OKLAHOMA DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISIONS
FOR
PLANT MIX BITUMINOUS BASES AND SURFACES

These Special Provisions revise, amend and where in conflict, supersede applicable sections of the 1999 Standard Specifications for Highway Construction, English and Metric, as applicable. Units of measurement are provided in the subsections in both English and Metric equivalents. The units applicable for this project will be those specified in the project plans.

708.02. MINERAL AGGREGATE. *(Add PFC column in Table 1 as follows:)*

TABLE 1
PHYSICAL PROPERTIES OF AGGREGATES

Test	PFC
L.A Abrasion(a) , % wear, maximum	30
Mechanically Fractured Faces [b c j], % minimum	100/95
Aggregate Durability Index [a], minimum	40
Insoluble Residue [d e], % minimum	40
Micro-Deval [a], % wear, maximum	25
Flat or Elongated Pieces [b c f], % maximum	10
Natural Sand and Gravel [b], % maximum	0
Clay Balls and Friable Particles [g], % maximum	0
Soft Particles [a], % maximum	5
Sticks or Roots [a], % maximum	0

[a] Applies to each source except as noted.
[b] Applies to the combined aggregate except as noted.
[c] Applies to the aggregate retained on the No.4 (4.75mm) sieve
[d] Applies to the combined coarse aggregate.
[e] Applies to the coarse aggregate used in the surface course. Does not apply to shoulders and temporary detours.
[f] A flat piece is one in which the maximum width is greater than 5 times the maximum thickness. An elongated piece is one in which the maximum length is greater than 5 times the maximum width.
[g] Applies to the combined aggregate. Provided the maximum for the combined aggregate is not exceeded, a maximum 1.5 percent will be allowed for any one source.
[j] In the requirement format "xx/yy", "xx" denotes the percentage of coarse aggregate requiring one fractured face and "yy" denotes the percentage of coarse aggregate requiring 2 fractured faces.
[l] Regardless of the actual design life of the roadway, the design ESALs are based on 20 years.

(a) Coarse Aggregate. *(Add the following:)* The coarse aggregate for PFC shall be that part of the aggregate retained on the No.8 (2.36mm) sieve and shall consist of clean, tough, durable particles.

(b) Fine Aggregate. *(Add the following:)* No fine aggregate shall be used in the permeable friction course.

Fine aggregate is defined as aggregate passing the No.8 (2.36mm) sieve and consisting of hard, durable grains of natural sand, crushed stone, stone dust, crushed gravel, mine chat or jig-sand or any combination of these materials.

708.04. COMPOSITION OF MIXTURES. *(Change as follows:)*

(a) Asphalt Mix Design and Initial Job-Mix Formula. The PFC mix design and initial job-mix formula are the responsibility of the Contractor and shall be submitted to the Materials Division for review. The review of the proposed mix design will be to determine that the mix meets the design criteria.

The Contractor shall furnish one mix design for each specific PFC mixture listed on the plans or in the Contract. The mix design shall be prepared in an approved laboratory of the Contractor's choice. A request for laboratory approval may be made either by a Contractor or a Laboratory. Approval will be according to the Materials Division Policy for Asphalt Mix Design Laboratories. Mix designs will not be approved for use until the Contractor submits an acceptance letter stating acceptance status, project number and mix design designation, or signs and returns the mix design to the Materials Engineer.

The initial job-mix formula shall meet the requirements of tables 5E and 6E. The contractor shall prepare a trial mixture.

If the trial mixture, prepared at the initial job-mix formula proportions, fails to meet the requirements of Tables 5E and 6E, the Contractor may propose changes to the job-mix formula. If the changes result in a mixture meeting these Specifications, the job-mix formula will be adjusted accordingly.

The job-mix formula shall establish a single percentage of aggregate passing each required sieve, a single percentage of asphalt to be contained in the mixture, and a single temperature of the mixture at point of discharge from the plant.

The job-mix formula with the allowable tolerances shown in Table 7 shall establish the Specification limits for each mixture. The aggregate gradation shall not exceed the broad range given in table 5E.

(c) Recycled Bituminous Pavements. *(Delete and replace as follows:)* No reclaimed asphalt pavement shall be used in the permeable friction course.

TABLE 5E
PFC MIXTURE GRADATION AND BINDER CRITERIA

Sieve	% Passing
3/4" (19.0mm)	100
1/2" (12.5mm)	80 - 100
3/8" (9.5mm)	35 - 60
No. 4 (4.75mm)	1 - 20
No. 8 (2.36mm)	1 - 10
No. 200 (0.075mm)	1 - 4
	% of mix weight
Binder Content	6.0 - 7.0
Cellulose Fiber	0.2 - 0.5
	% of binder weight

Anti-Stripping 0.5

TABLE 6E
PROPERTIES OF LABORATORY MOLDED SPECIMENS

Mixture Property	PFC Design Requirements	PFC Field Requirements
Drain-down	< 0.20 %	< 0.20 %
Lab-Molded Density [a]	80	82 max.

[a] PFC specimens shall be molded on a Superpave gyratory compactor at N = 50 gyrations.

Due to the inherently high air void content of PFC mixtures, the CoreLok™ apparatus according to OHD L-45 must be used to determine G_{mb} instead of the OHD L-14 method.

708.05. TOLERANCES. *(Add PFC column to Table 7:)*

TABLE 7
RANGE OF TOLERANCES FOR PFC MIXTURES

Sieve Size	Percent Passing
No.4 (4.75mm) & larger	± 7
No.8 (2.36mm)	± 5
No.200 (0.075mm)	± 2
Asphalt Cement	± 0.4 [a]
Temp. of mix as discharged from mixer, °F (°C)	± 20 (± 10)

[a] The tolerance shown for asphalt content is for individual samples. The average asphalt content by OHD L-26 shall be within ± 0.2 percent of the job-mix formula.

708.07. SAMPLING AND TESTING FOR PFC.
(a) Methods. Sampling and testing shall be done in accordance with AASHTO methods, except as noted below:

1. ***Sampling and Testing Aggregates:***

Sampling	T 2
Sieve Analysis	T 27
Material Passing No.200 (0.075 mm) Sieve	T 11
Los Angeles Abrasion	T 96
Mud, Clay Balls, Sand Clusters, Sticks and Roots, Retained on No. 4 (4.75 mm) Sieve	OHD L-9
Fractured Faces	OHD L-18
Flat or Elongated Particles in Coarse Aggregate	ASTM D4791
Aggregate Durability Index	T 210
Insoluble Residue	OHD L-25

Soft Particles	OHD L-38

2. ***Sampling and Testing Bituminous Mixtures:***

Mechanical Analysis of Extracted Aggregate	T 30
Sampling [a]	T 168
Bitumen Content	OHD L-26
Maximum Specific Gravity of Bituminous Paving Mixtures	T 209
Preparation and Density of Hot Mix Asphalt Specimens by SHRP Gyratory Compactor [b c]	T 312
Determination of Draindown Characteristics In Uncompacted Asphalt Mixtures	T 305
Determining the Specific Gravity and Unit Weight of Compacted Bituminous Mixtures Using the CoreLok™ Apparatus	OHD L-45

[a] The sample size of compacted bituminous pavement shall be in accordance with T 168.

[b] Lab molded specimens shall be compacted to N = 50 gyrations to determine the density, % of G_{mm}. All reported values shall be the average of 2 specimens.

[c] Design mixtures shall be mixed at 325°F (163°C), aged at 300°F (149°C) for a minimum of 2 hours and a maximum of 4 hours, and compacted at 300°F (149°C). Field samples shall be compacted at 300°F(149°C). No aging period is required for field samples, but they should be heated for a minimum of 2 hours to completely dry the sample and to ensure that the sample has stabilized at 300°F(149°C).

3. ***Testing Asphalt Materials:***

Performance Graded Asphalt Binder	MP 1
Accelerated Aging of Asphalt Binder Using a Pressure Aging Vessel	PP 1
Creep Stiffness by Bending Beam Rheometer	TP 1
Rheological Properties by Dynamic Shear Rheometer	TP 5
Grading or Verifying Asphalt Binder	PP 6
Solubility in Trichloroethylene	T 44
Flash and Fire Points by Cleveland Open Cup	T 48
Water	T 55
Rolling Thin Film Oven Test	T 240
Specific Gravity by Pycnometer	T 228