

SECTION 315A

ASPHALT CONCRETE PAVEMENT - SUPERPAVE

I. GENERAL

1.1. DESCRIPTION OF WORK

The Contractor shall furnish all labor, supervision, material (except as herein provided), tools, equipment, supplies, and services; and, shall perform all Work necessary for constructing one or more courses of asphalt concrete on a prepared foundation, in accordance with the requirements of these specifications and in conformity with the lines shown on the Drawings or as established by the Owner.

1.2. MATERIALS

Materials shall be furnished by the Contractor in accordance with Section 200.

1.3. EQUIPMENT

A. Hauling Equipment

Trucks used for hauling asphalt mixtures shall have tight, clean, smooth metal bodies equipped with a positive locking metal tailgate. Metal surfaces in contact with asphalt mixtures shall be given a thin coat of an aliphatic hydrocarbon invert emulsion release agent (nonpuddling), a lime solution, or other material on the VDOT's list of approved release agents. The beds of dump trucks shall be raised to remove excess agent prior to loading. Only a nonpuddling agent shall be used in truck beds that do not dump. Each truck shall be equipped with a tarpaulin or other cover that will protect the mixture from moisture and foreign matter and prevent the rapid loss of heat during transportation.

B. Asphalt Pavers

The asphalt paver shall be designed and recommended by the manufacturer for the type of asphalt to be placed and shall be operated in accordance with the manufacturer's recommendations. Written recommendations pertaining to handling and placing of the mix shall be made readily available on the project site to the Owner. In the absence of manufacturer's recommendations, the recommendations of the National Asphalt Pavement Association shall be followed. The paver (including the screed extensions, when used) shall be capable of producing a smooth uniform texture, dense joints and a smooth riding surface. The paver shall be capable of smoothing and adjusting longitudinal joints between adjacent strips or courses of the same thickness.

C. Rollers

Rollers shall be steel wheel, static or vibrator, or pneumatic tire rollers and shall be capable of reversing without backlash. Rollers shall be operated at speeds slow enough to avoid displacement of the mixture. The number and weight of rollers shall be sufficient to compact the mixture to the required density while it is still in a workable condition. The use of

equipment that results in excessive crushing of aggregate or marring of pavement surface will not be permitted. If during construction, it is found that the equipment being used mars the surface to the extent that imperfections cannot satisfactorily be corrected or produces permanent blemishes, the use of the equipment shall be discontinued and it shall be replaced with satisfactory units.

D. Rotary Saw

A gasoline-powered rotary saw with a carbide blade shall be furnished for cutting test samples from the pavement. The Contractor shall furnish gasoline, oil, additional carbide blades, and maintenance for the rotary saw. The Contractor shall cool the pavement prior to sawing the sample. In lieu of a rotary saw, the Contractor may furnish the necessary equipment for coring and testing 4-inch core samples in accordance with the requirements of VTM-22.

1.4. PLACEMENT LIMITATIONS

Asphalt concrete mixtures shall not be placed when weather or surface conditions are such that the material cannot be properly handled, finished or compacted. The surface upon which asphalt mixtures are to be placed shall be free of puddled water and the base temperature shall conform to the following:

- A. When the base temperature is above 80 °F, mixture laydown will be permitted at any temperature conforming to the limits of Section 200, Paragraph V.5.4.C.4.(f),.
- B. When the base temperature is between 35 °F and 80 °F, the Nomograph, Table 315A-1, shall be used to determine the minimum laydown temperature of the asphalt concrete mixes.

For SUPERPAVE asphalt concrete, the maximum laydown temperature of the mixture shall conform to Section 200, Paragraph V.5.4.B and at no time should the minimum base and laydown temperatures be less than the following:

Mix Designation	Minimum Base Temperature	Minimum Laydown Temperature
A	40°F	250°F
D	50°F	270°F
E	50°F	290°F
M	50°F	290°F
S	50°F	290°F
All Base Mix	35°F	250°F

The maximum temperature of the mixture shall conform to Section 200, Paragraph V.5.4.H.

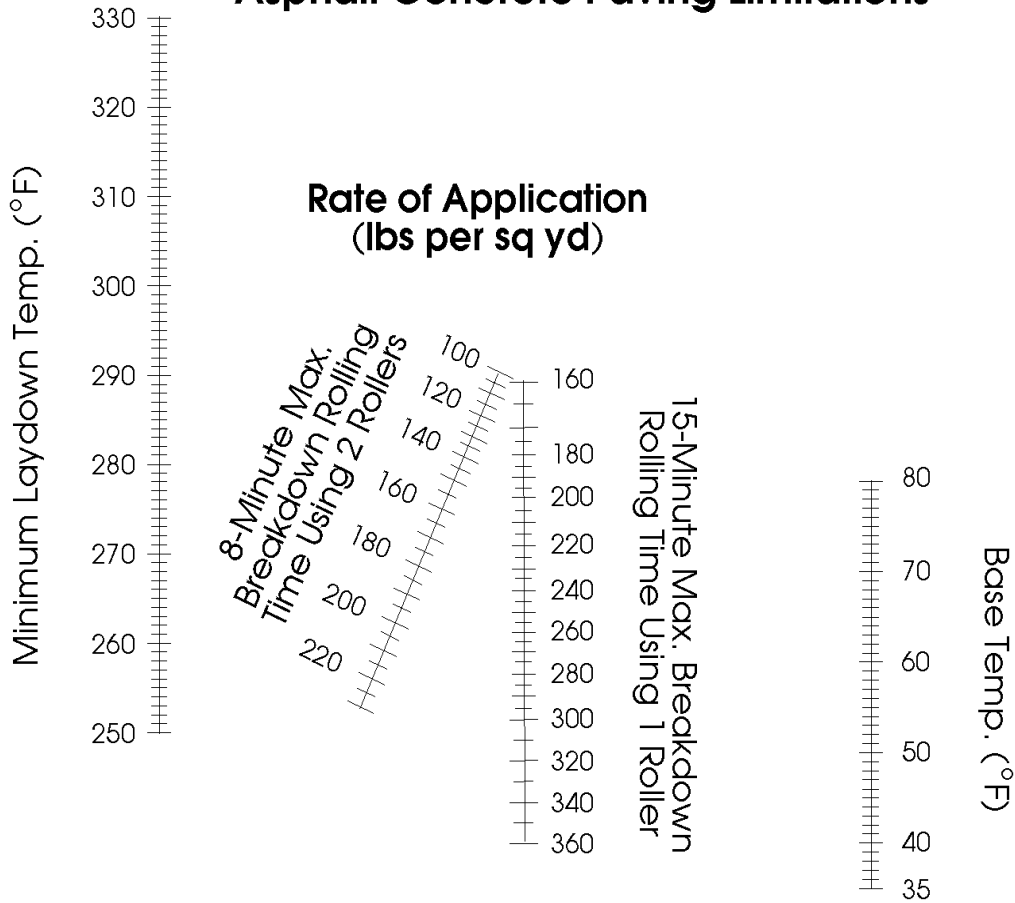
- C. When the laydown temperature is between 301 °F and 325 °F, the number of compaction rollers will be the same number as required for 300 °F.

Intermediate and base courses which are placed at rates of application which exceed the application rates shown in Table 315A-1 shall conform to the requirements for the maximum application rate shown for 8 minute and 15 minute compaction rolling as per number of rollers used.

TABLE 315A-1

COLD WEATHER PAVING LIMITATIONS

Asphalt Concrete Paving Limitations



Should the Contractor be unable to complete the compaction rolling within the applicable 8 minute or 15 minute period, the placing of asphalt mixture shall either cease until sufficient rollers are utilized or other corrective action taken to complete the compaction rolling within the specified period.

All compaction rolling shall be completed prior to the mat cooling down to 175 °F. Finish rolling may be performed at lower mat temperature.

The final asphalt pavement finish course shall not be placed until construction pavement markings are no longer required.

1.5. SUBMITTALS

- A. Submittals shall be made by the Contractor in accordance with the procedures set forth in Section 105.

- B. The Contractor shall submit reports of material analysis and asphalt mix designs confirming the conformance of all materials with the requirements of this section and all applicable VDOT or permit requirements.

II. EXECUTION

2.1. PROCEDURES

- A. Base Course:

The subgrade or subbase upon which the base course is to be placed shall be prepared in accordance with the requirements of the applicable provisions of these specifications for such course.

- B. Conditioning Existing Surface:

When the surface of the existing pavement or base is irregular, it shall be brought to a uniform grade and cross section as directed by the Owner. The surface on which the asphalt concrete is to be applied shall be prepared in accordance with the requirements of the applicable specifications.

When specified, prior to placement of asphalt concrete, longitudinal and transverse joints and cracks in hydraulic cement concrete shall be sealed by the application of an approved joint sealing compound.

When placing base and intermediate courses, contact surfaces of curbing, gutters, and other structures projecting into or abutting the pavement and cold joints of asphalt shall be painted with a thick, uniform coating of asphalt prior to placement of asphalt mixture.

The surface upon which the overlay is to be applied shall be thoroughly cleaned of all loose material, silt spots, vegetation and other deleterious materials, immediately preceding the application of tack coat. Where edge clipping is required, as determined by the Owner, excess material shall be removed prior to new pavement being placed.

- 1. Application of Tack Coat:

Tacking existing surface: A tack or prime coat of asphalt shall be applied between the existing surface and the next layer of asphalt. The tack or prime coat shall conform to the applicable requirements of Section 310 of these Specifications.

Asphalt classed as cutbacks or emulsions shall be applied ahead of the paving operations, and the time interval between applying and placing the paving mixture shall be sufficient to ensure a tacky residue providing maximum adhesion of the paving mixture to the base. The mixture shall not be placed on tack or prime coats that have been damaged by traffic or contaminated by foreign material. Traffic shall be excluded from such sections.

On rich sections or those that have been repaired by the extensive use of asphalt patching mixtures, the tack coat shall be eliminated when directed by the Owner.

Tack Coat will not be required for new layers of asphalt unless:

- a. The underlying layer has been contaminated;
- b. The underlying layer has been exposed to prolonged traffic use; or,
- c. Is otherwise required on the Drawings or in the Special Provisions.

Tacking: Application of tack at joints, adjacent to curbs, gutters, or other appurtenances shall be applied with a hand wand at the rate of 0.2 gallons per square yard. At joints, the hand wand applied tack shall be 2 feet in width with 4 to 6 inches protruding beyond the joint for the first pass. Tack for the adjacent pass shall completely cover the vertical face of the mat edge, so that slight puddling of asphalt occurs at the joint, and extends a minimum of 1 foot into the lane to be paved. Milled faces that are to remain in place shall be tacked as above for the adjacent pass. Use of tack at longitudinal joint vertical faces will not be required when paving in echelon.

2. Application of Prime

When asphalt concrete to be placed has a total thickness of 4 inches or more, priming with asphalt material will not be required on aggregate subbase or base material.

3. Removing Depressions and Elevating Curves

Where irregularities in the existing surface would result in a course more than 3-inches in thickness after compaction, the surface shall be brought to a uniform profile by patching with asphalt concrete and thoroughly tamping or rolling until it conforms to the surrounding surface. The mixture used shall be the same as that specified for the course to be placed.

When the Contractor elects to conduct operations to eliminate depressions, elevate curves, and place the surface course simultaneously, the Contractor shall furnish such additional spreading and compacting equipment as required to maintain the proper interval between the operations.

C. Placing and Finishing:

Asphalt concrete shall not be placed until the Owner has approved the surface upon which it is to be placed.

“Edge Clipping” is the removal of soil and debris that have accumulated on non curb and gutter streets, on top of the asphalt to be overlain or paved, by running a motor grader or front end loader blade longitudinally down the asphalt edge, removing the soil and debris from the area to be overlain or paved.

If required, edge clipping shall be performed prior to paving operations. The blade of the grader shall be set six inches outside the edge of existing pavement.

The edge of the pavement shall be marked by means of a continuous line placed and maintained a sufficient distance ahead of the paving operation to provide proper control of the pavement width and horizontal alignment.

An asphalt paver shall be used to distribute asphalt concrete over the widest pavement width practicable. Wherever practicable and when the capacity of sustained production and delivery is such that more than one paver can be operated, pavers shall be used in echelon to place the wearing course in adjacent lanes. Crossovers, as well as areas containing manholes or other obstacles that prohibit the practical use of mechanical spreading and finishing equipment, may be constructed using hand tools. However, care shall be taken to obtain the required thickness, jointing, compaction, and surface smoothness.

The longitudinal joint in one layer shall offset that in the layer immediately below by approximately 6-inches. However, the joint in the wearing surface shall be at the centerline of the pavement if the roadway comprises two traffic lanes or at lane lines if the roadway is more than two lanes in width. Offsetting layers will not be required when adjoining lanes are paved in echelon and the rolling of both lanes occurs within 15 minutes after laydown.

Immediately after placement the surface and edges of each layer shall be inspected and necessary corrections performed prior to compaction. The finished pavement shall be uniform, smooth, and have straight edges.

The placement of asphalt concrete shall be as continuous as possible and shall be scheduled such that the interruption occurring at the completion of each day's work will not detrimentally affect the partially completed work. Material that cannot be spread and finished in daylight shall not be dispatched from the plant unless the use of artificial lighting has been approved. When paving is performed at night, sufficient light shall be provided to properly perform and thoroughly inspect every phase of the operation. Such phases include cleaning planed surfaces, tack application, paving, compacting, and testing. Lighting shall be provided and positioned such as to not create a blinding hazard to the traveling public.

During compaction of asphalt concrete, the roller shall not pass over the end of freshly placed material except when a construction joint is to be formed. Edges shall be finished true and uniform.

Asphalt concrete SUPERPAVE pavement courses shall be placed in layers not exceeding 4.0 times the nominal maximum size aggregate in the asphalt mixture. The maximum thickness may be reduced if the mixture cannot be adequately placed in a single lift and compacted to the required uniform density and smoothness. The minimum thickness for a pavement course shall be no less than 2.5 times the nominal maximum size aggregate in the asphalt mixture. Nominal maximum size aggregate for each mix shall be defined as one sieve size larger than the first sieve to retain more than 10 percent aggregate as shown in the design range specified in Section 200, Table 200-5.4-1. Base courses to be placed in irregular shaped areas of pavement, such as transitions, turn lanes, crossovers, and entrances may be placed in a single lift.

Overlays in excess of ~~220~~ **165** pounds per square yard or milled depth greater than ~~2~~ **1 1/2**-inches shall be squared up prior to opening to traffic.

The milled roadway areas that are to be opened to traffic, excluding curb and gutter sections,

shall have drainage outlets cut through the shoulder at locations designated by the Owner. The Contractor shall plan and prosecute the milling operation to avoid the trapping of water on the roadway. Drainage outlets shall be restored to original grade, unless otherwise directed by the Owner. All cost for cutting and restoring the drainage slots in the roadway shoulder shall be included in the price bid for other items of work.

The Contractor shall plan and prosecute a schedule of operations so that milled roadways will be overlaid with asphalt concrete as soon as possible, and, in no instance, shall the time lapse exceed ten days after the milling operations, unless otherwise specified. The milled areas of the roadway shall be kept free of irregularities and obstructions that may create a hazard or annoyance to traffic in accordance with the requirements of the VDOT *Road and Bridge Specifications*, Section 104.

A short ski or shoe shall be used to match the grade of the newly overlaid adjacent travel lane on all primary and designated secondary routes when specified by the Owner. A 24-foot minimum automatic grade control ski shall be used on all asphalt mixtures on all divided highways, with the exception of less than full width overlays and the first course of asphalt base mixtures over aggregate subbases. Care shall be exercised when working along curb and gutter sections to ensure a uniformed grade and joint.

The Contractor shall construct the final riding surface to tie into the existing surface by an approved method, which shall include the cutting of a notch into the pavement. In addition to notching, the Contractor may use an asphalt design containing a fine graded mix to achieve a smooth transition from the new asphalt concrete overlay to the existing pavement, with the approval of the Owner. The material shall be of a type to insure that raveling will not occur.

Transverse tie-ins on milled surfaces shall have a minimum taper of 12-inches.

D. Compacting:

Immediately after asphalt mixture is placed and struck off and surface irregularities are corrected, the mixture shall be thoroughly and uniformly compacted by rolling.

The surface shall be rolled when the mixture is in the proper condition. Rolling shall not cause undue displacement, cracking, or shoving.

The number, weight, and type of rollers furnished shall be sufficient to obtain the required compaction while the mixture is in a workable condition. The sequence of rolling operations and the selection of roller types shall provide the specified pavement density.

Immediately after the hot mixture is placed, it shall be sealed with rollers. Thereafter, rolling shall be a continuous process, insofar as practicable, and all parts of the pavement shall receive uniform compaction.

Displacements occurring as a result of reversing the direction of a roller, or from other causes, shall be corrected at once by the use of rakes or lutes and addition of fresh mixture when required. Care shall be taken in rolling not to displace the line and grade of the edges of the asphalt mixture.

To prevent adhesion of the mixture to the rollers, the wheels shall be kept properly moistened

with water or water mixed with a very small quantity of detergent or other approved material. Excess liquid will not be permitted.

Along forms, curbs, headers, walls, and other places not accessible to rollers, the mixture shall be thoroughly compacted with hand tampers, smoothing irons, or mechanical tampers. On depressed areas, a trench roller may be used or cleated compression strips may be used under the roller to transmit compression to the depressed area.

The surface of the compacted course shall be protected until the material has cooled sufficiently to support normal traffic without marring.

E. Density:

Density shall be determined in accordance with the following:

1. Base courses:

Rollers shall move at a slow but uniform speed with the drive roll or wheels nearest the paver. Rolling shall be continued until roller marks are eliminated and a minimum density of 91.5 percent of the theoretical maximum density has been obtained.

When required by the Owner, a minimum of three cores, randomly selected, per 1000 tons of placed mix, shall be taken and tested in accordance with VTM-6, at the Owner's expense.

2. Surface mixtures with a specified top aggregate size of ½-inch when their application rate is greater than or equal to 135 pounds per square yard or with a specified top aggregate size of 1-inch when their application rate equals or exceeds 165 pounds per square yard:

Patching and leveling courses will not be tested for density.

The density of surface mixes having application rates less than specified herein shall be compacted by a standard roller pattern approved by the Owner.

3. The Contractor shall perform roller pattern and control strip density testing on surface and intermediate courses in accordance with the requirements of VTM-76.

Density shall be determined by the backscatter method of testing using a thin-lift nuclear gage with printer, conforming to the requirements of VTM-81. All density test locations shall be marked in accordance with the requirements of VTM-76. The Contractor shall furnish and operate the nuclear gage, which shall have been calibrated within the previous 12 months by an approved calibration service. In addition, the Contractor shall maintain documentation of such calibration service for a 12-month period. The required density of the compacted course shall be not less than 98.0 percent and not more than 102.0 percent of the control strip density.

Nuclear density, roller pattern and control strip density testing will be performed on asphalt concrete overlays placed directly on surface treatment roadways and when

overlays are placed rate less than 125 pound per square yard (based on 110 pounds per square yard per inch) on any surface. In these situations, sawed plugs or core samples will not be required and the minimum control strip densities as shown in Table 315A-2 will be waived. The required density of the compacted course shall be not less than 98.0 percent and not more than 102.0 percent of the control strip density.

TABLE 315A-2

Density Requirements

<u>Mixture Type</u>	<u>Min. Control Strip Density (%)</u>
SM-9.0 A	95.0
SM-9.0 D	95.0
SM-9.0 E	95.0
SM-9.5 A	92.5
SM-9.5 D	92.2
SM-9.5 E	92.2
IM-19.0 A	92.2
IM-19.0 D	92.0
BM-25.0A, BM-25.0D	91.5

Note: The control strip density requirement is the percentage of the theoretical maximum density of the job-mix formula as established in the SUPERPAVE design.

The project will be divided into “control strips” and “test sections” by the Owner for the purpose of defining areas represented by each series of tests.

a. Control Strip:

Construction of control strips shall be accomplished in accordance with the requirements of these specifications and VTM-40 **16**.

The term *control strip* density is defined as the average of 10 nuclear determinations selected at stratified random locations within the boundaries of a test area as described below.

One control strip shall be constructed at the beginning of work on each roadway and shoulder course and on each lift of each course. An additional control strip shall be constructed when a change is made in the type or course of materials, compaction equipment, whenever a significant change occurs in the composition of the material being placed from the same source, or when there is a failing control strip. However, paving and production shall be discontinued during construction and evaluation of the additional control strips. In the event that two consecutive control strips fail, subsequent paving operations shall cease until corrective action(s) has been made with the approval of the Owner. If it is determined, with the Owner’s approval, that the density cannot be obtained because of the condition of the existing pavement structure, the target control strip density shall be determined from the roller pattern that achieves the optimum density and shall be used on the remainder of the roadway that exhibits similar pavement conditions.

Either the Owner or the Contractor may initiate an additional control strip at any time.

The length of the control strip shall be approximately 300 feet regardless of the width of the course being placed. On the first day of construction or beginning of a new course, the control strip shall be started between 500 and 1,000 feet from the beginning of the paving operation. The control strip shall be constructed using the same paving and rolling equipment and procedures as will be used on the remainder of the course being placed.

One nuclear reading shall be taken at each of 10 stratified random locations. No determination will be made within 1 foot from the edge of any application width. The average of these 10 determinations will be the control strip density read to the nearest 0.1 pound per cubic foot. The minimum control strip density shall be determined in accordance with the requirements of VTM-76.

The control strip shall be considered a lot. If the control strip density conforms to the requirements of Table 315A-2, the control strip will be acceptable and the control strip density shall become the target nuclear control strip density. If the density does not conform to the requirements of Table 315A-2, the tonnage represented by the control strip will be paid for in accordance with Table 315A-3 on the basis of the percentage of the Table 315A-2 value achieved. The Contractor shall take corrective action(s) to meet the density requirement specified in Table 315A-2.

b. Test Section (lot):

For the purpose of acceptance, each day's production shall be divided into lots (test section). The standard size of a lot shall consist of 5,000 linear feet of any pass made by the paving train regardless of the width of the pass or the thickness of the course. Pavers traveling in echelon will be considered as two passes. Each lot shall be divided into five sublots of equal length. When a partial lot occurs at the end of a day's production or upon completion of the project, the lot size shall be redefined as follows: If the partial lot contains one or two sublots, the sublots will be added to the previous lot. If the partial lot contains three or four sublots, the partial lot will be redefined to be an entire lot. Each lot shall be tested for density by taking a nuclear density reading from two random locations selected by the Owner within each subplot. Readings shall not be taken within 1 foot of the edge of any application width. The average of the two subplot nuclear density readings will be compared to the target nuclear control strip density to determine the acceptability of the lot. Once the average nuclear density of the lot has been determined, the Contractor will not be permitted to provide additional compaction to raise the average. If two consecutive sublots produce nuclear density results less than 98 or greater than 102 percent of the target nuclear control strip density, the Contractor shall immediately notify the Owner and institute corrective action. By the end of the day's operations, the Contractor shall furnish the test data developed during the day's paving to the Owner.

The tonnage of each lot will be based on the lot's width and length and the mixture application rate as designated in the Contract Documents or as revised by the Owner. Payment will be made in accordance with the requirements of Table 315A-3 below.

TABLE 315A-3

Payment Schedule for Lot Densities

<u>% of Target</u>	<u>% of Payment</u>
<u>Control Strip Density</u>	
Greater than 102.	95
98.0 to 102.0	100
97.0 to less than 98.0	95
96.0 to less than 97.0	90
Less than 96.0	75

The Owner at any time on any project may perform Lot Density Verification testing. Lot Density Verification can be performed by either using a nuclear density gage or plugs. The Contractor shall be responsible for taking all plugs and testing. Testing of the plugs will be done in the presence of the Owner.

If a nuclear gage is used, the Owner will take 10 stratified random readings per lot. If, based on the average of the 10 readings, the density does not meet the requirement for 100 percent pay or the same percentage determined by the Contractor's testing for that lot, the Owner will read the 10 Contractor site then average all 20 sites together. If the density still does not conform to the requirements for 100 percent pay, payment for that lot will be in accordance with Table 315A-3 on the basis of the Owner's average of the 20 test results. If the Contractor questions the payment for the lot, the Contractor can request the referee procedure.

If plugs are used for Lot Density Verification, 5 plugs shall be taken per lot. If the density does not meet the requirements for the lot in question, payment for that lot will be in accordance with Table 315A-3 on the basis of the percentage of the Table 315A-2 value achieved.

4. Other Intermediate, Base and Surface Courses:

- a. Base Courses: Rollers shall move at a slow but uniform speed with the drive roll or wheels nearest the paver. Rolling shall be continued until roller marks are eliminated and a minimum density of 91.5 percent of the theoretical maximum density has been obtained in accordance with VTM-22.

Not more than one sample in every five shall have a density less than that specified, and the density of such sample shall be not more than 2 percent below the minimum specified.

Field density determinations will be performed with a nuclear field density

device using a density control strip as specified in VTM-10 or in accordance with the requirements of VTM-6. The method of density determination will be as directed by the Owner.

- b. Intermediate, Base and Surface Courses not having sufficient quantity of material to run a nuclear density roller pattern and control strip shall be compacted to a minimum average density of 91.50 percent of the theoretical maximum density as determined by VTM-22.

Any section having mixture (i.e. SM-9.0) being placed at an application rate less than 125 lbs. per square yard (based on 110 lbs. per square yard per inch) and not having sufficient quantity to run a nuclear density roller pattern and control strip shall be compacted by rolling a minimum of 3 passes with a minimum 8 ton roller.

F. Joints:

Transverse joints shall have a vertical edge exposing the full depth of the course. A coat of asphalt shall be applied to contact surfaces of transverse joints just before additional mixture is placed against the previously rolled material.

Joints adjacent to curbs, gutters, or adjoining pavement shall be formed by hand placing sufficient mixture to fill any space left uncovered by the paver. The joint shall then be set up with rakes or lutes to a height sufficient to receive full compression under the rollers.

G. **Rumble Strips:**

This work shall consist of constructing rumble strips on mainline shoulders or centerlines of highways by cutting 3/8 to 1/2-inch-deep concave depressions into existing asphalt concrete surfaces as shown on the detail drawings and as directed by the Owner.

Rumble strips shall be installed in accordance with Standard Detail drawings for Centerline Rumble Strips and Continuous Shoulder Rumble Strips. The depressions for Continuous Shoulder Rumble Strips shall have a concave circular shape with a minimum 1/2-inch depth at center and maximum 5/8-inch allowable depth at center. Depressions shall have a smooth finish with a maximum 1/16-inch variance between peaks and valleys of the depression. The maximum depth of Centerline Rumble Strips in passing zones shall be 3/8-inch if allowed by the Owner.

Prior to beginning production work on mainline shoulders, the Contractor shall demonstrate to the Owner the ability to achieve the desired surface regarding alignment, consistency, and conformity with these specifications and the plans. The test site shall be approximately 25 feet longitudinally at a site mutually agreed upon by the Contractor and Owner.

Following cutting and cleaning depressions of waste material, the entire rumble strip area shall be coated with liquid asphalt coating (emulsion) using a pressure distributor at an approximate rate of 0.1 gallon per square yard. Overspray shall not extend more

than 2 inches beyond the width of the cut and/or shall not come in contact with pavement markings.

Rumble strips shall not be installed on shoulders of bridge decks, in acceleration/deceleration lanes, on surface drainage structures, or in other areas identified by the Owner.

Waste material resulting from the operation shall be removed from the paved surface and shall not be disposed of where waterways may be at risk of contamination.

2.2. PAVEMENT SAMPLES

When specified, the Contractor shall cut samples from the compacted pavement for testing for depth and density. Samples shall be taken for the full depth of the course at the locations selected by the Owner. The removed pavement shall be replaced with new mixture and refinished. No additional compensation will be allowed for furnishing test samples and reconstructing areas from which they were taken.

2.3. PAVEMENT TOLERANCES

A. When rideability is specified, it shall be executed in accordance with the VDOT *Road and Bridge Specifications* Section 315.07.

B. Straightedge test:

The variation of the surface from the testing edge of the straightedge between any two contacts with the surface shall be not more than ¼-inch, using a ten-foot (10') straightedge. Humps and depressions exceeding the specified tolerance shall be corrected, or the defective work shall be removed and replaced with new material.

C. Thickness Tolerance:

Depth checks when required by the Owner shall be measured by cores with the following tolerances:

Base asphalt	+/- ½ inch
Surface asphalt	+/- ¼ inch

III. MEASUREMENT FOR PAYMENT

3.1 GENERAL

A. Measurement will be made on the basis of completion of the Work in accordance with the Contract Documents.

B. Measurement of quantities will be made by the Contractor in the presence of the Owner.

C. Pavement preparation, materials, labor, tools, equipment, maintenance of traffic and all other incidentals necessary to complete the work will not be measured and will not be paid for as such, but will be included in other items of work.

3.2. MEASUREMENT OF QUANTITIES

- A. Asphalt concrete base and surface mixes will be measured in ton or in square yards of a specified thickness in inches, as indicated on the Bid Form.
- B. Asphalt concrete sidewalks will be measured in tons of asphalt mixture placed.
- C. The bituminous concrete leveling course will be measured in tons of bituminous concrete, in place, and will be paid at the unit price bid per ton of bituminous concrete.
- D. Clipping shoulders shall be measured per linear foot. Each side of the road shall be measured separately.
- E. See Section 515 for measurement and payment for Milling Pavement.
- F. See Section 510 for measurement and payment for adjustments to existing structures.
- G. Control strips and test lots are considered incidental to the cost of furnishing, placing, and compacting the specified course and will not be measured for payment.
- H. **Rumble strips will be measured and paid for in linear feet where the rumble strips are actually placed, excluding the test site. The distance will be measured longitudinally along the edge of pavement with deductions for bridge decks, acceleration/deceleration lanes, surface drainage structures, and other sections where rumble strips are not installed. This price shall be full compensation for application; disposal of waste material; and, all labor, tools, equipment and incidentals necessary to complete the work. The test site will not be measured for payment, but shall be included in the unit price for the rumble strip. Where required, raised pavement markers shall also be considered incidental to the price of the rumble strip, unless bid separately on the bid form.**
- I. All cost for constructing tie-ins in the asphalt concrete overlay shall be included in the price bid for asphalt concrete.

3.3. PAY ITEMS

- A. Asphalt Concrete (Type and Class):
 - 1. Measurement will be as specified in Paragraph 3.2 and as indicated on the Bid Form.
 - 2. Payment shall be made at the unit price bid per ton or per square yard of the specified thickness in inches.
- B. Bituminous Concrete Leveling Course:

Payment shall be made at the unit price bid per ton.
- C. Edge Clipping of Shoulders:

Payment shall be made at the unit price per linear foot.

D. Rumble Strips (Asphalt)

1. **Continuous Shoulder Rumble Strips – Payment shall be made at the unit price per linear foot, including liquid asphalt coating.**
2. **Centerline Rumble Strips - Payment shall be made at the unit price per linear foot, including liquid asphalt coating and raised pavement marker, as appropriate.**

End of Section