

MainRoads

Connecting Queensland

Stone Mastic Asphalt

What is Stone Mastic Asphalt?

Stone mastic asphalt (SMA) was originally developed in Germany in the 1960s as a durable road surfacing to resist wear from studded tyres.

SMA is designed to have a large percentage of coarse aggregate with stone-on-stone contact, with the remaining voids partially filled with mastic comprising fine aggregate, filler, fibre and bituminous binder.

Both SMA and open graded asphalt (OGA) offer superior noise reduction compared to dense graded asphalt (DGA)

SMA has distinct advantages as a surfacing due to its potential for high resistance to fatigue and rutting (wear and tear due to traffic loading).



Safety and SMA

Safety is Main Roads' number one priority. This ongoing commitment to safety extends to engaging independent experts to investigate the use of SMA to maximise road safety outcomes.

Independent reports were commissioned after road crashes at Federal near Gympie and at Tanawha near Sippy Downs.

- » *Review of the use of SMA surfacing by the Queensland Department of Main Roads by Professor Rod Troutbeck and Dr Chris Kennedy in September 2005 (the Federal report).*
- » *Independent Review of the Safety Performance and Engineering Design of the Southbound Ramp from the Bruce Highway to the Sunshine Motorway and a Supplementary Investigation into the Road Safety Performance of SMA by Professor Troutbeck in August 2007 (the Tanawha report).*



In their report, Professor Troutbeck and Dr Kennedy state that "stone mastic asphalt is an appropriate surface" and "the use of stone mastic asphalt does not show any systemic safety issues".

Both reports contained a range of recommendations for Main Roads to improve safety at the sites examined and to enhance road safety across Queensland. Main Roads is adopting all the recommendations.

As at early 2008, Main Roads has completed or is continuing to address all of the recommendations from the Federal report.

Status report on implementation of 66 recommendations at Federal near Gympie

	Complete	Ongoing
Site specific recommendations	27	0
Network wide recommendations	17	9
Management of crash data recommendations	11	2

Main Roads has also either completed or is continuing to address implementation of all of the recommendations from the Tanawha report.

Status report on implementation of 18 recommendations at Tanawah

	Complete	Ongoing
Site specific recommendations	7	1
Network wide recommendations		4
Management of crash data recommendations		6

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Operational performance of SMA

Every road surfacing type has its advantages and disadvantages. Austroads and ARRB Group have outlined a number of these in their technical documents.

Advantages of SMA:

- » provides a textured, durable and rut resistant wearing course
- » surface texture characteristics are similar to OGA, so noise generated is lower than DGA but slightly higher than OGA
- » can be produced and compacted with the same plant and equipment as for normal hot mix DGA using procedural modifications
- » can be used on heavily trafficked roads where good deformation resistance is required
- » surfacings may reduce reflective cracking from underlying cracked pavements due to its flexible mastic
- » durability (longer in-service life) of SMA should be equal to, or greater than, DGA and significantly greater than OGA.

Disadvantages of SMA:

- » increased material cost associated with high bitumen and filler content
- » increased mixing time and time taken to add extra filler may result in reduced productivity
- » possible delays in openings (the road) as SMA should be cooled to 40°C to prevent early flushing of the binder to the surface.

Further information on SMA

If you are interested in learning more about SMA, the independent research and its recommendations, comprehensive information including the full reports are available on the Main Roads website.

Go to www.mainroads.qld.gov.au » Traffic and roads » Queensland road system » Road surfacings.

Austrroads and ARRB Group can be found at their respective websites:

- » www.austrroads.com.au
- » www.arrb.com.au

Using SMA in Queensland

Main Roads considers many factors when choosing the most appropriate surfacing for a given section of road. Whole-of-life costing is usually carried out to determine the appropriate combination of pavement layers, including the surface layer, to suit the road section's specific requirements.

Currently, there are around 1,518 trafficable lane kilometres of SMA on the state-controlled road network in Queensland.

Independent investigations have concluded that the use of stone mastic asphalt does not show any systemic safety issues.

Main Roads works closely with the Australian Asphalt Pavement Association to continually improve the performance of all asphalt surfacing.



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