

802 BITUMINOUS MATERIALS

802.01 GENERAL

In accordance with the quality control plan of the manufacturer and as approved by DDOT QA/QC Division, each delivery of bituminous material shall be accompanied by a copy of recently (not more than 4 weeks) certified results of test on the material being delivered and a statement as to the type and amount of material contained in each carrier and the identification of the storage tanks from which the material is being delivered. This statement shall be presented to the Chief Engineer or his representative upon delivery.

802.02 PERFORMANCE GRADED ASPHALT

- (A) **PERFORMANCE GRADED ASPHALT BINDER** – Mixes containing all virgin materials shall conform to AASHTO M-320, Table 1. The asphalt binder recovered from the final plant mixed material will be considered Rolling Thin Film Oven (RTFO) material and shall conform to AASHTO M-320 for the specified performance grade.

The PG binder shall be pre-approved by DDOT.

The Contractor shall submit a certificate of analysis showing conformance with the PG Binder Specification AASHTO M-320

The PG binder for HMA mixes shall be achieved by the use of neat asphalt with elastomer polymer modifications when needed.

Functional Classification of Streets	Asphalt Binder
Interstate	P.G. 70-22
Other Freeways and Expressways	P.G. 70-22
Principal Arterials	P.G. 70-22
Minor Arterials	P.G. 64-22
Collectors	P.G. 64-22
Local Streets	P.G. 64-22

- (B) **CERTIFICATION** – The manufacturer and hauler shall furnish as specified.

The manufacturer shall also certify:

- (1) Date and time of loading
- (2) Tank or blending system
- (3) Identification of hauling unit
- (4) Binder grade, temperature and quantity of materials
- (5) Complete certified analysis
- (6) Lot number, if applicable
- (7) Mixing and compaction temperatures when the binder is polymer modified.

The hauler shall also certify:

- (1) Identification of hauling unit
- (2) Binder grade and source of last delivery
- (3) The date of last delivery using this hauling tank and volume of material remaining in the tank at the time of current loading.

(C) PERFORMANCE GRADED ASPHALT MATERIAL FOR PARTIAL RE-CYCLING – As specified by the Chief Engineer.

802.03 CUT-BACK ASPHALT

Unless otherwise specified, cut-back asphalt shall meet the requirements of AASHTO M 82 for the Type and Grade specified.

Cut-back asphalt to be used as prime coat shall meet the requirements of AASHTO M 82, Grade MC-30.

802.04 EMULSIFIED ASPHALT

Emulsified asphalt for securing mulch shall meet the requirements of AASHTO M 140, SS-1 or AASHTO M 208 for the Type and Grade specified.

Emulsified asphalt to be used as tack coat shall meet the requirements of AASHTO M 140, Grades SS-1, SS-1h, or as specified.

802.05 BITUMINOUS MATERIALS FOR WATERPROOFING

- (A) ASPHALT PRIMER FOR WATERPROOFING.** Asphalt primer for waterproofing shall meet the requirements of ASTM D-41.
- (B) ASPHALT SEAL FOR WATERPROOFING.** Asphalt seal for waterproofing shall meet the requirements of ASTM D-449.
- (C) TAR PRIMER FOR WATERPROOFING.** Tar primer for waterproofing shall meet the requirements of D-450. For 2-ply waterproofing, Tar Primer shall be a liquid water gas tar or coal tar conforming to the following requirements:

Specific Gravity, 25/25° C (77/77° F)	1.03 to 1.12
Engier Viscosity, 40° C (104° F)	3 max.
Total Distillate, to 300° C (572° F)	50 max. by wt.
Bitumen Soluble in Carbon Disulphide	95% min.
Water	3.0 max. by total wt.

- (D) COAL-TAR PITCH SEAL FOR WATERPROOFING.** Coal-tar pitch seal for waterproofing shall meet the requirements of for the type specified.
- (E) BITUMINOUS SATURATED COTTON FABRIC.** Bituminous saturated cotton fabric used in waterproofing shall meet the requirements of.
- (F) WATERPROOFING MEMBRANE.** Waterproofing membrane shall conform to ASTM D 6153.

802.06 SOFTENING AGENT

Softening agents used to reconstitute the bitumen of recycled asphaltic concrete shall be asphalt cement or a modifying agent and shall conform to these specification requirements.

802.07 LIQUID ANTI STRIP ADDITIVE

The Chief Engineer shall determine the compatibility of the asphalt, aggregates, and liquid anti strip additive proposed for use in accordance with [818.02](#). Liquid anti strip additives shall be introduced at the refinery or at the plant by line blending, metering or other measuring to assure accurate proportioning and thorough mixing.

802.08 EMULSIFIED ASPHALT FOR CONCRETE VAULTS

Emulsified asphalt used as a protective coating and moisture barrier for cast-in-place and precast concrete vaults, shall meet the requirements of ASTM D1227, Type I.

802.09 ASPHALT FOR PERMEABLE BASE

Asphalt for Permeable Base shall conform to the following:

Property	AASHTO Test	Spec.	Deviation
Test on Original Binder	100	90 or remove	
Rotational Viscosity @ 135°C, Pa-s	TP 48	3.0	---
Dynamic Shear, 10 rad/s, G*/Sin Delta, kPa	TP 5	1.00+ @ 76°C	0.99-
Flash Point, °C	T 48	232+	
Solubility, percent	T 44	99.0+	---
Sep. of Polymer, 163°C, 48 hr. °C, dif R&B top to bot	2-	---	
Force Ductility Ratio (f2/f1, 4°C, 5cm/min., f2 @ 30 cm elongation	T 300	0.30+	0.29-
Force Ductility, 4°C, 5 cm/min, 30 cm elongation, kg	T 300	---	---
Test on Rolling Thin Film Residue	T 240	---	---
Mass Loss, percent	T 240	1.00-	1.01+
Dynamic Shear, 10 rad/s, G*/Sin Delta, kPa	TP 5	2.20+ @ 76°C	2.19-
Elastic Recovery. 25°C, 10 cm elongation, percent	T 301	60+	59-
Ductility, 25°C, 5 cm/min, cm	T 51	---	---
Test on Pressure aging Vessel	PP 1		

Residue

Dynamic Shear, @ 25°C 10 rad/s, G*/Sin Delta, kPa	TP 5	5000-	---
Bending Beam Creep Stiffness, S, Mpa @ -12°C	TP 1	300-	---
Bending Beam Creep Slope, m value @ -12°C	TP 1	0.300+	---

Rotational Viscosity will be measured to determine product uniformity. The rotational viscosity measured by the supplier shall be noted on the Certificate of Delivery. A binder having a rotational viscosity of 3.0 Pa-s or less will typically have adequate mixing and pumping capabilities. Binders with rotational viscosity values higher than 3.0 Pa-s should be used with caution and only after consulting with the supplier as to any special handling procedures and guarantees of mixing and pumping capabilities.

Solubility - Not all polymers are soluble in the specified solvents. If the polymer modified asphalt digested in the solvent will not pass the filter media, a sample of the base asphalt used in making the polymer modified asphalt should be tested for solubility. If the solubility of the base asphalt is at least 99.0%, the material will be considered as passing.

Separation of Polymer Test - to be used for pre-blended modified asphalt cement materials.

Elastic Recovery - AASHTO T 301 except the standard v-shaped sides for the specimen mold shall be replaced by straight-sided inserts of the same length, so that the specimen will contain a section 1 cm x 1 cm x 3 cm.