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# Method Of Determining The Optimum Binder Content In An Uncompacted Bituminous Mixture

## SC-T-91

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### 1. Scope

This method outlines the procedure for designing and preparing an uncompacted bituminous mixture (OGFC) composed of crushed mineral aggregate, polymer modified binder, mineral fiber stabilizing additives, and hydrated lime to determine optimum binder content.

### 2. Referenced Documents

#### 2.1 AASHTO Standards

T-11

T-27

T-245

#### 2.2 SC Test Methods

SC T 88 Inspection and Approval of Asphalt OGFC Mix Designs

SC T 90 Method for Determining Drain-Down Characteristics in an Uncompacted Bituminous Mixture

### 3. Apparatus

3.1 Refer to reference documents for a listing of equipment needed for Marshall mix design, and Superpave design.

### 4. Test Specimens

4.1 A SCDOT certified HMA Design Technician (Level 2S) must prepare the uncompacted mixture design, and submit the appropriate form and all design data, including optimum asphalt content, and drain down test information.

4.1.1 Six test specimens, three sets of two specimens each should be blended with binder, weighing approximately 1000 grams total. The first set of two OGFC specimens should be mixed at the optimum asphalt binder content, two 0.5 % above, and two 0.5 % below optimum asphalt binder content.

4.1.2 One asphalt drain down specimen must be blended with binder at optimum

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binder content, weighing approximately 350 grams total. This will be used to see if there is enough asphalt binder retained.

4.1.3 One 1000 grams batch, without asphalt binder, to be used for the SCDOT verification-check sample.

4.1.4 Containers of Polymer Modified Asphalt Binder, and mineral fibers need to be obtained and proportioned to the correct amounts.

## 5. Procedure

5.1 These steps will be performed by the Contractor's Level 2S technician.

5.1.1 Verify and determine the optimum asphalt content of the uncompacted asphalt blend. The mixtures should be placed into clear pyrex type dishes, which have minimum surface areas of at least 100 sq. in., and a minimum of 1 ½ in. of depth. The mix is allowed to stand inside a calibrated oven at mixing temperature for 2 hrs. The optimum asphalt content is determined by judging the appearance of the asphalt through the pyrex dishes. The optimum binder content should be determined by observing the excessive mixture draindown, or filling of un-compacted air voids through the pyrex dish. The technician must be careful not to allow the mixture to slide, or move while observing the uncompacted mixture.



5.1.2 Perform SC-T-90 to determine the amount of binder retention at optimum asphalt binder content. This will eliminate the use of excessive binder content in the OFGC. Adjustment of optimum

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binder content or dosage rate of mineral fibers may be required, in order to meet retention coating of the uncompacted mixture.

5.1.3 If either of the uncompacted blends do not compare, the technician must redesign a new mixture to meet SCDOT specifications.

5.1.4 Submit to the Office of Materials and Research the mix design results and at least one verification sample for mix verification and asphalt mix design approval.

## **6. Calculations**

As per AASHTO T-11, AASHTO T-27, and SC-T-90

## **7. Report**

None.