



**INDIANA DEPARTMENT OF TRANSPORTATION
DIVISION OF MATERIALS AND TESTS**

**QC/QA HMA Gsb PROCEDURES
ITM No. 597-19**

1.0 SCOPE.

- 1.1 This procedure covers the requirements for determining the established aggregate bulk specific gravity (Gsb) of a DMF as required in 401.09.
- 1.2 This procedure may involve hazardous materials, operations and equipment and may not address all of the safety problems associated with the use of the test method. The user of this ITM is responsible for establishing the appropriate safety and health practices and determining the applicability of regulatory limitations prior to use.

2.0 REFERENCES.

2.1 ITM Standards.

- 580 Sampling HMA
- 590 Total Aggregate Bulk Specific Gravity Determination from Extracted HMA or SMA Mixture
- 802 Random Sampling

3.0 TERMINOLOGY. Definitions for terms and abbreviations will be in accordance with the Department's Standard Specifications Section 101.

4.0 SIGNIFICANCE AND USE. These are the procedures to be followed to test production ITM 590 Gsb values and determine the established Gsb value of a DMF. The Contractor shall, and the Engineer will, share their respective test results regarding the Gsb during production and discuss any points of discrepancy within 2 weeks of notification.

5.0 SAMPLING. Plate samples shall be obtained in accordance with ITM 802 and ITM 580.

6.0 PROCEDURE Production Gsb testing will be conducted for dense graded 9.5 mm, 12.5 mm, 19.0 mm and 25.0 mm mixtures with original contract pay item quantities greater than or equal to 5,000 t of base and intermediate or 3,000 t of surface.

7.0 DETERMINING PRODUCTION GSB

- 7.1 The total aggregate bulk specific gravity, Gsb, value will be determined from a combination of the DMF Gsb value and acceptance plate sample Gsb values.

The Gsb values from acceptance plate samples will be determined in accordance with ITM 590 for dense graded 9.5 mm, 12.5 mm, 19.0 mm, and 25.0 mm mixtures following every 5,000 t of base and intermediate or every 3,000 t of surface produced for a DMF at a certified HMA plant.

The frequency of the Gsb testing may be altered at the direction of the Engineer.

7.2 The Gsb value for initial production of a DMF will be established as the Gsb value submitted on the DMF.

7.3 The first three-point moving average Gsb value will be calculated using the DMF Gsb value and the next two Gsb data points obtained during production of the DMF.

7.4 A three-point moving average Gsb value will then be calculated from the three most recent Gsb values for a DMF.

7.5 Established Gsb

- (a) If the three-point moving average Gsb has deviated no more than ± 0.020 from the established Gsb value, the established Gsb value will not change.
- (b) If the three-point moving average Gsb value has deviated more than ± 0.020 from the established Gsb value, the three-point moving average Gsb value will be set as the new established Gsb value for a DMF. The Department will notify the Contractor in writing of the new established Gsb value. The new established Gsb value will replace the previous established Gsb value on subsequent sublots following the date of notification.

7.6 Outliers

- (a) If a single tested Gsb value is more than 0.030 from the established Gsb value and the Gse value also is more than 0.020 in the same direction from the established Gse, the single Gsb value will be considered valid and will be used in the three-point moving average Gsb.
- (b) If a single tested Gsb value is more than 0.030 from the established Gsb and the Gse value is not also more than 0.020 in the same direction from the established Gse, the single Gsb value will be verified by additional Gsb testing at the Division of Materials and Tests. The three-point moving average Gsb will not be updated until the verification testing is complete.
- (c) The established Gse will be the average of the three effective specific

gravities associated with the established Gsb.

- (d) The Contractor may request additional Gsb testing contingent on provided supporting aggregate QC data. A new established Gsb may be determined based on a single department obtained Gsb value with the agreement of the Contractor.

8.0 OPTIONAL TEST STRIP

8.1 A test strip may be requested by the Contractor for dense graded 9.5 mm, 12.5 mm, 19.0 mm and 25.0 mm mixtures with original contract pay item quantities greater than or equal to 5,000 t of base and intermediate or 3,000 t of surface. The test strip shall be constructed as part of the first 300 t of DMF production or may be located off the paving project if requested.

8.2 Total aggregate bulk specific gravity, Gsb, value will be determined by the department in accordance with ITM 590.

8.3 If no additional DMF production occurs during testing, the Gsb determined in 8.2 will replace the DMF Gsb. Otherwise, the test strip Gsb will be considered a production data point in 7.3.

8.4 A new established Gsb may be determined based on a single department obtained Gsb value with the agreement of the Contractor.

9.0 REPORT.

9.1 Aggregate Gsb of the HMA is reported to the nearest 0.001.

9.2 The Contractor shall, and the Engineer will, share their respective test results regarding the Gsb during production.