

**CITY OF LINCOLN, NEBRASKA, STANDARD SPECIFICATIONS**

**CHAPTER 6**

**ASPHALTIC CONCRETE CONSTRUCTION**

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## CHAPTER 6

### ASPHALTIC CONCRETE CONSTRUCTION

#### 6.00 GENERAL

This Work shall be defined as the construction of a completely new pavement structure or reconstruction of an existing pavement including earthwork, appurtenances, and all related construction required to connect to existing pavement around the limits of construction.

Patching shall be defined as pavement replacement of areas requiring small quantities of asphaltic concrete per placement such as utility crossing repair or larger quantity placements such as longitudinal cuts for utility work not requiring curb to curb asphalt replacement, and for other similar situations.

Asphaltic Concrete Pavement shall be defined as Class 1, an asphaltic concrete wearing surface placed on a Portland Cement Concrete (PCC) base or Class 2, an asphaltic concrete wearing surface placed on an asphaltic concrete base. The pavement structure shall be designed in accordance with The City of Lincoln Standard Plans. The wearing surface and asphaltic concrete base shall be of a type or types of asphaltic concrete as shown on the plans and which meet the Mix Design and Aggregate Criteria requirements describe below unless otherwise specified.

The thickness of the wearing surface or overlay shall be as shown on the plans or approved by the City's Project Manager. The base shall be of a thickness as shown on the plans. Lift thickness of the first asphaltic concrete base lift shall be between 3 inches and 5 inches after compaction to required density. All subsequent asphaltic concrete base lifts shall be between 1 1/2 and 3 inches in thickness after compaction to required density. PCC base shall meet the requirements of Chapters 3 and 5 of these Standard Specifications.

Asphaltic Concrete shall consist of an intimate mixture of naturally occurring mineral aggregates of required gradations and asphalt binder content as hereinafter specified. Unless otherwise specified or approved by the City Engineer, neither industrial nor manufacturing byproducts will be allowed in the mixture. Reclaimed Asphalt Pavement (RAP) shall be allowed as described later in these Standard Specifications.

Asphaltic Concrete mixtures shall be classified as:

- Type 1 (for use as surface course on arterial streets)
- Type 2 (for use as surface course on non-arterial streets)
- Type 3 (for use as surface and base on streets and parking lots)
- Type 4 (for use in patching as defined above)

The factor of 141 pounds per cubic foot shall be used to compute asphaltic concrete quantities of all types for design purposes.

## 6.01 MATERIALS

### A. ASPHALT BINDER

The suppliers for asphalt binder used in City of Lincoln projects shall be certified by the Nebraska Department of Roads (NDOR) to supply Performance Graded Binder in Nebraska.

The asphalt binder for all mixes shall conform to the requirements of AASHTO M 320 for Performance Graded Asphalt Binder and must meet all requirements for use on NDOR projects. The PG Binder shall meet or exceed both the upper and lower temperature targets of the PG Binder grades as shown in Table 6.02 A of these Standard Specifications unless directed otherwise by the City Engineer.

In addition, unless otherwise specified or directed by the City Engineer, the PG Binder shall be a binder which incorporates a blend of base asphalt and elastomeric modifiers of styrene-butadiene (SB), styrene-butadiene-styrene (SBS) or styrene-butadiene-rubber (SBR).

The composite material shall be thoroughly blended at the asphalt refinery or terminal prior to being loaded into the transport vehicle. The polymer modified binder shall be heat and storage stable and shall not separate when handled and stored per the suppliers storage and handling recommendations.

A Material Certification from the PG Binder Supplier shall be submitted prior to construction. The Material Certification must state that acid has not been used. The Material Certification must also state that the material has not been air blown or oxidized.

When moisture susceptibility testing indicates the need for an anti-stripping additive, it shall be added by the PG Binder Supplier. The Contractor shall be compensated for the cost of the anti-stripping additive at the invoice price of the additive. The bill of lading or delivery ticket shall state the binder grade, specific gravity, and the percentage of anti-strip additive.

## 6.01 MATERIALS (Continued)

### B. TACK COATS

#### 1. Rapid-Curing Cut-Back Asphalts

The rapid-curing cut-back asphalts to be used as tack coats shall conform to the requirements of AASHTO M 81, Cut-Back Asphalt (Rapid-Curing Type).

This Specification covers liquid petroleum products, produced by fluxing an asphaltic base with suitable petroleum distillates.

#### 2. Emulsified Asphalts

Emulsified asphalts shall conform to the following Specifications:

- ASTM Designation D 977 - Standard Spec. for Emulsified Asphalts
- ASTM Designation D 2397 - Standard Spec. for Cationic Emulsified Asphalts
- ASTM Designation D 140 - Standard Practice for Sampling Bituminous Materials
- ASTM Designation D 244 - Standard Testing Emulsified Asphalts

Emulsified asphalts covered by these Standard Specifications shall be diluted in the distributor with sufficient potable water to reduce the asphalt residue in the mixture to approximately thirty percent (30%). Emulsified asphalt shall be homogeneous within the thirty (30) days after delivery. If separation of the emulsified asphalt has not been caused by freezing, thorough mixing shall be used to achieve a homogeneous mixture.

### C. MINERAL AGGREGATES

#### 1. General

Mineral aggregates for asphaltic concrete shall conform to the following requirements except where modified herein:

- ASTM Designation D 692 - Standard Specification for Coarse Aggregate for Bituminous Paving Mixture
- ASTM Designation D 1073 - Standard Specification for Fine Aggregate for Bituminous Paving Mixture
- ASTM Designation D 242 - Standard Specification for Mineral Filler for Bituminous Paving Mixture

## 6.01 MATERIALS (Continued)

### C. MINERAL AGGREGATES (Continued)

#### 1. General (Continued)

Mineral aggregates shall be crushed rock, broken stone, crushed gravel, sand-gravel, coarse sand, fine sand or a mixture of these materials composed of clean, hard, durable, and non-coated particles, free from injurious quantities of clay, dust, soft or flaky particles, loams, shale, alkali, organic matter, or other deleterious material. Chat or coal sand will not be allowed in any mix.

Crushed rock shall be crushed limestone, granite, quartzite, or other ledge rock approved for the intended purpose by the City Engineer and shall not contain deleterious substances in a quantity exceeding three and one-half percent (3.5%) of any combination of shale, clay lumps, coal, or soft particles with shale and clay lumps not to exceed one and one-half percent (1.5%).

The absorption of water by crushed rock for use in asphaltic concrete shall not exceed three and two-tenths percent (3.2%) by weight.

The mineral aggregate from different sources of supply shall not be mixed or stored in the same pile, nor used alternately in the same class of construction or mixed without permission from the City's Project Manager. All fractions of a crushed rock gradation shall be produced from the same type of material.

The chemical and physical characteristics of the fraction passing the # 4 sieve shall be substantially the same as those of the material which may be produced in the laboratory from the fraction which is retained on the # 4 sieve.

Mineral aggregates shall have a soundness loss of not more than 12 percent by weight at the end of 5 cycles using sodium sulfate solution.

Mineral aggregates shall be tested prior to use and shall conform to the above requirements based on the following test designations.

- ASTM C 127 - Specific Gravity & Absorption of Coarse Aggregates
- ASTM D 75 - Standard Practice for Sampling Aggregates
- ASTM C 136 - Standard Test Method for Sieve Analysis of Fine & Coarse Aggregates
- ASTM D 546 - Standard Test Method for Sieve Analysis of Mineral Filler for Bituminous Paving Mixtures
- ASTM C 128 - Specific Gravity & Absorption of Fine Aggregates
- ASTM C 131 - Standard Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion Impact in the Los Angeles Machine
- ASTM C 88 - Standard Test Method for Soundness of Aggregate
- ASTM D 693 - Standard Spec. for Crushed Aggregate for Macadam Pavements

**6.01 MATERIALS (Continued)**

**C. MINERAL AGGREGATES (Continued)**

**2. Mineral Fillers**

Mineral filler shall consist of pulverized soil, pulverized crushed rock, broken stone, gravel, sand-gravel, sand, or a mixture of these materials that conforms to the following requirements:

**TABLE 6.01 A - MINERAL FILLER REQUIREMENTS**

<b>Criteria</b>	<b>Minimum</b>	<b>Maximum</b>
Total Percent Passing the #50 (300 μm) Sieve	95	100
Total Percent Passing the #200 (75 μm) Sieve	80	100
Plasticity Index non-soil material passing #200 (75 μm)	0	3
Plasticity Index for Soil	0	6

**D. RECLAIMED ASPHALT PAVEMENT (RAP)**

Reclaimed Asphalt Pavement (RAP) may come from the job site or the Contractor’s stockpile. In either case, the Contractor will be responsible for testing the RAP prior to use. Tests shall include at a minimum, AC content and gradation. Test results shall be reported to the City's Project Manager for approval prior to use.

**E. NON-WOVEN PAVEMENT OVERLAY FABRIC**

Non-woven overlay fabric shall be furnished by an ISO approved manufacturer of polypropylene or polyester geo-synthetic fabric and shall be needle punched and heat treated on one side and shall conform to the following requirements:

<b>PROPERTY</b>	<b>MINIMUM</b>	<b>ASTM</b>
Mass, oz./sq. yd.	4.1	D 3776
Tensile Strength, lb.	102	D 4642
Elongation at Break, %	50	D 1682
Mullen Burst Strength, lb.	200	D 3786
Asphalt Retention, gal./sq. yd.	0.21	D 6140

Acceptance shall be based upon manufacturer's certification of conformity.

## 6.02 ASPHALTIC CONCRETE MIXTURES

### A. GENERAL

Asphaltic concrete mixtures shall be designed by the Contractor to meet the Mix Design Criteria for the appropriate mix types as shown in these Standard Specifications.

Unless otherwise specified or approved by the City Engineer, Asphaltic Concrete for Type 1 Mix shall meet or exceed all of the requirements for “Superpave-SPH” as described in these Standard Specifications.

Unless otherwise specified or approved by the City Engineer, Asphaltic Concrete for Mix Types 2 and 3 shall meet or exceed all of the requirements for “Superpave-SPR” as described in these Standard Specifications.

Unless otherwise specified or approved by the City Engineer, Asphaltic Concrete for Type 4 Mix shall meet or exceed all of the requirements of the Asphaltic Concrete Mix Requirements Summary table shown below and all other applicable requirements of this specification.

**TABLE 6.02 A - ASPHALTIC CONCRETE MIX REQUIREMENTS SUMMARY**

Type (Use)	* Mix Requirements	AC Grade	Aggregate Blend		
			% RAP (Max.)	Virgin Agg.	Gradation Requirements
1 Surface Course Arterial Streets	SPH (Superpave)  5.1% Min. AC by weight of mix	PG 70-34	25%	Limestone 90% Max.	½” Band (Superpave)
2 Surface Course Non-Arterial Streets	SPR (Superpave)  5.0% Min. AC by weight of mix	PG 64-34	35%	Limestone 95% Max.	SPR Band (Superpave)
** 3 Surface and Base Lifts, Parking Lots, and Temporary Pavement	SPR (Superpave)  5.0% Min. AC by weight of mix	PG 64-34	50%	Limestone 95% Max.	SPR Band (Superpave)
*** 4 Patching	5.0% Min. AC by weight of mix	**** PG 58-28	50%	Limestone 95% Max.  ***** Crushed 80% Min.	% Passing ¾” - 100% Min. #200 - 10% Max.

\* % AC shall be determined by ignition oven results.

\*\* Type 3 mixtures will not require mix design verification testing by the City but Contractor’s mix design data must be approved by the City Engineer prior to use.

\*\*\* Type 4 mix for patching must be approved by the City Engineer prior to use.

\*\*\*\* PG 64-22 if less than 25% RAP in mix.

\*\*\*\*\* Indicates aggregates crushing by mechanical means.

## 6.02 ASPHALTIC CONCRETE MIXTURES (Continued)

### B. SUPERPAVE VOLUMETRIC MIX DESIGN

The Contractor will be required to define properties using a gyratory compactor that has met the Superpave evaluation test procedures, according to the gyration levels indicated for the mix type specified.

The mix formula shall be determined by the Contractor from a mix design for each mixture. A volumetric mixture design in accordance with the latest edition of the Asphalt Institute Publication, SP-2 will be required. However, the mixture for the Superpave specimens and maximum specific gravity mixture shall be short-term aged for two hours. Mixing and compaction temperatures shall be in accordance with the latest NDOR specifications.

The following test procedures shall apply:

- AASHTO R 30 - Practice for Short and Long-Term aging of Hot Mix Asphalt
- AASHTO T 84 - Specific Gravity and Absorption of Fine Aggregate
- AASHTO T 85 - Specific Gravity and Absorption of Coarse Aggregate
- AASHTO PP 19 - Practice for Volumetric Analysis of Compacted Hot Mix Asphalt
- AASHTO T 312 - Method for Preparing and Determining the Density of Hot Mix Asphalt Specimens by Means of the Superpave Gyratory Compactor
- AASHTO T 209 - Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- AASHTO T 283 - Resistance of Compacted Bituminous Mixture to Moisture induced Damage

The optimum binder content shall be the binder content that produces required air voids, at Ndes, in the plant produced mix. The design shall have at least four points, including a minimum of two points above and one point below the optimum. The amount of un-compacted mixture shall be determined in accordance with AASHTO T 209.

Each Superpave mixture shall be tested by the Contractor for moisture susceptibility in accordance with AASHTO T 283. The loose mixture shall be short-term aged for two hours in accordance with AASHTO R30. The 6-inch specimens shall be compacted in accordance with AASHTO T 312 to 7 percent air voids at 95-mm in height and evaluated to determine if the minimum Tensile Strength Ratio (TSR) of 80 percent has been met. If the mixture has not met the minimum TSR value, the Contractor shall have the option of modifying the mixture, as approved by the City Engineer, and retesting to verify that the minimum TSR of 80 percent has been achieved or by having an approved liquid anti-stripping additive added to the PG Binder, by the PG Binder Supplier, at a dosage rate, such that the mix will meet the minimum TSR of 80 percent.

All data shall be submitted with the mix design for approval. During production, the Contractor may be required by the City's Project Manager, to provide and test additional specimens of the plant produced asphaltic concrete for moisture susceptibility. A TSR test result of less than 80 percent will require mixture modification(s) and a sample from subsequent lots will be tested by the Contractor until a TSR value of at least 80 percent is achieved.

Changes in the types or sources of aggregates or binder may require a new job mix formula, mix design, and moisture susceptibility test. If required, the new proposed job mix formula shall be in accordance with the requirements as stated above and submitted 5 working days prior to use for approval.

## 6.02 ASPHALTIC CONCRETE MIXTURES (Continued)

### B. SUPERPAVE VOLUMETRIC MIX DESIGN (Continued)

#### 1. MATERIALS SAMPLING AND TESTING

At the beginning of each year and at least 14 days before production of asphaltic concrete, the Contractor shall submit, in writing, a tentative job mix formula and material samples as described below, for approval, to the City Engineer. The job mix formula shall identify the mineral aggregates and mineral filler, if needed, with the value of the percent passing each specified sieve for the individual and blended materials.

A 65 pound bag of each of the individual mineral aggregates and RAP, if used, shall also be submitted to the City Engineer at this time. Each sample shall be marked to clearly indicate the type of material, name of the producer, and the pit location.

The Contractor shall submit, to the City Engineer, three proportioned 10,000-gram samples of the blended aggregates and a 1 gallon sample of the asphalt binder to be used in the mixture. Whenever RAP is used, it shall be processed through an ignition oven and then combined proportionally with the virgin aggregate in one of the 10,000-gram samples. The remaining two 10,000-gram samples shall be made up of the unprocessed RAP combined proportionally with the virgin aggregate. Submitted with these samples shall be a copy of the mix design values obtained from tests performed by the Contractor. This mix design shall include at a minimum, the following information:

- The bulk specific gravity (Gsb) of the blended aggregate (The specific gravity shall be determined for the combined blend from the unwashed portion of the - #4 and the + #4 material in accordance with AASHTO T 84 & T 85 respectively)
- The target asphalt binder content by total mix
- The supplier, grade, and specific gravity of the PG Binder
- The maximum specific gravity of the combined mixture (Rice)
- The average bulk specific gravity and air voids at N initial (Nini), N design (Ndes), and N maximum (Nmax) of the compacted gyratory specimens
- Voids in the Mineral Aggregate (VMA) and Voids filled with Asphalt (VFA) at Ndes
- Fine Aggregate Angularity (FAA), Coarse Aggregate Angularity (CAA), Flat and Elongated Particles and Clay Content of the aggregate blend

#### 2. MIX DESIGN CRITERIA

The design criteria for each mixture shall be determined from the following Tables.

The optimum binder content shall be the binder content that produces 4.0% air voids at Ndes for SPH mixes and 3.0% at Ndes for SPR mixes in the plant produced mix. Binder content shall be determined by ignition oven.

**6.02 ASPHALTIC CONCRETE MIXTURES (Continued)**

**B. SUPERPAVE VOLUMETRIC MIX DESIGN (Continued)**

**2. MIX DESIGN CRITERIA (Continued)**

**TABLE 6.02 B - MINIMUM BINDER REQUIREMENTS**

Mix Type	Minimum Binder Content (% by wt. of mix)
SPH	5.1%
SPR	5.0%

**TABLE 6.02 C - GYRATORY COMPACTION EFFORT**

Asphaltic Concrete Type	Nini	Ndes	Nmax
SPR	7	65	100
SPH	8	95	150

Average Design High Air Temperature = < 39 degrees C (102° F)

**TABLE 6.02 D – GYRATORY COMPACTION TEMPERATURE**

Mix Type	% RAP	COMPACTION TEMP. ° F
SPR	0-35	280 ± 5
	36-50	290 ± 5
SPH	0-35	300 ± 5

**TABLE 6.02 E - VOIDS IN MINERAL AGGREGATE \***

Nominal Maximum Aggregate Size	Recommended VMA, Percent (Criteria at Ndes)
SPR	12.0
½ (0.500) inch	14.0

\* For Design purposes only.

**TABLE 6.02 F - VOIDS FILLED WITH ASPHALT \***

Asphaltic Concrete Type	Recommended VFA, Percent
SPR	70 - 80
SPH	65 - 75

\* For Design purposes only.

**3. AGGREGATE BLEND CRITERIA**

**a. Coarse Aggregate Angularity (CAA)**

The coarse aggregate angularity value of the blended aggregate material shall meet or exceed the minimum values for the appropriate asphaltic concrete type shown in Table 6.02 G.

**TABLE 6.02 G - COARSE AGGREGATE ANGULARITY (ASTM D 5821)**

Asphaltic Concrete Type	CAA (minimum)
SPR	83
SPH	95/90*

\* Denotes two faced crushed requirements

**6.02 ASPHALTIC CONCRETE MIXTURES (Continued)**

**B. SUPERPAVE VOLUMETRIC MIX DESIGN (Continued)**

**3. AGGREGATE BLEND CRITERIA (Continued)**

**a. Coarse Aggregate Angularity (CAA) (Continued)**

Aggregate obtained from the residue of the ignition process shall not be used for the determination of CAA for mix design approval except when RAP material is specified and must be combined with the proportioned amount of virgin aggregate as defined by the mix design.

**b. Fine Aggregate Angularity (FAA)**

The fine aggregate angularity value of the blended aggregate material shall meet or exceed the minimum values for the appropriate asphaltic concrete type shown in Table 6.02 H.

The specific gravity for calculation of the FAA shall be based on a combined aggregate sample of material passing the No. 8 sieve and retained on the No. 100 sieve.

**TABLE 6.02 H - FINE AGGREGATE ANGULARITY  
(AASHTO T 304 METHOD A)**

<b>Asphaltic Concrete Type</b>	<b>FAA (minimum)</b>
SPR	43.0
SPH	45.0

Aggregate obtained from the residue of the ignition process shall not be used for the determination of FAA for mix design approval except when RAP material is specified and must be combined with the proportioned amount of virgin aggregate as defined by the mix design.

**c. Flat and elongated particles**

The coarse aggregate shall not contain flat and elongated particles exceeding the maximum value for the appropriate asphaltic concrete type shown in Table 6.02 I.

**TABLE 6.02 I - FLAT AND ELONGATED PARTICLES\* (ASTM D 4791)**

<b>Asphaltic Concrete Type</b>	<b>Percent, Maximum</b>
SPR	10
SPH	10

\* Criterion based on a 5:1 maximum to minimum ratio

**d. Clay Content**

The Clay Content of the blended aggregate material shall be such that the Sand Equivalent Minimum value for the appropriate asphaltic concrete type as shown in Table 6.02 J shall be met or exceeded.

**6.02 ASPHALTIC CONCRETE MIXTURES (Continued)**

**B. SUPERPAVE VOLUMETRIC MIX DESIGN (Continued)**

**3. AGGREGATE BLEND CRITERIA (Continued)**

**d. Clay Content (Continued)**

**TABLE 6.02 J – SAND EQUIVALENT CRITERIA (AASHTO T 176)**

<b>Asphaltic Concrete Type</b>	<b>Sand Equivalent, Minimum</b>
SPR	45
SPH	45

**e. Gradation**

The blended aggregate shall conform to the gradation requirements specified below for the appropriate nominal size.

The dust to binder ratio is the ratio of the percentage by weight of aggregate finer than the No. 200 sieve to the asphalt content expressed as a percent by weight of total mix.

The dust to binder ratio shall be between 0.7 and 1.7. This shall be verified during mix design approval and production sample testing.

**TABLE 6.02 K - GRADATION CONTROL POINTS FOR 0.500 (½) INCH NOMINAL SIZE**

<b>Sieve</b>	<b>Control Points (percent passing)</b>	
	<b>Minimum</b>	<b>Maximum</b>
3/4 inch	100.0	
½ inch	90.0	100.0
3/8 inch		90.0
No. 8	28.0	58.0
No. 16		
No. 30		
No. 50		
No. 200	2.0	10.0

**TABLE 6.02 L - GRADATION CONTROL POINTS FOR SPR**

<b>Sieve</b>	<b>Control Points (percent passing)</b>	
	<b>Minimum</b>	<b>Maximum</b>
3/4 inch		
3/8 inch	81.0	96.0
No. 8	46.0	56.0
No. 50	12.0	21.0
No. 200	4.0	9.0

**6.02 ASPHALTIC CONCRETE MIXTURES (Continued)**

**C. PRODUCTION SAMPLING AND TESTING**

During production, asphaltic concrete shall be sampled and tested for acceptance by the City’s Project Manager on a lot basis. A minimum of one sample shall be required for each lot of asphaltic concrete. A lot is defined as each 500 tons or fraction thereof of each day’s production. The location of the required samples shall be determined by the City’s Project Manager.

Tests shall include the following:

- AASHTO T 209 - Maximum specific gravity of the mix (Rice)
- ASTM C 136 - Standard Test Method for Sieve analysis of Fine and Coarse Aggregate
- AASHTO T312 - Method for Preparing and Determining the Density of Hot Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor
- AASHTO T 166 - Bulk Specific Gravity of compacted Bituminous Mixtures using saturated surface-dry specimens
- AASHTO T 138 - Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the ignition method

**TABLE 6.02 M - ASPHALTIC CONCRETE PRODUCTION TOLERANCES**

<b>Test</b>	<b>Mix Type</b>	
	<b>SPH</b>	<b>SPR</b>
AC	5.1% Min. (None)	5.0% Min. (None)
Air Voids	4% (+/- 1%)	3% (+/- 1%)
FAA (cold feed)	45 Min. (-0.50)	43 Min. (-0.20)
FAA (ignition oven)	45 Min (-1.00)	43 Min. (-0.50)

If at the end of the day’s production, the tolerances in Table 6.02 M are exceeded, the Contractor will not be allowed to resume production until corrective adjustments are made to the mix design.

Mix adjustments at the plant are authorized within the limits shown in Table 6.02 N without redesigning the initially approved mix.

The adjustment must produce a mix with the percent air voids and all other properties as stated in these Standard Specifications.

All adjustments must be reported to the City Engineer.

The adjustment values in Table 6.02 N will be the tolerances allowed for changes indicated by production or mix design test results, but cannot deviate from Superpave gradation criteria.

**6.02 ASPHALTIC CONCRETE MIXTURES (Continued)**

**C. PRODUCTION SAMPLING AND TESTING (Continued)**

**TABLE 6.02 N - AGGREGATE ADJUSTMENT TOLERANCE**

<b>Aggregate Adjustments</b>	
<b>Sieve Size</b>	<b>Adjustment Range</b>
1 inch, 3/4 inch, 1/2 inch, 3/8 inch, No. 4	± 6%
No. 8, No. 16, No. 30, No. 50	± 4%
No. 200	± 2%

**6.03 EQUIPMENT**

**A. GENERAL**

All equipment, tools and machinery shall be adequate for the purpose for which it is to be used, and shall be maintained in satisfactory working condition at all times. The equipment shall be at the Work site sufficiently in advance of construction operations to be thoroughly examined and approved by the City's Project Manager. The Contractor shall furnish the necessary accessories, equipment data, and assistance required by the City's Project Manager for making tests and calibrations on equipment.

The Contractor shall furnish the necessary accessories and personnel and shall perform calibrations on the equipment. Copies of the calibration data shall be provided to the City's Project Manager before production of Asphaltic Concrete. In the event problems are encountered during the calibrations, the Contractor shall arrange for a trained technician or company representative of the company from which the equipment was obtained to make the necessary repairs and/or adjustments to the equipment. Calibrations shall be made as often as is deemed necessary by the City's Project Manager to ensure accuracy of the equipment.

In the event that a Contractor elects to obtain asphaltic concrete from a commercial plant not under his direct control, he shall reach agreement with the commercial producer to perform the above functions in the same manner as though the plant was under his direct control. The Contractor shall also reach agreement with the producer to furnish or shall arrange to have furnished an approved building for use by the City Engineer if deemed necessary by the City's Project Manager.

## 6.03 EQUIPMENT (Continued)

### B. MIXING PLANT

#### 1. General

The equipment that is used for heating, proportioning, and mixing the aggregates and asphalt cement shall be able to produce a uniform mixture.

The dryers shall be able to dry and heat all aggregates to the required temperatures with positive control. Aggregates shall be agitated continuously during the process of heating. Damage to the asphalt cement in dryer-drum type mixing plants shall be avoided.

Salvaged bituminous material shall not be exposed to open flame.

Continuous temperature and time readings of the asphaltic materials shall be electronically recorded whenever the plant is operated. A copy of the temperature reading shall be made available to the City's Project Manager. Temperature and time displays shall be easily accessible. Temperature and time sensors will be provided at the following locations:

- a. Inside the asphaltic concrete mixture discharge chute.
- b. Inside the surge bin.
- c. Inside the asphalt cement storage tank.

During storage, the asphalt cement temperature shall be maintained between 250F and 350F or at the storage temperature range recommended by the binder supplier. All plants shall be equipped with a circulating system for asphalt cement which is designed to assure proper and continuous circulation during the operating period. Storage tanks shall have sufficient capacity to provide for continuous operation. The tanks shall be situated and constructed to allow the volume of the asphalt cement to be safely and accurately determined at any time.

If the plant is equipped with a surge bin for the temporary storage of asphaltic concrete, the asphaltic concrete taken from the surge bin will not differ significantly from the material taken directly from the plant. The first material entering the bin will be the first material removed. The surge bin shall be completely emptied at the end of each operating day unless insulated or heated.

All plants shall be equipped with a continuously operated dust collector. The collected material may be wasted or returned to the mix.

Mineral filler bins shall be protected from moisture.

#### 2. Pug-mill Plants

##### a. General

Pug-mill plants shall include cold aggregate feeders, oversize screens, storage bins for dried aggregate, ingredient proportioning devices, and all other equipment necessary to produce the specified mixture. The pug-mill blades shall have a minimum clearance of 3/4 inch from all fixed and moving parts. The mixer shall be equipped with a discharge hopper holding approximately 1 ton of hot mixture and capable of intermittent discharge.

## 6.03 EQUIPMENT (Continued)

### B. MIXING PLANT (Continued)

#### 2. Pugmill Plants (Continued)

##### b. Batch Plants

Batch plants shall have an accurate time lock to control the operations during a complete mixing cycle. They shall lock the scale box gate after the charging of the mixer until the closing of the mixer gate at the completion of the cycle. They shall lock the bituminous material bucket throughout the dry mixing period and shall lock the mixer gate throughout the dry and wet mixing periods.

The dry mixing period is defined as the time between the opening of the scale box gate and the addition of bituminous material. The wet mixing period is the interval of time between the addition of bituminous material and the opening of the mixer gate.

The control of the timing shall be flexible and capable of being set at 5-second intervals or less throughout a total cycle of not less than 3 minutes. A mechanical batch counter shall be installed as a part of the timing device and shall be designed and constructed to register only upon the release of the bituminous material. It shall not register any dry batches or any material wasted through the bins. The timing device shall have a suitable case with a locking door that shall always be kept closed and locked except when adjustments or repairs are required.

All batch plants shall be equipped with an asphalt cement volume meter or a heated or insulated asphalt bucket with scales.

Scale hoppers and scales for proportioning aggregates and asphalt to the batch plant's mixer shall be accurate within 0.5 percent; and they shall be sensitive within 0.2 percent or 2 pounds, whichever is greater, throughout the range of use.

##### c. Continuous Type

Plants shall be equipped with a pump synchronized to the feeding mechanism so that the required percentage of asphalt cement is applied continuously and uniformly. The feeding system shall be synchronized to the rest of the plant.

#### 3. Dryer-Drum Plants

These plants shall include cold aggregate feeders, vibratory screening units for removing oversize material from both virgin and reclaimed material, proportioning devices for controlling the quantity of each ingredient in the mixture, and any other equipment necessary to produce the mixture as specified.

Plants shall be equipped with a pump synchronized to the feeding mechanism so that the required percentage of asphalt cement is applied continuously and uniformly. The feeding system shall be synchronized to the rest of the plant.

## 6.03 EQUIPMENT (Continued)

### C. TRUCK SCALES

Truck scales shall be furnished by the Contractor for weighing loaded trucks at the plant site, and shall be installed on adequate foundations and in accordance with the manufacturer's recommendations. The scales shall have sufficient capacity to weigh the maximum axle, combination of axles or gross load used and shall be accurate to one-half percent (0.5%) of the total axle load or total load.

Scales shall be properly calibrated by the Contractor in the presence of the City's Project Manager unless the scales have current Nebraska Department of Agriculture inspection approval or unless calibration and adjustment by a recognized scale company service crew has been performed during the current season, and attested to by the City's Project Manager. The scales shall be periodically cross-checked for accuracy during the course of the Work by checking the net weight of loads of the material being produced on commercial scales in the vicinity of the project which have current agriculture inspection approval. The Contractor shall furnish at least ten (10) 50 pound weights for checking the accuracy of the scales. If the scale is not capable of weighing all axles at one time, the approaches shall be extended so the entire hauling unit will be level during weighing. Chuck holes, ruts or high spots in the approaches which develop during hauling operations shall be immediately repaired as directed by the City's Project Manager.

All weighing shall be done with the hauling unit stationary, level, and out of gear. Suitable protection shall be provided against wind currents that may affect the accuracy of the scales. The platform of the scale shall be kept clean and free from accumulations of materials, as directed by the City's Project Manager.

Serially numbered duplicated scale tickets shall be furnished to accompany each truck load of material to the unloading point. Scale tickets shall reflect the date, time, load number, total weight, tare weight, project number, mix type, destination, and net weight.

### D. DISTRIBUTORS

Whenever the use of a distributor is required, that piece of equipment shall be manufactured expressly for the purpose of applying heated asphaltic materials by pressure spray applications. Improvised equipment, such as converted road oilers, will not be acceptable. The distributor shall be so designed as to permit the application of heated asphaltic material in a uniform spray without atomization at the rate, temperature, and pressure required. The distributor shall be equipped with a tachometer registering revolutions per minute and so located as to be visible to the driver in order that the driver may maintain the constant speed required for the specified rate of application. The distributor shall be mounted on a motor truck or trailer, equipped with pneumatic tires. The pump shall be equipped with a meter registering the number of gallons (liters) per minute passing through the nozzle and this meter must be visible to the operator. The distributor shall be equipped with an accurate thermometer which indicates the temperature of the asphaltic materials at all times. The distributor shall be equipped with a full circulating spray bar and shall be provided with hand nozzles to permit application to areas not accessible to the spray bar. The distributor shall be equipped with a drip tray or other suitable means of preventing the dripping of material after the flow has been shut off.

### 6.03 EQUIPMENT (Continued)

#### E. ASPHALT SPREADER AND FINISHER

The mechanical asphalt spreader and finisher shall be self-propelled and shall be designed and equipped to spread upon the prepared surface without segregation of the mixture, a tamped and finished wearing surface of asphaltic concrete free from hollows and humps.

The machine shall be equipped with a hopper to receive the asphaltic concrete as it is dumped from the trucks and shall be designed so as to prevent the mixture from being deposited directly on the base or previously laid courses. The hopper shall have a suitable device to distribute the mix evenly across the full width of the screed. The machine shall be equipped with means of adjusting the thickness of the mat, and the transverse and longitudinal grade. It shall be equipped with a tamping or vibrating screed which shall be operated during the lay-down process to compact the applied material to a uniform density. No part of the machine shall travel on the freshly laid material. There shall be auxiliary attachments for the machine so that it may be adjusted to lay widths as approved by the City's Project Manager.

#### F. ROLLERS

The number and type of rollers furnished shall be adequate to produce the specified density and a satisfactory surface.

Wheels of all rollers shall be smooth and free from openings or projections which would mar the surface of the Work. They shall be equipped with suitable devices necessary to prevent adhesion of bituminous material to the tires and wheels. The rollers shall be equipped with water tanks for wheel sprinkling devices that extend the full width of each roller, and drip pans designed so as to prevent oil, grease, gas or diesel oil from spilling or dripping onto the asphaltic concrete surface.

## 6.03 EQUIPMENT (Continued)

### G. SURFACE MILLING MACHINE

The milling shall be done with a commercially manufactured machine able to perform this work to the City's Project Manager's satisfaction. The milling machine shall be self-propelled and shall have sufficient power, traction, and stability to maintain an accurate depth of cut. Pavement removal by scarifying, motor grading or heating will not be allowed as milling.

The milling machine shall be equipped with automatic controls for establishing profile grades at each edge of the machine. The reference shall be the existing pavement or taut reference lines erected and maintained by the Contractor true to line and grade. A single reference may be used if the machine can maintain the designated transverse slope.

When referenced from existing pavement, the cold milling machine shall be controlled by a self-contained grade reference system provided by the machine's manufacturer for that purpose. The sensing point shall react to compensate for 25 percent of the actual change in elevation due to a hump or dip that is 3 feet (900 mm) or less in length. The self-contained grade reference system shall be used at or near the centerline of the roadway. On the adjacent pass with the milling machine, a joint matching shoe may be used.

Broken, missing, or worn teeth shall be replaced if the machine is unable to maintain the surface texture requirements.

The machine shall be equipped with a loading elevator to remove the milled material from the roadway surface.

The machine shall be equipped with means to effectively control dust generated by the cutting operation.

### H. TRUCKS

Numbered trucks having tight, clean, smooth beds shall be used for transporting the freshly prepared asphaltic concrete to the site of the Work. The beds shall be sprayed, when necessary, to prevent the asphaltic concrete mixture from adhering to the bed, with a minimum quantity of approved lubricant. The equipment used and the frequency of spraying shall be determined by the City's Project Manager.

All trucks shall be equipped with a suitable waterproof canvas cover to protect the material as required by the City's Project Manager. Any truck that causes excessive segregation of materials by the action of its spring suspension or other contributing factors, or that causes undue delays, shall not be used for transporting the asphaltic concrete mixtures. All truck beds shall be so constructed that they may be insulated, when necessary. All truck boxes shall be equipped with box vibrators.

## 6.04 CONSTRUCTION METHODS

### A. SUBGRADE

Subgrade shall be prepared as described in Chapter 2 of these Standard Specifications.

### B. CLEANING

Prior to the application of asphaltic materials on existing base, the surface on which the asphalt is to be placed shall be thoroughly cleaned by means of mechanical sweepers, street flushers, shovels, scrapers, and hand brooms as is necessary to remove all mud, matted earth, dust and other foreign materials. Power sweeping shall be conducted in such a manner as to keep dust and debris under control and cause a minimum of disturbance to surrounding areas. Material cleaned from the surface shall be removed and disposed of by the Contractor.

The cost of cleaning the existing surfaces to which asphalt is to be applied shall be considered subsidiary to other items for which payment is made.

### C. SURFACE MILLING

Surface milling, where required, shall consist of removing and salvaging existing surfacing material to a depth and width as shown in the plans or as directed by the City's Project Manager. The Contractor shall remove all pavement millings which result from the performance of this work and dispose or transport them to locations as provided in the Contract or as approved by the City's Project Manager.

The interface between the surface milled area and the concrete gutter pan shall be cleaned of all old asphalt and maintained to provide a smooth, straight, and vertical surface.

The Contractor shall be responsible for location and protection of all manholes, valve boxes, and all other appurtenances, some of which may be below the surface of the street, and to protect equipment from the danger of striking same. Claims for any and all damages arising from hitting these appurtenances shall be the Contractor's responsibility. The Contractor shall have access to applicable records; however, the Contractor shall not rely upon these records to reveal all such hidden appurtenances.

The Contractor shall be held responsible for all appurtenances in the pavement surface which have been damaged or disturbed by the Contractor. The cost of repairing or replacing these damaged appurtenances shall be made at the Contractor's expense.

#### 1. BASIS OF PAYMENT

SURFACE MILLING, completed in conformance with the plans and Standard Specifications and accepted by the City's Project Manager, shall be measured and paid for at the contract unit price bid per square yard. Such payment shall be full compensation for all surface preparation, milling, removal of materials, labor, tools, equipment, clean up and incidentals necessary to complete the Work.

### D. CORRECTION OF PAVEMENT FAILURES

After the surface milling and cleaning have been accomplished, the City's Project Manager shall examine the pavement structure to which the asphaltic concrete is to be applied. Any pavement failures shall be repaired as designated by the City's Project Manager. The cost of repairing pavement failures shall be measured and paid for at the appropriate unit prices or shall be accomplished as an Extra Work Item.

## 6.04 CONSTRUCTION METHODS (Continued)

### E. TACKING

This Work shall consist of the application of asphaltic materials to previously prepared bases or existing surfaces.

After the surface is completely cleaned and dry it shall have a tack coat of rapid curing cut-back asphalt or emulsified asphalt applied sufficiently in advance of the laying operation to break or cure prior to the application of the surface coat.

Traffic shall not be permitted on the tack coat without the permission of the City's Project Manager, and the asphalt surface course shall be applied as soon as the tack breaks and the water has evaporated. The rate of application generally should be from 0.05 to 0.2 gallons per square yard, with the rate of application to be approved by the City's Project Manager. Tack or asphaltic cement shall be applied by hand to all vertical edges.

The cost of supplying and applying tack coat will not be measured for payment. It shall be considered subsidiary for other items to which direct payment is made.

### F. NON-WOVEN PAVEMENT OVERLAY FABRIC PLACEMENT

Non-woven pavement overlay fabric and asphaltic cement sealant shall be placed at locations called for on the plans. This Work shall consist of the application of an asphalt sealant and the placement of a non-woven pavement overlay fabric over the entire prepared surface of the pavement to be surfaced or resurfaced with asphalt. Sealants are applied both to seal the existing surface and to provide a cement to adhere to the fabric. Emulsified asphalts are not acceptable for sealant.

Sealant and fabric shall be placed only when the ambient air temperature is 50°F or above. The pavement surface on which the sealant fabric is to be placed shall be dry and free of dirt, debris and other foreign matter. Joint and crack openings of 1/8 inch and larger shall be filled with a suitable material as directed by the City's Project Manager. The asphalt sealant shall be applied with distributor equipment at a rate of 0.25 to 0.30 gallons per square yard. The width of the asphalt sealant application shall be the fabric width plus 2 to 6 inches or the entire width of the pavement to be surfaced. Temperature of the sealant shall be not less than 280°F at the time of application to ensure a uniform spray pattern.

No drilling or skipping shall be permitted. Asphalt drools or spills shall be cleaned from the pavement surface to avoid flushing and possible fabric movement at these asphalt rich areas. Fabric lay-down equipment shall be used for placement of the fabric. Overlap of fabric joints shall be 1 to 3 inches.

Immediately after the placement, the fabric shall be embedded into the asphalt cement sealant with a pneumatic roller, unless otherwise directed by the City's Project Manager. The construction of the asphaltic concrete overlay shall follow closely the placement of the fabric. In the event the sealant bleeds through the fabric before the overlay is placed, the Contractor shall be required to spread a thin layer of sand or asphaltic concrete over the affected areas in order to prevent the fabric from being picked up by the construction equipment. The application of tack coat will not be required on the fabric prior to the placement of the asphaltic concrete unless a delay in the placement of the overlay results in the fabric becoming dry or dirty.

## 6.04 CONSTRUCTION METHODS (Continued)

### F. NON-WOVEN PAVEMENT OVERLAY FABRIC PLACEMENT (Continued)

#### 1. BASIS OF PAYMENT

Placement of the non-woven pavement overlay fabric shall be measured and paid for at the contract unit price bid per square yard for the item NON-WOVEN PAVEMENT OVERLAY FABRIC. Such payment shall be full compensation for cleaning and preparing the pavement surface, filling joint and crack openings; for furnishing, heating, and applying the asphalt sealant; for placement and rolling of the fabric; for furnishing and applying material for blotting the surface of the fabric as required; and for all equipment, labor, tools, and incidentals required to complete the Work.

### G. HAULING

Clean trucks fully fueled shall be weighed in the morning when starting up and then again in the early afternoon to obtain accurate tare weights. The City's Project Manager may also require re-weighing at any time to obtain new tare weights.

### H. JOINTING

Longitudinal and transverse joints shall be made in such a manner that well bonded and sealed joints are achieved. Joints between old and new pavement shall be made in such a manner as to insure a thorough and continuous bond between the old and new surface.

Cold joints shall be painted with a light application of asphalt cement before the adjacent material is placed. When placing surface course, a hot joint between lane placements shall be maintained as directed by the City's Project Manager.

Joints in the surface course shall be formed by any approved method that will produce a dense vertical joint; otherwise the previously laid surface course shall be cut back to its full depth so as to expose a fresh surface, after which the hot mixture shall be placed in contact with it and raked to proper depth and grade.

## 6.04 CONSTRUCTION METHODS (Continued)

### I. SPREADING

Asphaltic concrete used in the construction of sections having a uniform width as shown in the typical cross section of the plans, shall be spread and finished with an approved mechanical spreading and finishing machine. The operation of placing mixtures shall be continuous, as nearly as possible.

The asphaltic concrete mixture shall be dumped in the center of the hopper of the spreading machine. Care shall be exercised to avoid overloading and slopping over of the mixture on the base, pavement, or previously laid asphaltic concrete. The operating speed and depth of strike-off of the spreading and finishing machine shall be regulated so as to produce a well knit, uniform layer of the required compacted thickness.

The asphaltic concrete mixture shall be laid only upon a surface which is dry and free from frost.

When the asphaltic concrete mixture is placed in irregular or narrow sections, intersections, or other areas where it is impractical to spread and finish the mixture by methods previously specified, the Contractor may use other equipment or acceptable hand methods for spreading the mixtures, as approved by the City's Project Manager.

The cost of hauling, jointing and spreading the asphaltic concrete mixture shall be considered subsidiary to other items for which payment is made.

### J. COMPACTION

Immediately after spreading, the mixture shall be compacted thoroughly by rolling. The number, weight, types of rollers, sequence of rolling operations and compaction procedures shall be such that the required density and a satisfactory surface are attained consistently while the mixture is in a workable condition.

The initial rolling shall begin as soon as the material will bear the weight of the roller without displacing the material. The final compaction and finishing shall be performed by rollers while the material is still hot and responds to the action of the roller. Rolling shall not be carried on in such a manner or at such a time as will cause shoving or cracking. No additional rolling or compaction will be allowed after final compaction.

The asphaltic concrete shall be compacted to required density such that the completed surface is slightly above the surface of the concrete at the gutter pan joint. This compaction shall be attained without the roller coming into contact with the concrete gutter pan and shall be smooth, true and conform to the grade, cross section and contour required without any irregularities that exceed 1/8 inch when tested with a 10 foot straightedge.

All areas not accessible to the equipment specified shall be compacted and finished by other equipment and methods that will provide a satisfactory surface and the specified density. Any areas determined by the City's Project Manager to be defective, shall be immediately reworked to the satisfaction of the City's Project Manager.

No measurement or direct payment shall be made for the operation of rolling asphaltic concrete pavement. The cost thereof shall be considered subsidiary to other items for which direct payment is made.

**6.04 CONSTRUCTION METHODS (Continued)**

**K. ASPHALTIC CONCRETE CURB**

Asphaltic concrete curb shall be constructed of a mix as shown on the plans or approved by the City's Project Manager. The curb shall conform to the shape and dimensions that are shown on the plans.

Whenever possible the asphaltic concrete curb shall be shaped and compacted with a curb machine capable of constructing the curb true to line, grade, and cross section and to a density and with a surface texture which is satisfactory to the City's Project Manager.

Special precautions shall be taken to provide a proper bond between the surface course and the curb. The surface shall be thoroughly cleaned and tacked with hot asphalt cement. If performed during cool weather, the surface course shall be heated so that it is sufficiently plastic to form a bond with the hot asphaltic concrete curb.

**1. BASIS OF PAYMENT**

ASPHALTIC CONCRETE CURB shall be paid for at the contract unit price bid per linear foot.

**L. COLD WEATHER PLACEMENT**

Asphaltic concrete shall not be placed on frozen or frost covered sub-grade or base. The Cold Weather Placement table shown below shall be used by the City's Project Manager to restrict the routine placement of asphaltic concrete as a result of cold temperatures. Wind velocity, cloud cover, and other project specific conditions will be considered by the City's Project Manager if deviating from this Table.

**TABLE 6.04 A – COLD WEATHER PLACEMENT**

<b>Lift Thickness</b>	<b>Minimum Surface Temperature</b>
Less than 2 inches	45°F
2 to 3 inches	37°F
Greater than 3 inches	35°F

## **6.05 DENSITY CORE SAMPLES**

### **A. GENERAL**

During the construction of asphaltic concrete pavement, the Contractor shall obtain core samples from each pavement lift for the determination of density. A minimum of one sample shall be required for each lot of asphaltic concrete. These samples shall be taken not later than two working days after the date of placement of the asphaltic concrete at locations designated by the Engineer. Cores shall be a minimum of 4 inches in diameter and shall be taken under direct supervision of the City's Project Manager and given to him/her immediately after removal from the pavement. The surfaces from which the samples have been taken shall be cleaned, dried, filled and compacted by the Contractor with hot asphaltic concrete mixture immediately after core removal. Density samples shall be tested in accordance with the Nebraska Standard Method of Tests for specific gravity of compressed bituminous mixtures, NDR T 166.

### **B. COMPACTION REQUIREMENTS**

Asphaltic concrete shall be compacted to a density of not less than ninety-two and one half percent (92.5%) of the void-less density for that mixture. The void-less density for each lot sample shall be tested in accordance with the Nebraska Standard method of test for Maximum Specific Gravity of Bituminous Paving Mixtures, NDR T 209. If any density test result indicates a compaction value of less than ninety-two and one half percent (92.5%) of the void-less density, two additional cores will be obtained from that lot by the Contractor at points designated by the City's Project Manager. These samples shall be taken and the surface restored as described above not later than seven days after the date of placement of the asphaltic concrete. The average density of the three samples shall be considered the density of the lot.

### **C. OVERLAYS**

Overlays shall be sampled and tested for density when the average thickness of the overlay is greater than 1 inch. The average overlay thickness shall be determined from the core samples located by the City's Project Manager as described above. The thickness of the samples shall be the average of four measurements made at four equally spaced locations on the perimeter of the sample. When the average thickness is 1 inch or less the testing of density for this layer shall be waived.

**6.06 BASIS OF PAYMENT**

Asphaltic concrete shall be paid for on a lot basis, as described above, at the contract unit price bid per ton for ASPHALTIC CONCRETE, TYPE \_\_\_ and subject to the payment tables for production density and air voids as described below. The amount of asphaltic concrete to be paid for shall be the net weight of the material actually incorporated into the work. Such payment shall be full compensation for all mixing, hauling, tack coats, spreading, compacting to required density, materials, equipment, tools, labor, and incidentals necessary to construct the asphaltic concrete surface course to the required thickness or as directed by the City's Project Manager.

**TABLE 6.06 A – DENSITY ACCEPTANCE SCHEDULE**

Average Density	Min. # Samples	% of Payment
92.5 and above	1	100
92.0 to 92.4	3	95
91.5 to 91.9	3	90
91.0 to 91.4	3	85
90.5 to 90.9	3	80
90.0 to 90.4	3	70
89.9 or less	3	40 or reject

**TABLE 6.06 B – AIR VOID ACCEPTANCE SCHEDULE \***

Air Voids Type 1 (SPH)	% of Payment
Less than 1.5	50 or reject
1.5 to 1.9	50
2.0 to 2.4	95
2.5 to 2.9	98
3.0 to 5.0	100
5.1 to 5.5	98
5.6 to 6.0	95
6.1 to 6.5	90
6.6 to 7.0	50
More than 7.0	50 or reject

\* Air Void Acceptance Schedule Table only applies to Type 1 Arterial surface course.

**TABLE 6.06 C – AC CONTENT ACCEPTANCE SCHEDULE**

% Below Minimum AC	% of Payment
0.2	80
0.3	70
0.4	60
Greater than 0.4	50 or reject