August 31, 2021

K&S Materials

CASE HISTORY

Ref: US0821

OUTLINE:

- Problem
- X-Phalt Approach

Permanent Repair Using X-PHALT™ of Asphalt Pothole Deteriorated Roadway

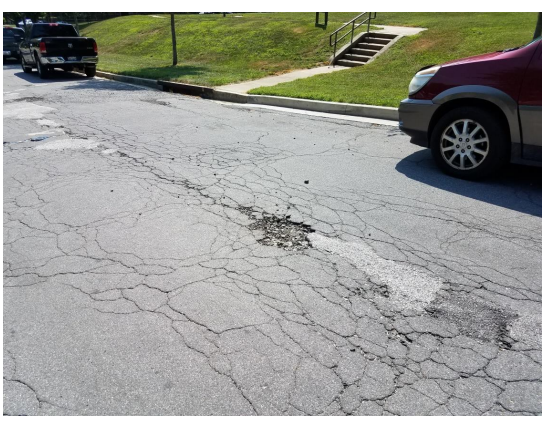
Problem: Deteriorated roads are a common sight as natural elements, chemicals, and heavy traffic take their toll. It is difficult to keep up with maintenance & repair due to resource limitations and availability of durable repair products.

Potholes in asphalt pavements are created by several forces: ultraviolet radiation can cause the bitumen (a.k.a. tar) to break down and become brittle. This leads to cracking, water penetration below the pavement and expansion of up to 9 percent in volume when freezing. Repeated freeze and thaw cycles cause the cracks to grow, spread, and deteriorate the pavement. The broken and loose pavement pieces become ejected when driven over, and the resulting potholes continue to grow in size.

Other contributing factors are unstable road bed caused by water erosion due to inadequate drainage and ground movement where roads are subjected to heavier loads than those for which they are designed. For larger areas the prevailing procedure is to remove the damaged material and replace it with an overlay using hot mix asphalt. However, this method requires onsite heavy equipment and is expensive. Small area repairs are usually dealt with as emergency repairs in which cold patch is applied.

Cold patch repairs are temporary with a service life expectancy of 6 to 12 months before they fail due to ejection, rutting, shoving, etc. Optimal compaction is often not achieved due to the requirement of estimating the correct amount over-filling needed to become level and flush with the surrounding pavement. The result is an uneven road surface. Snowplow blades can catch the raised cold patch and knock out pieces of the repair, aggravating the situation.

The Federal Highway Administration considers a height variance greater than ¼ inch to be a risk for hydroplaning. It also increases stopping difference due to reduced contact area between the vehicle tires and the surface of the road.



***Cold Patch** provides a "quick fix" with a low life expectancy.*

***Hot Mix** provides a more permanent solution, but is expensive and requires heavy equipment.*

***X-Phalt**™ provides a truly permanent solution at a low cost and without the necessity of on-site equipment.*

***Figure 1:** Deteriorating roadway. Note the cracking, distortion and disintegration of the surface and deeper levels.*

X-PHALT™ Approach:

X-PHALT ™ cementitious repair mortar will chemically bond to the bitumen in asphalt pavement, creating a permanent repair. X-PHALT™ is applied the same as concrete repair mortars – add water; mix using a drill & paddle, drum, or mortar mixer; and place. X-PHALT forms a hardened cement that will not rut, shove, or eject.

X-PHALT™ can be placed on level and sloped areas without sagging, with a trowel, broom, or tined finish as desired. X-PHALT™ can be feather edged for a flush finish with the surrounding pavement for a safer condition.

X-PHALT™ cleans up with water; does not burn skin like Portland cement; does not require a bonding layer, heat source, or heavy onsite equipment; and does not contain any solvents or VOC's, nor any noxious odors.

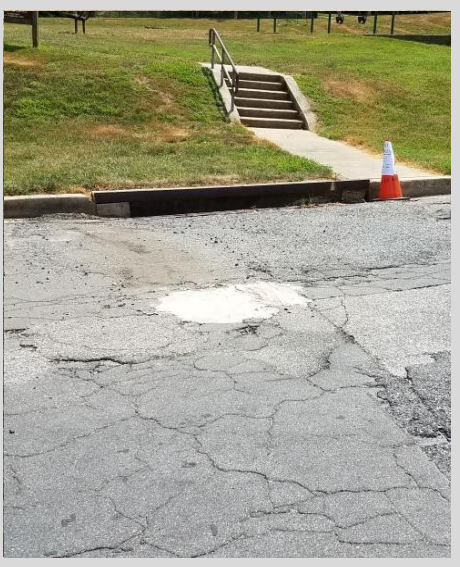


***Figure 2:** X-PHALT™ permanent repair of asphalt pothole opened to traffic in one hour.*

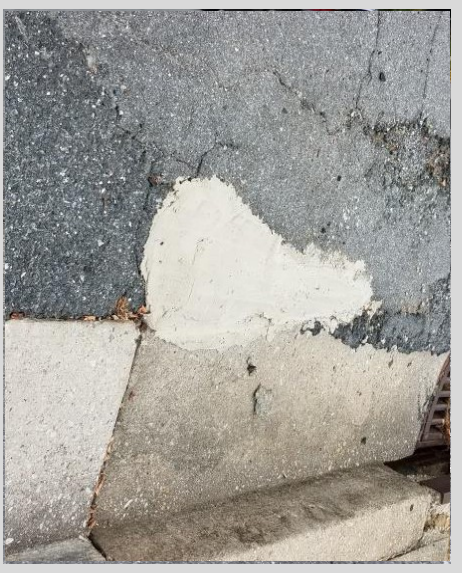


***Figure 3:** X-PHALT™ pothole repair tenaciously bonding to both asphalt and concrete*