Standard Practice for

Troubleshooting Asphalt Specimen Volumetric Differences between Superpave Gyratory Compactors (SGCs) Used in the Design and the Field Management of Superpave Mixtures

AASHTO Designation: R 99-21[1]

Adopted without Revisions: 2021

Technical Subcommittee: 2d, Proportioning of Asphalt–Aggregate Mixtures

American Association of State Highway and Transportation Officials
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1. SCOPE

1.1. This method covers the procedure for troubleshooting asphalt specimen volumetric differences between Superpave gyratory compactors (SGCs) used in the design and field management of Superpave mixtures. Evaluation of SGCs should include the SGC used in the mix design, the SGC used for production quality control (QC), and the SGC used for production quality assurance (QA). The evaluation will assist in the identification of within-procedure differences that may impact the field management of asphalt mixtures.

1.2. *This practice may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this procedure to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.*

2. REFERENCED DOCUMENTS

2.1. *AASHTO Standards*:

- R 30, Mixture Conditioning of Hot Mix Asphalt (HMA)
- R 35, Superpave Volumetric Design for Asphalt Mixtures
- R 47, Reducing Samples of Asphalt Mixtures to Testing Size
- R 97, Sampling Asphalt Mixtures
- T 166, Bulk Specific Gravity (G_{mb}) of Compacted Asphalt Mixtures Using Saturated Surface-Dry Specimens
- T 312, Preparing and Determining the Density of Asphalt Mixture Specimens by Means of the Superpave Gyratory Compactor
- T 344, Evaluation of Superpave Gyratory Compactor (SGC) Internal Angle of Gyration Using Simulated Loading

3. SUMMARY OF METHOD

3.1. This method is intended to provide a uniform process to assist in the identification of within-procedure differences that may impact the field management of asphalt mixes.

3.2. The design, QC, and/or QA SGCs shall be evaluated. All SGCs shall satisfy and be operated according to T 312.

3.3. Laboratory-prepared or production mix may be utilized in the evaluation.

3.4. Documentation of within-procedure differences and assessment of compacted specimens shall be utilized in the evaluation.

3.5. The evaluation shall be conducted in two phases. The initial evaluation shall use multiple operators and existing within-procedure handling practices. The second phase, if required, shall utilize a single operator and consistent, within-procedure handling practices, and one laboratory shall be used in the determination of the compacted bulk specific gravities (G_{mb}) of the SGC specimens.

4. SIGNIFICANCE AND USE

4.1. SGCs fabricated to operate in accordance with T 312 create cylindrical specimens from loose asphalt mixtures through a gyratory (kneading) effort. Within-procedure differences may impact the comparability of SGCs; in addition, variability within the manufacturing process may result in mechanical differences in SGC performance.

5. LABORATORY DEFINITIONS SPECIFIC TO THIS STANDARD

5.1. *The laboratories used in the evaluation are identified in the following sections*:

5.1.1. *Mix Design Laboratory*—The laboratory, SGC, and operator that produced the mix design for the mix being evaluated.

5.1.2. *Field Quality Control Laboratory*—The laboratory, SGC, and operator used by the contractor to ensure the quality of the production process.

5.1.3. *Field Quality Assurance Laboratory*—The laboratory, SGC, and operator used by the specifying agency to assure the quality of production mixes.

5.1.4. *Independent Quality Assurance Laboratory*—The laboratory, SGC, and operator employed to arbitrate differences in contractor and specifying agency results.

6. PROCEDURE: PHASE I—INITIAL EVALUATION

6.1. The specifying agency shall identify the laboratories to be included in the evaluation.

6.1.1. The operator responsible for each laboratory shall be used in the initial phase of the evaluation.

6.2. Prior to compaction of any specimens, each operator shall verify the SGC calibration and SGC mold tolerances according to T 312.

6.3. *The evaluation mix shall conform to one of the following sections*: