705.6
following performance graded binders will be used in the counties as listed (county where the project is located):

PG 64-22: Berkeley, Boone, Braxton, Brooke, Cabell, Calhoun, Clay, Doddridge, Fayette, Gilmer, Hampshire, Hancock, Harrison, Jackson, Jefferson, Kanawha, Lewis, Lincoln, Logan, McDowell, Marion, Marshall, Mason, Mercer, Mineral, Mingo, Monongalia, Monroe, Morgan, Nicholas, Ohio, Pleasants, Putnam, Raleigh, Ritchie, Roane, Summers, Taylor, Tyler, Wayne, Wetzel, Wirt, Wood, Wyoming.

PG 58-28: Pendleton, Pocahontas, Randolph, Tucker.

For the counties of Barbour, Grant, Greenbrier, Hardy, Preston, Upshur, and Webster, either PG 64-22 or PG 58-28 may be used at the contractor's option.

705.6-BLANK

705.7-ASPHALT FOR DAMPPROOFING AND WATERPROOFING:
Materials shall conform to the requirements of AASHTO M 115. Type B.

705.8-PRIMER FOR USE WITH ASPHALT IN DAMPPROOFING AND WATERPROOFING:
This primer shall conform to the requirements of AASHTO M 116.

705.9 THROUGH 705.10-BLANK

705.11-CATIONIC EMULSIFIED ASPHALT:
Cationic emulsified asphalt shall conform to the requirements of AASHTO M 208.

706-BLANK

SECTION 707
CONCRETE ADMIXTURES, CURING AND COATING MATERIALS

707.1-AIR-ENTRAINING ADMIXTURES FOR CONCRETE:

707.1.1-Acceptance Requirements for Air-Entraining Admixtures:

707.1.1.1-In the event that the Contractor elects to use an air-entraining admixture, evidence based on tests made in a recognized laboratory shall be submitted to show that the material conforms to the requirements of AASHTO

M 154 for 7-day and 28-day compressive and flexural strengths and resistance to freezing and thawing, except as provided in 707.1.1.2. Tests for bleeding, bond strength and volume change will not be required unless specifically called for in the Plans. A "recognized" laboratory is any Division, Federal Highway Administration or cement and concrete laboratory regularly inspected by the Cement and Concrete Reference Laboratory of the National Bureau of Standards. Tests may be made upon samples taken from a quantity submitted by the Contractor for use on the project or upon samples submitted and certified by the manufacturer as representative of the admixture to be supplied.

707.1.1.2-An exception to the requirements in the preceding paragraph is the case of air-entraining admixtures which are manufactured by neutralizing Vinsol resin with caustic soda (sodium hydroxide). When the Contractor proposes to use such an admixture, the Contractor shall submit a certificate concerning the admixture is the following form:

"This is to certify that the product (trade name) as manufactured and sold by the (company) is an aqueous solution of Vinsol resin that has been neutralized with sodium hydroxide. The ratio of sodium hydroxide to Vinsol resin is one part of sodium hydroxide to (number) parts of Vinsol resin. The percentage of solids based on the residue dried at 221° F (105° C) is (number). No other additive or chemical agent is present in this solution."

707.1.1.3-When the Contractor proposes to use a air-entraining admixture which has been previously approved, the Contractor shall submit a certification stating that the admixture is the same as that previously approved. If an admixture offered for use is essentially the same (with only minor differences in concentration) as another previously approved material, a certification will be required stating that the product is essentially the same as the approved admixture and that no other admixture or chemical agent is present.

707.1.2-Optional Acceptance Requirements for Air-Entraining Admixtures:

707.1.2.1-The Division may elect to approve air-entraining admixtures as satisfactorily meeting acceptance requirements as outlined. If the Division chooses to exercise this option, then the acceptance requirements specified in 707.1.1 above shall be modified as noted.

707.1.2.2-The Division may develop a spectroscopic standard for an air-entraining admixture if such air-entraining admixture has previously been approved by the Division as satisfactorily meeting all the specification requirements as set forth in 707.1.1.

707.1.2.3-When a Contractor proposes to use an air-entraining admixture for which a spectroscopic standard has been developed, then the air-entraining admixture may be approved without further certification being made if a

special analysis made on a representative sample of the admixture proposed for use on the project compares satisfactorily with the standard related thereto.

707.1.3-Additional Test Requirements for Air-Entraining Admixtures (Optional):

707.1.3.1-Either prior to or at any time during construction, the Engineer may require that the admixture selected by the Contractor be further tested to determine its effect upon the strength of the concrete. When so tested, the seven-day compressive strength of concrete made with the cement and aggregates in the proportions to be used in the work and containing the admixture under test is an amount sufficient to produce from four to seven percent entrained air in the plastic concrete shall be not less than 88 percent of the strength of concrete made with the same materials and with the same cement content and consistency but without the admixture.

707.1.3.2-The percentage reduction in strength shall be calculated from the average strength of at least five standard 6 by 12-in. (150 by300 mm) cylinders of each type of concrete. Specimens shall be made and cured in the laboratory in accordance with the requirements of ASTM C 192 and shall be tested in accordance with the requirements of ASTM C 39. The percentage of entrained air shall be determined in accordance with the requirements of ASTM C 231.

707.1.3.3-Admixtures failing to meet the above requirements will be rejected.

707.2-WATER-REDUCING AND RETARDING ADMIXTURES FOR CONCRETE:

707.2.1-Acceptance Requirements for Approval of Retarders: Water reducing and retarding admixtures for concrete shall conform to the requirements of AASHTO M 194, Type D or Type G.

707.2.2-Performance Requirements for Concrete Retarders:

707.2.2.1-The retarding effect caused by water-reducing and retarding admixtures may vary widely with different types of cement, cement from different mills, aggregates from different sources and of different gradation, and changes in water-cement ratio. Therefore, no retarder shall be used until the concrete of the specified class, designed in accordance with the Specifications and made with the ingredients proposed for use by the Contractor, including Type D or Type G admixtures as specified or permitted under this specification, is shown to meet the requirements of AASHTO M 194 for water reduction and compressive strength increases at ages 3, 7 and 28 days.

707.2.2.2-The mix shall contain the quantity of admixture recommended by the manufacturer at the prevailing temperature.

707.2.3-Optional Performance Requirements for Concrete Retarders:

707.2.3.1-The Division may elect to approve water-reducing and retarding admixtures as satisfactorily meeting performance requirements as outlined. If the Division chooses to exercise this option, then the performance tests specified in 707.2.2 will be waived.

707.2.3.2-The Division's testing laboratory may design concrete mixes in which various types and gradings of aggregates and various types of cements are used and in which water-reducing and retarding admixtures are used, the admixtures first having met the acceptance requirements for approval of concrete retarders as specified in 707.2.1. The water-reducing and retarding admixtures used in laboratory design mixes may be subjected to a spectral analysis, and a spectroscopic standard or a standard spectrograph may be developed if the admixture in combination with the particular type and grading of aggregate and the particular type of cement has met the performance requirements for water-reducing admixtures as specified in 707.2.2.

707.2.3.3-When a Contractor proposes to use a water-reducing and retarding admixture with a type of grading of aggregate and a type of cement which was previously used in a laboratory design mix and for which a special standard is available, the retarder may be approved on the basis of a spectral analysis made on a representative sample of the admixture proposed for use on the project if:

i. The spectral analysis compares satisfactorily with the standard related thereto, and
ii. The admixture met performance requirements in previous tests conducted in the Division's laboratory as outlined in 707.2.3.2.

707.2.4-Certification of Water-Reducing and Retarding Admixtures: When a Contractor proposes to use an approved water-reducing and retarding admixture, the Contractor shall submit a certificate stating that the admixture is identical in composition with the sample that was used for the acceptance tests. If the admixture varies in concentration from the acceptance sample, a certificate will be required stating that the product is essentially the same for chemical ingredients as the approved admixture, and that no other admixture or chemical has been added.

707.2.5-Additional Test Requirements for Water-Reducing and Retarding Admixtures (Optional): Either prior to or at any time during construction, the Engineer may require the selected admixture to be tested further to determine its effect on the strength of the concrete. When so tested

the retarder shall meet the requirements specified in 707.2.2.

707.3-WATER-REDUCING ADMIXTURES FOR CONCRETE:

707.3.1-Acceptance Requirements for Approval of Water-Reducers: Water-reducing admixtures for concrete shall conform to the requirements of AASHTO M 194, Type A or Type F.

707.3.2-Performance Requirements for Concrete Water-Reducers:

707.3.2.1-The effects of using water-reducing admixtures may vary widely with different types of cement, cement from different mills, aggregate proportions, aggregates from different sources and of different gradation, and changes in water-cement ratio. Therefore, no water-reducer shall be used until the concrete of the specified class, designed in accordance with these Specifications and made with the ingredients proposed for use by the Contractor, including Type A or Type F admixtures as specified or permitted under this Specification, is shown to meet the requirements of AASHTO M 194 for water reduction and compressive strength increases at ages 3, 7 and 28 days.

707.3.2.2-The mix shall contain the quantity of admixture recommended by the manufacturer at the prevailing temperature.

707.3.3-Optional Performance Requirements for Concrete Water-Reducers:

707.3.3.1-The Division may elect to approve water-reducing admixtures as satisfactorily meeting performance requirements as outlined. If the Division chooses to exercise this option, then the performance tests specified in 707.3.2 will be waived.

707.3.3.2-The Division's testing laboratory may design concrete mixes in which various types and gradings of aggregates and various types of cement are used and in which water-reducing admixtures are used, the admixture first having met the acceptance requirements for approval of concrete water-reducers as specified in 707.3.1. The water-reducing admixture used in laboratory design mixes may be subjected to a special analysis, and a spectroscopic standard or a standard spectrograph may be developed if the admixture in combination with the particular type and grading of aggregate and the particular type of cement has met the performance requirements for water-reducing admixtures as specified in 707.3.2.

707.3.3.3-When a Contractor proposes to use a water-reducing admixture with a type and grading of aggregate and a type of cement which was previously used in a laboratory design mix and for which a spectral standard is available, the water-reducer may be approved on the basis of a spectral analysis

made on a representative sample of the admixture proposed for use on the project if:

i. The spectral analysis compares satisfactorily with the standard related thereto, and
ii. The admixture met performance requirements in previous tests conducted in the Division's laboratory as outlined in 707.3.3.2.

707.3.4-Certification of Water-Reducing Admixtures: When a Contractor proposes to use an approved water-reducing admixture, the procedure set forth in 707.2.4 shall apply.

707.3.5-Additional Test Requirements for Water-Reducing Admixtures (Optional): Either prior to or at any time during construction, the Engineer may require the selected admixture to be tested further to determine its effect on the strength of the concrete. When so tested the water-reducer shall meet the requirements specified in 707.3.2.

707.4-POZZOLANIC ADDITIVES FOR USE IN PORTLAND CEMENT CONCRETE:

707.4.1-Fly ash shall conform to the following requirements when sampled and tested in accordance with the applicable Section of ASTM C311

FINENESS	Class F (ASTM C618)	Class C (ASTM C618)
Amount Retained on No. 325 (45 µm) Sieve	34% Max.	34% Max.
Loss on Ignition:	6% Max.	6% Max.
$Si0_2+A1_20_3+Fe_20_3$	70% Min.	50% Min

707.4.2-Ground granulated blast furnace slag shall conform to the requirements of AASHTO M302, Tables I and II except that slag activity index requirements of Table II do not apply.

707.4.3-Microsilica shall conform to requirements of AASHTO M 307 except Table 2 shall not apply.

707.5-BLANK

707.6-POLYETHYLENE COATED BURLAP FOR CURING

707.7

CONCRETE:

This material shall consist of burlap impregnated on one side with white opaque plastic film. The plastic film shall be securely bonded to the burlap. The film shall be clean and free of imperfections. Acceptance will be based on visual inspection.

707.7-BURLAP CLOTH MADE FROM JUTE OR KENAF FOR CURING CONCRETE:

The burlap cover shall be clean and free of defects. The cover shall provide a water retention blanket over the concrete. Acceptance will be based on visual inspection.

707.8-WATERPROOF PAPER FOR CURING CONCRETE:

Waterproof paper shall consist of two sheets of kraft paper cemented together with bituminous material and reinforced with fiber. The top surface shall be white. Acceptance will be based on visual inspection.

707.9-LIQUID MEMBRANE-FORMING COMPOUNDS FOR CURING CONCRETE:

Curing compounds shall conform to the requirements of AASHTO M148, Type 2, Class A.

707.10-WHITE POLYETHYLENE SHEETING (FILM) FOR CURING CONCRETE:

The sheeting shall be opaque white plastic film. The film shall be clean and free of imperfections. Acceptance will be based on visual inspection.

707.11-EPOXY RESIN PROTECTIVE COATING:

The material shall conform to the requirements of ASTM C881, Type III, Grades 1 or 2, Class B or C. Pigmentation shall be required in the system so the cured coating shall conform to Federal Color Standard 595, No. 16357.

707.12- Concrete Sealer:

707.12.1 – General: The material shall be a one component, water repellant penetrating sealer, meeting the criteria for Series II and Series IV (southern climate testing procedure) tests as referenced in NCHRP 244. The material shall be capable of meeting the criteria with a single coat and shall not alter the color of the treated surfaces.

707.12.2 – Acceptance: When using a sealer not on the Division's approved list, the Contractor shall furnish certified laboratory test data showing the material approved for the use meets the NCHRP 244 criteria at the manufacturers recommended rate of application.

SECTION 708
JOINT MATERIALS