

INTERIM REVISIONS TO THE

Supplemental Specifications and Recurring Special Provisions, Adopted July 1, 2004

Adopted May 11, 2007

The revisions contained herein are effective for all Division of Aeronautics projects bid on or after June 15, 2007.

The following sections of the Supplemental Specifications and Recurring Special Provisions, Adopted July 1, 2004 are to be deleted and replaced with the sections contained herein:

- Supplemental Specification for Item 402 Porous Friction Course
- Check Sheet #11 – Recurring Special Provision for Item AR201001 Bituminous Base Course Method I (Under 2,500 tons/pay item/location)
- Check Sheet #12 – Recurring Special Provision for Item AR201002 Bituminous Base Course Method II (Over 2,500 tons/pay item/location)
- Check Sheet #13 – Recurring Special Provision for Item AR201003 Bituminous Base Course Method I, Superpave (Under 2,500 tons/pay item/location)
- Check Sheet #14 – Recurring Special Provision for Item AR201004 Bituminous Base Course Method II, Superpave (Over 2,500 tons/pay item/location)
- Check Sheet #19 – Recurring Special Provision for Item AR401001 Bituminous Surface Course Method I (Under 2,500 tons/pay item/location)
- Check Sheet #20 – Recurring Special Provision for Item AR401002 Bituminous Surface Course Method II (Over 2,500 tons/pay item/location)
- Check Sheet #21 – Recurring Special Provision for Item AR401003 Bituminous Surface Course Method I, Superpave (Under 2,500 tons/pay item/location)
- Check Sheet #22 – Recurring Special Provision for Item AR401004 Bituminous Surface Course Method II, Superpave (Over 2,500 tons/pay item/location)

State of Illinois
Department of Transportation
Division of Aeronautics

SUPPLEMENTAL SPECIFICATION FOR
ITEM 402 POROUS FRICTION COURSE

This Supplemental Specification amends the provisions of the Standard Specifications for Construction of Airports, adopted January, 1985 and shall be construed to be a part thereof, superseding any conflicting provisions thereof applicable to the work under the contract.

Item 402 "Porous Friction Course (PFC)" is modified as outlined below:

DESCRIPTION

402-1.1 DESCRIPTION

DELETE: Second and third paragraphs and replace with the following:

"The porous friction course shall be constructed in one layer, having a compacted nominal thickness as shown on the plans.

No porous friction course shall be constructed until the underlying surface has been cleaned, prepared and accepted by the Resident Engineer.

The Contractor shall be responsible for the quality control in the production and construction of the porous friction course."

MATERIALS

402-2.1 AGGREGATE

"Aggregate shall consist of crushed stone blended with natural or manufactured sand and/or mineral filler.

The portion of the materials retained on the No. 8 sieve shall be known as course aggregate the portion passing the No.8 sieve and retained on the No. 200 sieve as fine aggregate and the portion passing the No. 200 sieve as mineral filler.

Course aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	40

DELETERIOUS TEST (IDOT B Quality)	PERCENT
Materials (Max. % allowed)	
Shale %	2.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	6.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>6.0</i>

Fine Aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product consisting essentially of silicates and aluminosilicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product that is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen, or electric furnace.

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Material ASTMI C 136 Max. % Loss [1]	6.0 [2]

[1] Fine aggregate shall not contain more than 3 (three) percent clay (2 micron or smaller) particles.

[2] Does not apply to stone sand.

DELETERIOUS TEST (IDOT B Quality)	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

402-2.3 BITUMINOUS MATERIAL

DELETE: This section and replace with the following:

For airports located North of U.S. Route 36, the bituminous material for the porous friction course shall be polymer modified and shall be SBS PG 70-28. For airports located south of U.S. Route 36, the bituminous material for the porous friction course shall be polymer modified and shall be either SBS PG 70-28 or SBS PG 70-22, at the Contractor's option.

COMPOSITION

402-3.1 COMPOSITION OF MIXTURES

INSERT: The following as the second paragraph:

An anti-stripping agent is required for this project. A heat-stable anti-strip additive shall be required in the manufacture of mix used in the construction of the porous friction course. The anti-strip additive shall come from a producer on the Department's latest list of approved HMA anti-strip additives. The dosage rate shall be 1.0 percent by weight of asphalt cement. The Engineer shall approve the method of adding the anti-strip additive to the mix. No additional compensation shall be allowed to the Contractor as payment for furnishing and using an anti-strip agent.

402-3.2 JOB MIX FORMULA

ADD: After the second sentence of the first paragraph:

No mix shall be placed until the Illinois Division of Aeronautics Engineer of Construction & Materials issues a letter with the approved Job Mix Formula (JMF), based upon data submitted by the Contractor.

DELETE: The second paragraph and replace with the following:

The combined aggregate shall be of such size, that the percentage composition by weight as determined by laboratory sieves, will conform to the gradation shown in table 2, ½ inch maximum, when tested in accordance

with ASTM C-136. The maximum mixing temperature shall not exceed 310° at the time of mixing.

402-3.3 TEST SECTION

DELETE: This section and replace with the following:

The Contractor shall schedule plant production on the first day of paving in order that a test section can be constructed. The test section shall be approximately 1000 feet in length and at least 12.5 feet in width. If mix production or mix laydown problems occur, the Contractor shall make corrective adjustments and may not continue paving past the limits of the strip until such corrective adjustments are made. Upon approval of the Engineer, the Contractor may continue paving past the limits of the test section. All preparation materials and construction methods shall be identical to those to be used on the remainder of the runway surface, and as specified in these Special Provisions and the construction plans. No separate payment will be made for construction of the test section, but will be paid for in accordance with section 402-6.1.

CONSTRUCTION METHODS

402-4.1 WEATHER AND SEASONAL LIMITATIONS

DELETE: This section and replace with the following:

The porous friction course shall be constructed on a dry surface when the atmospheric temperature has been 60°F and rising two days before and is 60°F and rising on the day of placement. In addition, the weather cannot be foggy or rainy and the wind conditions must be less than or equal to 15 mph on the day of paving.

402-4.2 HMA MIXING PLANT

INSERT: The following as the first paragraph:

“The HMA plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I HMA mixtures in accordance with Section 1102 of the current Standard Specifications for Road and Bridge Construction. In addition, the Contractor or producer shall provide a testing laboratory, meeting the requirements of IDOA’s latest Policy Memorandum 96-2 “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete *Mixtures*,” located at the IDOT internet site. The lab shall be used for quality control testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.

402-4.3 HAULING EQUIPMENT

DELETE: The last sentence and replace with:

All trucks shall be insulated sufficient to maintain the mixture at the specified temperature during hauling. The tarps shall be used at all times when transporting the PFC.

402-4.4 HMA PAVERS

ADD: The following to the fourth paragraph:

The paver speed shall not exceed 35 feet per minute. Only electronic grade control for both the horizontal and transverse control of grade shall be used on this project. The use of 30 foot long (minimum) paving ski's and matching shoes are required.

402-4.5 ROLLERS

DELETE: This section and replace with the following:

A minimum of two (2) self propelled steel-wheel rollers shall be furnished. They shall be in good condition, capable of reversing without backlash, and of operating at slow speeds to avoid displacement of the HMA mixture. The wheels shall be equipped with adjustable scrapers, water tanks and a sprinkling apparatus to prevent the HMA mixture from sticking to the wheels. If approved by the Engineer, the Contractor may add a small amount of detergent to the roller's water tanks to alleviate roller pick up. The weight of each roller shall be between 6 and 10 tons. When approved by the Engineer, vibratory rollers may be used in the static mode. The use of equipment, which results in crushing of the aggregate, will not be permitted. The resident engineer in compliance with these Special Provisions must approve all rollers at least one (1) day prior to paving.

402-4.6 PREPARATION OF MINERAL AGGREGATE

ADD: The following to this section:

The use of frozen aggregates or frozen aggregate stockpiles is prohibited. Frozen aggregates or frozen stockpiles must be thawed and/or double dried to reduce the combined aggregate moisture content to at or below 0.5 percent.

402-4.7 PREPARATION OF BITUMINOUS MIXTURE

DELETE: The second sentence of the first paragraph and replace with the following:

The porous friction course shall be prepared at the temperature designated by the Engineer; the mixture shall not exceed 310°F at the time of mixing.

402-4.8 TRANSPORTATION AND DELIVERY OF THE MIXTURE

DELETE: This section and replace with the following:

The mixture shall be transported from the central mixing plant to the paving site in trucks described in 402-4.3. The time interval between mixing and laydown shall not be more than ninety (90) minutes. The PFC mixture shall be placed at a temperature of 290°F plus or minus 10°F. Delivery of mixture to the spreader shall be scheduled so that spreading and rolling occur in a continuous matter. Intermittent production or stopping and starting of the pavers will be cause for suspension of work.

402-4.9 SPREADING AND LAYING

DELETE: This section and replace with the following:

(a) Preparation of Existing Surfaces

The existing pavement surface will be tacked in accordance with item 603. The Engineer will set the exact rate. The pavement shall be cleared of all loose or deleterious material with brooms or blowers before the tack coat is placed.

(b) Placing

Hauling over material already placed shall not be permitted until the material has been thoroughly compacted as specified and allowed to cool overnight and develop its stability for a period of at least 24 hours. No traffic or hauling will be allowed on the newly laid PFC during extremely hot temperatures or when marking or displacement of the porous friction course is observed.

402-4.10 COMPACTION OF MIXTURE

DELETE: The last two sentences of the first paragraph and replace with the following:

No more than a total of three passes by the rollers will be required. The optimum weight of the rollers and the rolling pattern shall be determined during the test section construction. The number and type of rollers will be as specified in section 402-4.5.

402-4.11 JOINTS

ADD: The following to this section:

Longitudinal joints will be butt joints and no lapping of pavements will be allowed.

402-4.14 SAMPLING PFC MIXTURE AND HOT BINS

DELETE: The last three sentences of the first paragraph and replace with the following:

Sampling procedures, sample sizes, and sampling frequency shall be done in accordance with the tables listed in Appendix B of the Illinois Division of Aeronautics latest edition of Policy Memorandum 96-2, "Requirements for Laboratory, Testing, Quality Control, and Paving of Bituminous Concrete Mixtures" located at the IDOT internet site.

402-4.16 PROTECTION OF PAVEMENT

DELETE: This section and replace with the following:

After final rolling, no vehicle traffic of any kind shall be permitted on the pavement until it has cooled and cured at least 24 hours. The Contractor may, with the approval of the Resident Engineer, water the pavement in order to cool it.

METHOD OF MEASUREMENT

402-5.1 MEASUREMENT OF POROUS FRICTION COURSE

DELETE: This section and replace with the following:

Porous friction course shall be measured as the number of square yards of pavement in place and accepted in accordance with these Special Provisions. Only the areas of porous friction course meeting the following thickness requirements shall be measured for payment:

The compacted thickness of the porous friction course will be measured in place at random locations for each 3,000 square yards of pavement. Minimum acceptable thickness of porous friction course is as shown in the table below. When a random in place measurement is less than the minimum acceptable thickness, additional thickness measurements will be taken at necessary intervals until the porous friction course is within the limits. All areas that are determined to be less than the thickness shown in the table below shall be removed and replaced at the Contractor's expense.

PAY ITEM	MINIMUM THICKNESS
Item AR402620 -- Porous Friction Course 5/8"	½ inches
Item AR402621 -- Porous Friction Course, 1"	¾ inches
Item AR402622 -- Porous Friction Course, 0.10'	1 inch

BASIS OF PAYMENT

402-6.1

Payment will be made under:

- Item AR402620 -- Porous Friction Course 5/8" -- per square yard
- Item AR402621 -- Porous Friction Course, 1" -- per square yard
- Item AR402622 -- Porous Friction Course, 0.10' -- per square yard

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR201001 BITUMINOUS BASE COURSE – METHOD I
(Under 2,500 tons/pay item/location)

Effective: May 11, 2007

This Special Provision Modifies Item 201 Bituminous Base Course of the Standard Specifications.

201-1.1 Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the HMA (Hot Mix Asphalt) base course.”

“The HMA base course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

201-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, or recyclable asphalt pavement (RAP), blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits; granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Recyclable Asphalt Pavement (RAP): Recyclable asphalt pavement shall be defined as the product resulting from milling and/or crushing of HMA pavement composed of aggregates and asphalt that originally met the quality requirements as stated herein. The Contractor shall furnish evidence

satisfactory to the Division and the FAA that the material met the specified quality requirements.

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

201-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:

“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST (IDOT C Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	20
Los Angeles Abrasion ASTM C 131 Max. % Loss	45

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	4.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	8.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>10.0</i>

Delete the second and third paragraphs.

201-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:

“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and aluminosilicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l. ASTM C 136 Max. % Loss [1]	6.0 [2]

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

[1] Fine aggregate shall not contain more than 3 (three) percent clay (2 micron or smaller) particles.

[2] Does not apply to Stone Sand.

201-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.

201-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the HMA base course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways Source Certification Program (AGCS). The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

201-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

“All the source(s) of the proposed aggregates for use by the Contractor in the Contractor’s proposed HMA mix design must be approved in writing by the I.D.A. Engineer of Construction & Materials prior to use in any design or production of HMA material.”

201-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.”

201-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Contractor is responsible for the job mix formula (JMF) and no HMA mixture for payment shall be produced until a letter from the Illinois Division of Aeronautics’ Engineer of Construction & Materials approving the Contractor’s proposed JMF has been issued to the Contractor. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of Marshall blows specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer upon the completion of the proposed JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,”* located at the IDOT internet site.

Delete the third paragraph and replace with the following:

“The HMA mixture shall be tested according to the Asphalt Institute, ‘Marshall Method of Mix Design’, in the current Manual MS-2, *Mix Design Method for Asphalt Concrete*, and shall meet the criteria set forth in Tables 2 and 4 herein.”

Table 2. MARSHALL DESIGN CRITERIA

Properties	Over 60,000 lb. [1]	Under 60,000 lb.
Number of Blows	75	50
Stability (Min.)	1800	1500
Flow	8-16	8-18
Percent Air Voids	1.5 – 4.0	1.5 – 3.5
Voids filled with asphalt (%)	75-90	75-90

[1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the JMF. The exact amount of stone sand will be determined by the Contractor based on preparation of the Mix Design. The percentage of stone sand will be verified as acceptable by the Division of Aeronautics based upon the Contractor's final proposed JMF. The Division reserves the right to request a change in the amount of stone sand at any point in the mix design process, as well as during production, based upon performance of the mix during placement.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Replace Table 4 with the following:

TABLE 4. AGGREGATE BITUMINOUS BASE COURSE

Percentage by Weight Passing Sieves Job Mix Formula (JMF)		
Sieve Size	Gradation B Range 1" Maximum	Ideal Target
1-1/4 in.	---	---
1 in.	100	100
3/4 in.	93 – 97	95
1/2 in.	75 – 79	77
3/8 in.	64 – 68	66
No. 4	45 – 51	48
No. 8	34 – 40	37
No. 16	27 – 33	30
No. 30	19 – 23	21
No. 100	6 – 10	8
No. 200	4 – 6	5
Bitumen %:		
Stone	4.5 – 7.0	5.5

Add the following sentence to the end of the fifth paragraph:

“When approved by the Engineer, the Contractor may add up to 25 percent of recyclable asphalt pavement to meet the required gradations, provided he can produce a consistent mixture meeting the mix design, temperature, and density requirements specified herein.”

Delete the second sentence of the seventh paragraph and replace with the following:

“The tolerances listed in TABLE 5 will only apply when they cause a grading band within the band listed in TABLE 4. Otherwise, the grading bands listed in TABLE 4 shall apply.”

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and asphalt content. Results falling outside the set tolerances shall be cause for rejection of all the material placed from the time of testing until a passing test is obtained. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,”* located at the IDOT internet site. These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer.”

Delete the last paragraph for this section.

201-3.4 TEST SECTION

Delete this section.

201-4.2 HMA MIXING PLANT

Insert the following as the first paragraph:

“The HMA hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I HMA mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling.”

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

“The Contractor or producer shall provide a testing laboratory, meeting the requirements of the Illinois Division of Aeronautics’ latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,”* located at the IDOT internet site, for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.”

201-4.3 HAULING EQUIPMENT

ADD:

“All trucks used for hauling HMA mixtures shall have a tightly closing tailgate to prevent spilling of material on airfield pavements or entrance roads used for haul roads. Prior to leaving the placing site, the end of the truck beds shall be cleaned of all loose material which may spill onto the pavements and the tail gate shall be secured.”

201-4.4 HMA PAVERS

Add the following after “activated screed” in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second sentence of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

201-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the base course aggregate(s) shall be screened into at least four sizes. This requirement does not apply to drum mixer plants.”

201-4.9 TRANSPORTING, SPREADING AND FINISHING

Add the following to the end of the third paragraph:

“The Engineer may increase the asphalt content of the first lift by up to 0.3 percent when the HMA mixture is placed directly on a prepared subgrade.”

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the HMA base course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane. A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of base course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.”

201-4.10 COMPACTION OF MIXTURE

Delete the third paragraph and substitute the following:

“Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein.”

201-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are “pinched” to provide adequate density at the joint. The method of “pinching” shall be as defined in Article 406.16 on compaction of HMA concrete in the most current issue of the I.D.O.T. Standard Specifications for Road and Bridge Construction. The Contractor shall cut one core per 2,500 tons or one per project at a random location over the longitudinal construction joint. The core shall be delivered to the Resident Engineer for density testing. The density at the joint shall be a minimum of 90%.

201-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

Delete this entire section and insert the following:

"201-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY.

After the completion of compaction, the pavement will be tested and accepted on the basis of percent air voids in the final compacted mat. The HMA base course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the Maximum Theoretical Specific Gravity (ASTM D 2041). If, during construction, the density test falls below 93 percent, additional approved rollers shall be required.

Two random nuclear density tests shall be taken for each 500 tons of mix placed. Each nuclear density test shall be the average of five (5) nuclear tests taken as a cross-section of the pavement. The Resident Engineer shall have a nuclear gauge and qualified operator on the project when constructing this item. One random mix sample shall be taken from each 1,000 tons of mix laid, for Marshall, Extraction, Maximum Specific Gravity, and Air Void tests."

201-4.15 SAMPLING PAVEMENT

Delete this section.

METHOD OF MEASUREMENT201-5.1

Add:

Measurement for payment will not be made for any bituminous base course in excess of 103 percent of plan quantity plus (or minus) theoretical quantities authorized by the Engineer.

BASIS OF PAYMENT201-6.1 Payment will be made under:

Item AR201610 -- Bituminous Base Course -- per ton.

Item AR201620 -- Bituminous Base Course, Leveling -- per ton.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR201002 BITUMINOUS BASE COURSE – METHOD II
(Over 2,500 tons/pay item/location)

Effective: May 11, 2007

This Special Provision Modifies Item 201 Bituminous Base Course of the Standard Specifications.

201-1.1 Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the HMA (Hot Mix Asphalt) base course.”

“The HMA base course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

201-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, or recyclable asphalt pavement (RAP), blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing by mechanical means the following types of rocks quarried from undisturbed consolidated deposits; granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Recyclable Asphalt Pavement (RAP): Recyclable asphalt pavement shall be defined as the product resulting from milling and/or crushing of HMA concrete pavement composed of aggregates and asphalt that originally met the quality requirements as stated herein. The Contractor shall furnish

evidence satisfactory to the Division and the FAA that the material met the specified quality requirements.

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

201-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:

“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT C Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	20
Los Angeles Abrasion ASTM C 131 Max. % Loss	45

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	4.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	8.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>10.0</i>

Delete the second and third paragraphs.

201-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:

“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and aluminosilicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT C Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l. ASTM C 136 Max. % Loss [1]	6.0 [2]

[1] Fine aggregate shall not contain more than 3 (three) percent clay (2 micron or smaller) particles.

[2] Does not apply to Stone Sand.

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

201-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.

201-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the

manufacture of the HMA base course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways Source Certification Program. The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

201-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

”All the source(s) of the proposed aggregates for use by the Contractor in the Contractor’s proposed HMA mix design must be approved in writing by the I.D.A. Engineer of Construction & Materials prior to use in any design or production of HMA material.”

201-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.”

201-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Contractor is responsible for the job mix formula (JMF) and no HMA mixture for payment shall be produced until a letter from the Illinois Division of Aeronautics’ Engineer of Construction & Materials approving the Contractor’s proposed JMF has been issued to the Contractor. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of Marshall blows specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, upon the completion of the proposed JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,”* located at the IDOT internet site.

Delete the third paragraph and replace with the following:

“The HMA mixture shall be tested according to the Asphalt Institute, ‘Marshall Method of Mix Design’, in the current Manual MS-2, *Mix Design Method for Asphalt Concrete*, and shall meet the criteria set forth in Tables 2 and 4 herein.”

Table 2. MARSHALL DESIGN CRITERIA

Properties	Over 60,000 lb. [1]	Under 60,000 lb.
Number of Blows	75	50
Stability (Min.)	1800	1500
Flow	8-16	8-18
Percent Air Voids	1.5 – 4.0	1.5 – 3.5
Voids filled with asphalt (%)	75-90	75-90

[1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the JMF. The exact amount of stone sand will be determined by the Contractor based on preparation of the Mix Design. The percentage of stone sand will be verified as acceptable by the Division of Aeronautics based upon the Contractor's final proposed JMF. The Division reserves the right to request a change in the amount of stone sand at any point in the mix design process, as well as during production, based upon performance of the mix during placement.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Replace Table 4 with the following:

TABLE 4. AGGREGATE BITUMINOUS BASE COURSE

Percentage by Weight Passing Sieves Job Mix Formula (JMF)		
Sieve Size	Gradation B Range 1" Maximum	Ideal Target
1-1/4 in.	---	---
1 in.	100	100
3/4 in.	93 – 97	95
1/2 in.	75 – 79	77
3/8 in.	64 – 68	66
No. 4	45 – 51	48
No. 8	34 – 40	37
No. 16	27 – 33	30
No. 30	19 – 23	21
No. 100	6 – 10	8
No. 200	4 – 6	5
Bitumen %:		
Stone	4.5 – 7.0	5.5

Add the following sentence to the end of the fifth paragraph:

“When approved by the Engineer, the Contractor may add up to 25 percent of recyclable asphalt pavement to meet the required gradations, provided he

can produce a consistent mixture meeting the mix design, temperature, and density requirements specified herein.”

Delete the second sentence of the seventh paragraph and replace with the following:

“The tolerances listed in TABLE 5 will only apply when they cause a grading band within the band listed in TABLE 4. Otherwise, the grading bands listed in TABLE 4 shall apply.”

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and the asphalt content. Results falling outside the set tolerances shall be cause for rejection of all the material placed from the time of testing until a passing test is obtained. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,”* located at the IDOT internet site. These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer.”

Delete the last paragraph for this section.

201-3.4 TEST SECTION

Delete this entire section and replace with the following:

“Prior to the manufacture of mix for the test section, Contractor quality control personnel shall have completed all proportioning and testing in accordance with Policy Memorandum 96-2, to assure that the mix produced will meet the JMF. The Contractor shall then prepare a quantity of HMA base course mixture in order to construct the test section.

The test section shall have a length of approximately 200 to 300 lineal feet and shall be of the same depth specified for the construction of the course which it represents. The Contractor may place up to 50 tons of mix prior to construction of the test section in order to line-out the plant, the mix, and the paving operation. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented.

A. Construction of the Test Section:

The test section shall consist of two (2) parts: Development of a Growth Curve and establishing a Rolling Pattern.

1. Growth Curve

To construct the Growth Curve a self-propelled vibratory roller meeting the following minimum requirements shall be required:

Drum diameter 48 inches, length of drum 66 inches, vibrators 1600 vibrations per minute (VPM) minimum, unit static force on vibrating drum(s) 125 pounds per lineal inch (PLI), total applied force 325 pounds per inch (PLI), adjustable eccentrics, reversible eccentrics on non-driven drum(s). The total applied force for various combinations of VPM and eccentric positions shall be shown on decals on the vibrating roller or on a chart maintained with the roller. The vibratory roller shall be equipped with water tanks and sprinkling devices, or other approved methods, which shall be used when necessary to wet the drum to prevent the HMA mixture from sticking.

The Contractor shall have a vibrating reed tachometer (hand type) at the job site for checking roller vibrations. The reed tachometer shall have a range of 1000 to 4000 vibrations per minute (vpm). The vibrating reed tachometer shall have two (2) rows of reeds. One row shall range from 1000 to 2000 vpm and the other row shall range from 2000 to 4000 vpm.

The Growth Curve shall be constructed by successive passes of the vibratory roller, in a given area, in order to determine the maximum compactibility of the mix. More than one Growth Curve may be required as part of the test section if adjustments to the mix, plant operation, laydown, etc., are necessary to reach optimum compactibility.

2. Rolling Pattern

The Contractor shall then proceed to establish the Rolling Pattern using the equipment that he intends to use for the compaction of the rest of the HMA course.

B. Test Section Acceptance

The Test Section shall be evaluated and approved based on the following:

1. The completed Test Section (Rolling Pattern area) shall be divided into four (4) subsections with one (1) sample two (2) cores obtained from each subsection for determination of density. One additional core sample shall be obtained from the Growth Curve.
2. The Contractor shall correlate a nuclear density gauge to the Test Section for Quality Control testing. The nuclear density gauge shall not be used for acceptance testing.
3. The completed Test Section (rolling pattern area) shall have a minimum density of 94 percent (6 percent air voids) of the maximum theoretical specific gravity of the mix (ASTM D2041). Individual test results (average of two cores) below 94% shall constitute a failing test section.

4. If the test section fails to meet these requirements, the Contractor shall construct a new Test Section meeting these requirements at his own expense.

5. Full production shall not be allowed until all tests, Reflux extraction or Ignition Oven, Gradation, Marshall Stability and Flow, Gravities of mix, and Core Densities are completed in order to determine compliance with these specifications.

6. The completed Test Section(s) shall be part of the proposed work. When recommended by the Resident Engineer and approved by the Engineer, test sections that do not conform to the specifications shall be removed and replaced at the Contractor's expense.

7. When a Test Section passes, the Test Section tonnage shall be paid 100%.

The mix used in construction of the Test Section shall be paid for under Section 201-6.10. Construction of the Test Section shall be paid for under Section 201-6.30.

201-4.2 HMA MIXING PLANT

Insert the following as the first paragraph:

“The HMA hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I HMA mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling.”

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

“The Contractor or producer shall provide a testing laboratory, meeting the requirements of Illinois Division of Aeronautics' latest *Policy Memorandum 96-2: "Requirements for Laboratory, Testing, Quality Control and Paving of HMA Concrete Mixtures,"* located at the IDOT internet site, for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.”

201-4.3 HAULING EQUIPMENT

ADD: All trucks used for hauling HMA mixtures shall have a tightly closing tailgate to prevent spilling of material on airfield pavements or entrance roads used for haul roads. Prior to leaving the placing site, the end of the truck beds shall be cleaned of all loose material which may spill onto the pavements and the tail gate shall be secured.

201-4.4 HMA PAVERS

Add the following after “activated screed” in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second and third sentences of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

201-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the base course aggregate(s) shall be screened into at least four sizes. This requirement does not apply to drum mixer plants.”

201-4.9 TRANSPORTING, SPREADING AND FINISHING

Add the following to the end of the third paragraph:

“The Engineer may increase the asphalt content of the first lift by up to 0.3 percent when the HMA mixture is placed directly on a prepared subgrade.”

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the HMA base course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference

stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane. A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of base course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.”

201-4.10 COMPACTION OF MIXTURE

Delete the third paragraph and substitute the following:

“Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein.”

201-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are “pinched” to provide adequate density at the joint. The method of “pinching” shall be as defined in Article 406.16 on compaction of HMA concrete in the most current issue of the I.D.O.T. Standard Specifications for Road and Bridge Construction. The Contractor shall cut one core per 2,500 tons or one per project at a random location over the longitudinal construction joint. The core shall be delivered to the Resident Engineer for density testing. The density at the joint shall be a minimum of 90%.

201-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

Delete this entire section and insert the following:

“201-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

After the compaction is completed, the pavement will be tested and payment made on the basis of percent air voids in the final compacted mat.

The HMA base course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the maximum theoretical specific gravity (ASTM D2041) and accepted by the following statistical procedure. When more than one base course mix design is used on the same project, each mix will be evaluated separately under the statistical acceptance procedure specified herein.

(a)Lot Size. The plant-produced mixture shall be tested on a lot basis. A lot shall consist of 4 sublots. End or final lots may contain between 3 and 6 sublots.

- (1) A subplot shall consist of 500 tons for each type of mix.

One density sample shall be taken randomly from each subplot. Each density sample shall be the average of two cores extracted from the sample location.

The Contractor shall take one random mix sample from each 1,000 tons of mix laid. This sample shall be split into two samples with one half tested by the Contractor for Marshall, Extraction or Ignition oven for Gradation and Nuclear Asphalt Gauge for asphalt content, Maximum Specific Gravity, Gradation, and Air Void tests. The other sample half shall be appropriately marked and retained by the Contractor until the Engineer requests the mix for testing or directs the Contractor in writing to dispose of the mix.

All tests shall be completed and reported to the Engineer no later than the morning of the day following production.”

(b)Lot Early Termination. When less than 3 sublots are produced, such as at the end of construction of the base course or at the end of the construction season, the final subplot data shall be included with the previous lot for payment. The final lot may thus contain up to six (6) sublots.

(c)Acceptance Criteria. The acceptance of each lot of HMA base course shall be based on the **P**ercentage of material **W**ithin specification **L**imits (PWL). The PWL is determined using standard statistical techniques and involves the number of tests in each lot (n) and the quality indexes (QL is the Quality Index for the lower limit; QU is the Quality Index for the upper limit). The quality indexes are calculated using the following formulae:

$$Q_L = \frac{\bar{X} - 1}{S} \qquad Q_U = \frac{7 - \bar{X}}{S}$$

Where Q = Quality Index (lower or upper)

\bar{X} = Mean (average) value of air voids in percent

% Air Voids = (100-% density)

S = Standard Deviation of test results

For mat in-place air voids, estimate the **P**ercentage **W**ithin **T**olerance (PWT) for the lower and upper tolerance limits by entering Table 8 with Q_L and Q_U using the column appropriate to the total number (n) of core samples. The

total percent of material between the lower and upper limits is defined as the **Percent Within Limits** and is calculated by the following formula:

$$PWL = [PWT(\text{lower}) + PWT(\text{upper})] - 100$$

Each lot of HMA material shall be accepted for 100 percent payment when the PWL equals or exceeds 90 percent. When the PWL is below 90 percent for a given lot, the lot tonnage shall be adjusted in accordance with Table 7.

TABLE 7 - PAY ADJUSTMENT SCHEDULE
(see note 2.)

PWL	% ADJUSTMENT IN LOT QUANTITY
90 - 100	100
80 - 89.9	0.5 PWL + 55.0
65 - 79.9	2.0 PWL - 65.0
Below 65	1.

1. The lot shall be removed and replaced. However, the Engineer may decide to accept the deficient lot. In that case, it will be paid for at 50% adjustment.

2. All preliminary calculations used in determining the Percent Within Limits should be rounded to a minimum of four digits right of the decimal point. The PWL that is used for Table 7 purposes should then be rounded to one digit right of the decimal point to determine the percent of contract quantity to be paid. The final percent pay figure should be rounded to one digit right of the decimal point. The Resident Engineer shall notify the Contractor, in writing, of the final percent pay for each lot as soon as all lot tests are completed.

(d)Mix sampling All mix sampling shall be done on a random basis as determined by the Resident Engineer. Samples that are obviously defective or become defective prior to testing shall be discarded and retaken. New samples shall be considered as if they were initial samples.

201-4.15 SAMPLING PAVEMENT

Delete this section and replace with the following:

“201-4.15 SAMPLING PAVEMENT Cores from each subplot shall be taken at random locations as outlined by the Resident Engineer. No core samples shall be taken within two feet of the edge of pavement. Any core less than 1-1/2 inch thickness shall not be used and a new location and sample shall be selected.

Core samples of approximately 4 inches in diameter, for determination of in-place air voids of the completed pavement, shall be obtained by the Contractor at no extra expense. The number and locations of the samples shall be as determined by the Resident Engineer. The Contractor shall furnish all tools, labor, and materials for sampling and replacing pavement.

All core tests necessary to determine initial conformance with specification requirements will be performed by the Resident Engineer at no cost to the Contractor.

(A) Resampling and Retesting Resampling of a lot may be allowed only under the following conditions:

(1) The Contractor must request, in writing, the resampling and retesting of a complete lot within 48 hours after receiving the written test results of the lot from the Resident Engineer. Only one retest per lot will be permitted.

(2) If the retested lot should result in a higher "Percent Within Limits" figure than the original, based on all lot samples (original and new) the following will apply:

(a) The cost of resampling and retesting will be borne by the Engineer.

(b) The new "Percent Within Limits" figure shall be calculated using all LOT samples, (original and new) for calculating the lot payment.

(3) If the retested lot should result in a "Percent Within Limits" figure equal to or less than the original, based on all the lot samples (original and new), the following will apply:

(a) The cost of resampling and retesting will be borne by the Contractor.

(b) The new "Percent Within Limits" figure shall be calculated using all lot samples, (original and new) for calculating the lot payment.

(4) Procedures in ASTM E-178 shall be used to determine outliers based on all samples taken and a 5% significance level.

(5) Results of the retesting and resampling shall be final."

METHOD OF MEASUREMENT

201-5.1

Add:

Measurement for payment will not be made for any bituminous base course in excess of 103 percent of plan quantity plus (or minus) theoretical quantities authorized by the Engineer.

BASIS OF PAYMENT

201-6.1

Delete this section and replace with the following:

201-6.1 The quantity of HMA base course mixture measured as outlined in Section 201-5.1 shall be adjusted in accordance with Section 201-4.13 herein. Payment shall be calculated by multiplying the contract unit price per ton of HMA base course and the adjusted tons per lot. Final payment shall be compensation for furnishing all materials, for all preparation, mixing, testing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

The test section shall be paid for at the contract unit price per each, which price shall include the additional specified equipment, labor, Engineering, and testing time necessary to construct this item.

Payment will be made under:

- Item AR201610 -- Bituminous Base Course -- per ton.
- Item AR201620 -- Bituminous Base Course, Leveling -- per ton.
- Item AR201630 -- Bituminous Base Test Section -- per each.

TABLE 8
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALITY INDEX (QL or QU)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362	2.0656	2.0897
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630	1.8828	1.8989
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420	1.7566	1.7684
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454	1.6566	1.6655
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635	1.5721	1.5790
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716	1.4829	1.4914	1.4981	1.5035
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265	1.4316	1.4358
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670	1.3709	1.3741
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118	1.3148	1.3172
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602	1.2623	1.2640
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115	1.2129	1.2141
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653	1.1661	1.1660
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204	1.1208	1.1212	1.1215	1.1218
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789	1.0788	1.0787
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382	1.0377	1.0374
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990	0.9982	0.9976
83	0.9939	0.9900	0.9785	0.9715	0.9672	0.9643	0.9624	0.9610	0.9599	0.9591
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241	0.9228	0.9219
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882	0.8868	0.8857
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533	0.8517	0.8505
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192	0.8175	0.8161
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858	0.7840	0.7826
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531	0.7513	0.7498
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211	0.7192	0.7177
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896	0.6877	0.6861
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587	0.6567	0.6551
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282	0.6262	0.6247
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982	0.5962	0.5947
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686	0.5667	0.5651
70	0.6787	0.6000	0.5719	0.5583	0.5504	0.5454	0.5419	0.5394	0.5375	0.5360
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105	0.5086	0.5072
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820	0.4802	0.4787
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537	0.4520	0.4506
66	0.5563	0.4800	0.4545	0.4424	0.4354	0.4310	0.4280	0.4257	0.4241	0.4227
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4031	0.4001	0.3980	0.3964	0.3951
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705	0.3690	0.3678
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432	0.3418	0.3407
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161	0.3148	0.3137
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892	0.2880	0.2870
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624	0.2613	0.2604

TABLE 8 (Continued)
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358	0.2348	0.2339
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2083	0.2084	0.2076
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829	0.1821	0.1814
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566	0.1559	0.1553
55	0.1806	0.1500	0.1406	0.1353	0.1338	0.1322	0.1312	0.1304	0.1298	0.1293
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1048	0.1042	0.1038	0.1034
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0792	0.0786	0.0781	0.0778	0.0775
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521	0.0518	0.0516
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260	0.0259	0.0258
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260	-0.0259	-0.0258
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521	-0.0518	-0.0516
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781	-0.0778	-0.0775
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1048	-0.1042	-0.1038	-0.1034
45	-0.1806	-0.1500	-0.1406	-0.1353	-0.1338	-0.1322	-0.1312	-0.1304	-0.1298	-0.1293
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566	-0.1559	-0.1553
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829	-0.1821	-0.1814
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2083	-0.2084	-0.2076
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358	-0.2348	-0.2339
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624	-0.2613	-0.2604
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892	-0.2880	-0.2870
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161	-0.3148	-0.3137
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432	-0.3418	-0.3407
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705	-0.3690	-0.3678
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980	-0.3964	-0.3951
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4354	-0.4310	-0.4280	-0.4257	-0.4241	-0.4227
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537	-0.4520	-0.4506
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820	-0.4802	-0.4787
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105	-0.5087	-0.5072
30	-0.6787	-0.6000	-0.5719	-0.5583	-0.5504	-0.5454	-0.5419	-0.5394	-0.5375	-0.5360
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686	-0.5667	-0.5651
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982	-0.5962	-0.5947
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282	-0.6262	-0.6217
26	-0.7904	-0.7200	-0.6920	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587	-0.6567	-0.6551
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896	-0.6876	-0.6861
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211	-0.7192	-0.7177
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531	-0.7513	-0.7498
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858	-0.7840	-0.7826
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8246	-0.8214	-0.8192	-0.8174	-0.8161
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533	-0.8517	-0.8565

TABLE 8 (Continued)
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882	-0.8868	-0.8057
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241	-0.9228	-0.9219
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610	-0.9599	-0.9591
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990	-0.9982	-0.9976
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382	-1.0377	-1.0374
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789	-1.0788	-1.0787
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212	-1.1215	-1.1217
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653	-1.1661	-1.1668
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115	-1.2129	-1.2141
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602	-1.2623	-1.2640
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118	-1.3148	-1.3172
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670	-1.3709	-1.3741
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265	-1.4316	-1.4358
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4716	-1.4829	-1.4914	-1.4981	-1.5035
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635	-1.5721	-1.5790
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5872	-1.6127	-1.6313	-1.6454	-1.6566	-1.6655
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6992	-1.7235	-1.7420	-1.7566	-1.7684
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8054	-1.8379	-1.8630	-1.8828	-1.8989
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362	-2.0657	-2.0897

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR201003 BITUMINOUS BASE COURSE – METHOD I, SUPERPAVE
(Under 2,500 tons/pay item/location)

Effective: May 11, 2007

This Special Provision Modifies Item 201 Bituminous Base Course of the Standard Specifications.

201-1.1

Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the HMA base course.”

201-1.1

Add to the second paragraph:

“The HMA base course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

201-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, or recyclable asphalt pavement (RAP), blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing, by mechanical means, the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Recyclable Asphalt Pavement (RAP): Recyclable asphalt pavement shall be defined as the product resulting from milling and/or crushing of HMA concrete pavement composed of aggregates and asphalt that originally met the quality requirements as stated herein. The Contractor shall furnish evidence satisfactory to the Division and the FAA that the material met the specified quality requirements.

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

201-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:

“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT C Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	20
Los Angeles Abrasion ASTM C 131 Max. % Loss	45

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	4.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	8.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>10.0</i>

Delete the second and third paragraphs.

201-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:

“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain

crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and alumino-silicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT C Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l. ASTM C 136 Max. % Loss [1]	6.0 [2]

[1] Fine aggregate shall not contain more than 3 (three) percent clay (2 micron or smaller) particles.

[2] Does not apply to Stone Sand.

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

201-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.”

201-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the HMA base course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways Source Certification Program (AGCS). The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

201-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

”All the source(s) of the proposed aggregates for use by the Contractor in the Contractor’s proposed HMA mix design must be approved in writing by the I.D.A. Engineer of Construction & Materials prior to use in any design or production of HMA material.”

201-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.”

201-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Contractor is responsible for the job mix formula (JMF) and no HMA mixture for payment shall be produced until a letter from the Illinois Division of Aeronautics’ Engineer of Construction & Materials approving the Contractor’s proposed JMF has been issued to the Contractor. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of gyrations specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, upon the completion of the proposed JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 2003-1: “Requirements for Laboratory, Testing, Quality Control and Paving of Superpave Bituminous Concrete Mixtures for Airports,”* located at the IDOT internet site.

Delete the third paragraph and replace with the following:

“The HMA mixture shall be tested according to the Asphalt Institute’s most current Superpave Series No. 2 (SP-2) manual entitled, “Superpave Mix Design” and shall meet the criteria set forth in Tables 2 and 4 herein.”

TABLE 2 SUPERPAVE DESIGN CRITERIA

TRAFFIC MIX					
Design Parameter	Aircraft over 60,000 lbs.[1]		Aircraft under 60,000 lbs.		Automobile
	Runway or Taxiway	Parking Apron	Runway or Taxiway	Parking Apron	Entrance Roads and Parking Lots
N_{ini} [2]	5	7	5	5	5
N_{des} [3]	40	50	30	30	30
N_{max}	58	74	42	42	42
% Air Voids V_a	2-4	2-4	2-4	2-4	2-4
VFA (min %)	75-90	75-90	75-90	75-90	75-90

[1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the JMF. The exact amount of stone sand will be determined by the Contractor based on preparation of the Mix Design. The percentage of stone sand will be verified as acceptable by the Division of Aeronautics based upon the Contractor’s final proposed JMF. The Division reserves the right to request a change in the amount of stone sand at any point in the mix design process, as well as during production, based upon performance of the mix during placement.

[2] Where N = number of gyrations on an IDOT approved superpave gyratory compactor.

[3] The N_{des} value may be changed in order to obtain an acceptable mix design when approved by the Engineer.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Replace Table 4 with the following:

TABLE 4. AGGREGATE BITUMINOUS BASE COURSE

Percentage by Weight Passing Sieves Job Mix Formula (JMF)		
Sieve Size	Gradation B Range 1" Maximum	Ideal Target
1-1/4 in.	---	---
1 in.	100	100
3/4 in.	93 – 97	95
1/2 in.	75 – 79	77
3/8 in.	64 – 68	66
No. 4	45 – 51	48
No. 8	34 – 40	37

No. 16	27 – 33	30
No. 30	19 – 23	21
No. 100	6 – 10	8
No. 200	4 – 6	5
<hr/>		
Bitumen %:		
Stone	4.5 – 7.0	5.5
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Add the following sentence to the end of the fifth paragraph:

“When approved by the Engineer, the Contractor may add up to 25 percent of recyclable asphalt pavement to meet the required gradations, provided he can produce a consistent mixture meeting the mix design, temperature, and density requirements specified herein.”

Delete the second sentence of the seventh paragraph and replace with the following:

“The tolerances listed in TABLE 5 will only apply when they cause a grading band within the band listed in TABLE 4. Otherwise, the grading bands listed in TABLE 4 shall apply.”

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and asphalt content. Results falling outside the set tolerances shall be cause for rejection of all the material placed from the time of testing until a passing test is obtained. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 2003-1: “Requirements for Laboratory, Testing, Quality Control and Paving of Superpave Bituminous Concrete Mixtures for Airports,”* located at the IDOT internet site. These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer.”

Delete the last paragraph for this section.

201-3.4 TEST SECTION

Delete this section.

201-4.2 HMA MIXING PLANT

Insert the following as the first paragraph:

“The HMA hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I HMA mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling.”

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

“The Contractor or producer shall provide a testing laboratory, meeting the requirements of Illinois Division of Aeronautics’ latest *Policy Memorandum 2003-1: “Requirements for Laboratory, Testing, Quality Control and Paving of Superpave Bituminous Concrete Mixtures,”* located at the IDOT internet site, for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.”

201-4.4 HMA PAVERS

Add the following after “activated screed” in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second sentence of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

201-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the base course aggregate(s) shall be screened into at least four sizes. This requirement does not apply to drum mixer plants.”

201-4.9 TRANSPORTING, SPREADING, AND FINISHING

Add the following to the end of the third paragraph:

“The Engineer may increase the asphalt content of the first lift by up to 0.3 percent when the HMA mixture is placed directly on a prepared subgrade.”

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the HMA base course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane. A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of base course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.”

201-4.10 COMPACTION OF MIXTURE

Delete the third paragraph and substitute the following:

“Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein.”

201-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are “pinched” to provide adequate density at the joint. The method of “pinching” shall be as defined in Article 406.16 on compaction of HMA concrete in the most current issue of the I.D.O.T. Standard Specifications for Road and Bridge Construction. The Contractor shall cut one core per 2,500 tons or one per project at a random location over the longitudinal construction joint. The core shall be delivered to the Resident

Engineer for density testing. The density at the joint shall be a minimum of 90%.

201-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY.

Delete this entire section and insert the following:

"201-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY.

After the completion of compaction, the pavement will be tested and accepted on the basis of percent air voids in the final compacted mat. The HMA Base Course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the Maximum Theoretical Specific Gravity (ASTM D 2041). If, during construction, the density test falls below 93 percent, additional approved rollers shall be required.

Two random nuclear density tests shall be taken for each 500 tons of mix placed. Each nuclear density test shall be the average of five (5) nuclear tests taken as a cross-section of the pavement. The Resident Engineer shall have a nuclear gauge and qualified operator on the project when constructing this item. One random mix sample shall be taken from each 1,000 tons of mix laid, for Extraction or Ignition Oven, Maximum Specific Gravity and Air Void tests."

201-4.15 SAMPLING PAVEMENT

Delete this section.

METHOD OF MEASUREMENT

201-5.1

Add:

Measurement for payment will not be made for any bituminous base course in excess of 103 percent of plan quantity plus (or minus) theoretical quantities authorized by the Engineer.

BASIS OF PAYMENT

201-6.1

Payment will be made under:

Item 201-6.10 Bituminous Base Course - Per Ton

Item 201-6.20 Bituminous Base Course, Leveling - Per Ton

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR201004 BITUMINOUS BASE COURSE – METHOD II, SUPERPAVE
(Over 2,500 tons/pay item/location)

Effective: May 11, 2007

This Special Provision Modifies Item 201 Bituminous Base Course of the Standard Specifications.

201-1.1

Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the HMA (Hot Mix Asphalt) base course.”

201-1.1

Add to the second paragraph:

“The HMA base course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

201-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, or recyclable asphalt pavement (RAP), blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing, by mechanical means, the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Recyclable Asphalt Pavement (RAP): Recyclable asphalt pavement shall be defined as the product resulting from milling and/or crushing of HMA concrete pavement composed of aggregates and asphalt that originally met the quality requirements as stated herein. The Contractor shall furnish evidence satisfactory to the Division and the FAA that the material met the specified quality requirements.

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

201-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:

“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT C Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	20
Los Angeles Abrasion ASTM C 131 Max. % Loss	45

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	4.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	8.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>10.0</i>

Delete the second and third paragraphs.

201-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:

“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain

crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and alumino-silicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT C Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l. ASTM C 136 Max. % Loss [1]	6.0 [2]

[1] Fine aggregate shall not contain more than 3 (three) percent clay (2 micron or smaller) particles.

[2] Does not apply to Stone Sand.

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

201-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate

producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.”

201-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the HMA base course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways Source Certification Program. The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

201-2.1(E) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

”All the source(s) of the proposed aggregates for use by the Contractor in the Contractor’s proposed HMA mix design must be approved in writing by the I.D.A. Engineer of Construction & Materials prior to use in any design or production of HMA material.”

201-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.”

201-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Contractor is responsible for the job mix formula (JMF) and no HMA mixture for payment shall be produced until a letter from the Illinois Division of Aeronautics’ Engineer of Construction & Materials approving the Contractor’s proposed JMF has been issued to the Contractor. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of gyrations specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, upon the completion of the proposed JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 2003-1: “Requirements for Laboratory, Testing, Quality Control and Paving of Superpave Bituminous Concrete Mixtures for Airports,”* located at the IDOT internet site.

Delete the third paragraph and replace with the following:

“The HMA mixture shall be tested according to the Asphalt Institute’s most current Superpave Series No. 2 (SP-2) manual entitled, “Superpave Mix Design” and shall meet the criteria set forth in Tables 2 and 4 herein.”

TABLE 2 SUPERPAVE DESIGN CRITERIA

TRAFFIC MIX					
Design Parameter	Aircraft over 60,000 lbs.[1]		Aircraft under 60,000 lbs.		Automobile
	Runway or Taxiway	Parking Apron	Runway or Taxiway	Parking Apron	Entrance Roads and Parking Lots
N_{ini} [2]	5	7	5	5	5
N_{des} [3]	40	50	30	30	30
N_{max}	58	74	42	42	42
% Air Voids V_a	2-4	2-4	2-4	2-4	2-4
VFA (min %)	75-90	75-90	75-90	75-90	75-90

[1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the JMF. The exact amount of stone sand will be determined by the Contractor based on preparation of the Mix Design. The percentage of stone sand will be verified as acceptable by the Division of Aeronautics based upon the Contractor’s final proposed JMF. The Division reserves the right to request a change in the amount of stone sand at any point in the mix design process, as well as during production, based upon performance of the mix during placement.

[2] Where N = number of gyrations on an IDOT approved superpave gyratory compactor.

[3] The N_{des} value may be changed in order to obtain an acceptable mix design when approved by the Engineer.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Replace Table 4 with the following:

TABLE 4. AGGREGATE BITUMINOUS BASE COURSE

Percentage by Weight Passing Sieves Job Mix Formula (JMF)		
Sieve Size	Gradation B Range 1" Maximum	Ideal Target
1-1/4 in.	---	---
1 in.	100	100
3/4 in.	93 – 97	95
1/2 in.	75 – 79	77
3/8 in.	64 – 68	66

No. 4	45 – 51	48
No. 8	34 – 40	37
No. 16	27 – 33	30
No. 30	19 – 23	21
No. 100	6 – 10	8
No. 200	4 – 6	5
<hr/>		
Bitumen %:		
Stone	4.5 – 7.0	5.5
<hr/>		

Add the following sentence to the end of the fifth paragraph:

“When approved by the Engineer, the Contractor may add up to 25 percent of recyclable asphalt pavement to meet the required gradations, provided he can produce a consistent mixture meeting the mix design, temperature, and density requirements specified herein.”

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and the asphalt content. Results falling outside the set tolerances shall be cause for rejection of all the material placed from the time of testing until a passing test is obtained. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 2003-1: “Requirements for Laboratory, Testing, Quality Control and Paving of Superpave Bituminous Concrete Mixtures for Airports,”* located at the IDOT internet site. These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer.”

Delete the last paragraph for this section.

201-3.4 TEST SECTION

Delete this entire section and replace with the following:

“Prior to the manufacture of mix for the test section, Contractor quality control personnel shall have completed all proportioning and testing in accordance with Policy Memorandum 2003-1, to assure that the mix produced will meet the JMF. The Contractor shall then prepare a quantity of HMA base course mixture in order to construct the test section.

The test section shall have a length of approximately 200 to 300 lineal feet and shall be of the same depth specified for the construction of the course which it represents. The Contractor may place up to 50 tons of mix prior to construction of the test section in order to line-out the plant, the mix, and the paving operation. The underlying grade or pavement structure upon

which the test section is to be constructed shall be the same as the remainder of the course represented.

A. Construction of the Test Section:

The test section shall consist of two (2) parts: Development of a Growth Curve and establishing a Rolling Pattern.

1. Growth Curve: To construct the Growth Curve a self-propelled vibratory roller meeting the following minimum requirements shall be required:

Drum diameter 48 inches, length of drum 66 inches, vibrators 1600 vibrations per minute (VPM) minimum, unit static force on vibrating drum(s) 125 pounds per lineal inch (PLI), total applied force 325 pounds per inch (PLI), adjustable eccentrics, reversible eccentrics on nondriven drum(s). The total applied force for various combinations of VPM and eccentric positions shall be shown on decals on the vibrating roller or on a chart maintained with the roller. The vibratory roller shall be equipped with water tanks and sprinkling devices, or other approved methods, which shall be used when necessary to wet the drum to prevent the HMA mixture from sticking.

The Contractor shall have a vibrating reed tachometer (hand type) at the job site for checking roller vibrations. The reed tachometer shall have a range of 1000 to 4000 vibrations per minute (vpm). The vibrating reed tachometer shall have two (2) rows of reeds. One row shall range from 1000 to 2000 vpm and the other row shall range from 2000 to 4000 vpm.

The Growth Curve shall be constructed by successive passes of the vibratory roller, in a given area, in order to determine the maximum compactibility of the mix. More than one Growth Curve may be required as part of the test section if adjustments to the mix, plant operation, laydown, etc., are necessary to reach optimum compactibility.

2. Rolling Pattern: The Contractor shall then proceed to establish the Rolling Pattern using the equipment that he intends to use for compaction of the rest of the HMA course.

B. Test Section Acceptance

The Test Section shall be evaluated and approved based on the following:

1. The completed Test Section (Rolling Pattern area) shall be divided into four (4) subsections with one (1) sample two (2) cores obtained from each subsection for determination of density. One additional core sample shall be obtained from the Growth Curve.

2. The Contractor shall correlate a nuclear density gauge to the Test Section for Quality Control testing. The nuclear density gauge shall not be used for acceptance testing.

3. The completed Test Section (rolling pattern area) shall have a minimum density of 94 percent (6 percent air voids) of the maximum theoretical specific gravity of the mix (ASTM D2041). Individual test results (average of two cores) below 94% shall constitute a failing test section.

4. If the test section fails to meet these requirements, the Contractor shall construct a new Test Section meeting these requirements at his own expense.

5. Full production shall not be allowed until all tests, Reflux extraction or Ignition Oven, Gradation, Gravities of mix, and Core Densities are completed in order to determine compliance with these specifications.

6. The completed Test Section(s) shall be part of the proposed work. When recommended by the Resident Engineer and approved by the Engineer, test sections that do not conform to the specifications shall be removed and replaced at the Contractor's expense.

7. When a Test Section passes, the Test Section tonnage shall be paid 100%.

The mix used in construction of the Test Section shall be paid for under Section 201-6.10. Construction of the Test Section shall be paid for under Section 201-6.30.

201-4.2 HMA MIXING PLANT

Insert the following as the first paragraph:

“The HMA hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I HMA mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling.”

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

“The Contractor or producer shall provide a testing laboratory, meeting the requirements of Illinois Division of Aeronautics' latest *Policy Memorandum 2003-1: "Requirements for Laboratory, Testing, Quality Control and Paving*

of *Superpave Bituminous Concrete Mixtures*,” located at the IDOT internet site, for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.”

201-4.4 HMA PAVERS

Add the following after “activated screed” in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second and third sentences of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

201-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the base course aggregate(s) shall be screened into at least four sizes. This requirement does not apply to drum mixer plants.”

201-4.9 TRANSPORTING, SPREADING, AND FINISHING

Add the following to the end of the third paragraph:

“The Engineer may increase the asphalt content of the first lift by up to 0.3 percent when the HMA mixture is placed directly on a prepared subgrade.”

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the HMA base course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement

shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane. A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of base course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.”

201-4.10 COMPACTION OF MIXTURE

Delete the third paragraph and substitute the following:

“Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein.”

201-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are “pinched” to provide adequate density at the joint. The method of “pinching” shall be as defined in Article 406.16 on compaction of HMA concrete in the most current issue of the I.D.O.T. Standard Specifications for Road and Bridge Construction. The Contractor shall cut one core per 2,500 tons or one per project at a random location over the longitudinal construction joint. The core shall be delivered to the Resident Engineer for density testing. The density at the joint shall be a minimum of 90%.

201-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

Delete this entire section and insert the following:

“201-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

After the compaction is completed, the pavement will be tested and payment made on the basis of percent air voids in the final compacted mat.

The HMA base course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the maximum theoretical specific gravity (ASTM D2041) and accepted by the following statistical procedure. When more than one base course mix design is used on the same project, each mix will be evaluated separately under the statistical acceptance procedure specified herein.

(a) Lot Size. The plant-produced mixture shall be tested on a lot basis. A lot shall consist of 4 sublots. End or final lots may contain between 3 and 6 sublots.

(1) A subplot shall consist of 500 tons for each type of mix.

One density sample shall be taken randomly from each subplot. Each density sample shall be the average of two cores extracted from the sample location.

The Contractor shall take one random mix sample from each 1,000 tons of mix laid. This sample shall be split into two samples with one half tested by the Contractor for, Extraction or Ignition oven, Maximum Specific Gravity, Gradation, and Air Void tests. The other sample half shall be appropriately marked and retained by the Contractor until the Engineer requests the mix for testing or directs the Contractor in writing to dispose of the mix.

All tests shall be completed and reported to the Engineer no later than the morning of the day following production.”

(b) Lot Early Termination. When less than 3 sublots are produced, such as at the end of construction of the base course or at the end of the construction season, the final subplot data shall be included with the previous lot for payment. The final lot may thus contain up to six (6) sublots.

(c) Acceptance Criteria. The acceptance of each lot of HMA base course shall be based on the **Percentage of material Within specification Limits (PWL)**. The PWL is determined using standard statistical techniques and involves the number of tests in each lot (n) and the quality indexes (Q_L is the Quality Index for the lower limit; Q_U is the Quality Index for the upper limit). The quality indexes are calculated using the following formulae:

$$Q_L = \frac{\bar{X} - 1}{S} \qquad Q_U = \frac{7 - \bar{X}}{S}$$

Where Q = Quality Index (lower or upper)

\bar{X} = Mean (average) value of air voids in percent

% Air Voids = (100-% density)

S = Standard Deviation of test results

For mat in-place air voids, estimate the **Percentage Within Tolerance (PWT)** for the lower and upper tolerance limits by entering Table 8 with Q_L and Q_U using the column appropriate to the total number (n) of core samples. The total percent of material between the lower and upper limits is defined as the **Percent Within Limits** and is calculated by the following formula:

$$\text{PWL} = [\text{PWT}(\text{lower}) + \text{PWT}(\text{upper})] - 100$$

Each lot of HMA material shall be accepted for 100 percent payment when the PWL equals or exceeds 90 percent. When the PWL is below 90 percent for a given lot, the lot tonnage shall be adjusted in accordance with Table 7.

TABLE 7 -- PAY ADJUSTMENT SCHEDULE
(see Note 2.)

PWL	% ADJUSTMENT IN LOT QUANTITY
90 - 100	100
80 - 89.9	0.5 PWL + 55.0
65 - 79.9	2.0 PWL - 65.0
Below 65	Note 1.

Note 1. The lot shall be removed and replaced. However, the Engineer may decide to accept the deficient lot. In that case, it will be paid for at 50% adjustment.

Note 2. All preliminary calculations used in determining the Percent Within Limits should be rounded to a minimum of four digits right of the decimal point. The PWL that is used for Table 7 purposes should then be rounded to one digit right of the decimal point to determine the percent of contract quantity to be paid. The final percent pay figure should be rounded to one digit right of the decimal point. The Resident Engineer shall notify the Contractor, in writing, of the final percent pay for each lot as soon as all lot tests are completed.

(d) Mix sampling All mix sampling shall be done on a random basis as determined by the Resident Engineer. Samples that are obviously defective or become defective prior to testing shall be discarded and retaken. New samples shall be considered as if they were initial samples.

201-4.15 SAMPLING PAVEMENT

Delete this section and replace with the following:

201-4.15 SAMPLING PAVEMENT Cores from each subplot shall be taken at random locations as outlined by the Resident Engineer. No core samples shall be taken within two feet of the edge of pavement. Any core less than 1-1/2 inch thickness shall not be used and a new location and sample shall be selected.

Core samples of approximately 4 inches in diameter, for determination of in-place air voids of the completed pavement, shall be obtained by the Contractor at no extra expense. The number and locations of the samples

shall be as determined by the Resident Engineer. The Contractor shall furnish all tools, labor, and materials for sampling and replacing pavement.

All core tests necessary to determine initial conformance with specification requirements will be performed by the Resident Engineer at no cost to the Contractor.

(a) Resampling and Retesting Resampling of a lot may be allowed only under the following conditions:

(1) The Contractor must request, in writing, the resampling and retesting of a complete lot within 48 hours after receiving the written test results of the lot from the Resident Engineer. Only one retest per lot will be permitted.

(2) If the retested lot should result in a higher "Percent Within Limits" figure than the original, based on all lot samples (original and new) the following will apply:

(a) The cost of resampling and retesting will be borne by the Engineer.

(b) The new "Percent Within Limits" figure shall be calculated using all LOT samples, (original and new) for calculating the lot payment.

(3) If the retested lot should result in a "Percent Within Limits" figure equal to or less than the original, based on all the lot samples (original and new), the following will apply:

(a) The cost of resampling and retesting will be borne by the Contractor.

(b) The new "Percent Within Limits" figure shall be calculated using all lot samples, (original and new) for calculating the lot payment.

(4) Procedures in ASTM E-178 shall be used to determine outliers based on all samples taken and a 5% significance level.

(5) Results of the retesting and resampling shall be final."

METHOD OF MEASUREMENT

201-5.1

Add:

Measurement for payment will not be made for any bituminous base course in excess of 103 percent of plan quantity plus (or minus) theoretical quantities authorized by the Engineer.

BASIS OF PAYMENT201-6.1

Delete this section and replace with the following:

201-6.1 The quantity of HMA base course mixture measured as outlined in Section 201-5.1 shall be adjusted in accordance with Section 201-4.13 herein. Payment shall be calculated by multiplying the contract unit price per ton of HMA base course and the adjusted tons per lot. Final payment shall be compensation for furnishing all materials, for all preparation, mixing, testing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

The test section shall be paid for at the contract unit price per each, which price shall include the additional specified equipment, labor, Engineering, and testing time necessary to construct this item.

Payment will be made under:

- Item 201-6.10 -- Bituminous Base Course - Per Ton.
- Item 201-6.30 -- Test Section - Per Each.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR401001 BITUMINOUS SURFACE COURSE – METHOD I
(Under 2,500 tons/pay item/location)

Effective: May 11, 2007

This Special Provision Modifies Item 401 Bituminous Surface Course of the Standard Specifications.

401-1.1 Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the HMA (Hot Mix Asphalt) surface course.”

“The HMA surface course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

401-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing, by mechanical means, the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the

No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

401-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:

“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	40

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	2.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	6.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>6.0</i>

Delete the second and third paragraphs.

401-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:

“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and aluminosilicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the

nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l ASTM C 136 Max. % Loss [1]	6.0 [2]

[1] Fine aggregate shall not contain more than 3 (three) percent clay (2 micron or smaller) particles.

[2] Does not apply to Stone Sand.

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

401-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.”

401-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the HMA surface course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways source certification program. The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in

any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

401-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

”All the source(s) of the proposed aggregates for use by the Contractor in the Contractor’s proposed HMA mix design must be approved in writing by the I.D.A. Engineer of Construction & Materials prior to use in any design or production of HMA material.”

401-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.

401-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Contractor is responsible for the JMF and no HMA mixture for payment shall be produced until a letter from the Illinois Division of Aeronautics’ Engineer of Construction & Materials approving the Contractor’s proposed JMF has been issued to the Contractor. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of Marshall blows specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, upon the completion of the proposed JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,”* located at the IDOT internet site.

Delete the third paragraph and replace with the following:

“The HMA mixture shall be tested according to the Asphalt Institute, ‘Marshall Method of Mix Design’, in the current Manual MS-2, *Mix Design Method for Asphalt Concrete*, and shall meet the criteria set forth in Tables 2 and 4 herein.”

Table 2. MARSHALL DESIGN CRITERIA

Properties	Over 60,000 lb. [1]	Under 60,000 lb.
Number of Blows	75	50
Stability (Min.)	1800	1500
Flow	8-16	8-18
Percent Air Voids	1.5 – 4.0	1.5 – 3.5
Voids filled with asphalt (%)	75-90	75-90

- [1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the JMF. The exact amount of stone sand will be determined by the Contractor based on preparation of the Mix Design. The percentage of stone sand will be verified as acceptable by the Division of Aeronautics based upon the Contractor's final proposed JMF. The Division reserves the right to request a change in the amount of stone sand at any point in the mix design process, as well as during production, based upon performance of the mix during placement.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Replace Table 4 with the following:

TABLE 4. AGGREGATE BITUMINOUS SURFACE COURSE

Percentage by Weight Passing Sieves Job Mix Formula (JMF)		
Sieve Size	Gradation B Range 3/4" Maximum	Ideal Target
1 in.	100	100
3/4 in.	100	100
1/2 in.	99 – 100	100
3/8 in.	91 – 97	94
No. 4	56 – 62	59
No. 8	36 – 42	39
No. 16	27 – 32	30
No. 30	19 – 25	22
No. 100	7 – 9	8
No. 200	5 – 7	6
Bitumen %:		
Stone	5.0 – 7.0	6.0

Delete the second sentence of the seventh paragraph and replace with the following:

“The tolerances listed in TABLE 5 will only apply when they cause a grading band within the band listed in TABLE 4. Otherwise, the grading bands listed in TABLE 4 shall apply.”

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and asphalt content. Results falling outside the set tolerances shall be cause for rejection of all the material placed from the time of testing until a

passing test is obtained. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 96-2: "Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,"* located at the IDOT internet site. These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer."

Delete the last paragraph for this section.

401-3.4 TEST SECTION

Delete this section.

401-4.2 HMA MIXING PLANT

Insert the following as the first paragraph:

"The HMA hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I HMA mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling."

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

"The Contractor or producer shall provide a testing laboratory, meeting the requirements of Illinois Division of Aeronautics' latest *Policy Memorandum 96-2: "Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,"* located at the IDOT internet site, for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested."

401-4.4 HMA PAVERS

Add the following after "activated screed" in the first sentence of the first paragraph:

"capable of vibrating at approximately 3000 VPM".

Add the following at the end of the first paragraph:

"All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers

need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second and third sentences of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

401-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the surface course aggregate(s) shall be screened into at least three sizes. This requirement does not apply to drum mixer plants.”

401-4.9 TRANSPORTING, SPREADING AND FINISHING

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the HMA base course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane.

A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of surface course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.”

401-4.10 COMPACTION OF MIXTURE

Add the following to the end of the second paragraph:

“A self-propelled pneumatic-tire roller meeting the following requirements shall be required on the top lift of surface course mixture:

The roller shall be of the oscillating wheel type consisting of not less than 7 pneumatic-tired wheels revolving on 2 axles, and capable of being ballasted to the mass (weight) required. The front and rear wheels shall be staggered so that the tire sidewalls will have a minimum overlap of 1/2 inch. The roller shall provide for a smooth operation when starting, stopping or reversing direction. The tires shall withstand inflation pressures between 60 and 120

psi. The roller shall be equipped with an adequate scraping or cleaning device on each tire to prevent the accumulation of material on the tires. When used for the compaction of HMA mixtures, the roller shall be equipped with a water system which will keep all tires uniformly wet to prevent material pickup. The Contractor shall provide means for determining the mass (weight) of the roller as distributed on each wheel. Ballast shall be included in determining the mass (weight).”

Delete the third paragraph and substitute the following:

“Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein.”

401-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are “pinched” to provide adequate density at the joint. The method of “pinching” shall be as defined in Article 406.16 on compaction of HMA concrete in the most current issue of the I.D.O.T. Standard Specifications for Road and Bridge Construction. The Contractor shall cut one core per 2,500 tons or one per project at a random location over the longitudinal construction joint. The core shall be delivered to the Resident Engineer for density testing. The density at the joint shall be a minimum of 90%.

401-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

Delete this entire Section and insert the following:

“401-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY.

After the completion of compaction, the pavement will be tested and accepted on the basis of percent air voids in the final compacted mat. The HMA Surface Course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the Maximum Theoretical Specific Gravity (ASTM D 2041). If, during construction, the density test falls below 93 percent, additional approved rollers shall be required. Two random nuclear density tests shall be required. Two random nuclear density shall be taken for each 500 tons of mix placed. Each nuclear density test shall be the average of five (5) nuclear tests taken as a cross-section of the pavement. One random mix sample shall be taken from each 1,000 tons of mix laid for Marshall, Extraction, Maximum Specific Gravity and Air Void tests. The Resident Engineer shall have a nuclear gauge and qualified operator on the project when constructing this item.”

401-4.15 SAMPLING PAVEMENT

Delete this section.

The completed pavement shall be cleaned so that no debris or dirt from coring operations is left on the surface of the pavement.

METHOD OF MEASUREMENT

401-5.1

Add:

Measurement for payment will not be made for any bituminous surface course in excess of 103 percent of plan quantity plus (or minus) theoretical quantities authorized by the Engineer.

BASIS OF PAYMENT

401-6.1

Payment will be made under:

Item AR401610 -- Bituminous Surface Course -- per ton.

Item AR401620 -- Bituminous Surface Course, Leveling -- per ton.

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR401002 BITUMINOUS SURFACE COURSE – METHOD II
(Over 2,500 tons/pay item/location)

Effective: May 11, 2007

This Special Provision Modifies Item 401 Bituminous Surface Course of the Standard Specifications.

401-1.1 Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the HMA (Hot Mix Asphalt) surface course.”

“The HMA surface course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

401-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing, by mechanical means, the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the

No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

401-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:

“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	40

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	2.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	6.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>6.0</i>

Delete the second and third paragraphs.

401-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:

“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and aluminosilicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the

nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l ASTM C 136 Max. % Loss [1]	6.0 [2]

[1] Fine aggregate shall not contain more than 3 (three) percent clay (2 micron or smaller) particles.

[2] Does not apply to Stone Sand.

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

401-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.

401-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the HMA surface course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways source certification program. The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in

any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

401-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

”All the source(s) of the proposed aggregates for use by the Contractor in the Contractor’s proposed HMA mix design must be approved in writing by the I.D.A. Engineer of Construction & Materials prior to use in any design or production of HMA material.”

401-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.

401-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Contractor is responsible for the JMF and no HMA mixture for payment shall be produced until a letter from the Illinois Division of Aeronautics’ Engineer of Construction & Materials approving the Contractor’s proposed JMF has been issued to the Contractor. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of Marshall blows specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, upon the completion of the proposed JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,”* located at the IDOT internet site.

Delete the third paragraph and replace with the following:

“The HMA mixture shall be tested according to the Asphalt Institute, ‘Marshall Method of Mix Design’, in the current Manual MS-2, *Mix Design Method for Asphalt Concrete*, and shall meet the criteria set forth in Tables 2 and 4 herein.”

Table 2. MARSHALL DESIGN CRITERIA

Properties	Over 60,000 lb. [1]	Under 60,000 lb.
Number of Blows	75	50
Stability (Min.)	1800	1500
Flow	8-16	8-18
Percent Air Voids	1.5 – 4.0	1.5 – 3.5
Voids filled with asphalt (%)	75-90	75-90

- [1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the JMF. The exact amount of stone sand will be determined by the Contractor based on preparation of the Mix Design. The percentage of stone sand will be verified as acceptable by the Division of Aeronautics based upon the Contractor's final proposed JMF. The Division reserves the right to request a change in the amount of stone sand at any point in the mix design process, as well as during production, based upon performance of the mix during placement.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Replace Table 4 with the following:

TABLE 4. AGGREGATE BITUMINOUS SURFACE COURSE

Percentage by Weight Passing Sieves Job Mix Formula (JMF)		
Sieve Size	Gradation B Range 3/4" Maximum	Ideal Target
1 in.	100	100
3/4 in.	100	100
1/2 in.	99 – 100	100
3/8 in.	91 – 97	94
No. 4	56 – 62	59
No. 8	36 – 42	39
No. 16	27 – 32	30
No. 30	19 – 25	22
No. 100	7 – 9	8
No. 200	5 – 7	6
Bitumen %:		
Stone	5.0 – 7.0	6.0

Delete the second sentence of the seventh paragraph and replace with the following:

“The tolerances listed in TABLE 5 will only apply when they cause a grading band within the band listed in TABLE 4. Otherwise, the grading bands listed in TABLE 4 shall apply.”

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and asphalt content. Results falling outside the set tolerances shall be cause for rejection of all the material placed from the time of testing until a

passing test is obtained. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 96-2: "Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,"* located at the IDOT internet site. These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer."

Change: Table 4. AGGREGATE – HMA SURFACE COURSE, Gradation B, $\frac{3}{4}$ inch maximum on the following sieves:

No. 16	20 – 43
No. 30	14 – 32
No. 100	5 – 16

Delete the last paragraph for this section.

401-3.4 TEST SECTION

Delete this entire section and replace with the following:

"Prior to the manufacture of mix for the test section, Contractor quality control personnel shall have completed all proportioning and testing in accordance with Policy Memorandum 96-2, to assure that the mix produced will meet the JMF. The Contractor shall then prepare a quantity of HMA surface course mixture in order to construct the test section.

The test section shall have a length of approximately 200 to 300 lineal feet and shall be of the same depth specified for the construction of the course which it represents. The Contractor may place up to 50 tons of mix prior to construction of the test section in order to line-out the plant, the mix, and the paving operation. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented.

A. Construction of the Test Section:

The test section shall consist of two (2) parts: Development of a Growth Curve and establishing a Rolling Pattern.

1. Growth Curve

To construct the Growth Curve a self-propelled vibratory roller meeting the following minimum requirements shall be required:

Drum diameter 48 inches, length of drum 66 inches, vibrators 1600 vibrations per minute (VPM) minimum, unit static force on vibrating drum(s) 125 pounds per lineal inch (PLI), total applied force 325 pounds per inch (PLI), adjustable eccentrics, reversible eccentrics on non driven drum(s). The total applied force for various combinations of VPM and eccentric positions shall be shown on decals on the vibrating roller or on a chart maintained with the roller. The vibratory

roller shall be equipped with water tanks and sprinkling devices, or other approved methods, which shall be used when necessary to wet the drum to prevent the HMA mixture from sticking. The Contractor shall have a vibrating reed tachometer (hand type) at the job site for checking roller vibrations. The reed tachometer shall have a range of 1000 to 4000 vibrations per minute(vpm). The vibrating reed tachometer shall have two (2) rows of reeds. One row shall range from 1000 to 2000 vpm and the other row shall range from 2000 to 4000 vpm.

The Growth Curve shall be constructed by successive passes of the vibratory roller, in a given area, in order to determine the maximum compactibility of the mix. More than one Growth Curve may be required as part of the test section if adjustments to the mix, plant operation, laydown, etc., are necessary to reach optimum compactability.

2. Rolling Pattern

The Contractor shall then proceed to establish the Rolling Pattern using the equipment that he intends to use for compaction of the rest of the HMA course.

B. Test Section Acceptance

The Test Section shall be evaluated and approved based on the following:

1. The completed Test Section (Rolling Pattern area) shall be divided into four (4) subsections with one (1) sample two (2) cores obtained from each subsection for determination of density. One additional core sample shall be obtained from the Growth Curve.
2. The Contractor shall correlate a nuclear density gauge to the Test Section for Quality Control testing. The nuclear density gauge shall not be used for acceptance testing.
3. The completed Test Section (rolling pattern area) shall have a minimum density of 94 percent (6 percent air voids) of the maximum theoretical specific gravity of the mix (ASTM D2041). Individual test (average of two cores) results below 94% shall constitute a failing test section.
4. If the test section fails to meet these requirements, the Contractor shall construct a new Test Section meeting these requirements at his own expense.
5. Full production shall not be allowed until all tests, Reflux extraction or Ignition Oven, Gradation, Marshall Stability and Flow, Gravities of mix, and Core Densities are completed in order to determine compliance with these specifications.

6. The completed Test Section(s) shall be part of the proposed work. When recommended by the Resident Engineer and approved by the Engineer, test sections that do not conform to the specifications shall be removed and replaced at the Contractor's expense.

7. When a Test Section passes, the Test Section tonnage shall be paid 100%.

The mix used in construction of the Test Section shall be paid under Section 401-6.10. Construction of the Test Section shall be paid for under Section 401-6.30. Payment will be made for only one (1) Test Section.

401-4.2 HMA MIXING PLANT

Insert the following as the first paragraph:

"The HMA hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I HMA mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling."

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

"The Contractor or producer shall provide a testing laboratory, meeting the requirements of Illinois Division of Aeronautics' latest *Policy Memorandum 96-2: "Requirements for Laboratory, Testing, Quality Control and Paving of HMA Concrete Mixtures,"* located at the IDOT internet site, for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested."

401-4.3 HAULING EQUIPMENT

ADD: All trucks used for hauling HMA mixtures shall have a tightly closing tailgate to prevent spilling of material on airfield pavements or entrance roads used for haul roads. Prior to leaving the placing site, the end of the truck beds shall be cleaned of all loose material which may spill onto the pavements and the tail gate shall be secured.

401-4.4 HMA PAVERS

Add the following after "activated screed" in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second and third sentences of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

401-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the surface course aggregate(s) shall be screened into at least three sizes. This requirement does not apply to drum mixer plants.”

401-4.9 TRANSPORTING, SPREADING AND FINISHING

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the HMA base course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane. A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of surface course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.

401-4.10 COMPACTION OF MIXTURE

Add the following to the end of the second paragraph:

“A self-propelled pneumatic-tire roller meeting the following requirements shall be required on the top lift of surface course mixture:

The roller shall be of the oscillating wheel type consisting of not less than 7 pneumatic-tire wheels revolving on 2 axles, and capable of being ballasted to the mass (weight) required. The front and rear wheels shall be staggered so that the tire sidewalls will have a minimum overlap of 1/2 inch. The roller shall provide for a smooth operation when starting, stopping or reversing direction. The tires shall withstand inflation pressures between 60 and 120 psi. The roller shall be equipped with an adequate scraping or cleaning device on each tire to prevent the accumulation of material on the tires. When used for the compaction of HMA mixtures, the roller shall be equipped with a water system which will keep all tires uniformly wet to prevent material pickup. The Contractor shall provide means for determining the mass (weight) of the roller as distributed on each wheel. Ballast shall be included in determining the mass (weight)."

Delete the third paragraph and substitute the following:

"Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein."

401-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are "pinched" to provide adequate density at the joint. The method of "pinching" shall be as defined in Article 406.16 on compaction of HMA concrete in the most current issue of the I.D.O.T. Standard Specifications for Road and Bridge Construction. The Contractor shall cut one core per 2,500 tons or one per project at a random location over the longitudinal construction joint. The core shall be delivered to the Resident Engineer for density testing. The density at the joint shall be a minimum of 90%.

401-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

Delete this entire section and insert the following:

"401-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

After the compaction is completed, the pavement will be tested and payment made on the basis of percent air voids in the final compacted mat.

The HMA surface course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the maximum theoretical specific gravity (ASTM D2041) and accepted by the following statistical procedure. When more than one surface course mix design is used on the same project, each

mix will be evaluated separately under the statistical acceptance procedure specified herein.

(a)Lot Size. The plant-produced mixture shall be tested on a lot basis. A lot shall consist of 4 sublots. End or final lots may contain between 3 and 6 sublots.

(1) A subplot shall consist of 500 tons for each type of mix.

One density sample shall be taken randomly from each subplot. Each density sample shall be the average of two cores extracted from the sample location.

The Contractor shall take one random mix sample from each 1,000 tons of mix laid. This sample shall be split into two samples with one half tested by the Contractor for Marshall, Extraction or Ignition oven for Gradation and asphalt content, Maximum Specific Gravity, Gradation, and Air Void tests. The other sample half shall be appropriately marked and retained by the Contractor until the Engineer requests the mix for testing or directs the Contractor in writing to dispose of the mix.

All tests shall be completed and reported to the Engineer no later than the morning of the day following production.”

(b)Lot Early Termination. When less than 3 sublots are produced, such as at the end of construction of the surface course or at the end of the construction season, the final subplot data shall be included with the previous lot for payment. The final lot may thus contain up to six (6) sublots.

(c)Acceptance Criteria. The acceptance of each lot of HMA base course shall be based on the **P**ercentage of material **W**ithin specification **L**imits (PWL). The PWL is determined using standard statistical techniques and involves the number of tests in each lot (n) and the quality indexes (Q_L is the Quality Index for the lower limit; Q_U is the Quality Index for the upper limit). The quality indexes are calculated using the following formulae:

$$Q_L = \frac{\bar{X} - 1}{S} \qquad Q_U = \frac{7 - \bar{X}}{S}$$

Where Q = Quality Index (lower or upper)

\bar{X} = Mean (average) value of air voids in percent

(% air voids = 100 - % density)

S = Standard Deviation of test results

For mat in-place air voids, estimate the **P**ercentage **W**ithin **T**olerance (PWT) for the lower and upper tolerance limits by entering Table 8 with Q_L and Q_U using the column appropriate to the total number (n) of core samples. The

total percent of material between the lower and upper limits is defined as the **Percent Within Limits** and is calculated by the following formula:

$$PWL = [PWT(lower) + PWT(upper)] - 100$$

Each lot of HMA material shall be accepted for 100 percent payment when the PWL equals or exceeds 90 percent. When the PWL is below 90 percent for a given lot, the lot tonnage shall be adjusted in accordance with Table 7.

TABLE 7 - PAY ADJUSTMENT SCHEDULE

(see Note 2.)

PWL	% ADJUSTMENT IN LOT QUANTITY
90 - 100	100
80 - 89.9	0.5 PWL + 55.0
65 - 79.9	2.0 PWL - 65.0
Below 65	Note 1.

Note 1. The lot shall be removed and replaced. However, the Engineer may decide to accept the deficient lot. In that case, it will be paid for at 50% adjustment.

Note 2. All preliminary calculations used in determining the Percent Within Limits should be rounded to a minimum of four digits right of the decimal point. The PWL that is used for Table 7 purposes should then be rounded to one digit right of the decimal point to determine the percent of contract quantity to be paid. The final percent pay figure should be rounded to one digit right of the decimal point. The Resident Engineer shall notify the Contractor, in writing, of the final percent pay for each lot as soon as all lot tests are completed.

(d) Mix sampling All mix sampling shall be done on a random basis as determined by the Resident Engineer. Samples that are obviously defective or become defective prior to testing shall be discarded and retaken. New samples shall be considered as if they were initial samples.

401-4.15 SAMPLING PAVEMENT

Delete this section and replace with the following:

“401-4.15 Sampling Pavement. Cores from each subplot shall be taken at random locations as outlined by the Resident Engineer. No core samples shall be taken within two feet of the edge of pavement. Any core less than 1-1/2 inch thickness shall not be used and a new location and sample shall be selected.

Core samples of approximately 4 inches in diameter, for determination of in-place air voids of the completed pavement, shall be obtained by the Contractor at no extra expense. The number and locations of the samples shall be as determined by the Resident Engineer. The Contractor shall furnish all tools, labor, and materials for sampling and replacing pavement.

All core tests necessary to determine initial conformance with specification requirements will be performed by the Resident Engineer at no cost to the Contractor.

(a)Resampling and Retesting Resampling of a lot may be allowed only under the following conditions:

(1)The Contractor must request, in writing, the resampling and retesting of a complete lot within 48 hours after receiving the written test results of the lot from the Resident Engineer. Only one retest per lot will be permitted.

(2)If the retested lot should result in a higher "Percent Within Limits" figure than the original, based on all lot samples (original and new) the following will apply:

(a)The cost of resampling and retesting will be borne by the Engineer.

(b)The new "Percent Within Limits" figure shall be calculated using all LOT samples, (original and new) for calculating the lot payment.

(3)If the retested lot should result in a "Percent Within Limits" figure equal to or less than the original, based on all the lot samples (original and new), the following will apply:

(a)The cost of resampling and retesting will be borne by the Contractor.

(b)The new "Percent Within Limits" figure shall be calculated using all lot samples, (original and new) for calculating the lot payment.

(4)Procedures in ASTM E-178 shall be used to determine outliers based on all samples taken and a 5% significance level.

(5)Results of the retesting and resampling shall be final."

The completed pavement shall be cleaned so that no debris or dirt from coring operations is left on the surface of the pavement.

METHOD OF MEASUREMENT

201-5.1

Add:

Measurement for payment will not be made for any bituminous surface course in excess of 103 percent of plan quantity plus (or minus) theoretical quantities authorized by the Engineer.

BASIS OF PAYMENT401-6.1

Delete this section and replace with the following:

401-6.1 The quantity of HMA surface course mixture measured as outlined in Section 401-5.1 shall be adjusted in accordance with Section 401-4.13 herein. Payment shall be calculated by multiplying the contract unit price per ton of HMA base course and the adjusted tons per lot. Final payment shall be compensation for furnishing all materials, for all preparation, mixing, testing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

The test section shall be paid for at the contract unit price per each, which price shall include the additional specified equipment, labor, Engineering, and testing time necessary to construct this item.

Payment will be made under:

- Item AR401610 -- Bituminous Surface Course -- per ton.
- Item AR401620 -- Bit. Surface Course, Leveling -- per ton.
- Item AR401630 -- Bituminous Surface Test Section -- per each.

TABLE 8
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)
QUALITY INDEX (Q_L or Q_U)

PERCENT WITHIN TOLERANCE	-----									
	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362	2.0656	2.0897
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630	1.8828	1.8989
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420	1.7566	1.7684
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454	1.6566	1.6655
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635	1.5721	1.5790
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4716	1.4829	1.4914	1.4981	1.5035
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265	1.4316	1.4358
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670	1.3709	1.3741
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118	1.3148	1.3172
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602	1.2623	1.2640
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115	1.2129	1.2141
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653	1.1661	1.1660
87	1.0597	1.1100	1.1173	1.1191	1.1199	1.1204	1.1208	1.1212	1.1215	1.1218
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789	1.0788	1.0787
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382	1.0377	1.0374
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990	0.9982	0.9976
83	0.9939	0.9900	0.9785	0.9715	0.9672	0.9643	0.9624	0.9610	0.9599	0.9591
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241	0.9228	0.9219
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882	0.8868	0.8857
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533	0.8517	0.8505
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192	0.8175	0.8161
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858	0.7840	0.7826
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531	0.7513	0.7498
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211	0.7192	0.7177
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896	0.6877	0.6861
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587	0.6567	0.6551
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282	0.6262	0.6247
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982	0.5962	0.5947
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686	0.5667	0.5651
70	0.6787	0.6000	0.5719	0.5583	0.5504	0.5454	0.5419	0.5394	0.5375	0.5360
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105	0.5086	0.5072
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820	0.4802	0.4787
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537	0.4520	0.4506
66	0.5563	0.4800	0.4545	0.4424	0.4354	0.4310	0.4280	0.4257	0.4241	0.4227
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4031	0.4001	0.3980	0.3964	0.3951
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705	0.3690	0.3678
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432	0.3418	0.3407
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161	0.3148	0.3137
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892	0.2880	0.2870
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624	0.2613	0.2604

TABLE 8 (Continued)
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358	0.2348	0.2339
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2083	0.2084	0.2076
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829	0.1821	0.1814
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566	0.1559	0.1553
55	0.1806	0.1500	0.1406	0.1353	0.1338	0.1322	0.1312	0.1304	0.1298	0.1293
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1048	0.1042	0.1038	0.1034
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0792	0.0786	0.0781	0.0778	0.0775
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521	0.0518	0.0516
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260	0.0259	0.0258
50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260	-0.0259	-0.0258
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521	-0.0518	-0.0516
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781	-0.0778	-0.0775
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1049	-0.1042	-0.1037	-0.1034
45	-0.1806	-0.1500	-0.1406	-0.1363	-0.1338	-0.1322	-0.1312	-0.1304	-0.1298	-0.1293
44	-0.2164	-0.1800	-0.1688	-0.1637	-0.1607	-0.1588	-0.1575	-0.1566	-0.1559	-0.1553
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829	-0.1821	-0.1814
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2093	-0.2084	-0.2076
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358	-0.2348	-0.2339
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624	-0.2613	-0.2604
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892	-0.2880	-0.2870
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161	-0.3148	-0.3137
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432	-0.3418	-0.3407
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705	-0.3690	-0.3678
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980	-0.3964	-0.3951
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4354	-0.4310	-0.4280	-0.4257	-0.4241	-0.4227
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537	-0.4520	-0.4506
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820	-0.4802	-0.4787
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105	-0.5087	-0.5072
30	-0.6787	-0.6000	-0.5719	-0.5583	-0.5504	-0.5454	-0.5419	-0.5394	-0.5375	-0.5360
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686	-0.5667	-0.5651
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982	-0.5962	-0.5947
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282	-0.6262	-0.6217
26	-0.7904	-0.7200	-0.6920	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587	-0.6567	-0.6551
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896	-0.6876	-0.6861
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211	-0.7192	-0.7177
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531	-0.7513	-0.7498
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858	-0.7840	-0.7826
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8246	-0.8214	-0.8192	-0.8174	-0.8161
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533	-0.8517	-0.8565

TABLE 8 (Continued)
TABLE FOR ESTIMATING PERCENT OF LOT WITHIN LIMITS (PWL)
(STANDARD DEVIATION METHOD)

PERCENT WITHIN TOLERANCE	N=3	N=4	N=5	N=6	N=7	N=8	N=9	N=10	N=11	N=12
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882	-0.8868	-0.8057
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241	-0.9228	-0.9219
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610	-0.9599	-0.9591
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990	-0.9982	-0.9976
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382	-1.0377	-1.0374
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789	-1.0788	-1.0787
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212	-1.1215	-1.1217
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653	-1.1661	-1.1668
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115	-1.2129	-1.2141
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602	-1.2623	-1.2640
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118	-1.3148	-1.3172
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670	-1.3709	-1.3741
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265	-1.4316	-1.4358
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4716	-1.4829	-1.4914	-1.4981	-1.5035
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635	-1.5721	-1.5790
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5872	-1.6127	-1.6313	-1.6454	-1.6566	-1.6655
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6992	-1.7235	-1.7420	-1.7566	-1.7684
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8054	-1.8379	-1.8630	-1.8828	-1.8989
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362	-2.0657	-2.0897

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR401003 BITUMINOUS SURFACE COURSE – METHOD I, SUPERPAVE
(Under 2,500 tons/pay item/location)

Effective: May 11, 2007

This Special Provision Modifies Item 401 Bituminous Surface Course of the Standard Specifications.

401-1.1

Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the HMA (Hot Mix Asphalt) surface course.”

“The HMA surface course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

401-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing, by mechanical means, the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

401-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:

“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	40

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	2.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	6.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>6.0</i>

Delete the second and third paragraphs.

401-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:

“Fine aggregate shall be defined as follows:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and aluminosilicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Minus No. 200 Sieve Mat'l ASTM C 136 Max. % Loss [1]	6.0 [2]

- [1] Fine aggregate shall not contain more than 3 (three) percent clay (2 micron or smaller) particles.
[2] Does not apply to Stone Sand.

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

401-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

“All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval.”

401-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

“All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the HMA surface course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways source certification program. The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures are not

being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein.”

401-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

”All the source(s) of the proposed aggregates for use by the Contractor in the Contractor’s proposed HMA mix design must be approved in writing by the I.D.A. Engineer of Construction & Materials prior to use in any design or production of HMA material.”

401-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.

401-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Contractor is responsible for the JMF and no HMA mixture for payment shall be produced until a letter from the Illinois Division of Aeronautics’ Engineer of Construction & Materials approving the Contractor’s proposed JMF has been issued to the Contractor. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of gyrations specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, upon the completion of the proposed JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 2003-1: “Requirements for Laboratory, Testing, Quality Control and Paving of Superpave Bituminous Concrete Mixtures for Airports,”* located at the IDOT internet site.

Delete the third paragraph and replace with the following:

“The HMA mixture shall be tested according to the Asphalt Institute’s most current Superpave Series No. 2 (SP-2) manual entitled, “Superpave Mix Design” and shall meet the criteria set forth in Tables 2 and 4 herein.”

TABLE 2 SUPERPAVE DESIGN CRITERIA

TRAFFIC MIX					
Design Parameter	Aircraft over 60,000 lbs.[1]		Aircraft under 60,000 lbs.		Automobile
	Runway or Taxiway	Parking Apron	Runway or Taxiway	Parking Apron	Entrance Roads and Parking Lots
N _{ini} [2]	5	7	5	5	5
N _{des} [3]	40	50	30	30	30
N _{max}	58	74	42	42	42

% Air Voids V_a	2-4	2-4	2-4	2-4	2-4
VFA (min %)	75-90	75-90	75-90	75-90	75-90

[1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the JMF. The exact amount of stone sand will be determined by the Contractor based on preparation of the Mix Design. The percentage of stone sand will be verified as acceptable by the Division of Aeronautics based upon the Contractor's final proposed JMF. The Division reserves the right to request a change in the amount of stone sand at any point in the mix design process, as well as during production, based upon performance of the mix during placement.

[2] Where N = number of gyrations on an IDOT approved superpave gyratory compactor.

[3] The N_{des} value may be changed in order to obtain an acceptable mix design when approved by the Engineer.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Replace Table 4 with the following:

TABLE 4. AGGREGATE BITUMINOUS SURFACE COURSE

Percentage by Weight Passing Sieves Job Mix Formula (JMF)		
Sieve Size	Gradation B Range 3/4" Maximum	Ideal Target
1 in.	100	100
3/4 in.	100	100
1/2 in.	99 – 100	100
3/8 in.	91 – 97	94
No. 4	56 – 62	59
No. 8	36 – 42	39
No. 16	27 – 32	30
No. 30	19 – 25	22
No. 100	7 – 9	8
No. 200	5 – 7	6
Bitumen %:		
Stone	5.0 – 7.0	6.0

Delete the second sentence of the seventh paragraph and replace with the following:

“The tolerances listed in TABLE 5 will only apply when they cause a grading band within the band listed in TABLE 4. Otherwise, the grading bands listed in TABLE 4 shall apply.”

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and asphalt content. Results falling outside the set tolerances shall be cause for rejection of all the material placed from the time of testing until a passing test is obtained. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 2003-1: “Requirements for Laboratory, Testing, Quality Control and Paving of Superpave Bituminous Concrete Mixtures for Airports,”* located at the IDOT internet site. These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer.”

Delete the last paragraph for this section.

401-3.4 TEST SECTION

Delete this section.

401-4.2 HMA MIXING PLANT

Insert the following as the first paragraph:

“The HMA hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I HMA mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling.”

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

“The Contractor or producer shall provide a testing laboratory, meeting the requirements of Illinois Division of Aeronautics’ latest *Policy Memorandum 96-2: “Requirements for Laboratory, Testing, Quality Control and Paving of Bituminous Concrete Mixtures,”* located at the IDOT internet site, for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.”

401-4.4 HMA PAVERS

Add the following after “activated screed” in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second and third sentences of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

401-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the surface course aggregate(s) shall be screened into at least three sizes. This requirement does not apply to drum mixer plants.”

401-4.9 TRANSPORTING, SPREADING, AND FINISHING

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the HMA surface course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane.

A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of surface course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.”

401-4.10 COMPACTION OF MIXTURE

Add the following to the end of the second paragraph:

“A self-propelled pneumatic-tire roller meeting the following requirements shall be required on the top lift of surface course mixture:

The roller shall be of the oscillating wheel type consisting of not less than 7 pneumatic-tired wheels revolving on 2 axles, and capable of being ballasted to the mass (weight) required. The front and rear wheels shall be staggered so that the tire sidewalls will have a minimum overlap of 1/2 inch. The roller shall provide for a smooth operation when starting, stopping or reversing direction. The tires shall withstand inflation pressures between 60 and 120 psi. The roller shall be equipped with an adequate scraping or cleaning device on each tire to prevent the accumulation of material on the tires. When used for the compaction of HMA mixtures, the roller shall be equipped with a water system which will keep all tires uniformly wet to prevent material pickup. The Contractor shall provide means for determining the mass (weight) of the roller as distributed on each wheel. Ballast shall be included in determining the mass (weight).”

Delete the third paragraph and substitute the following:

“Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein.”

401-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are “pinched” to provide adequate density at the joint. The method of “pinching” shall be as defined in Article 406.16 on compaction of HMA concrete in the most current issue of the I.D.O.T. Standard Specifications for Road and Bridge Construction. The Contractor shall cut one core per 2,500 tons or one per project at a random location over the longitudinal construction joint. The core shall be delivered to the Resident Engineer for density testing. The density at the joint shall be a minimum of 90%.

401-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY.

Delete this entire Section and insert the following:

“401-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY.
After the completion of compaction, the pavement will be tested and accepted on the basis of percent air voids in the final compacted mat. The

HMA surface course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the Maximum Theoretical Specific Gravity (ASTM D 2041). If, during construction, the density test falls below 93 percent, additional approved rollers shall be required. Two random nuclear density tests shall be required. Two random nuclear density shall be taken for each 500 tons of mix placed. Each nuclear density test shall be the average of five (5) nuclear tests taken as a cross-section of the pavement. One random mix sample shall be taken from each 1,000 tons of mix laid for Marshall, Extraction, Maximum Specific Gravity and Air Void tests. The Resident Engineer shall have a nuclear gauge and qualified operator on the project when constructing this item."

METHOD OF MEASUREMENT

201-5.1

Add:

Measurement for payment will not be made for any bituminous surface course in excess of 103 percent of plan quantity plus (or minus) theoretical quantities authorized by the Engineer.

BASIS OF PAYMENT

401-6.1

Payment will be made under:

Item 401-6.10 Bituminous Surface Course - Per Ton

Item 401-6.20 Bituminous Surface Course, Leveling - Per Ton

State of Illinois
Department of Transportation
Division of Aeronautics

SPECIAL PROVISION FOR

ITEM AR401004 BITUMINOUS SURFACE COURSE – METHOD II, SUPERPAVE
(Over 2,500 tons/pay item/location)

Effective: May 11, 2007

This Special Provision Modifies Item 401 Bituminous Surface Course of the Standard Specifications.

401-1.1

Add to the second paragraph:

“The Contractor shall be responsible for the Quality Control in the production and construction of the HMA (Hot Mix Asphalt) surface course.”

“The HMA surface course shall be laid in a maximum of two (2) inch lifts. Thicker lifts not to exceed three (3) inches may be authorized by the Resident Engineer provided a continuous paving operation is maintained.”

401-2.1 AGGREGATE

Delete the first paragraph and replace with the following:

“Aggregates shall consist of crushed stone or crushed gravel, blended with crushed or natural sand(s) and/or mineral filler.

Crushed Stone: Crushed stone shall be defined as the angular fragments resulting from crushing, by mechanical means, the following types of rocks quarried from undisturbed consolidated deposits: granite and similar phanerocrystalline igneous rocks; limestone; dolomite; or massive metamorphic quartzite, or similar rocks.

Crushed Gravel: . Crushed gravel shall be the product resulting from crushing by mechanical means, and shall consist entirely of particles obtained by crushing gravel, all of which before crushing will be retained on a screen with openings equal to or larger than the maximum nominal size of the resulting crushed material. If approved by the Engineer, final product gradations may be obtained by screening or blending various sizes of crushed gravel material.

Mineral Filler: Mineral filler shall consist of dry limestone dust, or other material approved by the Engineer and shall meet the requirements of ASTM D242.

The portion of the materials retained on the No. 8 sieve shall be known as coarse aggregate, the portion passing the No. 8 sieve and retained on the No. 200 sieve as fine aggregate, and the portion passing the No. 200 sieve as mineral filler.”

401-2.1(a) COARSE AGGREGATE

Delete the first paragraph and replace with the following:

“Coarse aggregate shall consist of sound, tough, durable particles conforming to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15
Los Angeles Abrasion ASTM C 131 Max. % Loss	40

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	2.0
Clay Lumps %	0.5
Soft & Unsound Frag. %	6.0
Other Deleterious %	2.0
<i>Total Deleterious Allowed %</i>	<i>6.0</i>

Delete the second and third paragraphs.

401-2.1(b) FINE AGGREGATE

Delete the first paragraph and replace with the following:

Sand: Sand shall be the fine granular material resulting from the natural disintegration of rock. Sand produced from deposits simultaneously with and by the same operations as gravel coarse aggregate may contain crushed particles in the quantity resulting normally from the crushing and screening of oversize particles.

Stone Sand: Stone sand shall be produced by washing or processing by air separation the fine material resulting from crushing rock quarried from undisturbed consolidated deposits.

Slag Sand: Slag sand shall be the graded product resulting from the screening of air cooled blast furnace slag. Air cooled blast furnace slag shall be the nonmetallic product, consisting essentially of silicates and alumino-silicates of lime and other bases, which is developed in a molten condition simultaneously with iron in a blast furnace.

Steel Slag Sand: Steel slag sand shall be the graded product resulting from the screening of crushed steel slag. Crushed steel slag shall be the nonmetallic product which is developed in a molten condition simultaneously with steel in an open hearth, basic oxygen or electric furnace.”

The fine aggregate shall also conform to the following quality requirements:

QUALITY TEST(IDOT B Quality)	PERCENT
Na ₂ SO ₄ Soundness, 5 Cycle ASTM C 88 Max. % Loss	15

Minus No. 200 Sieve Mat'l ASTM C 136 Max. % Loss [1]	6.0 [2]
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[1] Fine aggregate shall not contain more than 3 (three) percent clay (2 micron or smaller) particles.

[2] Does not apply to Stone Sand.

DELETERIOUS TEST	PERCENT
Materials (Max. % allowed)	
Shale %	3.0
Clay Lumps %	3.0
Coal, Lignite & Shells %	3.0
Conglomerate %	3.0
Other Deleterious %	3.0
<i>Total Deleterious Allowed %</i>	<i>5.0</i>

401-2.1(c) SAMPLING AND TESTING

Delete this paragraph and replace with the following:

"All aggregates proposed in the manufacture of the mix will be sampled and tested by the Contractor. ASTM D 75 shall be used in sampling coarse aggregate and fine aggregate, and ASTM C 183 shall be used in sampling mineral filler. The Contractor shall provide the Engineer with aggregate producer (quarry) and Contractor (plant) quality control gradations. No aggregate shall be used in the production of mixture without prior approval."

401-2.1(d) SOURCES OF AGGREGATES

Delete this paragraph and replace with the following:

"All aggregate sources that are approved by the Illinois Department of Transportation, Division of Highways, conforming to the description, gradation and quality specified herein, shall be permitted for use in the manufacture of the HMA surface course. The supplier of aggregates must participate and meet the requirements of the Illinois Department of Transportation Division of Highways source certification program. The Engineer reserves the right to inspect the source(s) and manufacturing of all aggregates. If satisfactory quality control and production procedures are not being implemented, the Engineer may remove approval of the source(s). Approval of the source(s) of aggregate(s) does not relieve the Contractor in any way of the responsibility for delivery to the job site aggregates that meet the requirements specified herein."

401-2.1(e) SAMPLES OF AGGREGATES

Delete this paragraph and replace with the following:

"All the source(s) of the proposed aggregates for use by the Contractor in the Contractor's proposed HMA mix design must be approved in writing by the I.D.A. Engineer of Construction & Materials prior to use in any design or production of HMA material."

401-2.3 BITUMINOUS MATERIAL

Add the following to the first paragraph:

“Performance Graded asphalt PG 64-22 shall be used.

401-3.2 JOB MIX FORMULA (JMF)

Delete the first paragraph and insert the following:

“The Contractor is responsible for the JMF and no HMA mixture for payment shall be produced until a letter from the Illinois Division of Aeronautics’ Engineer of Construction & Materials accepting the Contractor’s proposed JMF has been issued to the Contractor. The approved JMF shall indicate the definite percentage on each sieve for each aggregate, the percent of bitumen, and the number of gyrations specified for the individual project. The Contractor shall provide all laboratory sampling and testing to the Engineer, upon the completion of the proposed JMF. The exact tests and procedures are outlined in the Illinois Division of Aeronautics (IDOA) latest *Policy Memorandum 2003-1: “Requirements for Laboratory, Testing, Quality Control and Paving of Superpave Bituminous Concrete Mixtures for Airports,”* located at the IDOT internet site.

Delete the third paragraph and replace with the following:

“The HMA mixture shall be tested according to the Asphalt Institute’s most current Superpave Series No. 2 (SP-2) manual entitled, “Superpave Mix Design”and shall meet the criteria set forth in Tables 2 and 4 herein.”

TABLE 2 SUPERPAVE DESIGN CRITERIA

TRAFFIC MIX					
Design Parameter	Aircraft over 60,000 lbs.[1]		Aircraft under 60,000 lbs.		Automobile
	Runway or Taxiway	Parking Apron	Runway or Taxiway	Parking Apron	Entrance Roads and Parking Lots
N_{ini} [2]	5	7	5	5	5
N_{des} [3]	40	50	30	30	30
N_{max}	58	74	42	42	42
% Air Voids V_a	2-4	2-4	2-4	2-4	2-4
VFA (min %)	75-90	75-90	75-90	75-90	75-90

[1] Stone sand (IDOT Gradation FA20 or FA21) shall be required as part of the fine aggregate portion of the JMF. The exact amount of stone sand will be determined by the Contractor based on preparation of the Mix Design. The percentage of stone sand will be verified as acceptable by the Division of Aeronautics based upon the Contractor's final proposed JMF. The Division reserves the right to request a change in the amount of stone sand at any point in the mix design process, as well as during production, based upon performance of the mix during placement.

[2] Where N= number of gyrations on an IDOT approved superpave gyratory compactor.

[3] The N_{des} value may be changed in order to obtain an acceptable mix design when approved by the Engineer.

Delete: Table 3. MINIMUM PERCENT VOIDS IN MINERAL AGGREGATE

Replace Table 4 with the following:

TABLE 4. AGGREGATE BITUMINOUS SURFACE COURSE

Percentage by Weight Passing Sieves Job Mix Formula (JMF)		
Sieve Size	Gradation B Range 3/4" Maximum	Ideal Target
1 in.	100	100
3/4 in.	100	100
1/2 in.	99 – 100	100
3/8 in.	91 – 97	94
No. 4	56 – 62	59
No. 8	36 – 42	39
No. 16	27 – 32	30
No. 30	19 – 25	22
No. 100	7 – 9	8
No. 200	5 – 7	6
Bitumen %:		
Stone	5.0 – 7.0	6.0

Delete the second sentence of the seventh paragraph and replace with the following:

“The tolerances listed in TABLE 5 will only apply when they cause a grading band within the band listed in TABLE 4. Otherwise, the grading bands listed in TABLE 4 shall apply.”

Delete the second and third sentences of the ninth paragraph and replace with the following:

“Deviation from the approved JMF for bitumen content and gradation of aggregates shall not be greater than the tolerances permitted and shall be based on extraction, or calibrated ignition oven test for aggregate gradations and asphalt content. Results falling outside the set tolerances shall be cause for rejection of all the material placed from the time of testing until a passing test is obtained. The applicable ASTM and IDOT tests are outlined in the current IDOA *Policy Memorandum 2003-1: “Requirements for Laboratory, Testing, Quality Control and Paving of Superpave Bituminous Concrete Mixtures for Airports,”* located at the IDOT internet site. These tests shall be performed by Contractor quality control personnel. Split mix samples shall be maintained by the Contractor for random testing by the Engineer.”

Delete the last paragraph for this section.

401-3.4 TEST SECTION

Delete this entire section and replace with the following:

“Prior to the manufacture of mix for the test section, Contractor quality control personnel shall have completed all proportioning and testing in accordance with Policy Memorandum 2003-1, to assure that the mix produced will meet the JMF. The Contractor shall then prepare a quantity of HMA surface course mixture in order to construct the test section.

The test section shall have a length of approximately 200 to 300 lineal feet and shall be of the same depth specified for the construction of the course which it represents. The Contractor may place up to 50 tons of mix prior to construction of the test section in order to line-out the plant, the mix, and the paving operation. The underlying grade or pavement structure upon which the test section is to be constructed shall be the same as the remainder of the course represented.

A. Construction of the Test Section:

The test section shall consist of two (2) parts: Development of a Growth Curve and establishing a Rolling Pattern.

1. Growth Curve

To construct the Growth Curve a self-propelled vibratory roller meeting the following minimum requirements shall be required:

Drum diameter 48 inches, length of drum 66 inches, vibrators 1600 vibrations per minute (VPM) minimum, unit static force on vibrating drum(s) 125 pounds per lineal inch (PLI), total applied force 325 pounds per inch (PLI), adjustable eccentrics, reversible

eccentrics on non-driven drum(s). The total applied force for various combinations of VPM and eccentric positions shall be shown on decals on the vibrating roller or on a chart maintained with the roller. The vibratory roller shall be equipped with water tanks and sprinkling devices, or other approved methods, which shall be used when necessary to wet the drum to prevent the HMA mixture from sticking. The Contractor shall have a vibrating reed tachometer (hand type) at the job site for checking roller vibrations. The reed tachometer shall have a range of 1000 to 4000 vibrations per minute (vpm). The vibrating reed tachometer shall have two (2) rows of reeds. One row shall range from 1000 to 2000 vpm and the other row shall range from 2000 to 4000 vpm.

The Growth Curve shall be constructed by successive passes of the vibratory roller, in a given area, in order to determine the maximum compactibility of the mix. More than one Growth Curve may be required as part of the test section if adjustments to the mix, plant operation, laydown, etc., are necessary to reach optimum compactibility.

2. Rolling Pattern

The Contractor shall then proceed to establish the Rolling Pattern using the equipment that he intends to use for compaction of the rest of the HMA course.

B. Test Section Acceptance

The Test Section shall be evaluated and approved based on the following:

1. The completed Test Section (Rolling Pattern area) shall be divided into four (4) subsections with one (1) sample, consisting of two (2) cores, obtained from each subsection for determination of density. One additional core sample shall be obtained from the Growth Curve.
2. The Contractor shall correlate a nuclear density gauge to the Test Section for Quality Control testing. The nuclear density gauge shall not be used for acceptance testing.
3. The completed Test Section (rolling pattern area) shall have a minimum density of 94 percent (6 percent air voids) of the maximum theoretical specific gravity of the mix (ASTM D2041). Individual test (average of two cores) results below 94% shall constitute a failing test section.
4. If the test section fails to meet these requirements, the Contractor shall construct a new Test Section meeting these requirements at his own expense.
5. Full production shall not be allowed until all tests, Reflux extraction or Ignition Oven, Gradation, Gravities of mix, and Core Densities are completed in order to determine compliance with these specifications.
6. The completed Test Section(s) shall be part of the proposed work. When recommended by the Resident Engineer and approved by the Engineer, test sections that do not conform to the specifications shall be removed and replaced at the Contractor's expense.

7. When a Test Section passes, the Test Section tonnage shall be paid 100%.

The mix used in construction of the Test Section shall be paid under Section 401-6.10. Construction of the Test Section shall be paid for under Section 401-6.30. Payment will be made for only one (1) Test Section.”

401-4.2 HMA MIXING PLANT

Insert the following as the first paragraph:

“The HMA hot-mix plant(s) shall conform to the following requirements, or the Engineer may accept the use of a hot-mix plant approved by the IDOT Division of Highways for the manufacture of Class I HMA mixtures in accordance with Section 1102 of the current *Standard Specifications for Road and Bridge Construction*. When recyclable asphalt pavement is used, the hot-mix plant shall also conform to the additional IDOT plant requirements for hot-mix recycling.”

(a) Requirements for all plants:

(12) Testing laboratory

Delete the first sentence of this paragraph and insert the following:

“The Contractor or producer shall provide a testing laboratory, meeting the requirements of Illinois Division of Aeronautics’ latest *Policy Memorandum 2003-1: “Requirements for Laboratory, Testing, Quality Control and Paving of Superpave Bituminous Concrete Mixtures for Airports,”* located at the IDOT internet site, for Quality Control and acceptance testing during periods of mix production, sampling, and testing, and whenever materials subject to the provision of these specifications are being supplied or tested.”

401-4.4 HMA PAVERS

Add the following after “activated screed” in the first sentence of the first paragraph:

“capable of vibrating at approximately 3000 VPM”.

Add the following at the end of the first paragraph:

“All width extensions required to place material shall have the same placement features and equipment functions as provided on the main body of the paver. Augers shall be extended as additional sections of screed are bolted on or automatically adjustable screeds are extended. The augers need not be extended when the screed extensions on either side of the machine are one foot or less and the finished surface of the mat is uniform. The use of any machine obsolete in design or in poor mechanical condition will not be permitted.”

Delete the second and third sentences of the third paragraph and replace with the following:

“An automatic grade control system shall be used to automatically maintain the screed elevation as specified herein.”

401-4.7 PREPARATION OF MINERAL AGGREGATE

Add the following as the second sentence of the first paragraph:

“Immediately after heating, the surface course aggregate(s) shall be screened into at least three sizes. This requirement does not apply to drum mixer plants.”

401-4.9 TRANSPORTING, SPREADING, AND FINISHING

Add the following paragraph after the fourth paragraph:

“The first lane of the first lift of the HMA surface course shall be started at the center of the pavement with a taut stringline (guide wire) set to grade at both sides of the paver. The automatic grade control system of the paver shall be used to control grade of both sides of the paver from these reference stringlines. The grade control for the adjacent lanes of pavement shall be maintained by using a matching shoe with the previous laid pavement and a stringline on the outer edge of the next lane. A stringline and matching shoe shall be used to pave all remaining lanes of the first lift of surface course. If grade is established on the first lift, succeeding lifts shall be laid with a traveling ski on both sides of the paver for the center lane with matching shoe and traveling ski on adjacent lanes. If grade is not established on the first lift, the Resident Engineer shall require taut stringline references until satisfactory grade is established.”

401-4.10 COMPACTION OF MIXTURE

Add the following to the end of the second paragraph:

“A self-propelled pneumatic-tire roller meeting the following requirements shall be required on the top lift of surface course mixture:

The roller shall be of the oscillating wheel type consisting of not less than 7 pneumatic-tire wheels revolving on 2 axles, and capable of being ballasted to the mass (weight) required. The front and rear wheels shall be staggered so that the tire sidewalls will have a minimum overlap of 1/2 inch. The roller shall provide for a smooth operation when starting, stopping or reversing direction. The tires shall withstand inflation pressures between 60 and 120 psi. The roller shall be equipped with an adequate scraping or cleaning device on each tire to prevent the accumulation of material on the tires. When used for the compaction of HMA mixtures, the roller shall be equipped with a water system which will keep all tires uniformly wet to prevent material pickup. The Contractor shall provide means for determining the mass (weight) of the roller as distributed on each wheel. Ballast shall be included in determining the mass (weight).”

Delete the third paragraph and substitute the following:

“Sufficient rollers shall be used to handle the output of the plant. Rolling shall continue until all roller marks are eliminated producing a surface of uniform texture true to grade and cross section.

The Contractor shall provide, at all times, an approved Troxler (or equal) nuclear density gauge with a qualified operator to maintain quality control of the density as specified herein.”

401-4.11 JOINTS

Add the following as the fourth paragraph for this section:

All longitudinal joints constructed are to be compacted in such a manner that they are “pinched” to provide adequate density at the joint. The method of “pinching” shall be as defined in Article 406.16 on compaction of HMA concrete in the most current issue of the I.D.O.T. Standard Specifications for Road and Bridge Construction. The Contractor shall cut one core per 2,500 tons or one per project at a random location over the longitudinal construction joint. The core shall be delivered to the Resident Engineer for density testing. The density at the joint shall be a minimum of 90%.

401-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

Delete this entire section and insert the following:

“401-4.13 ACCEPTANCE TESTING OF HMA MIXES FOR DENSITY

After the compaction is completed, the pavement will be tested and payment made on the basis of percent air voids in the final compacted mat.

The HMA surface course shall be compacted to a minimum density of 93 percent (7 percent air voids) of the maximum theoretical specific gravity (ASTM D2041) and accepted by the following statistical procedure. When more than one surface course mix design is used on the same project, each mix will be evaluated separately under the statistical acceptance procedure specified herein.

(a) Lot Size. The plant-produced mixture shall be tested on a lot basis. A lot shall consist of 4 sublots. End or final lots may contain between 3 and 6 sublots.

(1) A subplot shall consist of 500 tons for each type of mix.

One density sample shall be taken randomly from each subplot. Each density sample shall be the average of two cores extracted from the sample location.

The Contractor shall take one random mix sample from each 1,000 tons of mix placed. This sample shall be split into two samples with one half tested by the Contractor for Extraction or Ignition oven, Maximum Specific Gravity, Gradation, and Air Void tests. The other sample half shall be appropriately marked and retained by the Contractor until the Engineer requests the mix for testing or directs the Contractor in writing to dispose of the mix.

All tests shall be completed and reported to the Engineer no later than the morning of the day following production.”

(b) Lot Early Termination. When less than 3 sublots are produced, such as at the end of construction of the surface course or at the end of the construction season, the final subplot

data shall be included with the previous lot for payment. The final lot may thus contain up to six (6) sublots.

(c) Acceptance Criteria. The acceptance of each lot of HMA base course shall be based on the **Percentage of material Within specification Limits (PWL)**. The PWL is determined using standard statistical techniques and involves the number of tests in each lot (n) and the quality indexes (Q_L is the Quality Index for the lower limit; Q_U is the Quality Index for the upper limit). The quality indexes are calculated using the following formulae:

$$Q_L = \frac{\bar{X} - 1}{S} \qquad Q_U = \frac{7 - \bar{X}}{S}$$

Where Q = Quality Index (lower or upper)

\bar{X} = Mean (average) value of air voids in percent.

(% air voids = 100 - % density)

S = Standard Deviation of test results

For mat in-place air voids, estimate the **Percentage Within Tolerance (PWT)** for the lower and upper tolerance limits by entering Table 8 with Q_L and Q_U using the column appropriate to the total number (n) of core samples. The total percent of material between the lower and upper limits is defined as the **Percent Within Limits** and is calculated by the following formula:

$$PWL = [PWT(\text{lower}) + PWT(\text{upper})] - 100$$

Each lot of HMA material shall be accepted for 100 percent payment when the PWL equals or exceeds 90 percent. When the PWL is below 90 percent for a given lot, the lot tonnage shall be adjusted in accordance with Table 7.

TABLE 7 -- PAY ADJUSTMENT SCHEDULE
(see Note 2.)

PWL	% ADJUSTMENT IN LOT QUANTITY
90 - 100	100
80 - 89.9	0.5 PWL + 55.0
65 - 79.9	2.0 PWL - 65.0
Below 65	Note 1.

Note 1. The lot shall be removed and replaced. However, the Engineer may decide to accept the deficient lot. In that case, it will be paid for at 50% adjustment.

Note 2. All preliminary calculations used in determining the Percent Within Limits should be rounded to a minimum of four digits right of the decimal point. The PWL that is used for Table 7 purposes should then be rounded to one digit right of the decimal point to determine the percent of contract quantity to be paid. The final

percent pay figure should be rounded to one digit right of the decimal point. The Resident Engineer shall notify the Contractor, in writing, of the final percent pay for each lot as soon as all lot tests are completed.

(d) Mix sampling All mix sampling shall be done on a random basis as determined by the Resident Engineer. Samples that are obviously defective or become defective prior to testing shall be discarded and retaken. New samples shall be considered as if they were initial samples.

401-4.15 SAMPLING PAVEMENT

Delete this section and replace with the following:

401-4.15 Sampling Pavement Cores from each subplot shall be taken at random locations as outlined by the Resident Engineer. No core samples shall be taken within two feet of the edge of pavement. Any core less than 1-1/2 inch thickness shall not be used and a new location and sample shall be selected.

Core samples of approximately 4 inches in diameter, for determination of in-place air voids of the completed pavement, shall be obtained by the Contractor at no extra expense. The number and locations of the samples shall be as determined by the Resident Engineer. The Contractor shall furnish all tools, labor, and materials for sampling and replacing pavement.

All core tests necessary to determine initial conformance with specification requirements will be performed by the Resident Engineer at no cost to the Contractor.

(A) Resampling and Retesting Resampling of a lot may be allowed only under the following conditions:

(1) The Contractor must request, in writing, the resampling and retesting of a complete lot within 48 hours after receiving the written test results of the lot from the Resident Engineer. Only one retest per lot will be permitted.

(2) If the retested lot should result in a higher "Percent Within Limits" figure than the original, based on all lot samples (original and new) the following will apply:

(a) The cost of resampling and retesting will be borne by the Engineer.

(b) The new "Percent Within Limits" figure shall be calculated using all LOT samples, (original and new) for calculating the lot payment.

(3) If the retested lot should result in a "Percent Within Limits" figure equal to or less than the original, based on all the lot samples (original and new), the following will apply:

(a) The cost of resampling and retesting will be borne by the Contractor.

(b) The new "Percent Within Limits" figure shall be calculated using all lot samples, (original and new) for calculating the lot payment.

(4) Procedures in ASTM E-178 shall be used to determine outliers based on all samples taken and a 5% significance level.

(5) Results of the retesting and resampling shall be final.”

The completed pavement shall be cleaned so that no debris or dirt from coring operations is left on the surface of the pavement.

METHOD OF MEASUREMENT

201-5.1

Add:

Measurement for payment will not be made for any bituminous surface course in excess of 103 percent of plan quantity plus (or minus) theoretical quantities authorized by the Engineer.

BASIS OF PAYMENT

401-6.1

Delete this section and replace with the following:

“401-6.1 The quantity of HMA surface course mixture measured as outlined in Section 401-5.1 shall be adjusted in accordance with Section 401-4.13 herein. Payment shall be calculated by multiplying the contract unit price per ton of HMA base course and the adjusted tons per lot. Final payment shall be compensation for furnishing all materials, for all preparation, mixing, testing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item.

The test section shall be paid for at the contract unit price per each, which price shall include the additional specified equipment, labor, Engineering, and testing time necessary to construct this item.

Payment will be made under:

Item 401-6.10 -- Bituminous Surface Course - Per Ton.

Item 401-6.30 -- Test Section - Per Each.