SECTION 312 - HOT MIX GLASSPHALT BASE COURSE

312.01 Description. This section describes furnishing and placing hot mix glassphalt base (HMGB) course on a prepared surface.

312.02 Materials.

Asphalt Cement (PG 64–16)	702.01
Aggregate for Hot Mix Asphalt Base Course	703.03
Filler	703.15
Hydrated Lime	712.03
Cullet and Cullet-Aggregate Mixtures on Construction Materials	717.01
Cullet Materials for Roadways	717.02

(A) General. HMGB shall include mixture of aggregate, cullet (crushed glass), and asphalt cement, and may include reclaimed asphalt pavement (RAP) or filler, or both. RAP is defined as removed or reprocessed pavement materials containing asphalt and aggregates.

Process cullet and RAP by crushing, until 100 percent of cullet passes 3/8-inch sieve and 100 percent of RAP passes 1-1/4-inch sieve. Size, grade uniformly, and combine materials such that blend of cullet, RAP, and virgin aggregate conforms to grading requirements of Subsection 703.03 - Aggregate for Hot Mix Asphalt Base Course.

Aggregate for HMGB may include cullet quantities up to 10 percent of total mix weight and RAP quantities up to 20 percent of total mix weight. Combined mixture shall conform to cullet content and maximum debris level requirements of Table 717.02-1 - Cullet in Roadway Applications.

When cullet is not produced on the project island, or material unit price of cullet is greater than material unit price of aggregate for hot mix asphalt base (HMAB) produced in accordance with Section 301 - Hot Mix Asphalt Base Course, HMAB may be substituted for HMGB. Before making substitution, submit availability and pricing documentation.

Furnish only one grade of asphalt cement for the project.

(B) Job-Mix Formula and Tests. Design job-mix formula in accordance with procedures contained in current edition of Asphalt Institute's *Mix Design Methods for Asphalt Concrete and Other Hot Mix Types*, Manual Series No. 2 (MS-2) for Marshall Method or Hveem Method of Mix Design.

Design asphalt content shall be between 3.8 percent and 5.7 percent, based on total weight of mix. Meet job-mix formula design criteria specified in Table 312.02-1 - Job-Mix Formula Design Criteria.

TABLE 312.02-1 – JOB-MIX FORMULA DESIGN CRITERIA	
Hveem Method Mix Criteria (AASHTO T 246 and AASHTO T 247)	
Stability, minimum	37
Air Voids (percent)[1]	4 - 6
Marshall Method Mix Criteria (AASHTO T 245)	
Compaction, number of blows each end of specimen	75
Stability, minimum (pounds)	1,800
Flow, (x 0.01 inch)	8 - 16
Air Voids (percent)[1]	4 - 6
Voids In Mineral Aggregate (VMA), minimum (percent)[2]	Table 401.02-3
Notes: 1. Air Voids: AASHTO T 166 or AASHTO T 275; AASHTO T 209, AASHTO T 269. 2. VMA: See Asphalt Institute Manual MS-2, Chapter 4.	

(C) Submittals. Establish and submit job-mix formula for HMGB mixture as follows:

(1) Design percent of aggregate passing each required sieve size.

(2) Design asphalt content added to aggregate, based on total weight of mix.

(3) Design proportion of cullet.

(4) Design proportion of processed RAP.

(5) Design temperature of mixture at point of discharge at the

paver.

(6) Source of aggregate.

(7) Grade of asphalt cement.

(8) Test data used to develop the job-mix formula.

With the exception of item (5) in this subsection, if design requirements are modified after the Engineer accepts job-mix formula, submit new job-mix formula before using HMGB produced from modified mix design.

Submit certificate of compliance for asphalt cement, accompanied by substantiating test data.

(D) Range of Tolerances for HMGB. Provide HMGB within allowable tolerances of accepted job-mix formula, as specified in Table 401.02-4 - Range of Tolerances for HMA.

312.03 Construction. Construct HMGB course in accordance with Subsection 401.03 - Construction and this subsection.

(A) Mixing Plant. If job-mix formula includes cullet or RAP, or both, modify mixing plant to accommodate adding cullet or RAP, or both, by appropriate methods, to virgin aggregate material. Provide positive control for proportioning these materials into mixture.

(B) Material Transfer Vehicle (MTV). When placing HMGB, use of a MTV will not be required.

(C) Compaction. Where compacted thickness is greater than 6 inches, spread and compact mixture in two or more lifts approximately equal in thickness. Maximum compacted thickness of one lift shall be 6 inches.

Compact mixture immediately upon completion of spreading operations to density of not less than 92 percent of maximum theoretical specific gravity in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate.

(D) HMGB Surface and Thickness Tolerances. Place HMGB to a thickness that when thoroughly compacted conforms to shape and dimension indicated in the contract documents. Limit surface deviations to not more than 1/2 inch above or below theoretical grade.

The combined thickness of HMGB and asphalt concrete pavement shall be within 1/2 inch of combined thickness indicated in the contract documents.

312.04 Measurement. HMGB course will be paid on a lump sum basis. Measurement for payment will not apply.

312.05 Payment. The Engineer will pay for the accepted HMGB on a contract lump sum basis. Payment will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will pay for the following pay item when included in the proposal schedule:

Pay Item	Pay Unit
Hot Mix Glassphalt Base Course	Lump Sum

No adjustment to the contract lump sum price will be made if hot mix asphalt base or RAP, or both are substituted for HMGB.

The Engineer may, in lieu of requiring removal and replacement, use a sliding scale pay factor to accept HMGB compacted below 92 percent. The Engineer will pay for material in that production day at a reduced price calculated by multiplying proportionate unit price by factor as indicated in Table 312.05-1 - Sliding Scale Pay Factor.

TABLE 312.05-1- SLIDING SCALE PAY FACTOR

Percent Compaction	Percent Payment
92 or greater	100
90 to less than 92	80
Less than 90	Removal

END SECTION 312