What is a Diverging Diamond Interchange?

County Materials Corporation manufactured and delivered prestress concrete girders to construct Wisconsin’s first Diverging Diamond Interchange Bridge (DDI), a state-of-the-art system designed to improve traffic flow and safety. The Wisconsin Department of Transportation (WisDot) constructed the DDI in fall 2015 and 2016 to replace the I-39/90 and WIS 11 Avalon Road interchange south of Janesville, Wis.

A DDI is designed to enhance safety by eliminating left turns in front of oncoming traffic. This is accomplished by shifting traffic to the opposite side of the road on both ends, allowing for free flow left turns. East and west traffic continuing on Avalon Road cross back over to the right side on the interchanges’ opposite end.

A WisDOT study found a majority of vehicles merge onto I-39/90, not continuing onto Avalon Road, from these results WisDOT determined a DDI is the most efficient and safest type of interchange to construct.

WisDOT spokesperson Steven Thiesen explained several benefits a DDI offers. “Although new to Wisconsin, DDIs have been utilized in other communities in the United States and have proven very successful in managing traffic flow and meeting needs for all users. The benefits include improved safety, increased capacity and efficiency, reduced backup congestion and easier navigation,” said Thiesen.

Limiting Road Closures with Prestressed I-Girders

County Materials supplied the project contractor, Zenith Tech, Inc., with 30 massive 45W prestress girders, measuring 115 feet each.

Limiting road closure time for the high-traffic highway was a major consideration in the construction process. This was accomplished by utilizing ready-to-install prestressed concrete girders. By manufacturing the girders in an indoor controlled environment, County Materials is able to carefully gauge each girder’s quality and strength. Many bridge projects cast girders onsite, which slows down construction time, requires more equipment and takes place in an uncontrolled environment.

The bridge was made in two phases, one for each direction of traffic, which has its own bridge. Girders were delivered for the first bridge on November 16, 2015. After the first sets of girders were installed, crews spent the next few months laying rebar, pouring the road surface, adding guardrails and other features. County Materials delivered girders for the second bridge in July 2016.

Grand Opening

On October 27, 2016, the DDI was opened to one lane with temporary traffic signals shifting vehicles. A week later, on November 3, 2016 WisDOT held an official ribbon cutting ceremony. Over the next few weeks, permanent traffic signals, pavement markings, and signs were installed to finish the project.
The DDI construction project was part of the larger WisDOT I-39/90 Expansion Project, one of the largest highway projects undertaken in south-central Wisconsin. The expansion project, including the DDI will play an important role in reducing congestion, increase safety, and expand the area’s economy by opening the road for more traffic.

Project Background

Products Used: Bridge Girders
Location: Janesville, WI
Contractor: Zenith Tech, Inc.