

Interstate 81 In-Place Pavement Recycling – 2011

Interstate 81 southbound just south of Staunton is one of many sections of I-81 where the entire pavement structure is deteriorating as the result of more than 40 years of high traffic volume and its accompanying heavy vehicle loads. Since the right lane carries more heavy traffic than the left, the repair must extend into the soil and stone sub-base. This includes the roadway foundation, which is now wet and must support the 22 inches of material that carries highway traffic. The top 10 inches of the road bed consists of asphalt and the bottom 10 to 12 inches is made of aggregate, which consists of stones of various sizes. Below the aggregate layer is the sub-grade, which is compacted earth on which the top layers rest.

The Right Lane

In the right lane, the damage to the road structure includes cracks that extend all the way through the pavement and into the stone sub-base (aggregate layer) and soil. Cracks allow moisture to enter this layer and through frequent freezing and thawing this layer becomes weak and begins to feature a muddy consistency. The deterioration of this layer must be repaired so that it can support the 10-inch asphalt surface above it.

To rehabilitate the right lane, the top 10 inches will be milled out using conventional milling machines. The milled material will be trucked a storage site where it will be kept until it is time to process it in the Mobile Cold-Recycling Plant located nearby.

Once the top 10 inches have all been milled out, there is another 10 to 12-inch sub-aggregate base. This material will be strengthened with a stabilizing agent called Calciment, which is a lime byproduct. The agent is applied to the aggregate subsurface "in place" meaning that this subsurface does not have to be milled out but can be "remixed" in its current position in the roadbed using the stabilizing agent. A machine called the Reclaimer perform this remixing and application process. Once the aggregate subbase is stabilized the roadbed will be ready for the foam asphalt application, which is a product of the Mobile Cold-Recycling Plant.

The Mobile Cold-Recycling Plant is a machine that reprocess the milled road asphalt material. While in the plant an asphalt binding agent is added. The asphalt will be made into foam asphalt and will be reapplied to the road bed. Motorists should be aware that in cold temperatures the Reclaimer machine processes may cause considerable steam, which may affect driver visibility in the adjoining travel lane.

A two-inch layer of traditional "hot mix" asphalt will be applied to top off the road bed. By the end of the week, that portion of road treated with these machines will be ready for interstate traffic.

Traffic in this work zone will be traveling in the adjoining left lane, while work is being performed in the right lane. Traffic will be separated from the work zone using orange safety drums. It should be noted in the areas where the asphalt layer has been milled out, there could be as much as a 10-inch drop from the left travel lane into the adjoining right work zone lane. Extreme caution should be used when traveling through this work zone.

Overnight motorist should anticipated seeing lighting focused on the work zone. Noise in the area should not exceed levels found in traditional paving operations. The work in the right lane will be done during the single lane closure period beginning on Fridays at 9 p.m. and ending on Thursdays at 7 a.m. Visit www.Virginial-81Pave.org for complete lane closure details.

Machines Used in Right Lane



**"Mobile Cold-Recycling Plant" that performs
"cold central-plant recycling" (Wirtgen)**



"Reclaimer" (Wirtgen)

Machine Used in Left Lane



"Cold Recycler" (Wirtgen)

Left Lane

The left lane has not experienced sub-base (aggregate layer) deterioration that is found in the right lane on this project. There are cracks that extend through the top 10-inch asphalt layer, but tests show the 10 to 12 inch aggregate to be sound.

The left lane will have a "paving train" that will include the Cold Recycler machine. The front end of this piece of equipment will mill down approximately five inches. The machine moves the milled asphalt into the processing plant that is in the middle of the machine. In the plant the asphalt will be stabilized and a binding agent will be applied. In the rear of the machine the reconstituted asphalt will be applied to the road bed. Rollers following the Cold Recycler will compact the asphalt. Then a two-inch layer of traditional "hot mix" asphalt will be applied. By the end of the day, that portion of road treated with these machines will be ready for interstate traffic.

Traffic in this work zone will be traveling in the adjoining right lane, while work is being performed in the left lane traffic will be separated from the work zone using orange safety drums.

It should be noted in the areas where the asphalt layer has been milled out, there could be as much as a 7-inch drop from the right travel lane into the adjoining left work zone lane. Extreme caution should be used when traveling through this work zone.

Overnight motorists should anticipate seeing lighting focused on the work zone. Noise in the area should not exceed levels found in traditional paving operations. The work in the left lane will be done during the single lane closure period beginning on Fridays at 9 p.m. and ending on Thursdays at 7 a.m. Visit www.Virginial-81Pave.org for complete lane closure details.