

Just for street and road workers

Editor's note: This article is the latest in a series based on information in Iowa's new Local Roads Maintenance Workers' Manual. The manual was developed by CTRE and sponsored by the Iowa Highway Research Board (TR-514). The series began with the July–August 2006 issue of *Technology News*. Previous topics included maintaining gravel roads and identifying and repairing asphalt and concrete pavement distresses.

This article discusses asphalt overlays, from chapter 3. A future issue of *Technology News* will include an article about concrete overlays (based on sources other than the TR-514 manual).

Repair, strengthen, and protect: Hot mix asphalt overlays

A hot-mix asphalt (HMA) overlay is a new HMA layer placed on an existing pavement. Such overlays can protect and add some strength to an existing pavement structure, extend the pavement life, and improve ride quality.

Before applying an overlay, repair distresses in the existing pavement. Notify affected residents about anticipated work schedules. Trim plant foliage that might break loose and contaminate the overlay material.

Following are general steps for applying HMA overlays; always check with your supervisor and follow your agency's procedures.

Preparing for the overlay

A day or two in advance

1. Prepare the existing pavement surface by grinding two-inch to zero wedges at start and stop points at the first lateral joint.
2. Lay tack paper and cold mix ramps.
3. Ensure that drainage will be maintained (e.g., bevel-grind cross streets at flow lines).
4. Remove loose material and water from deteriorated areas. Clean, patch, and compact.
5. Replace any failed areas of curb.
6. Make sure all manholes and intakes are working properly.

The day before the overlay

1. Count the number of risers and lids needed for manholes, water, gas, and monument castings. Assemble, inventory,

check for fit, and place the required risers and lids on the site.

2. Sweep the street. Remove any grass and water from pavement cracks.
3. Telephone the asphalt plant and let them know your tonnage requirements.

The day of the overlay

1. Have all traffic control and construction signs up and in place.
2. Spray the paving machine with a release agent and heat the screed to operating temperature.
3. Remove cold mix ramps and paper.
4. After the street has been cleaned, apply a tack coat at the proper rate so you can avoid pushing or shoving the mat.
5. Contact the plant and have trucks loaded

and dispatched to the job site. (Contact the plant immediately if any major breakdowns force you to stop paving during the day.)

6. Identify areas where leveling courses need to be placed to fill in low spots, and pave as needed.
7. Place all risers and lids.
8. At the beginning of the overlay section, set up the laydown machine to run the finish course. Set the heated screed on lath to gain prior mat elevation.
9. Position paver personnel with their workmanship tools.

Applying the HMA overlay

1. Back the asphalt truck up to the laydown machine. When contact is made raise



Placement of hot mix asphalt overlay. Photo courtesy of the National Center for Asphalt Technology.

the truck box, causing the mix to slide against the tailgate. This ensures that, when the tailgate is tripped, the mix will flood the hopper, reducing segregation behind the screed.

2. If the truck needs to be pulled away from the paver after loading, thoroughly remove any spilled asphalt before paving begins. (If the paver drives over spilled asphalt, the pavement surface will likely be irregular.)
3. During paving, the paving machine hopper should be full at all times to ensure a constant flow of materials to the screed. In addition, the augers that move the mix in front of the screed should be turning most of the time so that the mix is uniform in density before compaction.
4. To compact the overlay, a rubber-tired (breakdown) roller should follow the paver as closely as possible without rutting or disturbing the asphalt. This should be followed as closely as possible by a steel-wheeled (finish) roller; it will remove any wheel tracks left by the breakdown roller.

Cleaning the area and other follow-up activities

1. Clean the work zone, driveways, and parking areas of debris and excess asphalt.
2. Barricade the street to allow for cure time overnight. Notify police, fire, and transit of closure.
3. The next day, remove all construction signs.
4. Schedule a sand seal for the overlay at the end of the construction season.

For more information

Additional details can be found in the Iowa Local Roads Maintenance Workers' Manual, chapter 3, beginning on page 54, www.ctre.iastate.edu/pubs/maint_worker/index.htm.

The Iowa LTAP library has publications and a video about HMA overlays. Contact Jim Hogan, LTAP library coordinator, 515-294-9481, hoganj@iastate.edu. ■



A hot mix asphalt laydown machine with constant flow of materials helps ensure paving uniformity. Photo courtesy of the National Center for Asphalt Technology.



A consistent roller pattern helps achieve density, an important quality for hot mix asphalt longevity. Photo courtesy of the National Center for Asphalt Technology.

Rules of Thumb for asphalt overlays

Asphalt depth. Asphalt will densify approximately 20 percent after laydown machine placement. So if the layer being placed is to be 2 inches thick, the mix passing out from under the screed should be about 2½ inches deep to allow for compaction.

Estimating tonnage. For each load, the supervisor should keep track of the tonnage of asphalt going through the paver, and the distance the paver travels. This will provide the basis for estimating the tonnage required for the last truck load.

Laying asphalt on curb edges. This takes more hand work than the pass down the crown of the roadway. Construct wedges at the opening to driveways to keep water from ponding. Add the right amount of hot mix to force water past the drive. Square off and tap the upper edge of the wedge with a lute, then compact the wedge before the mix cools.

Ensuring uniform paving operations. This helps provide a better finished overlay product. Uniform delivery of mix at a consistent temperature allows for uniform laydown and compaction of the HMA overlay.