**Solid Density for Bituminous Granular Materials – What is Right?**

Topic: Advanced Materials Testing

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Traditionally the Solid Density of bituminous material such as foamed bitumen recycled or emulsion recycled basecourse has not been tested for in New Zealand due to challenges with obtaining an accurate result.

Foamed bitumen is neither an unbound aggregate nor an asphalt and as such there is no validated test methodology for determining the true solid density of the material.

Foamed bitumen works by coating the fine material and “spot-welding” the aggregate together, leaving he larger aggregate uncoated. This coating of fine material with bitumen while having the larger particles uncoated means that an aggregate solid density test can misrepresent the sample solid density. Likewise, the larger particles having no bitumen coating make the MTSG inaccurate.

If a reliable representative Solid Density cannot be achieved, then we have issues with meeting Degree of Saturation requirements. This has lead to pavements that are clearly too wet being seen as ready to seal and pavements that are clearly dry not able to be sealed based on DOS results alone.

Likewise, it is difficult to get an accurate MDD curve for the material, with the curve crossing the “zero voids” line in some instances.

Hiway has undertaken a number of different laboratory tests to assess a suitable Solid Density test method. We have also tried to use a calculation to establish it. A variation of the test method has also been assessed which we think may be appropriate. However, there are still some issues with this that need to be addressed.

This presentation will step through our testing with results and pose the question: “Which way is best to assess the Solid Density of Foamed Bitumen Recycled pavements?”.