

SECTION 1300 - ASPHALTIC CONCRETE PAVEMENT

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

1302 GENERAL. Pavement shall be constructed to the lines, grades, dimensions, and details as shown on the plans. Asphaltic concrete pavement shall conform to the 1990 KDOT Standards except as modified herein. Portions of the KDOT Standards are duplicated in this section for the convenience of the user.

Allowable bituminous mixes for pavements shall be the following:

Surface Course Mix.....BM-2, BM-2A

Base Course Mix.....BM-2B

Leveling Course Mix.....BM-1

Alternative mix designs may be used only where approved by the Engineer.

Composition of Mix. Mixes shall be composed of a combination of aggregates and mineral filler supplements meeting the requirements of the KDOT Standards for aggregates for bituminous mixtures. Immediately prior to the addition of the asphalt, the combined virgin aggregate shall meet the following grading and plasticity requirements:

| SIEVE SIZE | PERCENT MASTER GRADING LIMITS (PERCENT RETAINED) | | | | RETAINED DESIGN JOB-MIX TOLERANCES | | | |
|------------------|--|-------|-------|-------|------------------------------------|-------|-------|------|
| | BM-2 | BM-2A | BM-2B | BM-1 | BM-2 | BM-2A | BM-2B | BM-1 |
| 1" | 0 | | 0 | | | | | |
| 3/4" | 0 | | 0-5 | | | | | |
| 1/2" | | | | | | | | |
| 3/8" | 8-30 | 6-21 | 10-30 | 0-8 | +/-6 | +/-5 | +/-6 | |
| 4 | | 23-40 | | 18-39 | +/-6 | +/-5 | +/-6 | +/-5 |
| 8 | 42-72 | 38-56 | 42-72 | 35-53 | +/-6 | +/-5 | +/-6 | +/-5 |
| 16 | | | | 50-68 | +/-5 | +/-5 | +/-5 | +/-5 |
| 30 | 64-88 | 61-82 | 64-88 | 60-80 | +/-5 | +/-4 | +/-5 | +/-5 |
| 50 | | | | 70-90 | +/-4 | +/-4 | +/-4 | +/-4 |
| 100 | | 88-99 | | 82-95 | +/-4 | +/-3 | +/-4 | +/-3 |
| 200 (wash & Scr) | 92-98 | 92-99 | 92-98 | 92-98 | +/-2 | +/-2 | +/-2 | +/-2 |

Plastic Index Max. 6
Moisture in Final Mix: Max. 0.5%

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. When specified gradations are not achieved, payment will be reduced in accordance with the KDOT schedule of adjusted payment for Bituminous Mixes.

The asphalt content for each bituminous mix shall be the optimum content plus or minus one-half (1/2%) percent, as determined by the Engineer and shall be based on Gyratory compaction data or hot-mix design, to be submitted by the Contractor a minimum of five 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 20% reclaimed asphalt pavement (RAP) in the surface course and 30% in the base course. No RAP will be allowed in the leveling course mix. All RAP shall be processed such that 100% will pass the 1-1/2 inch (38 mm) sieve and shall be free of debris and foreign material.

Asphalt cement used in the manufacture of asphalt paving mixtures shall conform to the Performance Graded (PG) system. Asphalt shall be PG 64-22 unless otherwise specified.

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, which may affect the mix. 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 in cool weather when required by the Engineer. 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 to the greatest extent practicable. 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. The clean out of asphalt paver shall not be permitted on asphalt surfaces.

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

All bituminous 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. No asphaltic concrete shall be placed on frozen or wet subgrade.

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

When bituminous materials are being applied, 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 bituminous material 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 bituminous material and repair all damage, and leave the appurtenances in as good condition as they were before the work began and to the satisfaction of the Engineer.

All mixed material shall be delivered to the paver in time to permit completion of spreading, finishing, and compaction of the mixture during the daylight hours. **Nighttime work on projects will not be permitted unless approved at least twenty four (24) hours in advance by the Engineer.**

Hot-mix asphalt 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 or at any other time when weather conditions are unsuitable for the type of material being placed 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.

- 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 screens. 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. Rollers and other compactive devices shall be operated by competent and experienced roller personnel and shall be kept in operation continuously if necessary 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.

Compacting equipment shall conform to the requirements of Section 151 of the 2007 KDOT Standards.

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 speed shall not exceed three (3) miles per hour for steel-wheeled rollers and five (5) miles per hour for pneumatic-tired rollers.

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. Heavy equipment or 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 becomes loose, broken, mixed with foreign material, has broken aggregate, or which is in any way defective in finish or density, or which does not comply in all other 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 BITUMINOUS TACK COAT. Prior to the distribution of bituminous materials, the Contractor shall remove all loose materials from the surface by means of approved enclosed mechanical sweepers and/or hand brooms until it is as free from dust as is practicable. Side roads to receive bituminous treatment shall be shaped and bladed at the same time the sub-base is cleaned.

Contact surfaces of curbing, gutters, manholes, and similar structures shall be coated with a thin uniform coating of asphaltic material. The bituminous mixture shall be so placed so that after compaction it will be one-fourth (1/4") inch above the edge of the contact surfaces of such structures.

Joints between old and new pavements or between successive days work shall be made so as to ensure thorough and continuous bond between the old and new mixtures.

Prior to placing the new pavement against a cut joint or against old pavement, the contact surface shall be sprayed or painted with a thin uniform coat of asphalt material.

The tack oil shall be a SS-1, SS-1H, CSS-1 or CSS-1H grade oil. Alternative materials must be submitted for approval by the Engineer prior to beginning construction. Certification shall be submitted to Engineer. The tack coat shall be applied to the areas to be surfaced at the rate of from 0.05 to 0.15 gallons/square yard at application temperature. Bituminous materials 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 asphalt tack shall be entirely fogged over the base course and therefore 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 treatment and the surface of the sub-base intact until it has been covered by the surface course. Areas that have been damaged by traffic shall be repaired and shall receive applications of tack coat material in compliance with these specifications. The maintenance and repair of the tack coat shall be done 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, cores may be taken to determine in-place densities and as an aid for verifying thickness. Cores shall be made 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 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.

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.