Stone Matrix Asphalt and Advancement of Pavement Testing

Ian Anderson and Aaron Schwartz
Construction and Materials Bureau
Bituminous Concrete Materials

Stone Matrix Asphalt

Stone Matrix Asphalt (SMA) is a different type of pavement, that relies on direct stone on stone contact and a heavy asphalt mastic to provide superior rutting resistance, compared to conventional dense graded Superpave designs. SMA was piloted on a portion of the Sharon-Bethel I-89 paving project, to determine the feasibility of use on Vermont. Testing is ongoing to characterize the material, and future testing will be conducted to monitor its service life.

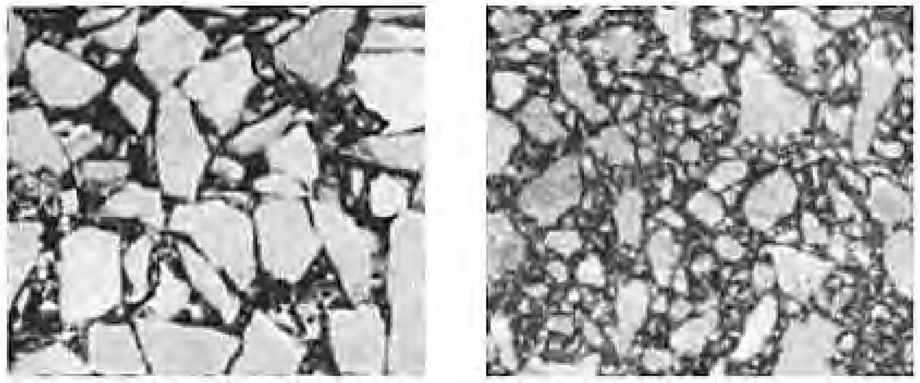

Figure 1. SMA compared to Dense Graded HMA

Construction Outcomes

To incorporate SMA into this project, a special provision was drafted to detail the material and construction requirements. SMA is notoriously more difficult to work with, containing fibers to stabilize the high asphalt content, and making it more difficult to compact. Acceptance testing showed compliant mix properties, and good in place compaction. Lessons learned from this project will be carried forward in future SMA implementations.

Figure 2. SMA construction, and an SMA sample for acceptance testing

Advancement of Pavement Testing

The FHWA Mobile Asphalt Technology Center (MATC) was in Vermont to coincide with the construction of SMA on the Sharon-Bethel project. The MATC's mission is to help implement new and innovated technologies to improve pavement quality. This included a variety of HMA performance tests (HWT, IFIT, AMPT, IDEAL-CT/RT), rapid binder testing, and in-place monitoring devices for temperature, density, thickness, and macrotexture.

Figure 3. PaveScan GPR Density tool, and MIT-scan pavement thickness tool

Implementation

FHWA MATC staff conducted a variety of field tests during their visit, in addition to collecting SMA and HMA samples for performance testing. Their testing of these materials is still ongoing, and when completed will be presented to VTrans to assist in our characterization of the SMA pavement, as well as future use of the innovative testing they demonstrated.

Several of the test they displayed have promise as QC tools to improve construction, the implementation of which would all the agency to raise our standards for quality, and could reduce both the contractor and agency risk in Quality Assurance Testing.

Acknowledgments (Calibri, 48 points, bold)

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