

# Repurposing Prestressed Concrete Girders in Oregon

by Matthew Stucker and Dr. Tanarat Potisuk, Oregon Department of Transportation



Repurposed girders erected on Bridge 22009 of the Newberg-Dundee Bypass Project.  
Photo: Oregon Department of Transportation.

Citizens and businesses of Yamhill County, Ore., have been advocating for the construction of a traffic-congestion solution along Oregon Route 99 West through the towns of Newberg and Dundee for over 25 years and will soon have access to the Newberg-Dundee Bypass (see the Project Profile article in this issue that is on the same project). It is expected to significantly improve the quality of life and overall traffic flow for the region. Bridge design and construction for this first phase of the planned 11-mile bypass incorporated 112 precast, prestressed concrete girders originally produced for another Oregon project.

During construction of the Pioneer Mountain-Eddyville (PME) project, the Oregon Department of Transportation (ODOT) had to reconsider the planned bridge solution. ODOT determined that a large fill and culvert, coupled with landslide mitigation, would be a better path forward for the PME project. Because girders for the PME project had already been fabricated by Knife River Corporation's Prestressed Concrete Division, ODOT entered into an agreement to store the unused bridge girders at the company's facility while ODOT searched for an opportunity to use the fabricated girders.

With the design of the 10 bridge structures on the ND Bypass underway, using the girders from the PME project presented a unique twist to designers during the bridge design type, size, and location decision process. All 112 girders were 84-in. bulb-tee sections, and 105 of them were approximately 150 ft long. Some of the girders were originally designed for bridge spans that were located on a horizontal curve with skew; therefore, the girder lengths in the same span varied by as much as 5 ft 2 in. While all design options were considered, it was determined that all 112 repurposed girders could be efficiently used on four of the 10 bridges on the ND Bypass project.

## All 112 repurposed girders could be efficiently used on four of the 10 bridges on the ND Bypass project.

Designers for the various bridges selected girders for each bridge by best fit and on a first-come, first-served basis. One bridge is located on a horizontal curve, and the other three bridges

are on a tangent roadway alignment. Minor modifications to the repurposed girders were required to fit the new end-girder connection design. The last bridge designed had to incorporate girders with varying lengths, which was accommodated by introducing slight skews in two interior piers that would have otherwise been oriented perpendicular to the roadway alignment. Before transporting the girders to the new site, lifting loops were evaluated for corrosion damage because they had been exposed to the elements for 7 years.

New bridge girders for the ND Bypass would have typically cost about \$3.4 million, whereas approximately \$1.1 million was spent for storage, transport, placement, and adjustment of the girders originally intended for the PME project. Collaboration with project stakeholders, cost justification, and construction timing resulted in a successful girder-repurposing project. 

*Matthew Stucker is a structural design engineer and Dr. Tanarat Potisuk is a prestressed concrete standards engineer, both with the Oregon Department of Transportation in Salem, Ore.*