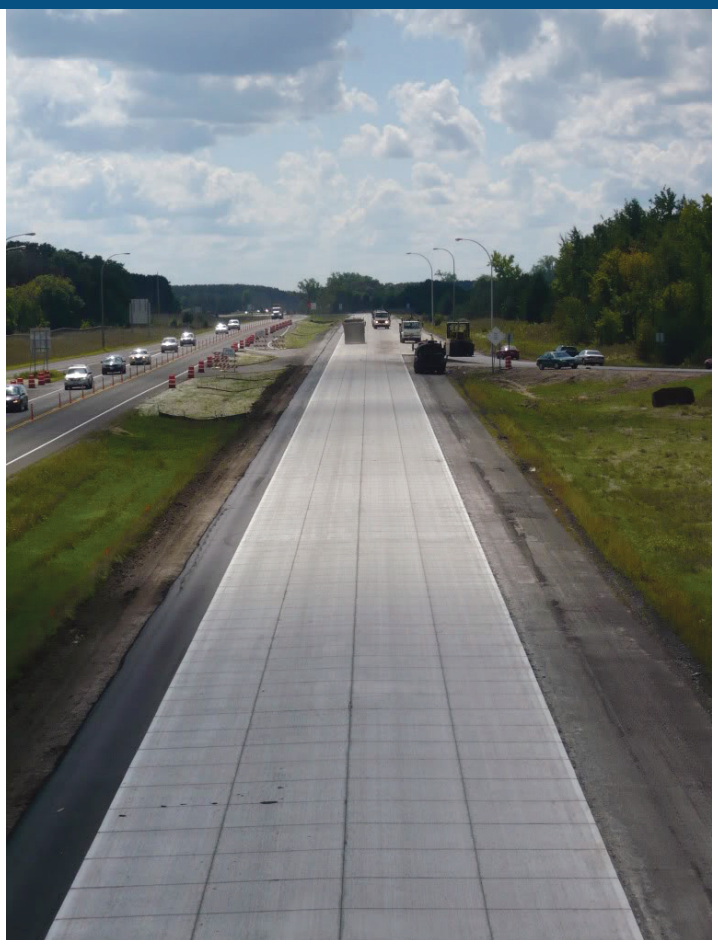
I-35, Harris, MN

THIN CONCRETE OVERLAY



BY THE SUMMER OF 2009, Interstate 35, located approximately 40 miles north of the Twin Cities, began to show signs of major deterioration. As the only north and south interstate in the state, I-35 serves as a major thoroughfare for access to northern Minnesota. Running northbound and southbound from Highway 95 in North Branch to Harris, Minn., a 7-mile, four-lane stretch of the Interstate was in need of repair. The existing asphalt had deteriorated to the point where the Minnesota Department of Transportation (Mn/DOT) decided to try a new rehabilitation method involving concrete over asphalt. This would come to be known as the first large scale project using a thin concrete overlay of asphalt pavement for Mn/DOT.

The scope of work included milling two inches of the existing asphalt and replacing it with a six-inch thick concrete overlay jointed in a six-foot by six-foot pattern. Existing asphalt conditions included cracks approximately 40 to 60 feet apart for the entire project length, with many of these cracks reaching several inches below the original surface level. Having considered mill and thick asphalt overlays, because of the extreme existing damage, Mn/DOT chose to use a concrete overlay instead.

"We were aware of the success of the MnROAD section that was built in 1997. That was a six-inch concrete section and we knew it was still performing really well today. We were looking for a project to try a concrete overlay on that would be successful," said Dave VanDeusen, Metro Materials Engineer at Mn/DOT. "Something needed to be done about the existing road conditions and we felt that concrete would be a good fit. Now we have a longer-lasting resurfacing option to add to our toolbox."

Throughout the summer months, Interstate 35 experiences higher traffic volumes from vacationing families, posing a challenge for the less than four-month time frame. Two phases were required to install the new concrete overlay, and work could not begin until after the Fourth of July weekend.

Despite these challenges, the project was completed on time and awarded incentives for exceeding specifications in the concrete mix design, aggregate quality and ride quality departments.

After the overlay was completed, a small amount of the deep, severely deteriorated cracks reflected through the concrete, causing the concrete to crack. As a result, future projects will combat this problem by patching and isolating the remaining cracks to prevent reflection through the concrete.

The initial average IRI smoothness was 167 inches per mile, with two miles in both the north and southbound direction of Interstate 35 at more than 200 inches per mile, prior to the concrete overlay application. The final IRI average was 45 inches per mile. The total project value was $8.5 million, or approximately $607,143 per mile, and the concrete paving totalled $3.8 million, or $19.50 per square yard. Mn/DOT anticipates a life expectancy of 20 years, and the use of concrete over asphalt should ensure that. The project was completed in the fall of 2009.

"We ended up with a really smooth ride, and Interstate 35 is one of the better roads we have now," said Eric Embacher, Metro Construction Resident Engineer at Mn/DOT.

TEAM MEMBERS

- Minnesota Department of Transportation (Owner)
- Knife River Corporation (Prime contractor)
- PCi Roads (Paving contractor)
- Lafarge North America (Cement supplier)
- Headwaters Resources (Fly ash supplier)
- Construction Materials, Inc. (Rebar, curing compound supplier)