

WHITE-TOPPING

by Peter Chase, P.E.

WHITE-TOPPING is the reconstruction of pavement by the placement of a five- to six-inch portland cement structural concrete slab on top of an existing, deteriorated asphalt pavement. "Ultrathin white-topping," two to four inches thick, is the designation applied to a recent variation of the process, in which a non-structural overlay is applied in a similar way.

Over the last several decades, several mid-western states began exploring the use of portland cement concrete overlays, placed directly over deteriorated asphalt pavements. In conventional white-topping, the asphalt pavement structure serves as a base for the new concrete slab.

Iowa has placed the most white-topping. Other states, primarily in the west and mid-west, have also used white-topping, and several eastern states are experimenting with the application. Although the greatest use is to rehabilitate local roads, it has been used wherever asphalt pavement is found, such as in parking lots, driveways and taxi-ways.

Construction cost comparisons of a conventional white-topping overlay show that it is as much as 50% more expensive than an asphalt overlay, but that it may last twice as long. If the asphalt pavement is structurally sound, white-topping becomes an economical alternative.

Once it is determined that the existing asphalt pavement has a good base, its deteriorated surface is removed by milling or simple cleaning, and the concrete is applied directly over the old pavement. Although a separate leveling course can be used to eliminate ruts and potholes, these imperfections can either be milled smooth or leveled by the placement of the white-topping. The structural nature of conventional white-topping allows it to bridge local weak spots in the underlying base.

Ultrathin white-topping requires additional

measures. Milling of the asphalt provides a better bonding surface for the thinner concrete overlay. Synthetic fibers are sometimes added to the mix, providing some toughness and resistance to cracking. After curing, ultrathin white-topping is typically sawed into squares or rectangles several feet on a side to minimize cracking. Of course, this non-structural application requires that the asphalt pavement underlying the concrete be better than one supporting conventional white-topping.

Although traditional construction methods can be followed, eliminating pavement excavation in typical road reconstruction means that a white-

topped pavement can be put into service sooner than a completely reconstructed road can be. Several jurisdictions are experimenting with special concrete mixes that allow for even quicker use of white-topped roads.

Mid-western states experienced in the application of white-

topping report as much as thirty years with minimal maintenance.

White-topping can be used wherever an existing asphalt pavement is deteriorated, but the base is sound. Applications include highways, local streets, parking lots, driveways, airport run-ways, etc. Although ultrathin white-topping is more limited in its applicability, it, too, is suitable for any of these locations. White-topping performs best on surfaces with light to moderate traffic demands. ■

About the Author *Peter Chase is a Project Manager in the New York office of Urbitran Associates, Inc. One of his current projects is the rehabilitation of the Major Deegan Expressway corridor in New York City.*

Photo: Proper joint spacing is critical in an ultrathin white-topping project. (Photo courtesy of American Concrete Pavement Association / National Ready Mixed Concrete Association.)

