Asphalt Pavement Repair and Preservation

Placing crack sealant.

By Sandy Lender

Many of the pavements across the United States and Canada show signs of wear and tear after decades of use. As agencies continue to develop and implement plans for maintaining and preserving parking lots, city streets, rural roads, bridge decks, highways and more, contractors everywhere see a proverbial pot of gold in the maintenance marketplace. From crack filling to interstate milling and overlays, asphalt contractors who expand their expertise to include maintenance and preservation methods will see an increase in profit margins in coming years. This means they will require excellent maintenance- and preservation-quality materials, including liquid asphalts, emulsions, polymer-modified binders and more. Here are some of the repair and preservation techniques in use in today's maintenance marketplace.

Smaller Scenarios

One of the smaller categories of projects is parking lot maintenance. But don't let the relatively small size of the project be deceiving. Contractors know proper preparation and attention to detail are integral to success. That includes choosing the right materials and using the best practices for any technique. Consider crack filling, which takes more finesse than you'd think.

There are two schools of thought when it comes to tackling cracks in the pavement. Either an initial cleaning sweep of the pavement surface can be done or routing cracks can begin immediately. Since the point is to stop water from getting into the underlying base layers, cleaning the surface may or may not be necessary before routing the cracks.

To rout cracks properly, the contractor will first use a pavement cutting device to increase the size of the crack. Sound backward? The reason contractors need to enlarge the crack is not to buy more asphalt material from the suppliers, but to create a more perfect hole to fill. By cutting smooth walls in the fissure, the contractor makes a surface that is easier to tack. Of course, there are limits to how large a hole to create. For best results, the cut depth should be half that of the width (See Figure 1).

After creating the proper cut, the contractor tacks the sides and then fills the crack with a sealant material. When filling, it is appropriate to let the sealant material overlap the sides of the fissure by an inch. This helps make the seal more

complete, keeping water from seeping down the sides of a seal that might not have properly adhered to the sides of the cut.

Contractors have to be careful with the height of the sealant material. It is not appropriate to allow a large, convex formation of material above the crack. Excess material above the pavement could be the grip that snow plows need to rip material from cracks in the winter. Instead, the material should be left in a slightly concave formation so that the material has room to expand and contract with the pavement's movements during temperature changes. Many hand tool distributors sell a V-squeegee to make this technique easier to perform.

Using squeegee to install sealant.

For parking lot projects, specifically, it is recommended contractors look next at the actual parking spaces. Often, there are soft spots in the pavement where cars have leaked oil or other binder-dissolving products into the surface. The overzealous contractor may bring in a small milling machine to grind up the spots, and then refill them with new material. But contractors wanting to make efficient use of time and money are more likely to brush on an oil-spot primer (preferably a latex, water-based emulsion) to prevent the absorbed oils from bleeding up into the new sealant or overlay material.

Once the cracks in a pavement surface are properly filled and soft spots treated, the surface should be swept clean before the next maintenance technique, such as an overlay or seal, is performed.

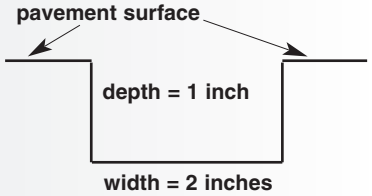
Movin' Up the Food Chain

Crack filling requires a small amount of material when compared to the next process for pavement maintenance — overlays. When performing parking lot overlays (or new construction), it is important for the contractor to actually paint the game plan on the surface first. The lines the crew members paint on the surface help them keep track of what step to take first, what step to take second, etc. This practice can reduce, or even eliminate, the amount of wasted material during the overlay process.

When the paver is set to pull its first pass, a haul truck will deliver a

Figure 1. Crack Filling

Step 1. Sweep the pavement surface (optional).
Step 2. Cut the fissure so its depth is half the length of the width.
Step 3. Blow out debris. Using a compressed air heat lance will not only clean out the crack, it will start heating the fissure's surfaces, providing a better bonding opportunity with the sealant material.
Step 4. Tack.
Step 5. Fill, leaving an overband for maximum sealing.
Step 6. Sweep the pavement surface.



Route the crack so tack and sealant materials have smooth surfaces to adhere to.

Gallagher Asphalt

Thin bonded overlay.

Koch Pavement Solutions

Spraying emulsion.

load of mix to its hopper. But if the second pass would require a delivery vehicle to drive on the uncompacted mat, or on the tacked surface, the crew needs another game plan. In such a situation, the contractor should have the haul truck driver charge the paver's hopper before the paver is set back in position for its second pass.

Waste is also reduced when crew members pay attention to stray material. Mix that has dribbled between the paver and the haul truck, or mix that has run over curbs, should be shoveled quickly back into the hopper or onto areas that the paver cannot reach. Time is of the essence in this situation so that the stray mix doesn't cool, thus creating a thermal segregation problem when it is reintroduced to the hopper. Good shoveling and luting practices are essential to a quality project, especially when the project is handwork-intensive as parking lot jobs are.

RUNNIN' WITH THE BIG BOYS

Once contractors move up to city street, rural road and highway maintenance projects, traffic control becomes a factor in a project's safe success. Contractors should never underestimate the ability of the traveling public to ignore construction signs, speed limits and workers. Every work zone must adhere to the standards set forth in the Manual of Uniform Traffic Control Devices (MUTCD), but contractors have come up with a variety of ideas for enhancing work zone safety.

For these relatively larger projects, contractors can be asked to perform any number of pavement maintenance or preservation methods. It depends on whom you ask which moniker the technique receives, but all are designed to extend the life of a pavement. Sealing (from sealcoats to chip seals), overlay, mill and overlay (resurfacing), crack and seat, rubblization with overlay, full depth reclamation, etc., serve the purpose of extending the life of a pavement. Each uses its own set of materials, but most require a quality liquid asphalt binder or emulsion product for success. For instance, different chip seal methods require different types of binders that set at varying rates, to hold chips (aggregate) in place. If a state agency chooses a binder that does not set quickly, allowing chips to come loose when traffic is turned onto it too soon, the agency could find itself paying for the repair of cracked windshields.

It takes more than quality materials to ensure pavement maintenance and preservation success. For instance, contractors must calibrate equipment properly and keep it well maintained. When preparing to apply a tack coat to an existing surface, the tack truck driver sets his controls to produce a triangular fan of liquid material from the spray bar. When spray nozzles and the spray bar are set correctly, and the material is set to flow at the proper rate from the tank, the contractor will see a triangular shape of overlapped spray hitting the surface.

No matter what method of pavement maintenance or preservation a contractor has been asked to perform, he will be counting on the material supplier to furnish a quality product. His best practices and back-to-basics skills work hand-in-hand with the best binders and aggregates available to give the motoring public a fantastic driving surface. ▲

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