement

EME in Australia
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