

Project Profile

General Project Information

Project Location: South 71st Street, Sedgwick County, KS
Road Owner: Sedgwick County
Application: Bonded Dense Graded HMA
Date Placed: June 12, 2008
Applicator: Hall Brothers



Given the success of the NovaChip® ultrathin bonded wearing course, and in an effort to improve the bonding of pavement layers, Road Science, LLC™ in conjunction with Sedgwick County, Kansas, decided to experiment with a bonded dense graded hot mix asphalt. Road Science and Sedgwick County conducted this trial south of Wichita on 71st street west of Hayesville, KS. The bonded dense graded HMA section was part of a larger study having a combined section length of 8,000 feet. Traffic was less than 5,000 ADT. The existing surface was oxidized dense graded HMA of several years in age. No rutting was apparent but slight to moderate severity transverse cracks were noted.

Mix and Trial Information

The mixture was a KDOT BM-1 designed using the Marshall Procedure (50 blow). Trial variables included 1 and 1.25 inch mixture thickness as well as NovaBond Polymer Modified Asphalt Emulsion (PMAE) application rates of 0.05, 0.1, 0.2, 0.25, 0.3 gallons per square yards (GSY). Each test section was 792 feet long and 13 feet wide creating test sections of 1,144 square yards.

Construction Information

The mix was placed using the Vogeles SF-1800 spray paver. The mix temperatures ranged from 285°F to 315°F in the hopper of the paver. The mix transferred through the auger system without difficulty. A total of 776.8 tons of BM-1 mix was placed on the bonded dense graded hot mix test sections of this trial. Density measurements were made to determine the density behind the screed, after initial breakdown and after final rolling on both the 1" and 1.25" thickness of BM-1 dense graded hot mix asphalt. From the data for both the 1" and 1.25" compacted lift thickness of BM-1 HMA, a trend was observed that the PMAE tack increases the density of the mixture for equal compactive effort. At 1.25" thickness of BM-1 HMA, the final mixture density showed the most increase as the NovaBond PMAE was increased from 0.2 to 0.25 GSY. No flushing was observed on the NovaBond PMAE, even when the BM-1 mix was placed at 1" compacted lift thickness with a NovaBond PMAE rate of 0.3 GSY.

Performance Results

The Hamburg wheel tracking device showed the beneficial effects of the bonding layer and the amount of PMAE used. For 0.06 GSY 6mm of rutting was reached upon 7,450 passes while 9850 passes were required to produce similar rutting for 0.2 GSY.

Photos



Finished Bonded BM-1 Test Sections



Bonded BM-1 Test Sections just after placement

For more on this project, the BondTekk process or other solutions available in your area, contact your local Road Science representative at 877 354 1851.

