



Hit the Road

It's Never too Early to Plan for Repairs

[by Jack Carr, P.E., RS, LEED-AP]

It's mid-summer with the grass growing tall and the Sox and Yanks in a traditional pennant race. So what's the rush in reminding the board it needs to be making paving decisions, now? The reason, of course, is the board missed the fall deadline for the asphalt plant's closing last November and had distractions this spring not allowing early action this year.

The potholes, sunken manhole covers, and expanding pavement cracks will not heal themselves. Before the Roads Committee chair calls the paving contractor(s) it is best to remember the methods of repairs.

1 Throw 'n Roll: A temporary pothole repair where liquid asphalt fills a hole and is then rolled over with heavy equipment to compact it.

2 Semi-permanent repair: Similar to the Throw 'n Roll except it is more deliberate with the hole properly cleaned and trimmed to sound pavement. The asphalt is then compacted using a vibratory roller or plate.

3 Spray-injection method: Uses special equipment to spray a tack coat of asphalt into a cleaned hole

and then blow asphalt and aggregate into the hole. This method does not require compaction.

4 Full-depth roadway replacement: Rebuilds the pavement by pulverizing the old asphalt and mixing it with cement and water to form a base for a final asphalt surface. This method is the most expensive, but the best.

5 Infrared Repair: Uses equipment emitting infrared heating to melt the damaged surface and

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remove defects with new asphalt on the surface. Patches become seamless with less chance of future potholes. This method is often more cost-effective than large patch jobs.

BACK TO BASICS

Asphalt pavement is also called bituminous concrete. It is called "concrete" because, like cement-based concrete, bituminous concrete has a mineral aggregate of stone and sand, held together with a binder of petroleum derivative asphalt. Different soil conditions (i.e. sandy subsurface vs. clay) warrant a different mix of asphalt paving, but this will be addressed by whoever creates your bid documents and specifications. For planning purposes, your board should assume paving will last about 20-25 years.

For purposes of discussions we will assume existing asphalt paved roads, parking areas, and/or driveways. Typically roadways have a sub-base of 4 to 8 inches of a well-drained, compacted soil and gravel mix. The first layer of paving is called the binder course and it is 1½ to 2 inches thick. This is covered by a topping coat of 1½ inches.

If it were not for the sun and water, asphalt paving would last a long time, but paving begins to deteriorate as soon as water begins to penetrate into the binder course and the UV rays remove asphalt from the topping coat. This can happen in less than five years. This is why adding a sealing coat in the first 2 to 5 years is sometimes recommended. It is also an area of confusion.

Sealing coat materials do not add back the asphalt lost due to UV deterioration. It only protects the pavement for a period of time from further deterioration such as shrinkage cracks and relevel-

ing (loss of surface aggregate). It does not bridge large cracks or fill in roadway depressions.

When water begins to infiltrate the pavement here in New England the freeze/thaw cycle takes its toll. The small cracks become larger in the binder course and eventually the sub-base begins to fail. At this point, surface cracks, settlement, alligating, and other surface visible signs make an appearance. Your maintenance plan should immediately address these problems by having crack-filling as a yearly project. The cracks should be filled with standard joint filler to within 1/8 to 1/4

inch of the top of the crack. Similarly, surface depressions and sink areas should be annually addressed as well.

After 15 years, major paving projects might present themselves. Sometimes a major resurfacing project can be delayed with judicious removal of large areas of deterioration and repairing the sub-base followed by a 1½ inch binder with a 1½ inch top coat. If the roadway or parking area deterioration is judged to be widespread, the options include a reclamation project where the top 6 to 12 inches of pavement and sub-base is ground into a recycled material that can be reused for a compacted and graded foundation for a new paving surface. This minimizes trucking and labor costs and extra materials costs.

So if you are on the Road Committee, it may be time to hit the road.



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