

## **SECTION 1300 – ASPHALT -KCMMB**

**1301** **SCOPE.** This section discusses asphaltic concrete pavement requirements for roadways, residential roadways, multipurpose pathways, parking areas, and other areas intended for use in City of Gardner, unless otherwise approved by the City Engineer.

**1302** **GENERAL.** Division 600 of the latest edition of the Kansas Department of Transportation *Standard Specifications for State Road and Bridge Construction* shall govern asphaltic concrete pavement requirements except as otherwise modified herein. The Contractor shall be responsible for all costs incurred for the asphaltic concrete mix design, material, delivery, placement, and testing, unless otherwise specified by the City Engineer.

If the project site has not been stabilized with seed and mulch prior to paving operations, erosion control devices including silt fence, wattles, or mulch berms shall be installed at the back of the curb and gutter or at the right-of-way in areas where the devices are needed to effectively control erosion and sedimentation. Erosion control devices in these locations must be installed before paving operations will be permitted. The devices shall be installed immediately after the curb has been backfilled. An exception will be granted when one or more lifts of base asphalt need to be placed before the curb and gutter can be placed. The placement of subsequent lifts of asphalt will not be permitted until the curb is backfilled and erosion control devices are in place.

Paving will not be permitted until the compressive strength of the concrete used for curb and gutter construction has reached seventy-five (75) percent of its design strength unless otherwise approved by the City Engineer.

Pavement shall be constructed to the lines, grades, dimensions, and details contained herein or as shown on the plans.

**1303** **MATERIALS.** Asphalt shall conform to the standards and specifications established by the Kansas City Metro Materials Board (KCMMB). If KCMMB asphalt is not available, the City Engineer must approve the mix design.

**1304** **MIX DESIGNS.** The Contractor shall submit a KCMMB approved mix design to the City Engineer for review and approval before any asphalt is scheduled for placement.

**1305** **DELIVERY.**  
**Release Agent**

The use of diesel fuel as a release agent in the bed of haul trucks is strictly prohibited. The release agent shall be a compound specifically designed to allow the asphaltic concrete mix to be dumped from the haul trucks, but shall in no way change or modify the properties of the asphalt cement binder. The Contractor shall submit to the City Engineer a specification of the release agent to be used for this purpose. It shall be the responsibility of the Contractor to inform all drivers hauling the asphalt mix of this requirement.

### **Transportation of Mix**

All haul trucks providing asphalt mix to the project site shall utilize load covers of sufficient size and weight to completely cover the truck bed protecting the upper surface of the asphalt from cooling. Failure to have the load completely covered shall be sufficient cause for rejection of the entire load. The load shall remain covered until the truck is next in line to be unloaded, but in no case shall the load remain uncovered for more than ten minutes before unloading begins. If for any reason there is a delay in unloading, the remaining part of the load shall be recovered until unloading resumes. It shall be the responsibility of the Contractor to inform all drivers hauling the asphalt mix of these procedures prior to starting the work. All bituminous mixtures shall be mixed and then delivered to the project within the mixing and compaction temperature ranges reported on the accepted mix design. Asphalt mixtures having a temperature less than 235°F when dumped into the mechanical spreader will be rejected. The Contractor shall provide a sufficient number of haul vehicles of the proper size, speed, and condition to ensure an orderly and continuous placement operation. The Contractor shall schedule and route his hauling operation to minimize hauling over newly paved areas.

## **1306 EQUIPMENT.**

### **Mechanical Paving Machines**

Bituminous-material spreaders shall be the self-propelled type equipped with hoppers, tamping, or vibrating devices, distributing screws (augers), adjustable screeds operated either manually or automatically, and equipment for heating the screeds and equalizing devices. The spreader shall be capable of spreading hot bituminous mixtures without leaving indented areas, tearing, shoving, or gouging, and capable of confining edge of strips to true lines without use of stationary side forms. The spreader shall be required place the course to the required thickness. It shall also be capable of producing a finished surface conforming to the smoothness requirements specified. Spreaders shall be designed to operate forward at variable speeds and in reverse at traveling speeds of not less than one hundred (100) feet per minute. If an automatic grade control device is used on the spreader for two-lane paving operations, it shall consist of sensing device for control of one end of the screed and a slope- control mechanism for control of the other end of the screed, or a sensing device on each side of the paving machine. Where the paver is used on multiple paving lanes (more than two paving lanes), sensing devices shall be used on each side of the spreader for control of the screed. The slope-control mechanism shall not be used for grade control in multiple paving lane operations. When the Contractor chooses to pave lanes through the project wider than twelve (12) feet, the paver shall be equipped with auger extensions.

### **Steel-Wheel Rollers**

Steel-wheel (drum) rollers shall be self-propelled, two-axle tandem, vibratory type, weighing not less than 20,000 pounds static weight and not less than 150 pounds per inch of wheel. Wheels shall be equipped with adjustable scrapers, water tanks, and sprinkling apparatus for keeping the wheels wet, thereby preventing the bituminous mixture from sticking to the wheels. Rollers shall be capable of reversing direction without backlash. The Contractor shall be responsible to maintain the equipment in a satisfactory condition. Roller wheels with flat and pitted areas or projections that leave marks in the pavement shall not be permitted. A minimum of two (2) steel-wheel rollers (one breakdown and one finish) shall be required with each paving operation.

### **Heavy Pneumatic-Tired Rollers**

Heavy pneumatic rubber-tired rollers shall be self-propelled and shall consist of two (2) axles on which are mounted an odd number of pneumatic rubber-tired wheels. The roller shall have at

least nine (9) pneumatic rubber-tired wheels in such manner that the rear group of wheels will not follow in the tracks of the forward group, but spaced to give essentially uniform coverage with each pass. Axles shall be mounted in a rigid frame provided with a loading platform or body suitable for ballast loading. Tires shall be inflated to ninety (90) psi. The surface of the tires shall remain smooth. Construction of the roller shall be such that each wheel can be loaded to a minimum of 1043 kg (2,300 pounds). A pneumatic rubber-tired roller shall be required with each paving operation.

## **1307 PREPARATION.**

### **Subgrade**

Subgrade preparation for pavement shall be as specified in Section 1200. The Contractor must receive the approval of the City Engineer before covering the subgrade with any pavement.

### **Road Surface Preparation**

When the bituminous mixture is placed on an existing bituminous surface, Section 614.3 (b) (3) of KDOT's *Standard Specifications for State Road and Bridge Construction* shall apply, except that in addition to brooming, a high pressure type water truck, capable of washing all fines, dirt, and debris from the surface, may be required prior to overlaying as directed by the City Engineer. Blowers and brooms shall be power type and suitable for cleaning the surface to be paved.

Equipment compliance with this specification shall be visual observation by the City Engineer at the commencement of washing operations. No direct payment shall be made for this item as it shall be considered subsidiary to other bid items.

### **Tack Coat**

Emulsified Asphalt CSS-1h shall be used for the tack coat. All existing asphaltic concrete surfaces shall receive a tack coat not more than six (6) hours prior to placement of the asphaltic concrete. Surfaces previously tack coated and not covered with new asphaltic concrete for more than six (6) hours shall be re-tacked. The rate of application shall be 0.05 gal/sy to 0.12 gal/sy, or as otherwise directed by the City Engineer. At locations where asphalt is being placed on top of existing concrete pavement or for night work where temperatures warrant, the emulsified asphalt shall be diluted ten (10) percent with water versus the normal fifty (50) percent dilution with water. Tack coat shall not be paid for directly but shall be considered subsidiary to other bid items.

The spray nozzles and spray bar on the distributor truck 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 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 requires 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 adhering to construction equipment and vehicles. 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. The Contractor shall be responsible for the cost of any clean-up that becomes necessary due to his operations.

## **1308 PLACEMENT.**

### **Placing Requirements**

The Contractor shall receive the approval of the City Engineer before placing any asphaltic concrete pavement.

Asphaltic concrete shall be placed in compacted lifts to the depths as indicated on the contract drawings. The maximum lift thickness of compacted asphalt shall not exceed four (4) inches for base courses and two (2) inches for surface courses. A minimum of two (2) leveling courses shall be placed for asphalt pavements with a total thickness of ten (10) inches or greater. A minimum of one (1) leveling course shall be placed for asphalt pavements with a total thickness of less than ten (10) inches. Through lanes shall be paved before left turn lanes and side street intersections. Through lane pavers shall not stop for other areas to be paved.

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. Night time work on projects will not be permitted unless approved by the City Engineer.

### **Preventing Material Segregation**

The wings of the spreader hopper shall not be emptied between truck loads. The screed auger shall be operated approximately three-fourths (3/4) full and the hopper conveyor shall not be allowed to run out of material during the paving operation. The augers should be running automatically and the vibrating screed should be turned on. The hopper conveyor shall always have approximately six (6) inches of material covering it and not be allowed to run out of material. Whenever the paver is run empty (conveyor exposed), the area behind the paver should be checked for segregation. The Contractor shall be responsible for the repair or replacement of segregated areas occurring in the asphaltic pavement. The repair or replacement shall be as directed by the City Engineer.

### **Pavement Joints**

Header joints between old and new pavements, between successive day's work, and joints that have become cold because of delay, shall be vertically sawed and tacked. The pavement joints shall be carefully constructed to insure continuous bond between old and new sections of the pavement course. All joints shall have the same texture, density, and smoothness as other sections of the course. The tack shall be overlapped onto the previous pavement one (1) inch to two (2) inches. Contact surfaces of previously constructed pavements, curbs, gutters, manholes, etc., shall be tacked. Surfaces that have become coated with dust, sand, or other objectionable material shall be cleaned by brushing or cut back with an approved power saw as directed by the City Engineer. The surface against which new material is to be placed shall be sprayed with a thin, uniform coat of bituminous material conforming to the requirements of Section 1307. The material shall be applied far enough in advance of placement of the fresh mixture to insure adequate curing. Care shall be taken to prevent damage or contamination of the sprayed surface.

Edges of previously placed pavement that have cooled and are irregular, honeycombed, poorly compacted, damaged, or otherwise unsatisfactory, shall be cut back to expose a clean, sound surface for the full thickness of the course as directed by the City Engineer.

### **Transverse Joints**

The roller shall pass over the unprotected end of freshly placed mixture only when placement of the course is discontinued or when delivery of mixture is interrupted to the extent that unrolled material may become cold. In all cases, the edge of the previously placed course shall be cut back to expose an even, vertical surface for the full thickness of the course. When paving continues, the mechanical spreader shall be positioned on the transverse joint so that sufficient hot mixture will be spread to obtain a joint after rolling which conforms to the required density and smoothness specified herein.

### **Offsetting Joints**

The surface course shall be placed such that longitudinal joints of the surface course will not coincide with joints in the underlying course by approximately nine (9) inches. Care shall be taken to offset longitudinal joints in a manner that the final surface course joint is in the correct location. Transverse joints in the surface course shall be offset by at least two (2) feet from transverse joints in the underlying course.

### **Special Requirements for Placing Adjacent Pavement Lanes**

The Contractor shall be responsible to determine the width of paving lanes ensuring acceptable joint locations prior to beginning the paving operation. A pre-pave coordination meeting will be held to discuss the proposed joint locations and their relationship to any pavement markings that will be placed. Longitudinal pavement joints shall be located so they are no closer than four (4) inches from the nearest edge of lane markings and no further than eight (8) inches from the nearest edge of the markings unless otherwise approved by the City Engineer. **The Contractor shall be responsible for locating pavement joints outside of areas where vehicle tires will travel.** The Contractor shall be required to suspend paving operations and make any necessary repair including pavement removal if he has failed to locate the pavement joint in the correct location.

In placing each succeeding pavement lane after the initial lane has been spread and compacted as specified, the screed end gate of the mechanical spreader shall overlap the previously placed lane slightly and shall be approximately 1.25 times thicker than the existing compacted lane to allow for satisfactory compaction roll down producing a smooth compacted joint with the specified density. Mixture placed on the edge of the previously placed lane by the paver screed shall be pushed back to the edge of the lane being placed by use of a lute (rake). The pushed back material shall form a ridge on the uncompacted lane along the edge of the previously placed lane. The height of the ridge above the uncompacted strip should be approximately equal to the thickness being allowed for roll down during compaction. These procedures shall be used to facilitate a smooth joint with density. Excess mixture shall be removed and wasted. In no case shall the Contractor waste excess material by broadcasting it over the uncompacted mat.

### **Compaction of Mixture**

The Contractor is responsible for the development of a compaction procedure that meets the density requirements specified. Failure to meet the required density shall be cause for rejection. Replacement of the material shall be at the Contractor's expense. The surface of the placed

material shall be corrected if necessary before compaction begins. Compaction of the mixture shall be accomplished using a minimum of two (2) steel-wheel rollers and one (1) pneumatic rubber-tired roller as specified above with a qualified operator for each roller. Combination rollers may be approved by the city engineer.

The speed of the rollers shall be slow enough at all times to avoid displacement of the hot mixture. Displacement of the mixture resulting from reversing the direction of the roller or from any other cause shall be corrected at once by raking or removing and replacing fresh mixture when necessary. Alternate passes of the roller shall be varied slightly in length. During rolling, the wheels of steel-wheel rollers and plates of vibrating plate compactors shall be moistened to prevent adhesion of the mixture to the wheels or plates, but excess water shall not be permitted. Tires of heavy pneumatic rollers shall be moistened with soapy water when required to prevent mixture from sticking to tires during rolling. Rollers shall not be permitted to stand on finished courses until the courses have thoroughly cooled. The minimum number of rollers shall be adequate to obtain the specified density. Places inaccessible to rollers shall be thoroughly compacted with hot hand-tampers or vibrating plate compactors.

Rollers shall not travel faster than three (3) mph. Steel-wheeled rollers shall not be used in the vibratory mode except for initial breakdown rolling. Rolling shall continue until the required density has been achieved.

The following information provides general guidelines for acceptable rolling procedures but may vary from the specific procedure developed by the Contractor:

Breakdown rolling- Breakdown rolling shall be as close behind the paver as possible. The breakdown roller shall be a steel-wheeled vibratory roller. The vibratory mode shall be used on the first forward pass and may be used in subsequent passes either forward or back. The vibratory mode should be set at maximum frequency and minimum amplitude. The unconfined edge or low side edge of the paving lane shall be broken down first. The other edge shall be broken down second and the middle shall be broken down last. Delays in rolling freshly spread mixture shall not be permitted.

As part of the break-down rolling and immediately after the break-down roller completes its first passes, the longitudinal joint shall be pinched to ensure compaction. The breakdown roller in the vibratory mode shall lap over the joint approximately six (6) inches onto the previously placed and compacted lane. The pneumatic rubber-tired roller shall make at least one (1) complete pass (forward and backward) operated on the hot lane with the four-wheeled axle forward and the front outside tire as close as possible to the previously placed lane. After the pneumatic rubber-tired roller rolls the joint, it shall make at least one (1) pass over the rest of the mat and then drop back to its intermediate rolling. The steel-wheeled roller in static mode shall immediately smooth out the pneumatic rubber-tired roller marks.

Intermediate rolling- The pneumatic rubber-tired roller shall be used as an intermediate roller; however, it shall also roll closely behind the breakdown roller. The pneumatic rubber-tired roller shall always be kept moving in order to keep its tires warm. The rubber-tired roller shall roll the same pattern as the breakdown roller. The rubber-tire roller should stay the thickness of the lift away from the free edge of the pavement.

Finish rolling- The second steel-wheel roller shall be used as a final finish roller. Finish rolling shall start when the mat has cooled down 20° to 40° below the intermediate rolling

(approximately 225°F plus or minus). The steel-wheel roller in static mode shall immediately smooth out the rubber-tire roller marks using the same pattern making the same coverage as the breakdown roller. Finish rolling should be completed by the time the asphalt cools to 150°F.

- 1309 TESTING.** A rolling pattern shall be established for testing asphalt on service and arterial streets. Refer to Section 8005 for all other asphalt testing.
- 1310 WEATHER LIMITATIONS.** Hot-mix asphalt paving shall be placed when the ambient temperature is 40°F and rising for base pavements and 50°F and rising for surface pavements. Hot-mix asphalt paving shall not 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. When the ambient temperature falls below 55°F, precautions shall be taken to compact the mix before it cools too much 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.
- 1311 SURFACE SMOOTHNESS.** The surface course, upon completion of final rolling, shall be smooth and true to grade and cross-section. When a 12-foot straightedge is laid on the surface parallel with the centerline, the surface shall not vary more than 1/8 inch from the straightedge. When the 12-foot straightedge is laid on the surface transverse to the centerline between the crown and edge of pavement, the surface shall not vary more than 1/4 inch from the straightedge. Testing for plan grade conformance and surface smoothness shall be performed by the Contractor in the presence of a representative of the City Engineer. The Contractor shall be required to perform profilograph measuring of the pavement smoothness, at his expense, if so directed by the City Engineer. Low or defective areas shall be immediately corrected by cutting out the faulty areas, replacing them with fresh hot mixture and compacting the areas to conform to the remainder of the pavement. The Contractor may be allowed to perform diamond grinding as an alternative repair method when approved by the City Engineer.
- 1312 PROTECTION.** The Contractor shall protect all sections of newly compacted base and surface courses from traffic until they have properly cooled, or as directed by the City Engineer. The Contractor shall be responsible for the repair or replacement of any asphalt surface that has been damaged.