

Two Lift Portland Cement Concrete Pavements

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The Republic of Belarus has always been considered the Republic of good roads. Our government pays great attention to the construction and maintenance of roads. New techniques and methods are widely used in road building. The student of group 11403315 Serebrenikov A. made a report at the students conference on two-lift portland cement concrete pavements, which are now used in Belarus.

The idea of two-lift paving has been around almost as long as concrete pavements were used. Fourteen years after the first concrete street construction was completed, a process called “Granitoid Concrete Streets” was patented in Chicago. These streets, which were constructed in 1909 and 1910, are still in service today and listed in the National Register of Historic Places. The two-lift paving technique was implemented extensively from 1950-2000 in many states to facilitate the placement of mesh in concrete interstate pavement construction. The first lift of concrete was placed at approximately one-half the final pavement thickness and then a welded wire mesh was placed on the wet concrete between the dowel baskets. Before the concrete had a chance to stiffen, a second lift of concrete was placed on top of the mesh and a paving machine finished the surface. This process used the same concrete mix for both lifts and was quite successful. From 1970 to 2000 the concrete paving industry moved from a mesh dowelled design to a plain pavement design, with or without dowels, based on traffic volumes. Eliminating the mesh and shortening panels from as great as one hundred feet to a fifteen or twenty foot pattern eliminated the need to pave with a two-lift process.

Implementation of two-lift system could help some agencies around the country consume growing recycled asphalt piles since most asphalt specifications only allow up to 40% recycled asphalt in their product and generally only on the lower sections. If recycled asphalt is available, it could be used to reduce costs, because less of the more expensive aggregates would need to be imported. Using recycled asphalt would also be beneficial to the environment by removing stockpiles of recycled material, whether it is concrete or asphalt rubble.

The student compared the thickness of two layers in different countries. In Austria it was 10.1 inches, in Germany – 15 inches, in Belarus – 24 cm. The road life with this surfacing is two times longer as with asphalt surfacing. This surfacing increases friction.