

Grassroots PMS Drives Township Preservation, Emphasizing CIR

When asked how many potholes Limerick Township, Pa., has, it's no surprise that after over 25 years, Limerick Township personnel can say "not many."

Public works superintendent Bill Bradford has been watching the township grow for that long. In Limerick, located 30 miles outside Philadelphia in Montgomery County, one thing is clear: the township takes pavement preservation as seriously as it takes snow removal or traffic safety.

A homegrown pavement management system (PMS) is providing Limerick Township the data it needs to program pavement preservation. Limerick developed its own PMS. The system uses an in-house database, utilized because of the small amount of lane miles that the township maintains. To engage in an off-the-shelf system would be too costly.

Limerick uses its own tracking system listing history, pavement condition indices of roadways, indications as to when pavement preservation is needed, and what type of preservation should be used.

Limerick's system is easy to manage and almost all 2,600 townships and boroughs within Pennsylvania use their own systems. Every township and borough works with a civil engineer, who may be employed with the public works department, or might be used when new development or sanitary and storm water issues arise; most are not retained full time.

'ALARMING' GROWTH

Limerick's recent growth includes new residential developments and industrial distribution centers, and even a nuclear power plant. All puts pressure on existing township roads.

The town has a fundamental understanding that "mill & fill" is not as cost-effective as pavement preservation. The growth Limerick has experienced led it to establish a PMS utilizing different preservation techniques, from micro surfacing and seal coating, to crack sealing, to the occasional pothole patch, to surface cold in-place recycling (CIR) and deeper.

"Limerick Township is expanding at an alarming rate," Bradford says. "Our road maintenance funding levels have been pretty consistent over the years, and we are required to maintain increased miles of roadway at times with the same amount of money. If we did not use cold in-place asphalt recycling to resurface, or in some cases, rebuild, the roadways that are too damaged for simple overlays or pavement preservation processes, we would have a major problem. We balance pavement



Roadtec RX-700 mill provides initial surface recycling with tanker supplying CSS-1h asphalt emulsion



At Limerick Township's modern public works facility are first row, Mike Polak, Recon; Bill Bradford, public works director; Dave Mayer, Keith Kulp, Joe Moyer, Jack Jeffers, Bill Eblinger; middle row, Sean Ferrell, Bill Stuart, Ander Miller, Bill Hinkle, Preston Moser; back row, Matt Pennypacker, Scott Miller and Len Bartosiewicz (partially hidden)

preservation with CIR, keeping the system healthy and maintained.”

Limerick Township has been utilizing CIR as part of its road maintenance and preservation program for over 30 years. When base-recycling CIR is required, CIR provides a less expensive, faster, easier and less disruptive alternative to conventional methods of reconstruction.

When renovating a surface, CIR has allowed Limerick Township to re-establish cross slope of roads, many former farming and rural roads, facilitating storm-water drainage.

CIR: HOW DEEP?

Pavement preservation involving CIR in the first 3 to 5 in. reduces the life cycle cost of the pavement structure by reusing the existing asphalt pavement. The process

uses 100 percent reclaimed asphalt pavement (RAP) mixed with a new binder.

The depth of Limerick's CIR is governed by PennDOT Specification 408. If using state *Liquid Fuels Funding*, as most townships do, this spec must be met, which requires compacted layers between 3 and 5 in. in depth.

“Cold in-place recycling is an environmentally friendly, cost-efficient maintenance and preservation technique that will avoid the cost of total reconstruction.” says Rick Nunemacher, vice president of ARRA member Recon Construction Services in York, Pa. Recon performs CIR via a recycling train.

Most pavement distresses can be successfully corrected with CIR. These include fatigue cracking, transverse thermal cracking, reflection cracking and raveling.

CIR destroys the existing cracking and produces a crack-free layer for the new surface course.

This application is cost effective with substantial savings over conventional reconstruction. Work is executed with minimal disturbance to traffic. CIR is an incredibly sustainable practice without the use of heat, and material hauling is minimized.

Emulsion supplier to Limerick CIR projects is Asphalt Emulsion Manufacturers Association-member Russell Standard Corp., which often partners with Recon in other non-preservation road construction projects such as full-depth reclamation (FDR) or FB paving for low-volume roads. Russell Standard plants in Mercer and Reading, Pa., received AEMA *Excellence in Manufacturing Awards* at its February

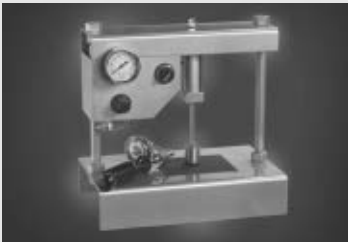
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In Limerick Township, 22-30 ton pneumatic rubber tired roller provides compaction

annual meeting in Cancun (see related article in this issue).

“We believe in improving communities through better infrastructure, and that starts with a good pavement preservation program which, for us, starts with high quality asphalt emulsions,” says Russell Standard’s senior vice president for asphalt materials Bob Huit, who is an AEMA vice president and a director of FP² Inc.

The binder that is most frequently used in the township is CSS-1h emulsion. CSS-1h emulsion allows for the material to be used “cold” without heat application at a remote site.

Before the project starts the proposed roadway is analyzed to ensure surface or deeper CIR is appropriate for preservation or for deeper application. Recon starts by obtaining drilled core samples for this analysis. A mix design is performed to find the optimal level of asphalt emulsion to be incorporated into the recycled pavement.

CSS-1h EMULSION USED

To begin the CIR process, Recon utilizes a Roadtec RX-700 down cutting asphalt mill. These mills are equipped with 240 carbide teeth, which cut the existing asphalt pavement to a depth prescribed in the final

mix design. The freshly cut RAP then is mixed with CSS-1h emulsion in the mill. The amount of emulsion is also prescribed in the mix design.

As a result of incorporating the RAP and CSS-1h, the mill produces a homogenous mixture of RAP & CSS-1h emulsion that is then fed via conveyor into a conventional paver. The paver then places the material to the new depth, as well as new design, of the new roadway.

To continue along with the CIR train, compaction of the freshly recycled roadway occurs within the standard prescribed by state or local specifications. After the recycled base is compacted/rolled, it is left to cure for a period of time.

CSS-1h is the ideal emulsion to use for a dense-mix such as CIR, as the base asphalt used within the emulsion formulation is harder and the slow set. As a result of this curing process, the CSS-1h emulsion is allowed to do what it does best: return to its naturally hard state.

CSS-1h grade emulsions, when used in CIR projects, offer a wide range of benefits and improved engineering performance compared to HFMS-2, CMS-2S and other grades of emulsions used in designing a CIR job. The highly stable nature of CSS-1h allows it to handle changes in base material and aggregates within the recycled substrate.

Increasing amounts of RAP have been successfully used in CSS-1h designs, and


yield excellent performance and cost savings compared to other emulsion options.

ROADRESOURCE.ORG TOOL

For municipalities, state officials, and engineers, the Pavement Preservation & Recycling Alliance has developed a comprehensive online resource that will help users navigate various pavement maintenance and preservation techniques.

This online resource website is **roadresource.org**, and is an invaluable

tool for road agencies to use to establish a pavement preservation program like Limerick Township's.

On this website, users can compare pavement conditions with preservation solutions, helping them align unique needs with the recommended preservation techniques. 

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