

SECTION 00745 - ASPHALT CONCRETE PAVEMENT - STATISTICAL ACCEPTANCE

(Follow all instructions and make all edits with “Track Changes” turned on. If there are no instructions [purple text] above a subsection, paragraph, sentence, or bullet, then include it in the Project. Delete all purple text before preparing the final document. All other modifications to this Section will require ODOT Technical Resource and State Specifications Engineer approval.)

Comply with Section 00745 of the Standard Specifications modified as follows:

(Use the following subsection .02 when one of the following definitions is required.)

00745.02 Definitions -

(Use the following three paragraphs when separate subplot definitions are required by the Pavement design report.)

Replace the sentence that begins “**Sublot Size** - A subplot is...” with the following paragraphs:

Sublot Size - Except for compaction, a subplot is 1000 Tons. The final subplot for a JMF may be increased up to a maximum of 1,500 Tons, if the production total does not reach the random number for the subplot.

A compaction subplot is 200 Tons. The final compaction subplot for a JMF may be increased up to a maximum of 400 Tons, if the production total does not reach the random number for the subplot.

(Add the following definition when IRI Pavement smoothness specifications are required by the Pavement design report.)

Add the following definition:

Localized Roughness - An area that exceeds 160.0 inches per mile in a continuous International Roughness Index (IRI) evaluation over a 25.0-foot base length.

(Add the following definition when a 10,000 Ton Lot Size is required by the Pavement design report.)

Replace the definition “**Lot Size**” with the following definition:

Lot Size - A lot consists of up to 10,000 Tons of ACP, with a maximum of 20,000 Tons for the final lot per JMF. The following circumstances will require a different lot:

- A new JMF is used. A JMF adjusted according to 00745.16 is not considered a new JMF
- The method for measuring compaction is changed
- A new compaction specification limit is required according to 00745.49(b)(3)
- A change from one test procedure for measuring asphalt content to another test procedure for measuring asphalt content occurs.

The Engineer may allow Material for irregular areas not completed during the main paving operations, such as driveways or guardrail flares, to be evaluated as a separate lot.

00745.10 Aggregate - Replace the paragraph that begins "When requested by the Engineer ..." with the following paragraph:

When requested by the Engineer, meet with the Engineer at a mutually agreed upon time to discuss accomplishing all phases of the crushing Work, including supervisory personnel of the Contractor and any Subcontractors who are to be involved in ACP Aggregate crushing.

00745.10(a) New Coarse and Fine Aggregates - Replace the paragraph that begins "Provide and stockpile ..." with the following paragraph:

Furnish and stockpile new Aggregates according to the following requirements:

00745.10(a)(1)a. Separated Sizes - Replace the paragraph that begins "Advise the Engineer ..." with the following paragraph:

Advise the Engineer of the separated sizes of Coarse and Fine Aggregate that are used and the proposed targets for each individual sieve size for each stockpile. A minimum of one Coarse Aggregate and one Fine Aggregate stockpile is required. If the Contractor proposes to produce Coarse and Fine Aggregates in separated sizes other than those specified, request the proposed size changes in writing, and state the proposed target value and specified tolerance for each of the individual sieve sizes of the proposed Materials.

00745.10(a)(1)b. Scalping - Replace the paragraph that begins "Scalp the Rock ..." with the following paragraph:

Scalp the Rock on a 3/4-inch sieve screen deck. For quarry Rock, scalp the Rock after it has passed through the primary crusher. The Material remaining may be accepted for use by visual inspection. The Engineer may perform verification testing of the gradation. Meet the following Material requirements:

00745.10(a)(1)c. Soundness - Replace this subsection, except for the subsection number and title, with the following:

Furnish Coarse and Fine Aggregate with a weighted loss not exceeding 12 percent when subjected to five cycles of the soundness test using sodium sulfate solution according to AASHTO T 104.

00745.10(a)(1)d. Durability - Replace the paragraph that begins "Provide Aggregate ..." with the following paragraph:

Furnish Aggregate not exceeding the following maximum values:

00745.10(a)(1)e. Fractured Faces - Replace the paragraph that begins "Provide crushed Aggregate ..." with the following paragraph:

Furnish crushed Aggregate with not less than the minimum number of fractured faces as determined by AASHTO T 335 as follows:

00745.10(a)(2) Coarse Aggregate - Replace the paragraph that begins "Provide Coarse Aggregate ..." with the following paragraph:

Furnish Coarse Aggregate meeting the following:

00745.10(a)(3) Fine Aggregate - Replace the paragraph that begins "Provide Fine Aggregate ..." with the following paragraph:

Furnish Fine Aggregate meeting the following:

00745.10(a)(3)e. Blend Sand - Replace the paragraph that begins "No natural or uncrushed ..." with the following paragraph:

No natural or uncrushed blend Sand is allowed in Level 4 ACP. Blend Sand is allowed for Levels 1, 2, and 3 mixes. For these mixes, establish the target gradation and produce all Material within the following tolerances (T):

00745.10(b) Reclaimed Asphalt Pavement - Replace the paragraph that begins "RAP Material used ..." with the following paragraph:

RAP Material used in the production of new ACP is optional. No more than 30 percent RAP is allowed in Level 1, Level 2, and Level 3 ACP. No more than 30 percent RAP is allowed in Level 4 Base Courses. No more than 20 percent RAP is allowed in Level 4 wearing Courses.

00745.10(d) Reclaimed Asphalt Pavement and Recycled Asphalt Shingle Aggregate - Replace this subsection, except for the subsection number and title, with the following:

Blend the RAP, RAS, or RAM Material with new Aggregate to provide a mixture according to the JMF within the tolerances specified. Have a CAT-I perform sampling and testing of RAP and RAS Aggregates according to Section 00165.

00745.11(a) Asphalt Cement - Replace the paragraph that begins "Use the grade of ..." with the following paragraph:

Use the grade of asphalt specified in the Contract Documents. Furnish asphalt cement according to ODOT's publication *Standard Specifications for Asphalt Materials*. The applicable Specifications are those contained in the current publication on the date the Project is advertised.

00745.11(b) Asphalt Cement Additives - Replace the paragraph and bullets that begins "Use standard recognized ..." with the following paragraph and bullets:

Use standard recognized asphalt cement additive products that are of known value for the intended purpose and approved for use on the basis of laboratory tests and capable of being thoroughly mixed. Do not use asphalt cement additives that have deleterious effects on the asphalt material. Do not use silicones as an additive. When required by the JMF add asphalt cement admixtures to aid in the mixing.

(Use the following lead-in paragraph and subsection .11(d) when latex polymer treatment of Aggregate is listed as an option in the Pavement design report.)

Add the following subsection:

00745.11(d) Aggregate Treatment - Latex Polymer - A latex polymer Aggregate treatment Material may be used to treat new crushed Aggregates instead of lime if Tensile Strength Ratio test results on the mixture with the latex polymer treatment at the JMF meet the minimum criteria in 00745.13(a).

(1) General:

- a. Provide a system to automatically meter the latex emulsion at the proper rate and apply the emulsion uniformly to the Aggregate prior to the addition of the asphalt cement. Follow manufacturer's recommendations to set up, adjust, and calibrate the Equipment.
- b. Demonstrate to the Engineer's satisfaction that the required application rate of latex solids is being met. If it is not, take corrective action. Document and notify the Engineer of the corrective action.

(2) Material - Use latex polymer emulsion concentrate meeting the following:

	Minimum	Maximum	Test Method
Solids Percent	65.0	—	ASTM D 1417
pH	9.0	11.0	ASTM D 1417
Brookfield Viscosity Spindle 3, 20 RPM, cPs	500	3000	ASTM D 1417

Provide a quality compliance certificate for the polymer latex emulsion concentrate to the Engineer according to 00165.35.

(3) Application Rate - Apply the latex emulsion to achieve a minimum of 0.75 pounds of latex solids per Ton of new Aggregate (0.0375%) for dense graded mixtures and a minimum of 0.50 pounds of latex solids per Ton of Aggregate (0.025%) for open-graded mixtures. Higher application rates may be required to meet minimum TSR limits. Determine application rate during mix design testing.

(4) Treatment During ACP Production:

- a. Adjust Aggregate moisture content to meet the manufacturer's recommendation for emulsion application. Apply the latex emulsion at the minimum rate specified above or at a higher rate if TSR testing indicates a higher rate is required.
- b. Apply the latex emulsion to the Aggregate just prior to entry into dryer drum. Mix Aggregate with the emulsion in a pugmill or in the dryer drum prior to application of asphalt cement. Heat Aggregates to at least 250 °F after treatment and prior to addition of asphalt cement.

(Use the following lead-in paragraph and subsection .11(e) when a liquid anti-stripping additive is listed as an option in the pavement design report.)

Add the following subsection:

00745.11(e) Liquid Anti-Stripping Additive - An asphalt cement liquid anti-stripping additive (LASA) may be used instead of lime treatment of Aggregate.

(1) General - For LASA to be considered for use, meet the following criteria:

- Be designated as an asphalt anti-strip additive, with test results posted on the Warm Mix Asphalt Technologies category on the *AASHTO Product Evaluation and Audit Solutions (APEAS)* website.
- APEAS test results indicate an increase of 10 percent or greater in TSR (AASHTO T 283) performed on durable Aggregate, not limestone.
- Be approved for use by another State DOT as an anti-stripping additive.

If a product meets these criteria, it may be used in the JMF development according to the *ODOT Contractor Mix Design Guidelines for Asphalt Concrete*. The standard addition rate of LASA for the JMF is the rate used in the APEAS testing. If no rate is published, the minimum rate is 0.5% of the virgin binder. If the APEAS published rates are 0.5% of total binder or higher, the minimum rate may be reduced to 0.5% of the virgin binder.

Approval of the JMF is also dependent on Hamburg wheel-track testing results conducted at the ODOT Central Materials Laboratory. When tested according to AASHTO T 324 for 20,000 passes at a test temperature of 50 °C the minimum requirements are:

Rut depth (Level 4 wearing Course).....	5mm max.
Rut depth (All others).....	7mm max.
Stripping inflection point (All levels).....	none

(2) Addition to Asphalt Cement - Blend the LASA at the asphalt terminal prior to delivery to the mixing plant. Use LASA compatible with the asphalt cement. Comply with all asphalt cement requirements for the blended product. Do not change the LASA addition rate without prior approval from the Engineer.

(3) Field Testing During Production - At the Agency's discretion, production mixture may be tested at the Central Materials Laboratory. Failure to meet the criteria listed above may require a change in addition rate, a change of approved LASA, or lime-treatment of Aggregate to continue production.

00745.13 Job Mix Formula Requirements - Replace the paragraph that begins "Do not begin production of ACP for use..." with the following paragraph:

Do not begin production of ACP for use on the Project until the JMF is reviewed by the Engineer and written consent is provided to proceed. The JMF proposed for use on the Project is evaluated based on the criteria identified in 00745.13(a) and 00745.13(b) and the latest *ODOT Contractor Mix Design Guidelines for Asphalt Concrete*. A new JMF is required if the asphalt cement source or grade, any additives, or the source of the Aggregate change during production. A change in the source of asphalt cement requires a new passing TSR.

Replace the paragraph that begins "A separate JMF..." with the following paragraph:

A separate JMF is issued for WMAC. Do not use RAS in WMAC mixes with minimum compaction temperatures less than 260 °F.

00745.13(b) Performance Test - Replace this subsection, except for the subsection number and title, with the following:

For Level 3 wearing Course mixes and all Level 4 mixes, include the results of performance testing as outlined in the latest *ODOT Contractor Mix Design Guidelines for Asphalt Concrete* in the mix design submittal.

00745.14 Tolerances and Limits - Replace the paragraph that begins "When a JMF tolerance..." with the following paragraph:

When a JMF tolerance applies to a constituent, full tolerance is given even if it exceeds the control points established in 00745.12(b). Full tolerance is given for RAP content even if it exceeds the limits established in 00745.10(b). Full tolerance is given for RAS or RAM content even if it exceeds the limits established in 00745.10(c).

(Use the following sentences when required by the Pavement design report.)

Replace the line "**Asphalt Cement - AASHTO...**" with the following line:

Asphalt Cement - AASHTO T 308 (Ignition)
and ODOT TM 323 JMF ± 0.35%

00745.16(a)(2) Laboratory Requirements - Replace this subsection, except for the subsection number and title, with the following:

Provide and maintain an ODOT certified quality control laboratory. Provide the laboratory with the necessary Equipment and supplies for performing Contractor quality control testing. Calibrate all testing Equipment according to the required test methods. The Engineer may inspect measuring and testing devices to confirm both calibration and condition.

Ensure the laboratory is operational before beginning the ACP production and be equipped with a telephone or cellular telephone, if either service is available. Provide laboratory Equipment meeting the requirements of the applicable test methods identified in the Specifications and selected for use on the Project.

00745.16(b)(1)a. General - Replace the paragraph that begins "Before beginning production..." with the following paragraph:

Before beginning production and placement of WMAC, perform mix design verification (MDV) tests on the HMAC as required at start-up according to 00745.16(b)(1)(c). Ensure two consecutive MDV test results from testing of HMAC are within the limits of 00745.16(b)(1)(a). The Engineer may waive ODOT TM 306 for HMAC production required before WMAC production for one shift.

Replace the paragraph that begins "The running averages..." with the following paragraph:

Provide running averages of four MDV results within the limits given below:

00745.16(b)(1)b. Reconciliation of Laboratory and In-place Properties - Replace this subsection, except for the subsection number and title, with the following:

Have a CDT provide the results from the initial control strip to the CAT-II for evaluation and comparison with the MDV results at the completion of the control strip. If the MDV and density test results are contradictory, inform the Engineer and initiate an investigation. The CAT-II is responsible for recommending a plan to the Engineer for resolving the discrepancy based on the results of the investigation. Submit results of investigation and plan no later than the end of two shifts after investigation has been initiated.

00745.16(b)(1)c. Mix Design Verification Requirements at Start-Up - Replace the paragraph that begins "Use the initial MDV ..." with the following paragraph:

Use the initial MDV sample as the first random QC subplot test. Subsequent MDV samples required due to failure of start-up criteria is used for a subplot QC test if the sample is taken within 100 Tons of the scheduled random QC sample location. If not, perform the MDV testing separate from, and not included in, the random QC testing program. Complete all required MDV testing at no additional cost to the Agency.

00745.16(b)(1)c.3. Replace the paragraph that begins "If the Va and VMA ..." with the following paragraph:

If the Va and VMA mix properties are out of tolerance in 00745.16(b)(1)(a), then make mix adjustments within the requirements of 00745.16(b)(1)(d) and immediately obtain another sample and perform MDV testing. Two adjustments are given. If any of the test results for Va and VMA are not within the limits of 00745.16(b)(1)(a) after second adjustment, then stop production and go to step "4".

00745.16(b)(1)c.4. Replace the paragraph that begins "Have the CAT-II ..." with the following paragraph:

Have the CAT-II submit the revised JMF targets and production and plant adjustments to the Engineer. Obtain the approval of the Engineer before restarting production. Production is restarted with MDV testing according to this Subsection.

00745.16(b)(1)f. Request for Job Mix Formula Target Adjustment - Replace this subsection, except for the subsection number and title, with the following:

A request for an adjustment to the JMF targets may be made to the Engineer by the Contractor's CAT-II. The requested change is reviewed and documented by the Engineer. If acceptable, a revised JMF is allowed. Document the subplot test when the adjusted targets are in effect. When making adjustments for gradation do not exceed the tolerances specified for the original JMF limits. Keep AC content adjustments for HMAC within 0.5 percent of the original JMF. Keep AC content adjustments for WMAC within 0.3 percent of the original JMF. The JMF asphalt content may only be adjusted if the production VMA meets the requirements of 00745.16(b)(1)(a). Keep adjustments for RAP or RAM within 5 percent of the original JMF blend percentage, but do not exceed the requirements of 00745.10(b) or 00745.10(c). Adjusting proportions of the combined RAP and RAS is not allowed during production of the mixture. Keep adjustments for RAS content within 1 percent of the original JMF, but do not exceed the requirements of 00745.10(c). A gradation adjustment is required if the VMA is outside of the 00745.16(b)(1)(a) limits. Regardless of these tolerances, keep the adjusted JMF within the mixture specification control points of 00745.12. If a redesign of the mixture becomes necessary, submit a new JMF according to the Specifications.

00745.16(b)(3) Mix Design Verification for Warm Mix Asphalt Concrete - Replace this subsection, except for the subsection number and title, with the following:

Perform MDV testing on WMAC according to 00745.16(b)(1)(a). Continued production and placement of WMAC is allowed at the discretion of the Engineer.

00745.16(c) Quality Assurance and Acceptance - Replace this subsection, except for the subsection number and title, with the following:

The Agency will provide quality assurance according to Section 00165. When QA testing is performed, the Contractor's quality control results is used for acceptance if they are within acceptable limits of the QA test results as defined in the Quality Assurance Program.

00745.17(a) Within Specification Limits - Replace this subsection, except for the subsection number and title, with the following:

If all subplot sample test results are within Specification limits for all constituents, including compaction, the Material is accepted and the Contract unit price is paid for the Material represented by that test.

00745.17(b) Outside Specification Limits - Replace this subsection, except for the subsection number and title, with the following:

If a subplot sample test result for any constituent is outside the specification limit the Engineer will have the backup sample tested.

(1) Backup Within Specifications - If the backup sample test results for all constituents are within specification, the Material is accepted and the full Contract unit price is paid for the Material represented by that test.

(2) Backup Out of Specifications - If the backup sample test results are out of specification, the Contractor may choose to accept the price adjustment calculated according to 00745.95 or may choose to sample the in-place Material for further testing according to 00745.17(b)(3). The price adjustments is computed using all original test results as well as all backup test results. If there are less than three tests, average the two

tests and use the average as a third test result. The maximum composite pay factor (CPF) is 1.0.

(3) In-Place Samples - If the Contractor chooses to sample the in-place Material, sample from a minimum of three random locations from the area represented by the lot in question under the observation of the Engineer. If the in-place sample test results are within specification, the Material is accepted and paid for at the full Contract unit price. If the in-place sample test results are not within specification, the Material is accepted and paid for at an adjusted price according to 00745.95. The maximum CPF is 1.0. Perform sampling and testing of in-place Material at no additional cost to the Agency.

00745.23 Pavers - Replace the bullet that begins "Self-contained, self-propelled ..." with the following bullet:

- Self-contained, self-propelled, supported on tracks or wheels, and does not contact the mixture being placed.

Replace the bullet that begins "Equipped with augers ..." with the following bullet:

- Equipped with augers and a screed, heated when necessary, that:

Replace the bullet that begins "Equipped with a paver ..." with the following bullet:

- Equipped with a paver control system that:

00745.24(b) Vibratory Rollers - Replace the paragraph that begins "If vibratory rollers..." with the following paragraph:

If vibratory rollers are used for finish rolling, provide rollers that:

Replace the bullet that begins "Not be operated ..." with the following bullet:

- Are not operated in the vibratory mode.

00745.24(c) Pneumatic-tired Rollers - Replace the paragraph that begins "Pneumatic-tired rollers..." with the following paragraph:

Pneumatic-tired rollers that:

Replace the bullet that begins "Be tandem ..." with the following bullet:

- Are tandem, or multiple axle, multiple wheel type.

Replace the bullet that begins "Be fully skirted ..." with the following bullet:

- Are fully skirted to reduce tire heat loss and mixture pick up.

00745.42 Preparation of Underlying Surfaces - Replace the paragraph that begins "All Bases and foundations..." with the following paragraph:

Prepare all Bases and foundations where the Pavement is to be constructed meeting the applicable Specifications. Obtain approval before the start of paving. Recondition existing Bases and foundations according to Section 00610. Trim broken or ragged edges to firm material when directed.

Replace the paragraph that begins "Treat all paved..." with the following paragraph:

Treat all paved surfaces on and against where ACP is to be placed with an asphalt tack coat, according to Section 00730.

Replace the paragraph that begins "Treat all waterproofing..." with the following paragraph:

Treat all waterproofing membranes on and against where ACP is to be placed with an asphalt tack coat meeting the requirements of 00745.11(a) or as recommended by the membrane manufacturer.

00745.43(b) Heating Temperatures - Replace the paragraph that begins "Establish the allowable..." with the following paragraph:

Establish the allowable mixing and placement temperature ranges by the JMF. Measure the mixture temperature at the discharge of the mixer. Measure the placement temperature behind the paver. The allowable production temperatures may be adjusted based on the asphalt cement Supplier's recommendation if approved by the Engineer. The maximum mixture temperature of the ACP and the minimum placement temperature is as follows:

00745.44 Asphalt Concrete Pavement Storage - Replace the paragraph that begins "Temporary storing..." with the following paragraph:

Temporary storing or holding of ACP in storage silos is allowed if the Contractor complies with the following:

00745.44(d) Heated Silos - Replace this subsection, except for the subsection number and title, with the following:

Store ACP in heated, insulated silos no more than 72 hours only if an atmosphere is maintained in the silo at all times that prevents damage to the mixture or asphalt properties.

00745.45 Control of Line and Grade - Replace this subsection, except for the subsection number and title, with the following:

Use a floating beam device of adequate length and sensitivity to control the grade of the paver. Where this method is impracticable, manual control of grade is allowed when approved.

00745.46(a) Hauling - Replace the paragraph that begins "ACP will be..." with the following paragraph:

ACP is rejected before placing if one or more of the following occurs:

00745.46(b) Depositing - Replace the paragraph that begins "When ACP is windrowed..." with the following paragraph:

When ACP is windrowed, provide pick-up Equipment that:

Replace the bullet that begins "Pick up substantially ..." with the following bullet:

- Picks up substantially all of the ACP deposited on the Roadway.

Replace the bullet that begins "Be self-supporting, not ..." with the following bullet:

- Be self-supporting, not exerting any vertical load on the paving machine, or causing vibrations or other motions that could have a harmful effect on the riding quality of the completed Pavement.

(Use the following two paragraphs when required by the Pavement design report.)

Replace the paragraph that begins "Deposit ACP from..." with the following paragraph:

Deposit ACP from the hauling vehicles so segregation is prevented. Do not deliver the ACP directly into the paving machine for wearing Courses where the continuous length of the Panel is greater than 500 feet. Deliver the ACP to the paving machine by either a windrow pick-up machine or an end-dump transfer machine.

00745.46(c) Placing - Replace the paragraph that begins "Do not intermingle..." with the following paragraph:

Do not intermingle ACP produced from more than one JMF. Use a single JMF for each Base Course Panel placed during a working shift. Use a single JMF for the wearing Course, except for adjustments in the JMF according to 00745.16(b)(1).

00745.47 Longitudinal Joints - Replace the paragraph that begins "At longitudinal joints..." with the following paragraph:

At longitudinal joints, bond, compact and finish the new ACP equal to the ACP against where it is placed.

00745.47(a) Location - Replace the paragraph that begins "Place the ACP..." with the following paragraph:

Place the ACP in Panel widths that hold the number of longitudinal joints to a minimum. Offset the longitudinal joints in one Panel by at least 6 inches from the longitudinal joints in the Panel immediately below.

00745.47(a)(2) Wearing Course - Replace this subsection, except for the subsection number and title, with the following:

Construct longitudinal joints six inches from permanent lane markings, or as shown or directed.

00745.47(b) Drop-Offs - Replace the bullet that begins "Construct, maintain, remove, ..." with the following bullet:

- Construct, maintain, remove, and dispose of the temporary wedge at no additional cost to the Agency. ACP for the temporary wedge is paid for at the Contract unit price.

00745.48(a)(1) Temporary End Panel - Replace the bullet that begins "For wedges that will be under traffic for less ..." with the following bullet:

- For wedges that are under traffic for less than 24 hours, construct an 8-foot-long wedge (1V:50H taper rate).

Replace the bullet that begins "For wedges that will be under traffic for 24 ..." with the following bullet:

- For wedges that are under traffic for 24 hours or longer, construct a 25-foot-long wedge (1V:160H taper rate).

Replace the bullet that begins "Construct, maintain, remove, ..." with the following bullet:

- Construct, maintain, remove, and dispose of the temporary wedge at no additional cost to the Agency. ACP for the temporary wedge is paid for at the Contract unit price.

00745.48(a)(3) Excess Asphalt Concrete Pavement - Replace this subsection, except for the subsection number and title, with the following:

After completing a temporary end Panel as specified, dispose of unused, remaining ACP as directed. Payment is made for the entire load of ACP, but is limited to only one load for each joint of each Panel.

00745.48(a)(5) Joint Requirements - Replace this subsection, except for the subsection number and title, with the following:

Compact both sides of the joint to the specified density. Test the joint surface according to 00745.70 with a straightedge placed across the joint.

00745.48(c) Bridge Deck Overlays - Replace the paragraph that begins "Saw cut the wearing Course of Pavement ..." with the following paragraph:

Sawcut the wearing or base Course of Pavement directly over the joints in bridge decks, bridge end joints and end Panel end joints as soon as practical but within 48 hours of paving each stage of the wearing or base Course, unless otherwise directed. Saw the cut 3/8 inch wide, \pm 1/8 inch, by 1/2 inch less than the thickness of the Panel of Pavement depth or 1 1/2 inches deep, whichever is less.

00745.49(a)(2) Rolling - Replace the paragraph that begins "Provide sufficient rollers ..." with the following paragraph:

Provide sufficient rollers of the types appropriate to compact the mixture while it is still within the specified temperature. Do not use equipment that crushes the Aggregate. Do not displace the line and grade of edges. Moisten steel roller wheels with a minimum amount of water, or other approved material, necessary to prevent the ACP from sticking to them and spotting or defacing the ACP.

Replace the paragraph that begins "Operate rollers at ..." with the following paragraph:

Operate rollers at a slow, uniform speed recommended by the manufacturer. Operate drive rolls or wheels nearest to the paver unless otherwise approved. Operate pneumatic rollers no faster than 3 mph. Operate vibratory rollers at frequencies of at least 2,000 vibrations per minute.

00745.49(b)(1) General - Replace the paragraph that begins "Compliance with the density ..." with the following paragraph:

Determine compliance with the density Specifications for ACP by random testing of the compacted road surface with calibrated nuclear gauges. Use the MAMD method of compaction measurement.

Replace the paragraph that begins "A pneumatic tired roller ..." with the following paragraph:

A pneumatic tired roller is not required for Level 1 and Level 2 ACP. Have at least one available pneumatic tired roller according to 00745.24(c) on the Project and in good operating condition for Level 3 and Level 4 ACP.

(Use the following two paragraphs when required by the Pavement design report.)

Replace the paragraph that begins "Have the CDT notify the Engineer..." with the following paragraph:

Have the CDT notify the Engineer and CAT-II when a density test is less than 90.0 percent or exceeds 95.9 percent of MAMD. Initiate an investigation to determine if the results indicate that a problem with the mix is developing. Electronically submit the results and recommendations of the CAT-II's investigation to the Engineer within two shifts of the density test. An adjustment to the JMF will not be allowed unless MDV testing supports a required change.

(Use one of the following Options)

00745.49(b)(2) Random Testing -

(Option 1)

Replace the paragraph that begins "Determine the density of each subplot by averaging..." with the following paragraphs:

Determine the density of each subplot by averaging five QC tests performed at random locations with the nuclear gauge operated in the backscatter mode. Lots and sublots are as defined in 00745.02. In addition, perform at least one density test each Day of production. The additional testing may be waived by the Engineer.

(Option 2 - Use the following subsection three paragraphs when blind random density testing and separate subplot definitions are required by the Pavement design report. Delete the two paragraphs above.)

Replace the paragraph that begins "Determine the density of each subplot by averaging..." with the following paragraphs:

Correspond lots and compaction sublots with those defined in 00745.02. Provide one density test location for each compaction subplot. Notify the Engineer when rolling operations are completed in a compaction subplot and it is ready for test location identification. The Engineer will use stratified random numbers to locate the QC tests according to ODOT TM 400 Annex. ODOT TM 400 Annex is available from the Engineer. The Engineer will mark where the QC tests are to be performed.

Allow 30 minutes for the Engineer to locate the final test locations after completion of finish rolling and any additional time required for testing, prior to opening the travel lane to traffic. Have the CDT locate and document the test locations not identified within this time frame.

(Use one of the following Options)

00745.49(b)(2)(b) Core Correlation of Nuclear Gauge Readings -

(Option 1)

Replace the paragraph that begins “Apply correlation factors ...” with the following paragraphs:

Apply correlation factors to all nuclear gauge readings for the Lift where the core correlation was performed.

Replace the paragraph that begins “Both the Engineer and the Contractor ...” with the following paragraphs:

Both the Engineer and the Contractor may request additional core correlation of nuclear gauge readings. Core correlations requested by the Contractor or that are required due to a change in Aggregate or asphalt cement source is at no additional cost to the Agency. The party requesting the core correlation pays the costs of coring and lab testing of the cores. The party performing nuclear gauge testing pays the costs of the nuclear gauge testing.

(Option 2 - Use the following four paragraphs when core correlation specifications are required by the Pavement design report.)

Replace this subsection, except for the subsection number and title, with the following:

For each Lift on the Project that contains more than 2,500 Tons of ACP, correlate each nuclear gauge that is used on that Lift. Perform core correlations and determine core correlation factors according to AASHTO T 355 and ODOT TM 327. Provide bulk specific gravity values to the Engineer within 24 hours of coring. If an Aggregate source or the asphalt cement source changes, new core correlations are required.

Apply correlation factors to all nuclear gauge readings for the Lift where the core correlation was performed.

Both the Engineer and the Contractor may request additional core correlation of nuclear gauge readings. Core correlations requested by the Contractor or that are required due to a change in Aggregate or asphalt cement source is at no additional cost to the Agency.

00745.49(b)(3) Moving Average Maximum Density Method - Replace the paragraph that begins "* If any part of the ..." with the following paragraph:

* If any part of the width of a Lift at a station requires 91.0 percent, then the entire width of that Lift at that station is 91.0 percent

(Use the following subsection .49(b)(4) when separate subplot definitions are required by the Pavement design report.)

00745.49(b)(4) Test Results - In the paragraph that begins "Provide density results..." replace the word "sublots" with the words "compaction sublots".

00745.49(c) Thin Pavement - Replace the paragraph that begins "Compaction to a specified ..." with the following paragraph:

Compaction to a specified density will not be required for Leveling, patches, or where the nominal compacted thickness of a Course of ACP is less than 2 inches.

(Use the following two paragraphs when required by the Pavement design report.)

Replace the paragraph that begins "Perform breakdown and intermediate rolling..." with the following paragraph:

Use ODOT TM 301 "Establishing Roller Patterns for Thin Lifts of ACP" to establish the rolling pattern for compaction. Use the roller pattern from ODOT TM 301 or four Coverages, whichever is greater. Complete additional Coverages as directed.

(Use the following lead-in paragraph and one of the following two options when traffic restrictions are required. Obtain information from the Pavement designer. Delete the option that does not apply.)

Add the following subsection:

[Option 1 - Use this .51 when paving through the top base course is required.]

00745.51 Opening Sections to Traffic - Schedule Work so that, during the same shift, the surfaces being paved are paved full width and length through the top Base Course before opening to traffic. Traffic is allowed on the top Base Course up to ____ Calendar Days.

Before beginning wearing Course paving operations, make repairs to the existing surface as directed. Payment for the repairs will be made according to 00195.20.

[Option 2 Use this .51 when paving through the wearing course is required.]

00745.51 Opening Sections to Traffic - Schedule Work so that, during the same shift, the surfaces being paved are paved full width and length through the wearing Course before opening to traffic.

(Use one of the following options)

00745.70 Pavement Smoothness -

[Option 1]

Replace this subsection, except for the subsection number and title, with the following:

Provide a 12-foot straightedge and, when required a 12-foot rolling straightedge, and test as specified. Additional testing may be required. Mark areas not meeting the surface tolerance.

(a) Level 1 and Level 2 ACP - Test with the 12-foot straightedge in travel lanes parallel to and perpendicular to the centerline, as directed. Do not vary the Pavement surface by more than 1/4 inch.

(b) Level 3 and Level 4 ACP:

(1) Single Course Construction - Test with the 12-foot straightedge in travel lanes parallel to and perpendicular to the centerline, as directed. Do not vary the Pavement surface by more than 1/4 inch.

(2) Multiple Course Construction - Test the surface of the Course where the wearing Course is placed according to 00745.70(a).

Test the wearing surface with the rolling straightedge in the designated wheel path of a 0.1-mile strip of each travel lane per mile, where directed, and on each transverse joint throughout the Project. Operate the rolling straightedge parallel to the centerline. Do not vary the surface by more than 0.015 foot.

Also test the wearing surface with a 12-foot straightedge placed perpendicular to the centerline at least once within the above-mentioned 0.1-mile strip. Do not vary by more than 1/4 inch.

If the 0.1-mile testing strip meets the Specifications, no further testing of the mile represented by the testing strip is required, except at the transverse joints. If any part of the testing strip does not meet the Specifications, test both wheel paths of the entire mile.

(c) Utility Appurtenances - If the Contractor constructs or adjusts Utility appurtenances, manhole covers, and valve boxes, the tolerances of 00745.70(a) and 00745.70(b) apply. If the Utility appurtenances are adjusted by others, these tolerances do not apply.

(d) Shoulders and Paved Medians - Test the Base and wearing Course with the 12-foot straightedge parallel to and perpendicular to the centerline for Shoulders and paved Medians where permanent traffic barriers are located. Do not vary the Pavement surface by more than 1/4 inch.

[Option 2 - Use the following when IRI pavement smoothness specifications are required by the Pavement design report.]

Replace this subsection, except for the subsection number and title, with the following:

Construct the Pavement wearing surface of Traffic Lanes to a profile that does not deviate from longitudinal and transverse smoothness more than the specified limits of 00745.73.

Perform profiling and straightedge testing under the supervision of the Engineer with Equipment furnished and operated by the Contractor at no additional cost to the Agency, according to ODOT TM 772. Complete all required smoothness testing no later than 14 Calendar Days following final completion of all Traffic Lane paving on the Project, or by October 15 of each calendar year for multiple year projects, whichever is earlier. The Contractor accepts the risk that the smoothness may be affected by exposure to traffic between the date the Traffic Lanes are paved and the date the smoothness testing is completed. If the Contractor elects to perform smoothness measurements on a Day other than the Day the Pavement is placed, additional traffic control required for smoothness measurement, and not required for other Work, is at no additional cost to the Agency.

(Use the following lead-in paragraph and subsection .72 when IRI Pavement smoothness specifications are required by the Pavement design report.)

Add the following subsection:

00745.72 Smoothness Testing Equipment - Furnish all Equipment and supplies for determining smoothness.

(a) Straightedge - Provide one 12-foot straightedge.

(b) Profiler - Provide a profiling device meeting the requirements of ODOT TM 772 and certified according to ODOT TM 769.

Provide competent and experienced operator(s) for the Equipment, certified with the profiler according to ODOT TM 769. Before beginning smoothness measurements, meet with the profiler operator and the Engineer at a mutually agreed upon time to discuss all aspects of smoothness measurement on the Project.

(Use the following lead-in paragraph and subsection .73 when IRI Pavement smoothness specifications are required by the Pavement design report.)

Add the following subsection:

00745.73 Smoothness Testing and Surface Tolerances - Test according to the following:

(a) General - Test the Base Course with a 12-foot straightedge as directed. Test the wearing Course with the profiler meeting the requirements of 00745.72(b). Compute the IRI from the profile data according to the procedures described in ODOT TM 772. Price adjustment for smoothness will be made according to 00745.96.

Before performing any smoothness measurements on the Project, verify calibration of the profiler according to the manufacturer's recommendations and ODOT TM 772.

(b) Surface Test:

(1) Transverse - Test the Base Course with the 12-foot straightedge perpendicular to the centerline, as directed. Do not vary the Pavement surface by more than 1/4 inch.

(2) Longitudinal - Test all Base or wearing Course sections of Pavement that are not required to be profiled according to 00745.73(c) with the 12-foot straightedge parallel

to the centerline and lane dividers, as directed. Do not vary the Pavement surface by more than 1/4 inch.

(c) Wearing Course Surface Test:

(1) Transverse - Test with the 12-foot straightedge perpendicular to the centerline, as directed. Do not vary the Pavement surface by more than 1/4 inch.

(2) Longitudinal - Perform testing as follows:

a. Quality Control - Run the profiling device over each Traffic Lane for the full length of the Project.

In the presence of the Engineer and according to ODOT TM 772, obtain profiles on the Pavement surface in the right and left wheel path of the Traffic Lane along a line parallel to permanent longitudinal Pavement markings, at 3-foot and 9-foot offsets from the left edge of the Traffic Lane. Take the profile on transition areas of entrance and exit ramps, as close to the right and left wheel path of the through Traffic Lane as practical. Submit data files to the Engineer at the completion of each shift that profiling has taken place. For the Pavement sections tested, provide the raw data files and provide electronic copies of the profile data in PPF and manufacturer proprietary formats, as required by the Engineer.

Analyze profiles according to 00745.73(d), and give the results to the Engineer no later than 24 hours following completion of required smoothness. Provide results consisting of a table showing areas of Localized Roughness in each wheel path, and the left wheel path IRI, right wheel path IRI, and mean IRI (average of left and right wheel path IRI) at 0.10-mile intervals.

b. Quality Assurance - At the discretion of the Engineer, the Agency may perform Quality Assurance of Profiles on projects according to ODOT TM 772.

(3) Transverse Joints - Test with the 12-foot straightedge parallel to the centerline, as directed. Do not vary the Pavement surface by more than 1/4 inch.

(d) Determination of the International Roughness Index:

(1) General - Determine the IRI in 0.10-mile segments and partial segments of the wearing Course. Begin segments 50 feet into the Project and run consecutively in the direction of travel. A segment ends as a partial segment and a new segment begins when the segment sequence is interrupted by stage construction or by profiled areas excluded from the smoothness requirements. Minimize the number of partial segments.

The following areas of Pavement are excluded from IRI smoothness requirements and are not profiled:

- Profiles extending beyond the Project ends.
- Bridge decks, Bridge end panels, and Pavement within 50 feet of Bridge end panels.
- First and last 50 feet of the ACP paving limits of the Project.

- The 50 feet before and after No Work Areas within the Project limits.
- Ramps and auxiliary lanes that are less than 2500 feet in length.
- First 800 feet of entry ramps and the last 800 feet of exit ramps.
- The 25 feet before and after Utility appurtenances in the Traffic Lane.
- Continuous portions of Traffic Lanes with less than 0.05 mile between excluded areas.
- Portions of the Project with posted speed limits less than 45 mph.

Locate ACP IRI profiling excluded areas prior to smoothness measurement. Meet the straightedge requirements of 00745.73(b)(2) for areas excluded from longitudinal profile measurement.

(2) Method of Analysis - Determine the IRI for each wheel path and areas of Localized Roughness for each wheel path according to ODOT TM 772. Submit the results to the Engineer for review.

(e) Shoulders and Paved Medians - Test the Base and wearing Course with the 12-foot straightedge parallel to and perpendicular to the centerline for Shoulders and paved Medians, as directed by the Engineer. Do not vary the Pavement surface by more than 1/4 inch.

(Use the following subsection .75 when IRI Pavement smoothness specifications are required by the Pavement design report.)

00745.75 Correction of Pavement Roughness - Replace this subsection, except for the subsection number and title, with the following:

If testing described in 00745.73 shows that the Pavement does not conform to the prescribed limits, the following applies:

(a) General - The Contractor is responsible for locating areas that require corrective work.

(b) Base Course - If the requirements of 00745.73(b) are not met, correct according to one of the following and retest:

(1) Cold Plane Removal - Profile grind with Equipment meeting the requirements of 00620.20 to a maximum depth of 0.4 inch.

(2) Grinder - Profile grind with abrasive grinder(s), equipped with a cutting head comprised of multiple diamond blades to a maximum depth of 0.4 inch.

(c) Wearing Course - After locating each area of Localized Roughness and the 0.10-mile segments that have an average IRI value greater than 95.0 inches per mile, meet with the Engineer at a mutually agreed upon time and drive the Project together. During the drive-through, evaluate each area of Localized Roughness between 160.0 and 189.9 inches per mile and partial segments with an average IRI value greater than 95.0 inches per mile to determine if corrective Work is required. All 0.10-mile segments with an IRI value more than 95.0 inches per mile and all areas of Localized Roughness equal to or greater than

190.0 inches per mile require corrective action. Disagreements are resolved by the Engineer.

Correct all areas of Localized Roughness, segments and partial segments identified for corrective work, and any transverse joint and excluded areas that exceed the requirements of 00745.73, by one of the methods listed below and to the specified limits:

(1) Remove and Replace - Remove and replace the wearing surface lift.

(2) Grind - Profile grind with abrasive grinder(s) equipped with a cutting head comprised of multiple diamond blades to a maximum depth of 0.3 inch and apply an emulsion fog seal according to Section 00705, or as directed. Half or full lane width corrective grinding is required for areas requiring correction in one or both wheel paths as shown by the Localized Roughness, respectively. Perform corrective grinding in such a manner that the shedding of water is not interrupted across the travel lanes due to the grinding.

Following corrective work, the Engineer will re-evaluate all corrected areas for acceptance. The Engineer may require retesting per ODOT TM 772 and 00745.73. Further corrective Work may be required. Perform all corrective Work and retesting, including traffic control, at no additional cost to the Agency.

(d) Time Limit - Complete correction of all surface roughness prior to application of permanent Pavement markings within 14 Calendar Days following notification, unless otherwise directed.

(Obtain the specific gravity for the Project from the Designer and fill in the blank.)

00745.80 Measurement - Add the following paragraph to the beginning of this subsection:

The quantities of ACP shown in the Contract Schedule of Items were computed on the basis of Aggregates having a specific gravity of _____.

(Use the following two paragraphs when no separate measurement is made for the liquid asphalt. Do NOT use on NHS projects or on Projects that have more than 150 Tons of liquid asphalt. When used, be sure to also include the boilerplate language under subsection .90.)

Replace the paragraph that begins "The quantities of ACP..." with the following paragraph:

The quantities of ACP will be measured on the weight basis. No separate measurement will be made for asphalt cement used in the mixture. No deduction will be made for lime or any other additive used in the mixture.

(Use the following two paragraphs when core correlation specifications are required by the Pavement design report.)

Add the following paragraph to the end of this subsection:

The quantities of core correlation of nuclear gauge readings will be measured on the unit basis for each core correlation test that is completed and accepted according to

ODOT TM 327. Core correlations that are requested by the Contractor or that are required due to a change in Aggregate or asphalt cement source will not be measured.

00745.90 Payment - Replace the paragraph and bullets that begins "In item (a)..." with the following paragraph and bullets:

In item (a), the following is inserted in the blanks:

- The level of ACP "1", "2", "3", "4" is inserted in the first blank.
- The type of ACP "3/4 inch", "1/2 inch", "3/8 inch" is inserted in the second blank.
- The words "Lime Treated" is inserted in the third blank when applicable.
- The words "in Leveling", "in Temporary", or "in Leveling and Temporary" is inserted in the fourth blank when applicable.

Replace the paragraph that begins "In item (b), the..." with the following paragraph:

In item (b), the performance graded asphalt binder is inserted in the first blank. The level and type of ACP is inserted in the second blank. This item applies to all asphalt used in ACP, including residual asphalt in RAP, RAS, or combined RAP and RAS. Substituted asphalt cement described in 00745.11(a) will be paid for under the asphalt specified in the Contract Schedule of Items.

Replace the paragraph that begins "Payment will be payment ..." with the following paragraph:

Payment will be payment in full for furnishing and placing all Materials, and for providing all Equipment, labor, and Incidentals necessary to complete the Work as specified.

Replace the paragraph and bullets that begins "No separate or additional ..." with the following paragraph and bullets:

No separate or additional payment will be made for:

- Reconditioning existing Roadway
- Leveling Work
- Lime
- QC testing
- Sawing, cleaning, and filling joints on bridge deck overlays

(Use the following paragraph and Pay Item when core correlation specifications are required by the Pavement design report. The Pavement designer will estimate the quantity of core correlations on the basis of one core correlation for each paving lift over 2,500 Tons. If the Project is a multi-year Project, add correlations for each lift to be paved each subsequent year.)

Add the following Pay Item to the Pay Item list:

(c) Core Correlation of Nuclear Gauge Readings.....Each

(Use the following two paragraphs when core correlation specifications are required by the Pavement design report.)

Add the following paragraph after the paragraph that begins "In item (b)...":

Item (c) includes developing core correlation factors for all gauges to be correlated for the lift where the core correlation was performed, according to the procedure in ODOT TM 327.

(Use the following paragraph and bullet when latex polymer treatment of Aggregate is listed as an option in the Pavement design report.)

In the paragraph that begins "No separate or additional payment...", add the following bullet to the end of the bullet list:

- Aggregate treatment - latex polymer

(Use the following two paragraphs when no separate payment will be made for the liquid asphalt. Do NOT use on NHS projects or on Projects that have more than 150 Tons of liquid asphalt. When used, be sure to also include the boilerplate language under subsection .80.)

Add the following paragraph to the end of this subsection:

No separate or additional payment will be made for asphalt cement used in the mixture.

(Use the following two paragraphs when no separate payment will be made for the liquid anti-stripping asphalt cement additives.)

In the paragraph that begins "No separate or additional payment...", add the following bullet to the end of the bullet list:

- liquid anti-stripping asphalt cement additives

(Use the following subsection .95 when separate subplot definitions is required by the Pavement design report.)

00745.95 Price Adjustments - Add the following two paragraphs after the bullet that begins "The adjusted target..."

If the Pay Factor (PF) for compaction is 1.00 or greater as calculated in 00165.40, use that compaction PF for the lot. If the PF for compaction is below 1.00, re-calculate the PF for compaction using a lower specification limit (LSL) of 91.5. The compaction PF re-calculated using a LSL of 91.5 will not exceed 1.00. The minimum PF of 1.00 described in 00165.40(d)(8) does not apply when re-calculating the compaction PF.

A completed lot with a CPF of between 0.95 and 1.00 will be accepted, subject to a price adjustment according to 00150.25. The basis of adjustment will be the CPF as calculated in 00165.40.

[End subplot definitions language]

(Use the following lead-in paragraph and subsection .96 when IRI Pavement smoothness specifications are required by the Pavement design report.)

Add the following subsection:

00745.96 Smoothness Price Adjustment - No separate or additional payment will be made for smoothness testing.

(a) General - A price adjustment based on the results of the IRI will be made for each 0.10-mile segment or partial segment of Traffic Lane ACP requiring IRI measurement according to 00745.73. The price adjustment will be based on the IRI values determined according to ODOT TM 772 for each 0.10-mile segment and partial segment. Partial segments less than 0.10 mile in length shall be evaluated with the IRI price adjustment value multiplied by the ratio of the partial segment length to 0.10 mile.

A smoothness price adjustment will be made for all segments, or partial segments based on the average IRI value and the following equations:

(Use one of the following options as required by the Pavement design report. Only use one option and delete the one that does not apply.)

[Option 1 - Schedule 1 IRI smoothness price adjustment.]

Schedule 1

Averaged IRI (inches/mile)	Equation
≤ 35.00	Y = \$500.00
35.01 - 60.00	$Y = (-\$20.00 \times X) + \$1,200.00$
60.01 - 65.00	Y = \$0.00
65.01 - 95.00	$Y = (-\$20.00 \times X) + \$1,300.00$
> 95.00	Corrective Action

Y = The price adjustment for the segment or partial segment
X = The averaged IRI value for the segment or partial segment

[End Option 1]

[Option 2 - Schedule 2 IRI smoothness price adjustment.]

Schedule 2

Averaged IRI (inches/mile)	Equation
≤ 50.00	Y = \$300.00
50.01 – 65.0	$Y = (-\$20.00 \times X) + \$1,300.00$
65.01 – 80.00	Y = \$0.00
80.01 – 95.00	$Y = (-\$20.00 \times X) + \$1,600.00$
> 95.00	Corrective Action

Y = The price adjustment for the segment or partial segment
X = The averaged IRI value for the segment or partial segment

[End Option 2]

Any positive smoothness price adjustment due to the Contractor will be made on the next monthly progress estimate following the satisfactory completion of all corrective Work and the submission of all test data for all Traffic Lane paving on the Project.

00745.96(b) applies when corrective action is taken by the Contractor, or the Engineer elects to not correct identified Areas of Localized Roughness according to 00745.75(c).

(b) Adjustments for Sections Requiring Corrective Work or with Areas of Localized Roughness - Segments or partial segments where corrective Work is performed according to 00745.75(c) are subject to the price adjustments described in 00745.96(a) except that no positive price adjustment (bonus) is due to the Contractor. If a segment or partial segment containing corrective Work is retested according to ODOT TM 772 and 00745.73, the retested average IRI value will be used for payment, except that no positive price adjustment will be made for a segment or partial segment containing corrective work.

No segment or partial segment containing an area of Localized Roughness with a value of 160.0 inches per mile or greater is eligible for positive price adjustment, even if corrective action is not required by the Engineer.

Segments or partial segments containing corrective Work with an IRI value of more than 95.0 inches per mile are subject to additional corrective action and retesting according to 00745.75(c). The Engineer may waive corrective action in partial segments with the application of a smoothness price adjustment based on an IRI value of 95.0 inches per mile.