

INTERSTATE 88 – ILLINOIS TOLLWAY PAVING PROJECT NEAR ROCHELLE, ILLINOIS

The Illinois Tollway System has been a pioneer in the development and deployment of sustainable pavements. The Tollway is a series of interstate highways that operates most of the limited access highways around the perimeter of Chicago, IL. Their work includes the extensive use of crumb rubber modified asphalt in place of polymer modified asphalt throughout a large portion of their system, even though the use of wet process rubber is just as costly as the use of polymer modified asphalt.

When Tollway representatives were briefed on the extensive successes experienced with engineered, dry process crumb rubber modified asphalt, they commissioned a two part technology demonstration on I-88 west of DeKalb, IL. The project included the laboratory evaluation of two asphalt mix designs (one each for ILDOT and WIDOT) and placement of two lane-miles of pavement on I-88. The first mix was a friction SMA (ILDOT) and the second was a 12.5 N75 Fine Surface Graded Mix (WIDOT). The SMA Mix included 34% ABR (5% RAS and 8 lbs. of rubber/mix ton). The WIDOT Mix had 23.2% ABR with six lbs. of rubber per mix ton and no RAS content.

Lab testing of the SMA against a comparable PMA mix showed comparable Hamburg and DCT performance (2 versus 2.5 mm rut respectively, and a 602 versus a 566 DCT result respectively). Tests suggest comparable performance between dry process CRM asphalt and PMA.

Lab testing of the WIDOT mix with and without engineered dry process rubber showed the rubber additions significantly improved mix performance. The presence of rubber improved Hamburg rutting from 8.2 mm at 10,000 passes to 3.4 mm at 20,000 passes. The addition of rubber increased DCT results from 358 to 482.

When the rubberized blends were approved for use in the project, the Curran DeKalb Asphalt Plant was modified for dry process asphalt production in a matter of a few hours. Using a loss-in-weight feeder system, engineered crumb rubber was injected into production with a high degree of accuracy, and plant production of CRM asphalt at full production rates occurred without interruption.



The two different mix designs were produced in sequence with minimal waste. The asphalt mixes were trucked 40 miles on a cool day (55 F at start), and placement temperatures ranged from 235 to 280 F off the trucks. The finished asphalt laid without any tearing, and vibratory rollers produced

specified compaction without special effort. The compacted mixes were 1.5” in depth.

The placement effort was considered a success. Plant operations were considered successful, and when the project was complete, all equipment was removed and the plant returned to its normal operating condition in approximately two hours. The project gave the plant the ability to produce modified asphalt at a modification cost roughly 40% less than polymer modification. No special tankage, pumps, or piping were required, and the system allows on-off control of modified asphalt

production without stopping plant operations, thus eliminating any losses caused by excess polymer or wet process rubber-modified asphalt.

Performance evaluations will continue in the field following a winter of service. The existing record of technology field performance in colder climates strongly suggests that the use of dry process engineered rubber in asphalt mix designs will be permitted as a competitive alternative to other forms of modified asphalt. The cost advantage suggests this process will benefit both producers and road owners.