

SECTION 406

ASPHALTIC CONCRETE

406-1 Description

The work under this section shall consist of furnishing all materials, mixing at a plant, hauling, placing and compacting a mixture of aggregate, recycled asphalt pavement (RAP) if utilized, asphalt cement and approved mineral admixture to form an asphaltic pavement course or for other purposes as specified and in accordance with the details shown on the project plans and the requirements of these specifications.

When allowed by an Agency, RAP may be used in the mixture provided all requirements of the specifications are met; however, RAP will not be allowed in the mixture when asphalt cement type PG 76-22 TR+ is specified. References to the use of RAP in this section apply only if RAP is utilized as part of the mixture.

Agency	Use of RAP in Base Lift(s)	Use of RAP in Surface Lift
City of Tucson	Yes	No
Pima County	Yes	Yes
Town of Marana	Yes	No
Town of Oro Valley	Yes	No
Town of Sahuarita	No	No

Asphaltic concrete shall be produced in a batch mixing plant, a continuous pugmill mixing plant or a drum drier mixing plant. Proportioning shall be either by hot-feed control or cold-feed control.

406-2 Materials

406-2.01 General. The contractor shall obtain Agency approval of materials before any material is mixed at any plants. Approval of coarse and fine mineral aggregates shall be in accordance with Section 1001 - Material Source of the Standard Specifications.

Collector, minor and major arterial streets and other streets identified in the contract documents shall be classified as high volume roads. Residential and local roads and other streets or pavements identified in the contract documents shall be classified as low volume roads.

406-2.02 Composition of Asphaltic Concrete Mixtures. The asphaltic concrete mix shall be composed of a mixture of aggregate, mineral admixture, bituminous material in the form of asphalt cement and RAP if utilized.

For any asphaltic concrete mix required by the plans or special provisions, the contractor shall develop and submit to the Agency, a job mix formula that satisfies the general criteria listed herein.

The optimum asphalt cement content for the gradation proposed shall be determined by the contractor using the Marshall Mix Design Method. The traffic level (low volume or high volume) shall be specified on the plans, special provisions, or by the engineer. If not specified refer to section 406-2.01

In the City of Tucson, Town of Marana, Town of Oro Valley and Town of Sahuarita, the asphalt cement used for the surface layer shall be a PG 76-22TR+ and a PG 70-10 for the underlying layers unless otherwise specified. For Pima County and private work, the asphalt cement used shall be a PG 70-10 in all layers unless otherwise specified.

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(A) **Marshall Mix Design.** The Marshall Mix Design shall be developed in accordance with the requirements the latest edition of the Asphalt Institute’s Manual MS-2.. For high volume roads the mix shall use a compactive effort of 75 blows on each side of the specimen. For low volume roads the mix shall use a compactive effort of 50 blows on each side of the specimen. The Marshall Mix shall comply with the criteria in Table 406-1.

**TABLE 406-1
MARSHALL MIX DESIGN PROPERTIES**

<u>Mix Property</u>	<u>Mix Criteria</u>			<u>Test Method</u>
	<u>No. 1</u>	<u>No. 2</u>	<u>No. 3</u>	
Stability, Lb., Kn. Min.	2500 (11.2)	2500 (11.2)	2000 (9.0)	Arizona Test Procedure 815
Flow, 0.01 In. (mm)	8-16 (2-4)	8-16 (2-4)	8-16 (2-4)	Arizona Test Procedure 815
Index of Retained Strength, Percent, Min,	65	65	65	Arizona Test Procedure 802
Minimum Wet Strength, psi (MPa), min	140 (0.95)	140 (0.95)	140 (0.95)	Arizona Test Procedure 802
Dust To Eff. Asphalt Ratio, Range *	0.6 – 1.4	0.6 – 1.4	0.6 – 1.4	-
Effective Voids, %	4.0 ± 0.2	4.0 ± 0.2	4.0 ± 0.2	Arizona Test Procedure 815
VMA, %, Min	13	14	15	Arizona Test Procedure 815
Absorbed Asphalt, %	0 – 1.0	0 – 1.0	0 – 1.0	Arizona Test Procedure 815

* The ratio of the mix design composite gradation target for the No. 200 sieve, including admixture, to the effective asphalt content shall be within the indicated range.

406-2.03 Mineral Aggregate. Coarse mineral aggregate shall consist of crushed gravel, crushed rock, or other approved inert material with similar characteristics, or a combination thereof, conforming to the requirements of these specifications.

Fine mineral aggregate shall be obtained from crushed gravel or crushed rock. All uncrushed material passing the No. 4 sieve shall be removed prior to crushing, screening and washing operations necessary to produce the specified gradation.

The contractor may blend uncrushed fine aggregate up to a maximum of 10 percent of the total aggregate, provided that the composite of uncrushed fine aggregate and crushed fine aggregate meets the requirement for uncompacted void content. The uncrushed fine aggregate shall be 100 percent passing the 1/4 inch sieve and

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contain not more than 4.0 percent passing the No. 200 sieve. Should the contractor modify the method of producing either the uncrushed or crushed fine aggregate, the Engineer shall be immediately notified and the materials sampled and tested for determination of uncompacted void content.

Mineral aggregate furnished for mix designs shall be representative of the source(s) and sampled from the materials stockpiles to be utilized in asphaltic concrete production. Mix designs shall be performed utilizing mineral aggregate that conforms to the grading limits in Table 406-3 or in the case of batch type plants, from bin samples if authorized by the Engineer.

**TABLE 406-3
COMPOSITION OF ASPHALTIC CONCRETE MIXTURES**

<u>MIX DESIGNATION</u>	<u>PERCENT PASSING</u>		
	<u>NO. 1</u>	<u>NO. 2</u>	<u>NO. 3</u>
Sieve Size			
1"	100	--	--
3/4"	90-100	100	--
1/2"	72-90	90-100	100
3/8"	60-76	70-85	85-100
#4	48-62	54-68	55-75
#8	40-52 (Note 1)	44-52 (Note 1)	38-50 (Note 1)
#40	12-24	13-23	16-26
#100	--	--	--
#200 (NOTE 2)	3-7	3-8	3-8

Notes:

1. A minimum of 85 percent, by weight, of the material retained on the No. 8 (2.36 millimeters) sieve shall have at least two fractured surfaces and a minimum of 92% with at least one fractured face (plus 4 material), produced by crushing when tested in accordance with the requirements of Arizona Test Method 212a.

2. The percent passing the No. 200 (0.75 millimeters) sieve shall include the amount of mineral admixture.

Mineral aggregate shall conform to the requirements found in Table 406-4 when tested in accordance with the applicable test methods.

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**TABLE 406-4
MINERAL AGGREGATE CHARACTERISTICS**

<u>Characteristic</u>	<u>TEST METHOD</u>	<u>REQUIREMENT</u>
Combined Bulk Specific Gravity (Note 1)	AASHTO T 85, Arizona Test Method 251	2.35 TO 2.85
Combined Water Absorption (Note 1)	AASHTO T 85, Arizona Test Method 251	0.00 TO 2.50
Sand Equivalent (Note 1)	AASHTO T 176	Minimum 55
Crushed Faces (Note 3)	Arizona Test Method 212	Minimum Values Per Table 406-3
Abrasion (Note 2)	AASHTO T 96	100 REV., MAX. 9% 500 REV., MAX. 40%
Uncompacted Voids (Note 1)	Arizona Test Procedure 247	Minimum 45
Flat And Elongated Pieces, % 5:1 Ratio (Note 1)	ASTM D 4791	10.0 Max

Note (1) When the mix proportions contain RAP, the requirements shall be for virgin aggregates only.

Note (2) Abrasion shall be run on samples from each source of mineral aggregate, including RAP Aggregate. All sources shall meet the requirements for abrasion.

Note (3) When the mix design contains RAP, the requirements shall be for the composite of virgin and RAP aggregates.

Tests on aggregates outlined in Table 406-3 shall be performed on materials furnished for mix design purposes and composited to the mix design gradation.

Mineral aggregate from a source or combination of sources that does not meet the requirements, according to the contractor's mix design proposal, for combined bulk specific gravity and/or combined water absorption up to a maximum of 3.0 percent, but meets the other requirements of Table 406-4 may be further considered for acceptance by the Engineer if: a) the total estimated cost of all asphaltic concrete components, using the mix design unit weight, asphalt cement content and mineral admixture percentage, does not exceed the total amount bid for these items by more than 5.0 percent; or b) a supplemental agreement is executed adjusting the unit prices of asphaltic concrete components such that the total estimated cost does not exceed the total amount bid by more than 5.0 percent.

406-2.04 Mineral Admixture. The mix design shall include a mineral admixture. The amount of mineral admixture used shall be a minimum of 0.5 percent, by weight, of the mineral aggregate, with the exact amount to be specified in the mix design. A maximum of 2.0 percent admixture will be permitted. Mineral admixture shall be either Portland cement, blended hydraulic cement or hydrated lime conforming to the requirements of Table 406-5.

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**TABLE 406-5
MINERAL ADMIXTURE**

<u>Material</u>	<u>Requirement</u>
Portland Cement, Type I Or II	ASTM C 150
Blended Hydraulic Cement, Type IP	ASTM C 595
Lime	ASTM C 1097

A Certificate of Analysis, conforming to the requirements of Subsection 106-5, shall be submitted to the Engineer.

406-2.05 Bituminous Material. Unless otherwise specified in the Special Provisions, the bituminous material shall meet the requirements of AASHTO M320.

A Certificate of Analysis conforming to the requirements of Subsection 106-5 shall be submitted and duplicate samples per shift shall be taken. In addition, the supplier shall determine the laboratory mixing and the compaction temperature ranges for each PG asphalt binder used for mix design purposes. The mixing temperature range is defined as the range of temperatures where the unaged asphalt binder has a rotational viscosity 0.17 ± 0.02 Pascal seconds measured in accordance with AASHTO T 316. The compaction temperature range is defined as the range of temperatures where the unaged asphalt binder has a rotational viscosity 0.28 ± 0.03 Pascal seconds measured in accordance with AASHTO T 316. The testing required by AASHTO T 316 shall be performed at 275 °F (135 °C) and 350 °F (175 °C), and the results plotted on a semilog graph with viscosity (logarithmic scale) versus temperature (arithmetic scale) in accordance with ASTM D 2493. PG asphalt binders that are polymer modified shall have mixing and compaction temperature ranges based on the manufacturer's recommendations if the mixing temperature range exceeds 325 °F (162 °C) and/or the compaction temperature range exceeds 300 °F (148 °C) as determined by the AASHTO T 316 procedure.

If it is determined by testing that bituminous materials used in asphaltic concrete production fail to meet the requirements of the AASHTO M320 for the specified grade, the contract unit price of the asphaltic concrete will be adjusted by the dollar amount per ton shown in tables in ADOT stored specification 1005, when the asphaltic concrete is allowed to remain in place. Should the bituminous material be in reject status, the Contractor shall, upon request by the Engineer, supply an engineering analysis of the expected performance of the material in which the bituminous material is incorporated. The engineering analysis shall detail any proposed corrective action and anticipated effect of such corrective action on the performance. Asphaltic concrete not allowed to remain in place shall be removed at no additional cost to the Agency and replaced with asphaltic concrete meeting the requirements of these specifications.

406-2.06 Recycled Asphaltic Concrete

If allowed by the Agency, Recycled asphaltic concrete can be used up to 15 percent of the total weight(s) of aggregate in the mix as long as the resulting recycled mix meets all the requirements that are specified for virgin mixtures. RAP material shall be reclaimed asphalt pavement obtained from streets or highways- no low quality materials from parking lots or other small areas should be included. Recycled asphaltic concrete shall consist of reclaimed asphaltic pavement (RAP), fine aggregate and mineral filler to produce a consistent gradation and asphalt content and properties. When RAP is fed into the mixing plant, the maximum RAP chunk size shall not exceed 1 1/4 inches (31.75 mm). The job mix shall meet the requirements of Section 406-2.02.

406-2.07 Mix Design Proposal

(A) New Mix Designs. Utilizing mineral aggregate which has been crushed, processed, separated and stockpiled, a mix design proposal shall be formulated and submitted by the contractor to the Engineer.

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The proposal shall be based on the mix design criteria and other requirements herein specified, utilizing asphalt cement and mineral admixture of the type and from the sources proposed for use in the production of asphaltic concrete.

The mix design proposal shall be prepared under the direct supervision of a professional engineer experienced in the development of mix designs and mix design testing. The mix design shall be provided in a format that clearly indicates all the mix design requirements, and shall be signed, sealed, and dated by the mix design engineer. The mix design shall be prepared by a mix design laboratory that has met the requirements of the Arizona Department of Transportation's (ADOT) "System for the Evaluation of Testing Laboratories". The requirements may be obtained from ADOT Materials Group, 1221 North 21st Avenue, Phoenix, Arizona. The mix design proposal shall be submitted to the Agency a minimum of three weeks prior to the scheduled start of production.

The mix design proposal shall contain as a minimum:

- (1) The name and address of the testing organization and the individual responsible for the mix design development and testing.
- (2) The mix plant identification and/or location, as well as the supplier or producer name.
- (2) The specific location(s) of the source(s) of mineral aggregate.
- (3) The supplier, refinery, and type of asphalt cement, and the source and type of mineral admixture, and the percentage of each to be used.
- (4) The mineral aggregate gradation in each stockpile.
- (5) The percentage of RAP and RAP binder and the source of the RAP material.
- (6) Mix design gradation. The mix design shall contain the gradation of the mineral aggregate as well as the mix gradation with the mineral admixture if it is used. The submittal shall include a plot of the gradation on the Federal Highway Administration's 0.45 Power Gradation Chart.
- (7) The results of all testing, determinations, etc., such as: specific gravity of each component, water absorption, asphalt absorption, sand equivalent, loss on abrasion, crushed faces, uncompacted void content, Index of Retained Strength, wet and dry strengths. Historical abrasion values may be supplied on existing sources. The submittal shall include graphical plots and summary tabulation of stability, flow, air voids, voids in mineral aggregate and unit weight versus asphalt content. The summary tabulation shall include individual specimen data for each specimen tested.
- (8) The Viscosity-Temperature curve for the asphalt cement together with the laboratory mixing and compaction temperature ranges or documentation of manufacturer recommendations in accordance with Section 406-2.05.

The Engineer will review the mix design proposal to assure that it contains all required information. If it does not, it will be returned, within three working days, for further action and resubmission by the contractor.

406-2.08 Mix Design. The contractor shall have proposed mix design verified, in accordance with Subsection 406-2.09, by an independent lab listed on the Arizona Department of Transportation certified laboratories, and results submitted along with mix design proposal. The independent verification lab shall not be affiliated with the design of the Asphaltic concrete mix design or supplier. No compensation will be provided for Mix design verification.

NOTE: A previously used mix design older than two years from the date it was formulated, sealed, signed and dated shall not be allowed for use. Once approved for use on a project, a mix design may be used for the duration of the project.

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The approved mix design shall specify a single percent of material passing each required sieve; the approximate percent of material to be used from each source; including the recycled asphalt pavement (RAP) source, if utilized; the type, source and percent of asphalt cement; the percent effective voids; the type and percent of any mineral admixture; the laboratory bulk density and any special treatment.

If approval of the mix design is contingent upon the use of a minimum or maximum percentage of special materials such as washed or imported aggregates, the approved mix design will also contain such stipulation.

406-2.09 Verification Testing. Mineral aggregate samples submitted for verification testing will be combined in the proportions specified in the contractor's proposed mix design. The resultant composite gradation will be compared to the proposed mix design gradation and the percentage deviations determined. The required action is determined from Table 406-6.

**TABLE 406-6
ALLOWABLE DEVIATIONS FROM PROPOSED TARGETS**

<u>Sieve Size</u>	<u>Proceed</u>	<u>Adjust</u>	<u>Reject</u>
3/8 Inch (9.5 Mm) Or Larger	±2	> ±2 To ±8	> ±8
No. 4* (4.75 Mm) (Note 1)	±2	> ±2 To ±6	> ±6
No. 8 And No. 40 (2.36 Mm And 425 µm)	±2	> ±2 To ±6	> ±6
No. 200 (75 µm)	±0.5	> ±0.5 To ±3	> ±3

*Note 1: No. 4 (4.75 mm) sieve size criteria is applicable to Mix No. 3 (Table 406-3) only.

If the deviations are such that they fall into the adjust column of Table 406-6, the contractor has the option to request artificial grading of the samples in accordance with the requirements of Arizona Test Method 244 or to resample the material. In lieu of resampling, the contractor may elect to submit new stockpile percentages.

When the final composite is determined, tests will be performed in accordance with Arizona Test Method 815 for conformance to the criteria of Table 406-7.

**TABLE 406-7
VERIFICATION CRITERIA**

<u>Property</u>	<u>Allowable Deviation From Proposal Targets</u>	<u>Values</u>
1) Sand Equivalent	-10 (Note 1)	55 Min.
2) Fine Aggregate Angularity	----	45 min
2) Crushed Faces, Percent	-----	(Note 2)
3) Abrasion 100 Revolutions	-----	9 Max.
500 Revolutions	-----	40 Max.
4) VMA, Percent	±1.5	Min. Per Table 406-1
5) Effective Voids, Percent	----	3.5-4.5

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6) Stability, Pounds (<i>Kn</i>)	-----	1,750 Min. (<i>8.0 Min</i>)
7) Flow, 0.01-Inch (<i>mm</i>)	-----	7-17 (<i>1.8-4.3</i>)
8) Index Of Retained Strength, Percent	-----	65 Min.
9) Wet Strength, psi (<i>Mpa</i>)	-----	140 Min. (<i>0.95 Min</i>)
10) Absorbed Asphalt Percent	-----	1.0 Max.

Note 1: In verifying previously used mix designs only.

Note 2: Refer to Table 406-3 and 406-4.

406-2.10 Mix Design Revisions. The contractor shall not significantly change his methods of crushing, screening, or stockpiling from that used during production of material used for mix design purposes without approval of the Engineer or submitting for approval, a new mix design proposal in accordance with Subsections 406-2.07 (A) and 406-2.08. Significant changes may include changes in the amount or type of materials rejected or wasted, changes in the amount of materials crushed, or reductions in the amount of crushed fines.

During production of asphaltic concrete, the Engineer shall independently test samples of the mineral aggregate. The mineral aggregate samples shall be obtained and tested in accordance with the requirements of Subsection 406-2.03 and Table 406-4. Should the results of the testing indicate values fall outside the allowable deviation from the mineral aggregate characteristics specified in Table 406-7, Items 1 through 10, paving operations shall cease until a new mix design proposal, addressing the deficiencies and conforming to the requirements of Subsection 406-2.07, is approved.

At any time after a mix design has been approved, the contractor may submit a new mix design proposal to the Engineer in accordance with Subsections 406-2.07 (A) and 406-2.08. If the revised mix design proposal is determined to meet all the requirements, the Engineer will approve the proposal and it shall be the approved mix design.

During the production of asphaltic concrete, the contractor, on the basis of field test results, may request a change to the approved mix design Target Values. The Engineer will evaluate the proposed changes and notify the contractor verbally of his decision within three working days of the receipt of the request. This verbal notification will be promptly verified, in writing, by the Engineer. If approved, the revised Target Values will be applied to the samples immediately following the request for Target Value changes. If the Engineer determines that the test results indicate that the asphaltic concrete previously sampled will perform satisfactorily, the Engineer may apply the revised Target Values to samples taken prior to the request for the Target Value change(s).

If, at any time, changes are made in the source of asphalt cement, source(s) of mineral aggregate, or proportional changes, in violation of approved mix design stipulations, production shall cease until the contractor has approval for a new mix design or complies with the approved mix design.

406-2.11 Time and Cost for Mix Designs and Verification Testing. The number of working days established for completion of the work includes fifteen days for the required verification of the first mix design proposal. Should this proposal be disapproved, the contract time shall be extended, if requested, for no more than 15 working days for formulating one new mix design proposal and verification testing. Additional contract time will not be granted for subsequent mix design proposals and associated verification testing.

Once a mix design proposal has been verified and approved by the Engineer, the costs associated with verification testing for subsequent mix design proposals requested by the contractor shall be borne by the contractor.

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406-2.12 Acceptance of Materials.

(A) General. The contractor's attention is directed to the requirements of the Standard Specifications in Subsection 105-12 under Removal of Unacceptable and Unauthorized Work and Section 110, Corrective Requirements For Deficiencies. The Agency reserves the right to suspend the work should the following occur:

- (1) Three or more consecutive Mixture Property or Compaction sample test results that are subject to pay adjustment(s).
- (2) Five or more Mixture Property or Compaction sample test results that are subject to pay adjustments within any ten consecutive samples.

If the Agency elects to suspend the work for any of these conditions, the contractor shall either submit a revised mix design in accordance with Subsection 406-2.07, or submit an engineering analysis. The engineering analysis shall detail the course of action necessary to correct deficiencies in the contractor's present production methods such that further production can be accomplished without penalties. If approved by the Engineer, the revised mix design or course of action proposed in the engineering analysis, shall be implemented, and the work may continue. Costs or delays due to the provisions of this subsection are not compensable.

The acceptance of the mineral aggregate gradation, the asphalt cement content and the effective voids shall be determined on the basis of the tests specified herein. The Engineer will determine the variance from the stated values of each mix characteristic based on the measured value of each characteristic. The Engineer shall use this variance to determine the appropriate monetary pay adjustment, or action, from Section 110, to be applied to the deficient mix quantity.

The Engineer, at any time, may increase the frequency of sampling and testing.

(B) Mineral Aggregate Gradation in Asphaltic Concrete. For each 500 tons (*450 metric tons*) or portion thereof of asphaltic concrete, at least one sample of mineral aggregate will be taken. The Engineer will split the sample in half, saving one-half of the sample for 15 days. Samples will be taken in accordance with the requirements of Arizona Test Method 105 on a random basis, just prior to the addition of asphalt cement, by means of a sampling device which is capable of producing samples which are representative of the mineral aggregate. The device, which shall be approved by the Engineer, shall be furnished by the contractor. In any shift that the production of asphaltic concrete is less than 500 tons (*450 metric tons*), at least one sample will be taken.

Samples will be tested for conformance with the mix design gradation target values in accordance with the requirements of Arizona Test Method 201. When mineral admixture is required, gradation results will be adjusted to reflect this addition.

The sand equivalent will be determined by the Engineer in accordance with the requirements of AASHTO T 176. The percent of crushed faces will be determined in accordance with Arizona Test Method 212.

(C) Asphalt Cement Content and Effective Voids. For each 500 tons (*450 metric tons*) or portion thereof of asphaltic concrete, at least one sample of the asphaltic concrete will be taken on a random basis. The Engineer will split the sample in half, saving one-half for 15 days. Samples will be taken in accordance with the requirements of Arizona Test Method 104, Section 3.

The asphalt cement content will be determined in accordance with the requirements of Arizona Test Method 427a. If RAP is used the asphalt content will be determined in accordance with the requirements of Arizona Test Method 428. The asphalt cement content obtained will be compared to the mix design target value.

Marshall density and maximum theoretical density shall be tested in accordance with the requirements of

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Arizona Test Method 415 & 417. Effective voids shall be determined in accordance with the requirements of Arizona Test Method 424, Section 2.

(D) Referee Testing. In the event the contractor elects to question the results obtained for a particular sample, the contractor may make a written request for additional testing of the sample within 15 days after notification of test results. The contractor may request additional testing for either the mineral aggregate gradation of the aggregate sample or the asphalt cement content and effective voids of the hot mix sample, or both. The additional testing shall be performed by an independent lab listed on the Arizona Department of Transportation certified laboratories designated by the Engineer. The testing of the samples will be performed by the independent laboratory without knowledge of the specific project conditions such as the identity of the contractor or mix design laboratory, the test results obtained by the Agency or the mix design targets. The samples previously saved will be tested as specified in Subsection 406-2.12 (B) and (C). A new Total Pay Adjustment Amount will be determined for the sample. The results of the additional testing will be binding on both the contractor and the Agency. The Agency will pay for the testing; however, if the dollar pay adjustment amount of the sample does not improve or is reduced, or the sample remains in reject, payment to the contractor for asphaltic concrete, after the application of all penalties shall be reduced by an amount equivalent to the cost of the testing.

406-3 Construction Details

406-3.01 Quality Control. Quality control shall be the responsibility of the contractor. The Engineer reserves the right to obtain samples of any portion of any material at any point of the operations for testing.

406-3.02 Stockpiling. The contractor will not be allowed to feed the hot plant from stockpiles containing less than two full days of production, unless only two days production or less remain to be done or special conditions exist where the Engineer deems this requirement waived.

Mineral aggregate shall be separated and stockpiled so that segregation is minimized.

406-3.03 Proportioning. Mixing plants shall conform to the requirements of AASHTO M 156, except as modified herein. The contractor shall provide documentation by calibration charts or other approved means that the mineral aggregate, asphalt cement and mineral admixture is being proportioned in accordance with the approved mix design.

If a mineral admixture is necessary to produce asphaltic concrete that meets the design criteria, the mineral admixture shall be mechanically mixed with the mineral aggregate prior to combining the mineral aggregate and asphalt cement. The Engineer may direct a spray of water be applied either to control the loss of the mineral admixture or to comply with any mix design requirements for set mixing of aggregate and admixture.

If a drum mix plant is used, the mineral admixture shall be added and thoroughly mixed by means of a mechanical mixing device prior to the mixture entering the drum drier. The mineral mixture shall be weighed across a weigh belt or an approved alternative weighing system, with a weight totalizer prior to entry into the mechanical mixing device. The mechanical mixing device shall be a pugmill type mixer consisting of at least two motorized shafts with mixing paddles. The mixing device shall be designed such that the mixture of aggregate and admixture is moved in a near horizontal direction by the mixing paddles without the aid of conveyor belts for a distance of at least 3 feet (*1 meter*). Mixing devices, which permit the aggregate to fall through mixing blades onto a belt or chute are not acceptable. The mixing device's rated capacity in tons per hour shall not be exceeded by the rate of aggregate feed to the mixer. The mixer shall be constructed to prevent the leakage of the contents. The mixer shall be situated in the aggregate delivery system at a location where the mixed material can be readily inspected on a belt prior to entry into the drum. The mixing device shall be capable of effective mixing in the full range of asphaltic concrete production rates. If a batch plant is used, the mineral admixture shall be added and thoroughly mixed in the pugmill prior to adding asphalt cement.

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The contractor shall furnish daily documentation to the Engineer that the required amount of mineral admixture has been incorporated into the asphaltic concrete.

A positive signal system and a limit switch device shall be installed in drum drier plants at the point of introduction of the admixture. The positive signal system shall be placed between the metering device and the drum drier, and utilized during production whereby the mixing shall automatically be stopped if the admixture is not being introduced into the mixture.

Unless specified in the mix design approved for the project, no fine material which has been collected in the dust collection system shall be returned to the mixture unless the Engineer, on the basis of tests, determines that all or a portion of the collected fines can be utilized. If the Engineer so determines, he will authorize, in writing, the utilization of a specific proportion of the fines; however, authorization will not be granted unless the collected fines are uniformly metered into the mixture.

Mineral aggregate, mineral admixture, and asphalt cement shall be proportioned by volume, by weight, or by a combination of volume and weight.

When mineral aggregate, RAP if utilized, mineral admixture, and asphalt cement are proportioned by weight, all boxes, hoppers, buckets or similar receptacles used for weighing materials, together with scales of any kind used in batching materials, shall be insulated against the vibration or movement of the rest of the plant due to the operation of any equipment so that the error in weighing with the entire plant operating shall not exceed 2% for any setting or 1 ½ % for any batch. Bituminous material shall be weighed in a heated, insulated bucket suspended from a springless dial scale system.

When mineral aggregate, RAP if utilized, mineral admixture, and asphalt cement are proportioned by volume, the correct portion of each mineral aggregate size introduced into the mixture shall be drawn from the storage bins by an approved type of continuous feeder which will supply the correct amount of mineral aggregate and RAP if utilized in proportion to the asphalt cement and so arranged that the proportion of each mineral aggregate size can be separately adjusted. The continuous feeder for the mineral aggregate and RAP if utilized shall be mechanically or electrically actuated.

406-3.04 Drying and Heating. A recording pyrometer or other approved recording thermometric instrument sensitive to a rate of temperature change not less than 10° F (-12 °C) per minute shall be placed at the discharge chute of the drier so as to record automatically the temperature of the asphaltic concrete or mineral aggregate. A copy of the recording shall be available to the Engineer at the end of each shift.

The moisture content of the asphaltic concrete immediately behind the paver shall not exceed one percent. The moisture content will be determined in accordance with Arizona Test Method 406. Drying and heating shall be accomplished in such a manner as to preclude the mineral aggregate from becoming coated with fuel oil or carbon.

406-3.05 Mixing. The production of the plant shall be governed by the rate required to obtain a thorough and uniform mixture of the materials. Mixing shall continue until the uniformity of coating, when tested in accordance with the requirements of AASHTO T 195, is at least 95 percent.

A positive signal system shall be provided to indicate the low level of mineral aggregate and RAP if utilized in the bins. The plant will not be permitted to operate unless this signal system is in good working condition. Each bin shall have an overflow chute or a divider to prevent material from spilling into adjacent bins.

The temperature of asphaltic concrete upon discharge from the mixer shall not exceed 325° F (165 °C). If the asphaltic concrete is discharged from the mixer into a hopper, the hopper shall be constructed so that segregation of the asphaltic concrete will be minimized.

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406-3.06 Placing and Finishing.

(A) General Requirements.

At least three days prior to the start of Asphalt Concrete paving operations the Contractor's supervisory personnel (to include as minimum the project manager, the paving superintendent and the paving foreman) and any subcontractors who will be involved in the paving work, shall meet with the Engineer at a mutually agreed time to discuss methods of accomplishing all phases of the paving work.

The handling of asphaltic concrete shall at all times be such as to minimize segregation. Any asphaltic concrete which displays obvious and unwanted segregation shall be removed and replaced.

All wheels and tires of compactors and other equipment shall be wiped, when necessary, with an approved product in order to prevent the picking up of the asphaltic concrete.

Before asphaltic concrete is placed, the surface to be paved shall be cleaned of objectionable material, and a bituminous tack coat shall be applied, if directed by the Engineer. The tack coat shall be cured prior to the beginning of paving operations.

A light coat of bituminous material shall be applied as directed to edges or vertical surfaces against which asphaltic concrete is to be placed. Application shall be in a continuous and controlled manner to assure positive contact of surface area in contact with asphalt mixture.

The base or subgrade upon which the asphaltic concrete is to be placed shall be prepared in accordance with the applicable requirements for the material involved and maintained in a smooth and firm condition until placement. Asphaltic concrete shall not be placed on a frozen or excessively wet base or subgrade.

At any time, the Engineer may require that the work cease or that the work day be reduced in the event of weather conditions which would have an adverse effect upon the asphaltic concrete.

All asphaltic concrete shall be placed either as a leveling course or as a surfacing course. Leveling courses are defined as courses placed for the primary purpose of raising an existing paved or unpaved surface to a smooth plane. Surfacing courses are defined as courses placed to serve either as the traffic surface or as a surface upon which a finishing course or seal coat is to be placed.

The thickness of leveling and surfacing courses will be shown on the project plans. No change in thickness will be allowed without the written approval of the Engineer. When the plans indicate a leveling course or surfacing course thickness greater than 4 inches (100 mm) that course shall be placed in multiple lifts of equal thickness with no single lift having a compacted thickness of more than 4 inches (100 mm).

The contractor shall furnish a delivery ticket for each type of asphalt concrete used in the construction of any project. The minimum information to be shown on each delivery ticket shall be the ticket number, date, project name, truck number, truck tare weight, truck gross weight, net tons, time of loading, and type of mix by name. Contractor product code numbers will not preclude or be an acceptable substitute for this information. An authorized representative of the contractor shall be responsible for each delivery ticket and shall sign each delivery ticket accepting the contractor's responsibility for the asphaltic concrete. The contractor shall furnish the delivery ticket to the Engineer at the time of placement.

(B) Hauling Equipment. The mixture shall be transported from mixing plants to the work site in tight vehicles having clean, smooth beds.

The inside surface of the vehicles used for the transportation of plant mixes shall be lightly coated, just before the vehicles are loaded, with either a whitewash of lime and water, soap solutions or detergents, as approved by the Engineer.

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After application, excess fluid shall be drained from the truck bodies.

(C) Loading Asphaltic Concrete into the Paving Machine. If the asphaltic concrete is dumped from the hauling vehicles directly into the paving machine from trucks, care shall be taken to avoid jarring the machine or moving it out of alignment. No vertical load shall be exerted on the paving machines by the trucks. Trucks, while dumping, shall be securely attached to the paving machine.

If the asphaltic concrete is dumped upon the surface being paved and subsequently loaded into the paving machine, the loading equipment shall be self-supporting and shall not exert any vertical load on the paving machine. Substantially all of the asphaltic concrete shall be picked up and loaded into the paving machine. Any large deposits of Asphaltic concrete that has cooled shall be removed prior to paving machine passing over.

(D) Placing and Finishing Asphaltic Concrete by Means of Self-Propelled Paving Machines. All courses of asphaltic concrete shall be placed and finished by means of self-propelled paving machines except under certain conditions or at certain locations where the Engineer deems the use of self-propelled paving machines impracticable.

In order to achieve, as far as practicable, a continuous operation, the speed of the paving machine shall be coordinated with the production of the plant.

Self propelled paving machines shall be provided with an activated screed or strike-off assembly. The machine shall be capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical section and thicknesses shown on the plans. When screed extensions are permitted by the Engineer for placement of mainline pavement, such extensions shall be of the same design as the main screed. The screed or strike-off assembly shall be heated as necessary to produce a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture. When laying mixtures, the paver shall be capable of operating at forward speeds consistent with satisfactory placement of the mixtures.

Screeds shall include any strike-off device operated by tamping or vibrating action which is effective without tearing, shoving or gouging the mixture and which produces a course with a uniform texture and density for the full width being paved. Screeds shall be adjustable as to height and crown and shall be equipped with a controlled heating device for use when required.

Tapered sections not exceeding 8 feet (2.4 meters) in width, or widened sections not exceeding 4 feet (1.2 meters) in width may be placed and finished by other means as approved by the Engineer.

The mixture shall be laid upon an approved clean, dry surface, spread and struck off to the established grade and elevation.

Approved bituminous pavers shall be used to distribute the mixture either over the entire width or over such partial width as may be practicable. Bituminous pavers shall be in the charge of an experienced operator.

If there are areas to be paved which are small and scattered, a paver may be dispensed with and the course spread by hand methods if approved by the Engineer. For such areas, the mixture shall be dumped, spread and leveled to give the required section and compacted thickness.

Before any rolling is started, the loose mat shall be checked, any irregularities adjusted, and all unsatisfactory material shall be removed and replaced.

(E) Automatically Actuated Control System. Except under certain conditions or at certain locations where the

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Engineer deems the use of automatic controls impracticable or unnecessary, all courses of asphaltic concrete shall be placed and finished by means of self-propelled paving machines equipped with and automatically actuated control system that function properly.

The system shall control the elevation of the screed at each end by controlling the elevation of one end directly and the other end indirectly, either through controlling the transverse slope or alternately, when directed, by controlling the elevation of each end independently.

The controls shall automatically adjust the screed and increase or decrease the mat thickness to compensate for irregularities that are in the surface being paved. The controls shall be capable of maintaining the proper transverse slope and be readily adjustable so transitions and super-elevated curves can be satisfactorily paved. The controls shall operate from suitable fixed or moving references as prescribed herein.

The transverse slope and longitudinal grade screed controls of the bituminous paver may be manually adjusted, where permitted by the Engineer, and according to the requirements specified herein. The levels of the final pavement shall coincide and match reference points given by the agency for elevation controls when provided.

The paving machine(s) shall be at the job site or locally available sufficiently ahead of the start of paving operations to allow for examination by the Engineer. Any paving machine found worn or defective either before or during its use shall be immediately repaired to the satisfaction of the Engineer or replaced.

The control system shall be capable of working with the following devices:

Ski-type device at least 30 (9 meters) feet in length, supported throughout its entire length.

Short ski.

500 feet (150 meters) of control line.

Joint matcher shoe.

When the control line is used it shall be set and maintained taut by the contractor to the grade and alignment established by the Engineer.

Failure of the control system to function properly shall be cause for the suspension of the asphaltic concrete operations if so directed by the Engineer.

406-3.07 Joints. The finished pavement at all joints shall comply with the surface smoothness requirements, specified in Subsection 406-3.10, when tested with a straightedge placed across the joint, and exhibit the same uniformity of texture and compaction as other sections of the course.

The placement of successive courses shall be such that all joints are offset at least 6 inches from the joint of the lower pavement course, unless otherwise approved by the Engineer.

(A) Transverse. The placement of the courses shall be as continuous as possible to limit the number of transverse joints. The transverse joints in adjacent lanes shall be staggered a minimum of 10 feet. The transverse joint shall be formed by cutting back on the previous run to expose the full depth of the course. The exposed edge of the existing course that will become part of the joint shall be the full thickness of the course, straight and vertical. The joint shall be formed by using a power-driven saw or other approved apparatus to cut, in a neat line, the cold existing pavement course to its full thickness to expose a fresh face.

(B) Longitudinal. Prior to paving operations, the Contractor shall submit a paving plan showing the joint locations and stating the joint compaction method to be utilized. If multiple lifts are to be placed, the required

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staggered lifts shall be shown in both plan and profile.

Longitudinal joints shall be located within one foot of the center of a lane or within one foot of the dividing-line between two adjacent lanes.

The placement of longitudinal joints in successive courses shall be such that joints are offset at least one foot from the joint of the immediate underlying pavement course, unless otherwise approved by the Engineer.

Placement of the surface course shall be carefully planned to assure that the longitudinal joints in the surface course will correspond with the edges of proposed traffic lanes. Other joint arrangements will require approval of the Engineer.

When traffic is maintained on the roadway during paving operations, the mixture shall be laid such that no more than 100 feet of the pavement edge will be exposed at the end of the working day. The Engineer may permit an exposed edge of this type in excess of 100 feet providing that the edge is adequately protected against damage by vehicles and equipment.

Joints shall be formed by a slope shoe unless otherwise approved by the Engineer.

The edge of the asphaltic concrete mat, comprising the initial placement of the longitudinal joint, to be formed using a sloping, vibratory metal plate attached to the edge of the self-propelled paving machine's screed. The beveled edge produced by the sloping plate shall have a six-inch horizontal length for a mat thickness of 2 inches. Mat thicknesses greater than 2 inches shall use a sloping metal plate that provides a horizontal length acceptable to the Engineer.

When compacting the initial mat, the wheel of the compactor shall not extend more than two inches onto the beveled edge area.

The subsequent, adjacent mat shall be placed such that the screed of the paving machine overlaps the beveled edge area of the first mat and extends onto the initial mat a minimum of 2 inches beyond the beveled area.

The excess asphaltic concrete that extends onto the finished surface of the initial mat shall be carefully pushed onto the freshly placed mat, using hand lutes, to form a slight mound over the beveled edge area of the previous mat. Care shall be taken when using hand lutes or asphalt rakes, to avoid reducing the thickness of the un-compacted mat along the beveled area of the longitudinal joint or causing any segregation whatsoever to the surface of the freshly placed asphalt concrete mat. The longitudinal joint shall be compacted while the mixture is still hot, in conformance with the temperature requirements of Subsection 406-3.08 (D).

When compacting along the finished longitudinal joint, the wheels of the compaction equipment shall extend onto the previously placed mat at least 6 inches.

Should the contractor wish to construct longitudinal joints in a manner differing from that specified above, the contractor shall submit the proposed method, in writing, to the Engineer for approval.

406-3.08 Compaction.

(A) Temperature Requirements. Asphaltic concrete placed in nominal thicknesses of 1-1/2 inch (37.5 mm) or less shall be placed only when the temperature of the surface on which the asphaltic concrete is to be placed is at least 65° F (18° C). Asphaltic concrete immediately behind the laydown machine shall be a minimum of 250° F (121° C). If WMA asphaltic concrete is used the asphaltic concrete shall be placed at temperatures recommended by the WMA supplier.

Asphaltic concrete placed in nominal thicknesses greater than 1- 1/2 inches (37.5 mm) shall be placed only when

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the ambient temperature is at least 40° F (4.5° C) and rising. Placement shall be stopped when the ambient temperature is below 45° F (7.2° C) and falling.

(B) Equipment. Compacting and smoothing shall be accomplished by the use of self-propelled equipment. Compactors shall be pneumatic tired and/or steel wheel.

The rollers shall be in good mechanical condition, and capable of operating at speeds slow enough to avoid displacement of the mixture. The number and weight of rollers shall be sufficient to satisfactorily compact the mixture while it is still in a workable condition. The use of equipment which results in excessive crushing of aggregate will not be permitted. Vibratory rollers shall be of a type that is specifically designed for the compaction of bituminous concrete.

Compactors shall be operated in accordance with the manufacturer's recommendations. Compactors shall be designed and properly maintained so that they are capable of accomplishing the required compaction.

Static steel wheel compactors used on mainline paving shall weigh not less than eight tons.

Pneumatic tired compactors shall be the oscillating type with at least seven pneumatic tires of equal size and diameter. Wobble wheel compactors will not be permitted. The tires shall be spaced so that the gaps between adjacent tires will be covered by the following tires. The tires shall be capable of being inflated to 90 pounds per square inch and maintained so that the air pressure will not vary more than five pounds per square inch from the designated pressure. Pneumatic tired compactors shall be constructed so that the total weight of the compactor will be varied to produce an operating weight per tire of not less than 5,000 pounds. Pneumatic tired compactors shall be equipped with skirt-type devices mounted around the tires so that the temperature of the tires will be maintained during the compaction process.

(C) General Requirements. Immediately after the bituminous mixture has been spread, struck off and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. The surface shall be rolled when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking or shoving. When the compaction procedure used by the contractor fails to produce results acceptable to the Engineer, the procedure shall be adjusted to obtain the desired results. Rollers shall move at a slow and uniform speed in accordance with the manufacturer's recommendations.

Any displacement occurring as a result of the reversing of the direction of a roller, or from other causes, shall be corrected at once by the use of rakes and addition of fresh mixture as required. Care shall be exercised in rolling not to displace the line and grade of the edges of the bituminous mixture. To prevent adhesion of the mixture to the rollers, the wheels shall be kept properly moistened with water or water mixed with small quantities of detergent or other approved material, but in no case shall a solvent having any affect upon the bituminous pavement be used.

Along forms, curbs, headers, walls and other areas not accessible to the rollers, the mixture shall be thoroughly compacted with mechanical tampers as directed by the Engineer. Suitable means shall be provided to keep pavers and other equipment and tools free from bituminous accumulations. The surface of the pavement shall be protected from drippings of oil, kerosene, or other materials used in paving and cleaning operations.

Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective shall be removed and replaced with fresh hot mixture which shall be compacted to conform to the surrounding area. Any area showing the excess of deficiency of bituminous material shall be corrected to the satisfaction of the Engineer.

(D) Rolling Method Procedure. For courses of 1-1/2 inches (37.5 mm) or less in nominal thickness, compaction shall consist of an established sequence of coverage using specified types of compactors. A pass shall be defined as one movement of a compactor in either direction. Coverage shall be the number of passes necessary to cover the entire width being paved.

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The rolling sequence, the type of compactor to be used and the number of coverages required shall be as follows:

<u>Rolling Sequence</u>	<u>Type of Compactor Option</u>		<u>No. of Coverages Option</u>	
	No. 1	No. 2	No. 1	No. 2
Initial	Static Steel	Vibrating Steel	1	1
Intermediate	Pneumatic Tired	Vibrating Steel	4	2-4*
Finish	Static Steel	Static Steel	1-3	1-3

* Based on the roller pattern which exhibits the best performance.

The Engineer shall select the option for compaction and, when pneumatic tired compactors are used, will verify, the tire pressure is in accordance with the manufacturer's recommendations.

When option No. 1 is used, one pneumatic tired roller shall be furnished for each 300 tons (272 metric tons) of asphaltic concrete placed per hour.

Steel wheel compactors shall not be used in the vibratory mode for courses of 1 inch (25 mm) or less in nominal thickness nor when the temperature of the asphaltic concrete falls below 180° F (82° C).

Initial and intermediate compaction shall be completed before the temperature of the asphaltic concrete falls below 200° F (93° C). All edges shall be rolled by a method approved by the Engineer.

Compaction will be deemed to be acceptable on the condition that the asphaltic concrete is compacted using the type of compactors specified, ballasted and operated as specified and with the number of coverages of the compactors as specified.

When compacting a surface lift, the rolling equipment shall not remain parked on the freshly placed mat that has not completed intermediate rolling.

For longitudinal joints next to a cold joint the joint shall be rolled by placing the majority of a non-vibratory steel roller on the hot mat with only 6 inches (150 mm) of the drum overlapping on the previously placed cold mat. The roller shall continue roll along this line, its position being shifted gradually across the joint until a thoroughly compacted neat joint is obtained. Vibration shall not be used when operating on the cold mat.

The transverse joints shall be compacted by cross rolling the joint with the roller on the previously laid material, except for a 6 inch (150 mm) projection of the wheels when using a tandem and of one rear wheel when using a three-wheeled roller. This operation should be repeated with successive passes covering 6 to 8 inches (150 mm to 200 mm) of fresh material until the entire width of a drive roll is on the new mix. Boards of proper thickness shall be placed at the edge of the pavement to provide for off-the-pavement movement of the roller. If boards are not used, transverse rolling must stop 6 to 8 inches (150 mm to 200 mm) short of the outside edge in order to prevent damage to the edge. The outside edge then must be rolled out later when rolling longitudinally. If lane restrictions prohibit cross-rolling, the joint shall be rolled straight onto the new mat very slowly so the mix will be pinch down into the joint area instead of being pushed away from it until a tight, level joint flush with the existing edge has been formed.

(E) Compaction Control. Compaction control for courses greater than 1 1/2 inches (37.5 mm) in nominal

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thickness shall be defined as the responsibility of the contractor, and shall be based on the anticipated rate of production and placement to determine the number and types of compactors and the sequence and manner in which they are to be used to achieve the specified density.

Responsibility for compaction control shall rest solely with the contractor.

Compaction shall be determined from samples taken utilizing mechanical coring equipment in accordance with the requirements of Arizona Test Method 104, Section 3. Cores shall be a minimum of four inches in diameter. In-place air voids shall be determined in accordance with Arizona Test Method 424 utilizing the cores taken from the finished pavement. The core samples shall be tested for acceptance in accordance with the requirements of Arizona Test Method 415. The maximum theoretical density will be used to determine the in-place air voids. Compaction of a course shall continue until the Asphaltic Concrete achieves in-place air voids of 7.0% or less. Payment for asphaltic concrete not meeting these compaction criteria will be adjusted in accordance with Table 110-5.

For each 250 Tons of asphaltic concrete, two cores shall be taken by the contractor under the Engineer's direction. The Engineer will save one core from each location for 15 days after written notification to the contractor of test results for that location has been made.

Compaction, other than finish rolling, shall be completed before the temperature of the asphaltic concrete falls below 200° F (93° C). All edges shall be rolled by a method approved by the Engineer.

406-3.09 Compacting Miscellaneous Items and Surfaces. Asphaltic concrete used in the construction of curbs, spillways, and spillway inlets, ditches, catch basin entrances, median strips, sidewalks or other similar miscellaneous items or surfaces shall be compacted using compactors, hot hand tampers, smoothing irons, mechanical vibrating hand tampers or with other devices to the extent considered necessary by the Engineer.

406-3.10 Surface Requirements and Tolerances. All courses of asphaltic concrete shall be compacted as required, smooth and reasonably true to the required lines, grades, and dimensions.

Leveling course surfaces shall not vary more than 1/4 inch (6.25 mm) from the lower edge of a 10 foot (3 meters) straightedge when the straightedge is placed parallel to the center line of the roadway.

Surfacing course surfaces shall not vary more than 1/8 inch (3.1 mm) from the lower edge of a 10 foot (3 meters) straightedge when the straightedge is placed parallel to the center line of the roadway, nor shall the surface vary more than 1/4 inch (6.25 mm) on any portion of the pavement surface when a 10 foot (3 meters) straightedge is placed transverse to the center line.

406-4 Method of Measurement

Asphaltic concrete will be measured by the ton for mainline paving and by either the ton or the square yard for miscellaneous areas of paving as noted in the bidding schedule, for the specific use listed therein. When measured on the basis of tonnage, such measurement will be for asphaltic concrete actually used, complete-in-place, and shall include the weight of mineral aggregate, RAP if utilized, bituminous material in the form of asphalt cement, and approved admixtures.

Measurement, as provided above, will include asphaltic concrete used in the construction of intersections, turnouts, driveways, median strips, sidewalks, bike paths or other miscellaneous items or surfaces.

406-5 Basis of Payment

The accepted quantities of asphaltic concrete, measured as provided above, will be paid for under the appropriate bid items at the contract unit price, or adjusted unit price, complete-in-place.

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Should testing determine the asphalt cement deficient in meeting the requirements specified in Section 1005 of the Standard Specifications, the asphaltic concrete, representing the half shift or half-shifts in which such a deficient material was utilized, shall be evaluated as to acceptance in accordance with the requirements of Subsection 110-2.03.

Deficiencies in mineral aggregate gradation, asphalt cement content, asphaltic concrete thickness or compaction will be evaluated in accordance with the criteria established in Subsection 110-2.

Table 110-5 is modified to read:

Table 110-5 Asphaltic Concrete
PAYMENT ADJUSTMENT AMOUNTS FOR COMPACTION DEFICENCIES

In-place Air Voids (Percent)	Payment Adjustment Amount	
	Dollars/To n	Dollars/Metric Ton
7.0% or less	0.00	0.00
7.1 to 8.0	-1.00	-1.10
8.1 to 9.0	-2.00	-2.20
9.1 or greater	-3.00 (1)	-3.30 (1)

Note (1): Reject status: The payment adjustment amount shall apply only if the asphaltic concrete is allowed to remain in place, subject to the provisions of Subsection 110.2.04(B).