

## SECTION 1300 - ASPHALTIC CONCRETE PAVEMENT

1301 SCOPE. This section covers asphaltic concrete (AC) pavement for roadways and parking areas.

1302 GENERAL. Pavement shall be constructed to the lines, grades, dimensions, and details as shown on the plans. Allowable mixes for AC pavements shall be the following:

Surface Course Mix – KDOT HMA-Commercial Grade 12.5A

Base Course Mix – KDOT HMA-Commercial Grade 12.5A,

BM-2B, or BM-2

Leveling Course Mix – KDOT BM-1

Alternative mix designs may be used only where approved by the Engineer prior to bidding a project.

### Materials.

A. Asphalt cement shall conform to the Performance Graded (PG) system. The asphalt oil used for residential, collector, and arterial streets shall be PG 64-22 for all types of AC mixes. PG 64-22 oil shall also meet the additional testing requirements:

	PG 64-22
Separation Test (AASHTO PP-5)	$\leq 10$
Elastic Recovery Test (ASTM D6084)	$\geq 45$

B. The quality of individual aggregates and mineral filler supplements shall meet the requirements of the current KDOT Standards for aggregates for hot mix asphalt.

C. Recycled asphalt pavement (RAP) shall be processed such that 100% will pass the 1-1/2 inch sieve and shall be free of debris and foreign material.

D. Tack oil shall be SS-1, SS-1H, CSS-1 or CSS-1H grade oil. Alternative materials must be submitted for approval by the Engineer prior to submitting a bid on a project. Certification shall be submitted to Engineer.

Composition of Mix. Immediately prior to the addition of the asphalt, the combined virgin aggregate shall meet the following requirements:

SIEVE SIZE	PERCENT MASTER GRADING LIMITS (PERCENT RETAINED)				RETAINED DESIGN JOB-MIX TOLERANCES			
	SM- 12.5A	BM-2	BM-2B	BM-1	12.5A	BM-2	BM-2B	BM-1
1"			0					
3/4"	0 *	0	0-5					
1/2"	0-10							
3/8"	10 Min	8-30	10-30	0-8	+/-6	+/-6	+/-6	
4				18-39	+/-6	+/-6	+/-6	+/-5
8	42-61	42-72	42-72	35-53	+/-5	+/-6	+/-6	+/-5
16				50-68	+/-5	+/-5	+/-5	+/-5
30		64-88	64-88	60-80	+/-4	+/-5	+/-5	+/-5
50				70-90	+/-4	+/-4	+/-4	+/-4
100				82-95	+/-3	+/-4	+/-4	+/-3
200 (wash&Scr)	90-98	92-98	92-98	92-98	+/-2	+/-2	+/-2	+/-2
Plastic Index = 6 max.								
Moisture in Final Mix: = 0.5% max.								
* 0-2 for SR-12.5A								

In addition, there shall not be less than three (3%) percent nor more than twenty-three (23%) percent material between any two of the following successive sieves: Numbers 4, 8, 16, 30, and 50.

The asphalt content for each mix shall be the optimum content plus or minus one-half (1/2%) percent, based on the approved mix design for the project. Mix design shall be submitted to the Engineer by the Contractor a minimum of ten (10) days in advance of the paving operation.

The Contractor may use virgin materials or a blend of virgin materials in combination with a maximum of 15% reclaimed asphalt pavement (RAP) in the surface course and 25% in the base course. No RAP will be allowed in the leveling course mix. The use of recycled roofing materials will not be allowed in asphaltic mixes.

1303 SUBGRADE PREPARATION. Subgrade preparation for pavement shall be as specified in Section 1200 *Subgrade Preparation*.

1304 TRANSPORTATION OF MIX. The mix shall be transported to the jobsite in vehicles cleaned of all foreign material including asphalt left from previous loads. The inside of the truck beds shall be lubricated with a thin non-petroleum based oil to prevent the mix from adhering to the bed, but an excess of lubricant will not be permitted. Vehicles shall be provided with covers of sufficient size and design to protect the load and to prevent

cooling of the mix during transportation to the site. The Contractor shall provide a sufficient number of haul vehicles of the proper size, speed, and condition to ensure an orderly and continuous nonstop paving operation. Contractor must have a minimum of 3 loaded trucks onsite before paving will be allowed to commence.

No diesel or petroleum base solvents will be permitted on tools or on equipment that comes in contact with asphalt, or to clean equipment on the job site.

- 1305 PLACING REQUIREMENTS. The bituminous mixture shall be spread and finished true to crown and grade by a mechanical, self-propelled paving machine. AC mixture may be spread and finished by other methods only where machine methods are impractical as determined by the Engineer.

All construction activities shall be completed during daylight hours. **Nighttime work on projects will not be permitted unless approved in advance by the Engineer.**

All AC mixtures shall be delivered to the paver at a temperature between 250°F and 325°F. Delivery of the material to the paver shall be at a continuous rate and in an amount well within the capacity of the paving and compacting equipment. If asphalt plant or trucks cannot keep up with the paver, the speed of the laydown operation shall be reduced to match the supply of material to the job site and avoid “stop-and-start” operations.

The maximum depth of any individual lift shall be four (4) inches for base course and two (2) inches for surface course.

When AC pavement is being placed, the surface of all structures, driveways, entrances, curb and gutters, and other roadway appurtenances shall be protected in a satisfactory manner to prevent them from being splattered with paving materials or marred by equipment operation. In the event that any appurtenances become splattered or marred, the Contractor shall, at his own expense, remove all traces of material and repair all damage, and leave the appurtenances in the same condition as before the work began and to the satisfaction of the Engineer.

Pavement may be placed only when either the ambient air temperature or the road surface temperature is equal to or greater than the temperatures in the table below. No pavement shall be placed when there is frost in the subgrade, on wet subgrade, or at any other time when weather conditions are unsuitable without the expressed consent of the Engineer.

Paving Course	Thickness (inches)	Air Temperature (Degrees F)	Road Surface Temperature (Degrees F)
Surface	All	50	55
Base	Less than 3	40	45
Base	3 or more	30	35

When the ambient temperature falls below 55°F, precautions shall be taken to compact the mix before it cools below 175°F to obtain the required density. In no case shall successive lifts of asphalt be placed until the previous lift has cooled to 150°F or less.

During placement, excess material raked from the surface shall not be placed back onto the new pavement surface prior to rolling.

- 1306 MECHANICAL PAVING MACHINES. Mechanical pavers shall be capable of spreading the mix, within the specified tolerances, true to the line, grade, and crown indicated on the contract drawings.

Pavers shall be equipped with quick and efficient steering devices and shall be capable of traveling both forward and in reverse. They shall be equipped with hoppers and distributing screws, which place the mix evenly in front of adjustable screeds. They shall be equipped with a vibrating screed.

The screed shall include any strike-off device operated by cutting, crowding, or other action which is effective on mixes at workable temperatures without tearing, shoving, or gouging them and which produces a finished surface of an even and uniform texture. The screed shall be adjustable as to height and crown and shall be equipped with a controlled heating device for use when required.

Pavers shall be capable of spreading mixes without segregation or tearing. They shall also be capable of placing courses in varying thicknesses and from widths of eight (8') feet to at least thirteen (13') feet.

- 1307 COMPACTION REQUIREMENTS. Compacting equipment shall conform to the requirements of the KDOT Standards. Rollers and other compaction devices shall be operated by competent and experienced roller personnel and shall be kept in operation continuously so that all parts of the pavement will receive substantially equal compaction. The Engineer shall order the paver to cease operations at any time proper rolling is not being performed.

After spreading and strike-off and as soon as the temperature and mix conditions permit the compacting to be performed without excessive shoving or tearing, the mixture shall be thoroughly and uniformly compacted.

The selection of the type of roller to be utilized in breakdown rolling may be varied to suit mix characteristics and shall be acceptable to the Engineer. The final rolling of the top or surface course shall be accomplished with a steel roller unless otherwise approved by the Engineer. In the event a vibratory roller is used for finish rolling, it shall be operated with the vibratory unit in its off position.

During rolling, the roller wheels shall be kept moist with only sufficient water to avoid picking up the material.

The line of rolling shall not be changed suddenly or the direction of rolling reversed suddenly. If rolling causes displacement of the material, the affected areas shall be loosened at once with lutes or shovels and restored to the original grade of the loose material before being re-rolled. Rollers shall not be permitted to stand on the finished surface before it has been compacted and has thoroughly cooled.

In laying a surface mix adjacent to any finished area, it shall be placed sufficiently high so that, when compacted, the finished surface will be true and uniform and match the existing surface.

Any mixture that does not comply in all respects with the requirements set forth herein, shall be removed, replaced with suitable material, and finished, by and at the expense of the Contractor, in accordance with these specifications.

- 1308 TACK COAT. Tack coat shall be placed on all contact surfaces such as existing or previously placed pavement, curb and/or gutter, manholes, and other structures. Contact surfaces shall be adequately coated so as to ensure a thorough and continuous bond between the existing surface and the new AC mixture.

Prior to the distribution of the tack coat, the Contractor shall remove all debris, trash and loose materials from the surface by means of preapproved enclosed mechanical sweepers with watering systems, hand brooms and/or other approved equipment as required, until it is as free from dust and other foreign materials as is practicable. Extra care will be used to ensure dust control. If dust is found to be in excess as determined by the Engineer, work will be stopped until dust can be controlled.

Tack coat shall be placed on only one lane of the roadway at a time. Place tack coat just enough in advance of paving operations to allow the tack to cure before overlying pavement is placed. No traffic shall be allowed on tacked surfaces.

The tack coat shall be applied to areas to be surfaced at the rate of from 0.05 to 0.15 gallons/square yard at application temperature. It shall be applied by means of approved pressure distributors operated by skilled workmen. The spray nozzles and spray bar shall be so adjusted and frequently checked that uniform distribution is ensured. The distribution shall cease immediately upon any clogging or interference of any nozzle and corrective measures taken before distribution is resumed. Hand sprays shall be used only in tacking small patches or inaccessible areas that have been missed by the distributor.

The tack coat shall be entirely fogged over the surface to be paved and require no sand blot. If, however, it has not been uniformly distributed, sufficient sand shall be spread over the surface to blot up the excess asphalt and prevent it from picking up. Prior to laying an intermediate or surface course, all loose or excess sand shall be swept from the base.

The Contractor shall maintain the tack coat and the surface to be paved intact until it has been covered by the overlying course. Areas that have been damaged shall be repaired and shall receive additional applications of tack coat material in compliance with these specifications. The maintenance and repair of the tack coat shall be at the Contractor's expense.

The Contractor shall be responsible for protecting adjacent streets and other surfaces from tracking of tack material. Protection of surfaces and tack material tracking removal shall be performed at the Contractor's expense.

- 1309 DENSITY AND SURFACE REQUIREMENTS. Both density and thickness shall be carefully controlled during construction and shall be in full compliance with plans and specifications. During compaction, 4-inch diameter cores will typically be taken to determine in-place densities and as an aid for verifying thickness. Contractor shall obtain cores by means approved by the Engineer. Core locations shall be repaired using epoxy concrete, high-strength non-shrink grout, or other approved product.

Unless otherwise specified, the completed asphaltic concrete pavement shall have a density greater than or equal to ninety-two (92%) percent of Theoretical Maximum Specific Gravity. Upon request by the Engineer, representative samples of the compacted asphalt paving shall be obtained by the Contractor under the supervision of the Engineer and shall be

tested by a suitable independent or municipal testing laboratory as necessary to verify compliance with respective density requirements.

The testing laboratory shall be selected and compensated by the Owner, unless otherwise specified. The Engineer will establish the number, timing, location and testing procedures for the representative samples. Copies of each report covering the details and results of the tests shall be provided to the Contractor.

The surface of the final course shall be of a uniform texture, without segregation, and conform to lines and grades shown on the plans. It shall not vary from a ten (10') foot straight edge, applied parallel to the centerline, by more than one-fourth (1/4") inch. Segregation checks, in accordance with KDOT procedures, may be run in areas that appear to be segregated.

Correct all surface irregularities exceeding the specified tolerances using equipment and methods approved by the Engineer. Method for correction shall be approved by the Engineer and may include:

- Diamond grinding
- Remove and replace the entire pavement thickness
- Mill the surface and replace the specified surface course
- Other methods proposed by the Contractor as approved by the Engineer.

When specified densities are not achieved payment for the material will be reduced, or the pavement shall be removed and replaced, as follows:

<u>% GMM</u>	<u>% of Payment</u>
≥ 92	100
90-91.9	98
88-89.9	96
86-87.9	94
< 86	50 OR remove & replace at Contractors option

Reduced payment will apply only to the amount of material represented by each test but no more than 500 tons. If a test indicates a density below the minimum required, additional tests will be performed to better define the extent of the area subject to reduced payment. No more than one test per 150 tons will be performed.

1310 **PROTECTION OF PAVEMENT.** The Contractor shall protect all sections of newly compacted base and surface courses from traffic until they have hardened properly, or as directed by the Engineer.

- 1311 ROLLING PROCEDURE. At the option of the Engineer, the effectiveness of the rolling procedure will be verified using a nuclear density-moisture measuring device. The Contractor shall revise the rolling procedure as necessary to obtain the specified density.
- 1312 CLEANUP. Cleanup shall follow the work progressively and final cleanup shall follow immediately behind the finishing. The contractor shall remove from the site of work all equipment, tools, discarded material, and other construction items. The entire right-of-way shall be left in a finished and neat condition. Clean up shall be considered a subsidiary obligation.