

**KANSAS DEPARTMENT OF TRANSPORTATION
SPECIAL PROVISION TO THE
STANDARD SPECIFICATIONS, EDITION 2015**

SECTION 155

ASPHALT SURFACING AND ASPHALT RECYCLING EQUIPMENT

Page 150-13, delete subsection 155.6 and replace with the following:

155.6 HOT MIX ASPHALT (HMA) PLANTS

Plants used for the manufacture of HMA shall consist of a drum mix plant, batch plant or continuous mix plant. Provide equipment complying with the requirements specified below, having capacity to adequately handle the proposed asphalt construction, and meeting the approval of the Engineer.

Continued use of any hot mix plant is on the condition that the Contractor is fully responsible for producing material that complies with contract requirements.

a. Requirements for All HMA Plants.

(1) Uniformity. Design, coordinate and operate the plants to produce a uniform mixture.
(2) Proportioning Equipment. The Engineer may require locking or sealing of any automated proportioning equipment that can be manually manipulated.

(3) Heating and Storage Tanks for Asphalt Material. Use storage tanks for asphalt material that have sufficient capacity to provide for continuous operation. They shall be capable of uniformly heating and holding the asphalt material at the required temperature range without damaging or changing its characteristics. Direct flame against the tanks is prohibited. Design the circulating system to obtain proper and continuous circulation during the operating period. Provide an accurate procedure for determining the amount of asphalt material in the tanks at any time. Document and substantiate the calibration data. Situate and construct the tanks so the level of material can be safely and accurately measured at any time. Set the tanks as nearly level as possible. Include a means of obtaining samples of asphalt material from the delivery line to the plant in the system.

(4) Cold Feed Aggregate Bins. Provide separate cold feed bins for each aggregate size used, unless blending is permitted by methods approved by the Engineer. Use cold feed bins with sufficient capacity to maintain a continuous flow of material. Construct the bins to prevent any spilling or leakage from one bin to another. Each bin shall have a belt feeder equipped with an adjustable gate or an adjustable drive, or both, that can be calibrated and controlled. Provide a uniform distribution of aggregate on the conveyor belt. Equip each bin with a device that shall detect any reduction or interruption of aggregate flow and actuate a visual or audible signal at locations approved by the Engineer.

(5) Thermometric Equipment. Equip the plant with a sufficient number of thermometric instruments to control the temperature of the aggregate and the asphalt material. Use instruments capable of recording temperature on a chart over each 24-hour period with a maximum chart gradation of 15 minutes and 10°F. Use a 24-hour clock or designate AM and PM on the chart. The Engineer shall retain all temperature records as part of the contract records. Install the units separate from the plant in a readily accessible location.

Locate the actuating unit for recording temperature either in the storage tank or in the feed line between the pump and the discharge valve.

Locate the actuating unit for recording aggregate temperature and HMA as specified for each type of plant.

(6) Use of Storage Bins and Batchers. When used with a storage bin, design and operate these plants so the transfer of HMA from the drum to the storage bin shall not cause segregation of the mix, and the batcher can be operated according to **subsection 602.4a.(3)(d)**.

Equip all storage bins with controls capable of maintaining a specified minimum level or amount of HMA in the bin at all times during production.

If the amount of HMA in the bin can be determined by reading the output of load cells or other approved sensors, the Engineer shall specify the minimum amount of material in tons. Otherwise, the minimum level of HMA is the top of the tapered portion of the bin or at the point designated by the Engineer on special designed bins.

Set the controls to close and lock the bin gate when the specified minimum amount or level is reached. Override of the lock is permitted only to clean out the bin at the end of a production run.

Equip every storage bin with a batcher at the top, located so the HMA is discharged vertically from the batcher into the center of the bin. The Engineer may approve other equipment such as a rotating chute. Do not load the storage bin directly from a belt or other conveyor. Cover the belts carrying HMA to prevent excess heat loss.

Establish control of the batcher gates so the batcher shall operate as specified in **subsection 602.4a.(3)(d)** throughout the output range of the plant.

(7) Dust Collectors. Equip the plant with an approved dust collector, bag house or other type of collector that complies with limit particulate emissions standards.

Dispose of all waste material in a suitable manner.

Equip the plant to prevent particulate leakage.

(8) Air Emission Permit. Provide a copy of an Air Emission Permit issued by the Kansas Department of Health and Environment (KDHE) to the Engineer before installing a hot mix plant. It is the Contractor's responsibility and expense to satisfy the KDHE requirements.

(9) Safety Requirements. Provide adequate and safe access to sampling points and other locations where checking of plant operations is necessary. Thoroughly guard and protect all gears, pulleys, chains, sprockets and other dangerous moving parts. When required by the Engineer, provide access to the top of truck bodies by a platform or other suitable device to enable the Engineer to obtain samples and temperature data.

b. Requirements for Drum Mix Plants.

(1) General. Specifically design the plant for drum mixing and to be capable of satisfactorily heating, drying and mixing the HMA.

(2) Cold Aggregate Feed System. Use belt scales or other devices approved by the Engineer for positive weight measurement of the combined cold aggregates. Continuously record the amount of cold aggregate using a non-set-back recorder. Belt scales and approved devices shall be accurate within 2% by weight of the material being measured over any given period of time. Calibrate belt scales and approved devices at intervals as directed by the Engineer. Provide a weight system automatically coupled with the asphalt flow to maintain the required proportions.

(a) Sampling. Provide safe, adequate and convenient facilities for obtaining representative samples of the combined cold aggregate. Provide a sampling device capable of producing a sample of proper size (large enough to be representative, but small enough to be carried safely by 2 people) from the full width of the combined aggregate flow, while the plant is operating at regular production rate.

(b) Recycled Material Conveyor. If the plant is used for recycling, a weighing system is required to control delivery of virgin aggregate and recycled material to the drum. Equip the system with interlocking mechanisms that shall accurately deliver virgin aggregates and recycled material in proper proportions. When both Reclaimed Asphalt Pavement (RAP) and Recycled Asphalt Shingles (RAS) are used, obtain weight measurements on the RAP and RAS individually or obtain weight measurements on the combined recycled material and either the RAP or RAS so that individual RAP and RAS weights may be calculated. Belt scales and other approved devices for the RAP, RAS and combined recycled material shall comply with **subsection 155.6b.(2)**.

(c) Moisture Compensation. Include a moisture compensation device in the cold feed system to correct for the moisture in the aggregate weighed by the belt scales or approved devices.

(d) Weather Protection. Protect belt scales and approved weighing devices from the effect of wind and weather.

(3) Asphalt Material Feed System. Supply asphalt material to the mixing drum through a continuously registering cumulative indicating meter by a pump specifically designed for drum mix plants. Locate the meter in the asphalt material so it shall register the discharge to the drum. Provide a means to divert the flow into a container for calibration. Supply the meter with a non-set-back register accurate within 2% by weight of the material measured in any given period of time. The register shall record only material delivered to the drum.

(4) Mineral Filler Feed System. Introduce and uniformly disperse fly ash and similar mineral fillers into the drum mixer at the point of introduction of the asphalt without loss to the dust collector system. Use a non-set-back register to record the quantity of mineral filler discharged into the mixer. Equip the delivery system with variable speed to interlock with the aggregate weigh belt so the total aggregate weight including the mineral filler is indicated to the asphalt proportioning system. Provide a device to indicate that mineral filler is being delivered uniformly to the drum that shall activate a visible or audible signal to the plant operator if the flow is reduced or interrupted.

(5) Calibration of Feed Systems. Enable easy calibration of the aggregate weighing system and the asphalt material meter system. The calibration methods are subject to approval by the Engineer, who may require a schematic diagram of the system.

(6) Mixing Drum. Equip the drum with automatic burner controls to prevent damage to the aggregate or asphalt material. Keep the discharge temperature of the mixture within the range specified in **DIVISION 600** for the type of asphalt material being used. Install the activating unit for recording the asphalt mixture temperature in the discharge chute of the drum mixer.

Use a rate of flow through the drum such that the aggregate and asphalt material form a homogeneous mixture with all particles uniformly coated. Do not exceed the manufacturer's rated capacity.

c. Requirements for Hot Mix Batch Plants.

(1) Dryer. Include one or more dryers in the plant that continuously agitate the aggregate during the heating and drying process. Use dryers that dry and heat all aggregate to specified requirements.

(2) Aggregate Temperature. Install the actuating unit for recording the aggregate temperature where the hot materials flow over it during the proportioning operation.

(3) Hot Aggregate Storage Unit. Configure the unit so the aggregate shall not be segregated and can be discharged into the weigh hopper in a manner that shall not affect the accuracy of weighing.

(4) Weigh Box or Hopper. Include a means for accurately weighing the aggregate in a weigh box or hopper suspended on scales, and of ample size to hold a full batch without running over. The gate shall close tightly so no material is allowed to leak into the mixer while a batch is being weighed.

(5) Asphalt Control. The weigh bucket shall be non-tilting with a loose sheet metal cover. Make the length of the discharge opening or spray bar greater than $\frac{3}{4}$ the length of the mixer, and make it discharge directly into the mixer. Heat the asphalt material bucket, its discharge valve or valves and spray bar. Provide an asphalt material bucket with a capacity a minimum of 15% in excess of the weight of asphalt material required in any batch. Have a heated quick-acting, non-drip, charging valve located directly over the asphalt material bucket.

Locate a scale dial with a capacity of a minimum of 15% in excess of the quantity of asphalt material used in a batch in full view of the mixer operator. Automatically control the flow of asphalt material to begin when the dry mixing period is over, and all of the asphalt material required for one batch shall be discharged in less than 15 seconds after the flow has started. If an approved metering device is used to control the amount of asphalt material, provide a valve and outlet for checking the meter in the section of line between the charging valve and the spray bar.

(6) Scales. Scales may be of the beam, springless dial or electronic type that complies with **subsection 152.2**. Equip beam scales with a Tel-Tale dial that shall start to function when the load being applied is within 100 pounds of that required. The dials shall be compounding, with full complements of index pointers. Do not place dials to give excessive parallax errors. Locate all dials to be plainly visible to the operator at all times.

(7) Control of Mixing Time. Equip the mixer:

- with an accurate time lock to control the operations of a complete mixing cycle;
- to lock the weigh box gate after charging the mixer until the mixer gate closes at completion of the cycle; and
- to lock the asphalt material bucket throughout the dry mixing period and lock the mixer gate throughout the dry and wet mixing periods.

The dry mixing period is defined as the interval of time between the opening of the weigh box gate and the start of introduction of asphalt material. The wet mixing period is the interval of time between the start of introduction of asphalt material and the opening of the mixer gate.

Perform the setting of time intervals in the presence of the Engineer. The Engineer will then lock the case covering the timing device until such time as a change is to be made in the timing device.

(8) Mixer. Use an approved type of batch mixer capable of producing a uniform mixture.

If not enclosed, equip the mixer box with a dust hood to prevent loss of dust.

The clearance of blades from all fixed or moving parts may not exceed 1 inch, if the maximum size of the aggregate is less or equal to 1 inch. The clearance may not exceed 1 $\frac{1}{4}$ inches, if the maximum size of the aggregate in the mix exceeds 1 inch.