

High Stress HMA Pavement Demonstrated in Fostoria, Ohio

Do you have a location where the pavement is rutted, shoved or corrugated?

There is a Hot Mix Asphalt (HMA) solution.

In our last newsletter FPI announced the publishing of its “ Standard Practice for the Design and Treatment of High Stress Pavement Areas “. The treatments recommended have been tried and proven effective in preventing deformation of the HMA pavements where properly applied. First reported in this newsletter on March 4, 1994, the ultimate high stress HMA design has been undergoing a torture test in Fostoria, Ohio since 1993.

The project on US 23 in Fostoria was conceived by ODOT, District 2 as a way of correcting a severe rutting and shoving condition. US 23 through Fostoria carries 2300 B and C type trucks per day with perhaps 25% overloaded , according to the Ohio State Highway Patrol. To make matters worse the trucks stop , start and turn a sharp curve on their way through town. The original portland cement concrete (PCC)pavement constructed in 1952 polished so severely that it was soon overlaid with a 3/4ths inch thick latex sand asphalt anti-skid treatment. Later the road was resurfaced again with a 404 type mix, and again in 1988 (the hot summer, 45-50 days at or above 90 degrees) with another 1 ¼ inch of 404. Within 2 months the pavement rutted so severely that it actually slid over the curb and onto the sidewalk. ODOT replaced all of this existing overlay with a coarse 402 mix that still rutted severely over the next 2 years.

In July , 1993 ODOT awarded project 460(93) , Sen. US 23 and SR 613, for resurfacing with Item 448 , to FPI member, the S.E. Johnson Co.. ODOT and the contractor in consultation soon concluded that no conventional mix would perform under these extreme high stress conditions. ODOT requested the contractor to propose a solution. Alex Johnson, R and D Engineer for S.E. Johnson proposed the following pavement:

1. scarify off all 3 and ½ inches of existing overlay,
2. scarify the surface of the PCC pavement to a depth of ½ in.,
3. apply a rubberized asphalt emulsion tack coat using SS 924 at 0.1 gal/sy,
4. 1 and ¾ in. stone mastic asphalt base course with an SBS polymer modified binder and
5. 1 and ¼ in. stone mastic asphalt surface course using an SBS polymer modified binder

Mixes were designed for heavy traffic, and their rutting resistance proven by testing on loaded wheel testers. ODOT accepted the recommendations and authorized the construction by change order.

Now , more than 4 years later, the project is still performing beautifully, proving that HMA can be designed and constructed to perform under the most severe conditions of stress.

By contrast, other material approaches to dealing with high stress applications are showing less promise. A recent survey of Ohio’s ‘ Ultra Thin Whitetopping’ demonstration pavements by FPI shows extensive deterioration after only 2 years of service, under less stressful conditions.

For more information on dealing with High stress applications, contact FPI for our “ Standard Practice for the Design and Treatment of High Stress Pavement Areas “

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