

HIGH MODULUS ASPHALT



International and Australian experience indicates EME2 technology can significantly reduce pavement thickness without compromising performance, which lowers construction and maintenance costs.

EME2 technology

Enrobés à Module Elevé (EME) high modulus, performance based asphalt mixtures were developed in France. Class 2 EME (EME2) mixes, produced using a hard, paving grade bitumen applied at a high binder content, are typically used in France for roads subject to heavy traffic loads, airports and for maintenance of deteriorated roads.

EME2 technology offers the prospect of reduced asphalt thicknesses for heavy duty pavements. Strong, durable and sustainable EME2 pavements provide economic benefits compared to traditional flexible pavement materials, such as reduced construction periods and cost, longer time between maintenance actions and longer service life.

The project

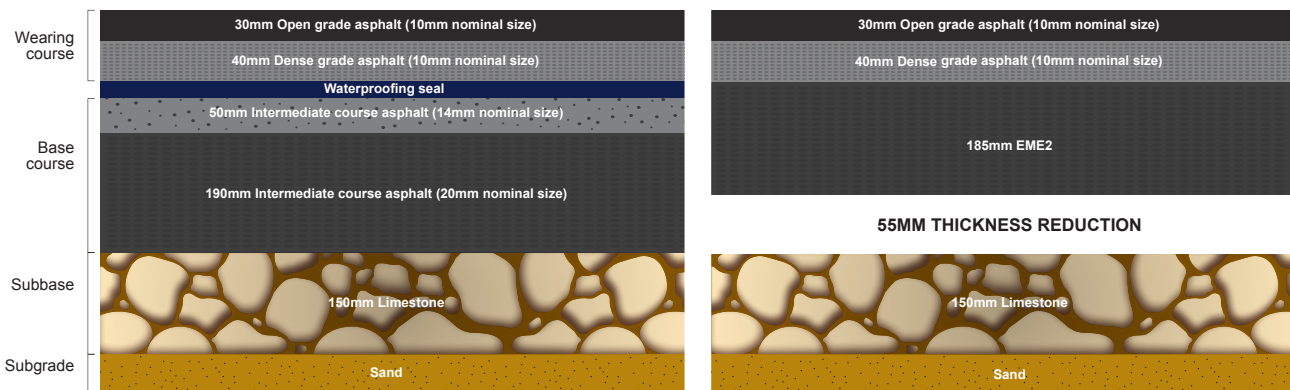
This project investigated the use of EME2 to reduce the thickness of full depth asphalt pavements. In WA, EME2 may be particularly beneficial where traffic loads have grown substantially, such as mining areas in the Pilbara. The project developed manufacturing, paving and compliance requirements and interim WA EME2 specification limits.

European practice

EME2 use in Europe has indicated pavement layer thicknesses can be reduced by 25-30 per cent compared to traditional flexible pavement designs for a given design life. Our review of European practice indicates no significant barriers to EME2 implementation in WA and interim specifications adopted by Main Roads are consistent with European practice.

WA pavement design calculations

Overall asphalt thicknesses using Main Roads' Engineering Road Note 9 (ERN9) design guides for different asphalt materials were modelled to compare existing pavement configurations (as control) with EME2.



Example possible asphalt thickness reduction using EME2 as Intermediate course

Modelling showed an overall reduction of asphalt thickness using EME2 of 45mm-90mm, depending on which asphalt layers were substituted and whether wearing and binder courses were combined with EME2. It confirmed the benefits of EME2, including improved fatigue resistance and thinner FDA pavements, without compromising performance.



Australian trials



Material compaction during paving operation at Perth trial site



Cored samples from the Perth trial site

The project team observed an EME2 demonstration trial in Queensland to apply lessons learnt to WA. An EME2 demonstration trial was conducted in metropolitan Perth to assess whether the design mix could be manufactured, placed and compacted to the developed standards using local aggregates and locally-available equipment. A key aspect was input from expert EME2 practitioners.

- **The High Modulus Asphalt (EME2) project found potential pavement thickness reductions from using EME2, relative to Main Roads pavement design supplement ERN9, of 45mm-90mm.**
- **EME2 pavements provide economic benefits, such as reduced construction periods and cost, longer time between maintenance actions and longer service life.**
- **A review of European practice revealed no significant barriers to EME2 implementation in WA.**
- **Main Roads has adopted interim specification limits for EME2 asphalt that are in line with the national specification framework.**

More details on this project are available at www.warrip.com.au.