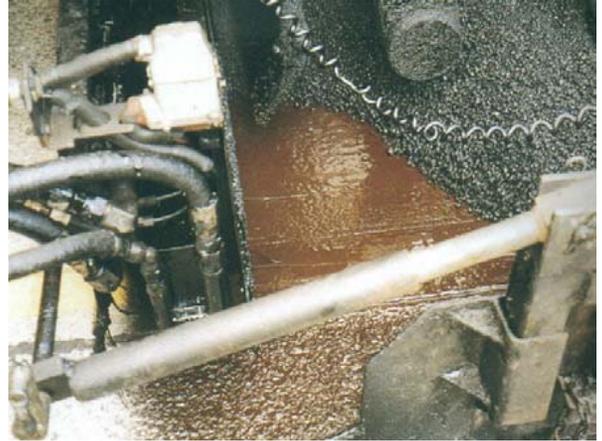

UTAH DEPARTMENT OF TRANSPORTATION

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INSPECTION TECHNIQUES FOR SPRAY PAVER APPLIED HOT-MIX ASPHALT

What makes a spray paver different than a conventional paver? A spray paver is a combination of the hot-mix asphalt paving machine and the emulsion spray truck. With the emulsion spray system included on the paver, it eliminates the spraying of a tack emulsion in front of the hot mix laydown operation. The paving unit receives the hot-mix asphalt, the mix is placed in front of the auger and screed, the emulsion membrane is sprayed in front of the screed and the hot mix is laid on top.



The first significant use of a spray paver for UDOT work applied a polymer-modified emulsion membrane (PMEM) in conjunction with a gap-graded bonded wearing course, but there are advantages for other applications in sealing pavements and bonding open-graded wearing courses and dense-graded asphalt mixes as well. The spray paver can facilitate the application of undisturbed emulsions that migrate downward into the existing surface and upward into the mix, filling voids in both materials and creating an interlayer of high cohesion that does not delaminate when applied correctly.

Emulsion application rates may vary based on the gradation and thickness of the hot mix asphalt being placed, and on the condition of the underlying pavement. Application rates are generally reduced for thinner lifts, smooth or less permeable surfaces, (i.e. PCC), or for new asphalt pavements. Application rates may be increased for thicker lifts, or for more absorbent, textured, or badly-pocked pavement surfaces. To date, recommended applications have ranged from 0.12 gallons per square yard to 0.26 gallons per square yard for PMEM placements.

Pre Paving

Calibration of the emulsion spray system should be completed before every production day of paving. The spray system should be adjusted within +/- 10% of the design application rate. Coverage of the spray system on the pavement must be even and uniform. It is important that there are no plugged nozzles on the spray bar.

Roadway Preparation

The surface should be prepared before Hot Mix Asphalt placement. Pavement cracks should be clean or routed and sealed flush with an approved hot applied crack sealing material and joints greater than 1/4 inch. No over banding greater than 2 inches should be permitted. For applications thinner than 1-1/2", any surface irregularities deeper than 1 inch should be filled with dense graded hot mix asphalt before applying the hot mix layer. The pavement surface should be swept and free of debris and loose particles. Make sure no material is spilled in front of the paver before the hot mix is placed.

Paving

Good paving practice should always be followed. The hot mix asphalt may be applied on damp, but not wet surfaces. The minimum air and pavement temperature requirements are 50°F and rising. It is recommended that the surface temperature be above 60°F. No freezing conditions within the first 24 hours are allowed.

Windrowing and pick up machines are not allowed for paving with a spray paver. The trucks servicing the paving unit should operate in a smooth manner, causing no bumps and allow paving to proceed continuously to create a smooth ride.

The minimum delivery temperatures are very critical to successful placement. Minimum temperature guidelines specified in the respective specifications need to be followed. Placement should not be allowed if mat temperatures behind the screed fall below 285°F due to the propensity of the freshly laid mat to result in shadowing, dragging and raveling.

During paving operations, the inspector should monitor the application rate of the emulsion, especially at startup and whenever the width changes. Additionally daily yield checks based on weight tickets are required to ensure that target rate ranges are met. If the screed extension is outside the spray bar width, the emulsion will need to be applied manually to coat the pavement between the end of the spray bar and the end of the screed. Care should be taken to ensure the correct application rate in such circumstances.

Spilling of mixture in front of the spray paver should be avoided as it could create localized delamination.

Joint Location

Longitudinal joints should be straight or correctly aligned to the curvature of the roadway, and should occur only at the edge a traffic lane and never in the wheel paths. Unlike traditional paving, miscellaneous areas, turn lanes, and handwork areas should be paved before paving main line.

The spray paver may improve the durability of longitudinal joints by applying the emulsion to overlap the vertical edge with the outside nozzle 0.5 to 1.5 inches.

Compaction

Steel drum type rollers should only be used. The rollers must be at least 10 tons and meet the safety requirements for UDOT standards. Vibrating of material equal to or less than one inch should not be allowed. Compaction must meet the project specifications for density and be achieved before the minimum temperature for the given asphalt mix. (Typically no less than 190°F.)

FURTHER INFORMATION

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