



EPOXY POLYMER EXTENDS LIFE FOR WORLD'S LONGEST COVERED BRIDGE

It's a smoother and safer ride for motorists crossing over the Hartland Covered Bridge in Hartland, New Brunswick, Canada—the world's longest covered bridge. The bridge deck has been covered with an epoxy polymer overlay from Unitex. The wood deck of the 107-year-old, 1,282-foot structure should now last for decades.

The deck repairs were part of a bridge rehabilitation project—the most extensive in its history.

“Many governments choose our epoxy overlay application as a better way to protect bridge structures for the long term, reducing the environmental impact of added construction,” says John Grissinger, Unitex president. “It helps them save taxpayer dollars, too.”

INNOVATIVE APPROACH

The first stage of deck repairs was completed in June 2008. The bridge was closed for about 4 weeks. Remaining deck repairs should be completed this fall.

The epoxy polymer overlay was applied in the morning and allowed to cure overnight. The covered bridge kept the surface area cool, providing for longer working times. The crew was even able to work on rainy days.

The epoxy polymer adds less weight than resurfacing with asphalt, which had been done previously. Compared to using concrete, the epoxy overlay reduces added weight by more than 50 percent. It is also more flexible and more corrosion resistant than resurfacing with asphalt or concrete, and it provides better skid resistance.

The epoxy polymer overlay is traditionally used on concrete bridge decks, but has proven successful on wood bridges as well. It is also used on parking structures, pedestrian bridges, and more.

Unitex's project partner was its distributor, J.W. Bird Stairs of Fredericton, New Brunswick.



Workers spread Unitex Pro-Poxy Type III DOT epoxy to the wood deck of the world's longest covered bridge in Hartland, New Brunswick, Canada. The epoxy adds less weight than resurfacing with asphalt, which had been done previously. The overlay will extend the bridge deck's life, and make it smoother and more skid resistant.

DECK REHAB: STEP BY STEP

The New Brunswick Department of Transportation was responsible for all of the repairs. In all, the deck repairs used 1,650 gallons of Type III DOT epoxy polymer overlay; 119,000 foot-boards of decking lumber; and 6,000 pounds of nails.

The deck repairs included the following steps:

- Five of the seven deck spans were removed, one span at a time. (Two spans were repaired several years ago.) The spans measure 16 feet wide by either 150 or 175 feet long. The deck consisted of asphalt over timbers, which had been treated with coal tar creosote.
- New, Wolmanized-brand timbers treated with a copper-based preservative and fungicide were laid. The timbers are 7 inches wide by 1¾ inches thick, with lengths of 12, 14, or 16 feet.

FOR more
INFORMATION



Unitex Chemicals, based in Kansas City, Missouri, develops and manufactures solutions for concrete construction and repairs. The 40-year-old, family-owned company serves contractors, departments of transportation, and others worldwide. For more information, please visit www.unitex-chemicals.com.

They were placed on edge, laid side by side, and nailed down.

- The crews roughened the new timber surface with a very light sandblasting to help the Unitek Pro-Poxy Type III DOT epoxy adhere better.
- The epoxy was mixed on-site in large plastic tubs, using a drill with a "Jiffy mixer" at 300 revolutions per minute for exactly 3 minutes.
- For the first layer, the crew mixed the aggregate with the epoxy in the tubs, adding extra aggregate to thicken it. This thicker mixture kept the epoxy from leaking through the timbers. They then dumped the mixture and spread the epoxy using squeegees with notches. They were able to cover about 20 to 23 linear feet of deck per each tub mixture.
- Three additional applications were then done. Again, the epoxy was mixed in the tubs and spread onto the deck. Next, aggregate was broadcast by hand onto the wet epoxy. This approach, as opposed to blowing it onto the surface, provided better control and kept the aggregate from blowing into the St. John River below.

SEALING THE DEAL WITH AN EYE ON THE ENVIRONMENT

The Pro-Poxy Type III DOT epoxy polymer is a solvent-free, moisture-insensitive, 100-percent solids, low-modulus, low-viscosity, two-component bonding agent. The overall environmental advantages of the system include the following:

- Increasing the life span of a structure, thus reducing or delaying the environmental impact of rebuilding
- Reducing construction impacts by extending the amount of time between repairs or resurfacing
- Utilizing a low-emitting material
- Reducing the downtime and the environmental impact of stopped and diverted traffic

Compliances and other technical specifications for the epoxy include the following:

- American Society for Testing and Materials (ASTM) C-881-90, Type III, Classes B & C
- Meets U.S. Department of Agriculture (USDA) specifications for use in food-processing areas
- Meets American Association of State

Highway and Transportation Officials (AASHTO)/Association of General Contractors (AGC)/American Road & Transportation Builders Association (ARTBA) Task Force 34, October 1995

Using the epoxy polymer overlay also provided excellent bond strength and

high early strength. The epoxy is moisture insensitive and non-flammable, and it is easy to mix, with a 1:1 ratio.

After 107 years, the Hartland Covered Bridge was due for some tender loving care. With this environmentally friendly epoxy, the extensive rehabilitation project should ensure that the bridge lasts for many years to come. ♦

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Growth. n.

*Definition: A process of PROGRESSIVE DEVELOPMENT and CHANGE.
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