Rural Connecticut town stretches its road maintenance budget by focusing on chip seal program

By Paul Fournier

In past years the small town of East Windsor, Conn., has employed a variety of maintenance techniques to protect its road system, but with this year’s budget reduced due to the depressed economy, the community decided the best way to optimize the amount of road improvements was to use chip seal almost exclusively.

“We have only $275,000 for this year’s road surface maintenance program, so we really have to stretch those dollars,” said Leonard Norton, P.E., East Windsor’s town engineer and director of the Public Works Department and its nine-member staff.

Located on the east side of the Connecticut River halfway between Hartford, Conn., and Springfield, Mass., East Windsor has a land area of 26 square miles and a network of about 70 miles of roads. Most of the these are rural in nature with the exception of streets in its five villages and in residential subdivisions, a short section of I-91 in the town’s northwest corner, and US 5 (Main Street) running north-south parallel to the river.

Norton pointed out that the public works department devoted almost all its limited budget to chip sealing this year because it is the most cost-effective surface treatment, and they wanted to preserve as many miles of structurally strong road pavements as they could with the money available.

Chip Seal Candidates

“We wanted to keep our good roads good. Pavements that may have surface cracks but are otherwise in good condition with a sound base are candidates for chip seal.”

Norton said that applying this surface treatment at the right time significantly extends pavement service life. He also noted that in addition to being an economical choice, chip seal is thin enough to preclude having to adjust structures, and is a tough product.

“We’ve found that chip seal wears very well. You can plow it and the stones stay in place. And there’s no problem with black ice. You don’t have to raise manholes and other structures, and you don’t lose curb reveal.”

Pavement Preservation on the Rise

Chip seal involves applying hot liquid asphalt emulsion to an existing structurally sound pavement, spreading small stones or “chips” over the asphalt, and consolidating the surface with a pneumatic roller. Traffic is allowed almost immediately on chip-sealed surfaces, adding compaction. Later, loose stones are swept away.

This process is one of several thin, non-structural surface treatments being promoted as pavement preservation methods by the Federal Highway Administration and such organizations as the American Association of State Highway and Transportation Officials, National Center for Pavement Preservation and its regional partnerships.

In addition to chip seal, pavement preservation applications include thin-lift asphalt overlays, slurry seal and micro surfacing. They serve as thin protective covers for structurally sound pavements, and are being recognized by a growing number of state and local transportation agencies as economical ways to protect and extend the service life of engineered road pavements.
East Windsor Protects Roads Economically

General Contractor:
The Gorman Group

Owner:
East Windsor, Conn., Public Works Department
As a rule East Windsor employs chip seal on its higher-volume roads, according to the DPW director. “Most of these are two-lane, 22-foot roads. We don’t chip seal village roads that are 20 feet wide or less and have low-volume traffic,” he said.

For the 2009 season the DPW awarded the chip sealing of about 120,000 square yards of pavement, equivalent to about 11 miles of two-lane roads, to The Gorman Group headquartered in Albany, N.Y. A third-generation family-owned company that has been involved in highway construction since 1916, Gorman not only applied the chip seal but produced and supplied construction materials for the work including the asphalt emulsion – a styrene-butadiene-rubber (SBR) latex polymer-modified product.

In recent years, in order to increase the effectiveness of chip seal applications, East Windsor’s DPW has called for the use of SBR latex polymer-modified cationic asphalt emulsion for the process.

**Latex Improves Asphalt Performance**

Gorman’s asphalt emulsion plant in Scotia, N.Y., produced the emulsion, which was modified by SBR latex supplied by Fred Mello, a BASF Corporation consultant. Mello described the product:

“A Bearcat distributor truck sprays pavement with SBR latex polymer-modified, CRS-2PM asphalt emulsion at the rate of .40 gallons per square yard.

Left: Knight Construction’s Kenworth truck delivers 3/8-inch stone to Gorman Group’s crew during chip sealing of Plantation Road in East Windsor.

**Third-Generation Supplier-Contractor**

Gorman used a 3,500-gallon Bearcat asphalt distributor on a Mack truck chassis to spray the road surface. According to Todd Konifka, sales representative for Gorman, the CRS-2PM cationic rapid-setting SBR-modified asphalt emulsion was applied at the rate of .40 gallons per square yard. This was followed immediately by a Bearcat chip spreader broadcasting 3/8-inch quarry stone at the rate of 20 pounds per square yard. A CAT 10-ton pneumatic roller performed compaction right behind the chip spreader.

Gorman allowed traffic on the compacted chip seal surface immediately after its crew switched work lanes.

Konifka said the crew – headed by Jim Brush, a working foreman with 15 years experience in chip sealing – can achieve production rates up to 40,000 square yards per day. They work fast, he said, because polymer-modified asphalt emulsions cure quickly – one of the reasons they resist raveling and have a long service life.
Long Life a Plus in a Recession

According to the DPW’s Norton, they began using latex-modified asphalt emulsion about three years ago and are very satisfied with its performance. “It really grabs the stones and holds them. There’s no problem with asphalt peeling off the stones or bleeding up to the surface.”

Based on the performance so far of pavements chip sealed using polymer-modified asphalt emulsions, Norton expects them to realize an extended service life of seven to 10 years. That kind of longevity is an attractive option for anyone responsible for maintaining a community’s roads and streets as municipal revenues continue to drop in the worst recession since the Great Depression.