

HALFWAY DOWN THE ROAD

Kansas bridge polymer surface project is largest in United States.

By Rebekah Rosenfeld, Editor

When it came time to resurface the concrete on a portion of one of I-135's expressways in Wichita, the Kansas Department of Transportation (KDOT) decided to repair the 1.76 million square feet using epoxy. Halfway completed, the project is believed to be the largest polymer surface project in the United States and is expected to cut bridge maintenance costs and repairs while providing a safer driving surface. The winning bid for the project went to Wildcat Concrete Services, a subsidiary of Wildcat Construction Co. Inc. & Subsidiaries, which is headquartered in Wichita, Kan.

EPOXY IS THE WINNING METHOD

Epoxy is a binder that holds the aggregate together and is stronger than concrete. It is so strong that to attempt to pull it off would break the concrete. Epoxy polymer is lighter and more flexible and weather- and corrosion-resistant than resurfacing with concrete. Because it reduces weight added to the structure by more than 50 percent, it will help reduce the amount of structural repairs in the future. "We believe using an epoxy overlay can help save Kansas taxpayers dollars because research shows that repairs made with this material are quicker and less costly, weigh less and are more waterproof than those using concrete," says Dave Meggers, KDOT research development engineer. It has also proved to be a durable material, lasting at least 15 years before needing to be replaced or repaired.

NO STOPPING TRAFFIC

Unlike previous bridge epoxy resurfacing projects Wildcat has worked on, the busy bridge stayed open throughout the entire project. To avoid disturbing heavy daytime traffic, the 10-person crew worked from 7 p.m. to 6 a.m. for 55 nights and completed 15 days ahead of schedule. "We've used epoxy on other projects," says Wildcat Concrete Services President Stuart Brock. "But this project was different for us because all of the work was done at night." One lane remained open during the working hours while the crew applied the epoxy to the other. It is time-friendly. If the crew began working at 7 p.m., the epoxy would be set by 6 a.m. in time for the morning rush-hour traffic.

I-135 EPOXY APPLICATION

Unitex Type III DOT, a flexible epoxy that bends with the bridge deck, was used for the project. The application process is a quick, four-step process: shot-blasting the concrete, mixing the epoxy, pouring and spreading, and finally laying the aggregate.



Wildcat crews lay Unitex epoxy at night to avoid disturbing traffic on Kansas' I-135 expressway.

Before anything can be done, the existing surface must be totally clean. To do so, the crew shot-blasted the concrete to pick up all dust and materials and free the surface of oils, which would prevent the epoxy from correctly bonding to the surface. This gives the epoxy a good, clean surface to bind to and is done only a couple of hours before applying it. Once the surface is shot-blasted and free of any materials that would interfere with the bonding, the epoxy is mixed.

There are two components of epoxy, known as "A Side," the resin, and "B Side," the hardener. The mixture is a 1:1 ratio of both components and takes three minutes to mix. After the two parts are mixed, it is poured, or "flooded," onto the bridge deck where the crew, wearing spiked shoes (similar to golf cleats) to protect their feet and keep from messing up the wet surface, will spread the epoxy out with large squeegees that have ³/₈-inch notches on them to ensure the correct amount is evenly spread.

Before the epoxy "sets up," or hardens, it is important to get the aggregate into it. Temperature is important for the epoxy to bind to the concrete. "The ideal temperature is 70 degrees," says Jerry Byrne, Unitex technical services specialist who worked on the project. "However, you don't always get that. It

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INFORMATION



For more information about Wildcat Construction Co. Inc. & Subsidiaries, call 316.945.9408.

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“WE BELIEVE USING AN EPOXY OVERLAY CAN HELP SAVE KANSAS TAXPAYERS DOLLARS BECAUSE RESEARCH SHOWS THAT REPAIRS MADE WITH THIS MATERIAL ARE QUICKER ...”

—DAVE MEGGERS, KDOT RESEARCH DEVELOPMENT ENGINEER

cannot be below 55 degrees, and if it is at that temperature, it has to be rising. That has to be the day's low, not the high.” The maximum temperature for applying epoxy is 100 degrees because the hot temperature causes the epoxy to harden too fast. “The saying is, the lower it [the temperature] is, the slower the set. The higher, the quicker,” Byrne says.

The entire process is known as the “double broom and seed” because of its two-layer system. After the initial layer is set, the surface is blown off to clean the surface from the day's traffic before the second layer is applied. Having to do so was a new step for the Wildcat crew. “Previously, we were able to close down the bridge, so it stayed clean because there was no traffic going back and forth on it,” Johnson says. “With this particular project, it was almost like we were taking a step back because we would have to re-clean

between the two layers, so it changed the way we used to doing things.”

PROBLEM PREVENTION

Fortunately, the only challenges encountered on the project were the basic equipment maintenance problems and other usual jobsite problems. Preventing other problems required a lot of communication and preparation prior to beginning the project. “There was an extensive amount of preparation that went into this project,” Byrne says. “The communication between the owner (KDOT), the contractor and Unitex was perfect. We all worked really well together, and we truly worked as a team. Because of this, we were able to knock out any kinks that may have delayed the project beforehand. Since all of the work had to be done at night to not disrupt traffic, there had to be a lot of coordination, and there was.” ♦

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