

I-5/SR 16 Interchange & Westbound Nalley Valley

Location: Tacoma, WA

Products Used: US SPEC NA Grout and NA-50

Highlights: ASBI Bridges Award of Excellence in 2011

The Nalley Valley Interchange Reconstruction Project is designed to increase safety, improve mobility and reduce congestion on I-5 through Tacoma, WA. This project will distribute traffic between I-5 and the Tacoma Narrows Bridge toward Olympic Peninsula. The westbound Nalley Valley Interchange is the second of three phases of bridge construction. This project was awarded to Guy F. Atkinson Construction.

Nearly 131,000 vehicles travel each day through the Nalley Valley Interchange. Because the interchange was too narrow to accommodate additional traffic lanes, Atkinson reconstructed the roadway by building three new bridges with a total of 400,000 sq. ft. of bridge deck. The four-span bridge is 1,061 feet long with span lengths of 224, 295, 295 and 246 feet.



The design for the southwest bridge originally called for a steel tub girder bridge; however, it was redesigned and value engineered to be a precast segmental box girder bridge - **the first precast segmental bridge constructed in WA**. The redesign provided a more economical bridge with extended design life and reduced maintenance.

A challenging portion of the Nalley Valley Interchange was a post-tensioned overpass utilizing concrete segmental bridge construction. In order to minimize weight and satisfy shear demands in a shallow structure, they introduced inclined post-tensioning tendons. To increase ductility and continuity for seismic demands, the included tendons are located in the webs and anchored at each pier.

The contractor, Guy F. Atkinson Construction, LLC, had experience with US SPEC products and was very happy with the performance of NA-Grout as well as the support and service they received from US SPEC on a previous project in 2008. They chose to work with US SPEC in selecting the grout for this project.

The grout not only had to meet the required specification (WSDOT and AASHTO LRFD), it also had to work with a unique feature of the project: a vertical curve in the bridge which increased head-pressure in the cantilever tendons. When referencing Post-Tensioning Institute (PTI) Guide Specification, a Grout Type B or C with zero bleed at 50 psi is needed to resist bleeding with a vertical rise between 7'-99'. US SPEC NA-50 was evaluated and determined suitable, experiencing zero bleed when tested in accordance to Appendix C of PTI-Guide Specification and correlated to Table 4-1.

NA Grout and NA-50 met the same project specification; however, it proved to be a more cost-effective solution without compromising quality or product availability.

This project went on to win an ASBI Bridges Award of Excellence in 2011.

