

TECHNICAL SPECIFICATIONS  
FOR  
ASPHALTIC CONCRETE SURFACE

1. Description

This work shall consist of an asphaltic concrete pavement composed of a mixture of coarse aggregate, fine aggregate, mineral filler if specified or required, and asphalt cement, constructed on a prepared roadbed in accordance with these Specifications and in reasonably close conformity with the lines, grades, typical cross sections and rate of application shown on the Plans, or established by the Engineer.

2. Materials

(a) Asphalt Cement

- 1) Asphalt cement shall conform to the requirements of PG-64-22 as specified in Subsection 904.01 TDOTSS, January 1, 2015, and all special provisions pertaining thereto through the date of the advertisement for this Contract.
- 2) Asphalt cement used with aggregate Grading D and E mixtures shall be treated with an anti-stripping additive as specified in Subsection 918.09(B) TDOTSS, January 1, 2015, and all special provisions pertaining thereto through the date of the advertisement for this Contract.

(b) Mineral Aggregate

Mineral aggregates shall conform to the following requirements and Subsection 903.11, TDOTSS, January 1, 2015, and as revised by all Special Provisions dated through the date of the advertisement of this Contract, with the following exceptions and additions:

The Combined Grading:

The several aggregate fractions shall be sized, graded, and combined in such proportions that the resulting composite blend will meet one of the following grading requirements, as specified, together with the stipulations pertaining to the constituents of the blend hereinafter specified.

ASPHALTIC CONCRETE SURFACE COURSE  
MIXTURE DESIGNATION

MASTER RANGE OF GRADATIONS

Total Percent Passing, by Weight

Grading Sieve Size	D	E
1/2"	95-100	95-100
3/8"	80-93	80-93
No. 4	54-76	54-76
No. 8	35-57	35-57
No. 30	17-29	17-29
No. 50	10-18	10-18
No. 100	3-10	3-11
No. 200	0-6.5	0-8

Grading D

The coarse aggregate shall consist of crushed gravel, crushed granite, crushed quartzite or crushed gneiss. Other crushed aggregate may be used provided it has the following chemical, physical, and performance characteristics for Type I, Type II or Type III aggregate, per TDOTSS 903.11. Crushed slag will not be permitted as a coarse or fine aggregate.

The fine aggregate shall consist of natural sand or sand manufactured from gravel or from crushed stone aggregate meeting the physical and chemical requirements listed above. The use of carbonate rocks such as limestone and dolomite or other aggregates tending to polish under traffic will not be permitted in the coarse aggregate and will be permitted only to the extent specified herein in the fine aggregate.

In addition to the other requirements of these Specifications, the composition of the mineral aggregate shall be such that when combined with the required amount of bitumen the resultant mixture shall have:

High Volume Roads (ADT over 1000)

*Minimum Stability, kN (lbs) -	9.0 (2000)
*Void Content (%) -	3-5.5
*Flow, mm (.01 inch) -	2-4 (8-16)
*Minimum VMA (%) -	14
**Dust to Asphalt Ratio -	0.6-1.2

\*Tested in accordance with AASHTO T 245 with 75 blows of the hammer on each side of the test specimen, using a Marshall Mechanical Compactor.

\*\*The dust to asphalt ratio is the percent of the total aggregate sample that passes the 75 um (200 mesh) sieve as determined by AASHTO T11 divided by the percent asphalt in the total mix.

The addition of limestone screenings or agricultural limestone in a maximum amount of 25 percent by weight of the mineral aggregate may be required to comply with this section. When crushed stone screenings meeting the requirements of Subsection 903.11(c) are used, all additional fines shall be natural or manufactured sand. A maximum of 5 percent mineral filler meeting the requirements of Subsection 903.16 may be substituted for an equal quantity of the limestone fines. If the mixture does not comply with the design criteria, another source of aggregate shall be required.

When gravel is used as the coarse aggregate for a 411 Grading “D” mix, a minimum of 20 percent by weight limestone screenings, agricultural limestone and/or mineral filler shall be required.

#### Grading E:

When Grading E is to be used as a surface for traffic lanes, the mineral aggregate shall be composed of not less than 50 percent, nor more than 80 percent crushed limestone, and not more than 50 percent or not less than 20 percent natural sand, sand manufactured from gravel, or any combination of these materials, except as herein specified. All or any part of this mix may be calcareous sandstone, including Size 10 (screenings) or manufactured sand.

The sand percentage on the job mix formula shall be in the range of 20-50 percent. However, if needed to meet or improve the specified design criteria, the limestone and sand percentage may be altered by the numerical value of 5 percent from the percentage shown by the Contractor on the original job mix formula. If the aggregate percentages shown on the original job mix formula are altered, the Contractor shall submit a new job mix formula using the aggregate percentages shown on the Design.

In addition to the other requirements of these Specifications where Grading E is used for the riding surface, the composition of the mineral aggregate shall be such that when combined with the required amount of bitumen, the resultant mixture shall have:

#### High Volume Roads (ADT over 1000)

*Minimum Stability, kN (lbs) -	9.0 (2000)
*Void Content (%) -	3-5.5
*Flow, mm (.01 inch) -	2-4 (8-16)
*Minimum VMA (%) -	14

\*Tested in accordance with AASHTO T245 with 75 blows of the hammer on each side of the test specimen, using a Marshall Mechanical Compactor.

If the design criteria above cannot be obtained with the aggregate submitted to the laboratory for design, another source of aggregate will be necessary.

3. Composition of Mixtures

- (a) The asphaltic concrete surface shall be composed of aggregate, filler if required, and bituminous material. The mix shall meet all applicable requirements of Subsection 407.03 of TDOTSS January 1, 2015.
- (b) The proportions by weight of the total mixture shall be combined in such proportions as to produce mixtures within the following master composition limits.

Proportions of Total Mixture, Percent by Weight

	Combined Mineral	
<u>Surface Courses</u>	<u>Aggregate</u>	<u>Asphalt Cement</u>
Grading D and E*	93.0 - 94.7%	5.3 - 7.0

\* If Grading "E" is used as a roadway surface mix, the above proportions shall be changed to 93.0-95.5 and 4.5-7.0 for mineral aggregate and asphalt cement respectively.

4. Equipment

All the equipment necessary for the construction shall be approved before the work will be permitted to begin. The equipment shall meet the requirements of Subsections 407.04 through 407.08, TDOTSS, January 1, 2015, and as revised by all Special Provisions dated through the date of advertisement for this Contract.

5. Construction Requirements

- (a) The construction requirements shall be as prescribed in Subsection 407.09 and Subsections 407.11 through 407.16 of TDOTSS, January 1, 2015, and the requirements listed below.
- (b) The Plans will indicate whether the bituminous pavement is to be constructed on an asphalt base or an existing surface.
- (c) When bituminous mixes are placed upon existing bituminous pavement, any areas containing excess bitumen and any failures in existing pavement shall be removed to a depth up to 3 feet and backfilled with crushed stone base up to the bottom of the surrounding pavement structure and with appropriate asphaltic base, leveling or surface material to the existing surface, all as directed by the Engineer. Crushed stone base material, asphaltic base, leveling and surface materials to be paid at Contract Unit Price for those items. Pavement removal and undercut up to 3 feet will be measured and paid in accordance with Subparagraphs 6(e) and 7(c) of this section.

The existing pavement surface shall be thoroughly cleaned of all dirt and loose particles prior to the application of tack coat as specified in Specifications for Tack Coat.

- (d) The joints, between new asphaltic pavement and bridges, concrete pavement, etc. shall have a joint prepared with the existing pavement by grinding, scarifying, or saw cutting the existing pavement for a length of six (6) feet, the full width of the existing pavement, and to the depth of the overlay of new material. The six (6) feet length of cut may be a wedge cut varying from zero (0) to the required depth over six (6) feet). On new construction projects, all joints shall be constructed as above.

- (e) Thickness shall be controlled during the spreading operation by frequent measurements taken of the freshly spread mixture to establish relationship between the noncompacted mixture and the completed course. Thickness or pounds per square yard shall be within reasonably close conformity with that specified on the Plans.
- (f) The surface shall meet the requirements of Subsection 407.18 of TDOTSS, January 1, 2015, and when tested the deviation of the surface from the testing straightedge shall not exceed 1/4 inch.
- (g) Costs for joints shall be included in the cost of the aggregate for asphaltic concrete surface.

6. Method of Measurement

- (a) Asphaltic concrete surface shall include mineral aggregate and asphaltic cement. Measurement shall be by the ton of 2,000 pounds of asphaltic concrete surface accepted and placed as indicated or directed.
- (b) Material for tack coat will be measured for payment as prescribed in the Specifications for tack coat.
- (c) Adjustment of sewer manholes and castings will be measured for payment as prescribed in its Specifications.
- (d) No allowance will be made for unacceptable material, for material used in replacing defective or condemned construction, or for materials wasted in handling, hauling, or otherwise.
- (e) The surface measurements of any pavement, base or subbase removal shall be made in square yards by the Engineer prior to backfilling.

7. Basis of Payment

- (a) The accepted quantity of Mineral Aggregate and Asphalt Cement (PG-64-22) for Asphaltic Concrete Surfaces, complete in place shall be paid for at the Contract unit price per ton listed in the Bid Schedule. This price shall be full compensation for all work, materials, labor and other incidentals required to complete the work in accordance with the Plans and Specifications.
- (b) The acceptance of the mixture shall be as determined in Subsection 407.20(B) of TDOTSS, January 1, 2015, and all Special Provisions pertaining thereto through the date of the advertisement for the Contract.
- (c) The accepted quantity of pavement removal (up to 3' in depth) shall be paid for at the Contract Unit Price per square yard listed in the Bid Schedule. This price shall be full compensation for all work, labor, equipment, and other incidentals required to complete the work in accordance with the Plans and Specifications.