

SR 526/I-5 Interchange and Flyover Ramp

Everett, Washington

Owner: City of Everett

Description: The City of Everett, in a partnership with Boeing, WSDOT, and FHWA, undertook this project to accommodate the increase in traffic with the opening of Boeing's 777 Plant. INCA Engineers, Inc., A Tetra Tech Company (INCA) provided scoping, conceptual design, alternatives analyses, preliminary and final plans, specifications, cost estimates, and construction services for major interchange modifications. This section of SR 526 is a fully-directional, four-level interchange, over a mile in length. Proximity to the Everett Mall required year-around traffic flow during construction. The bridge is a five span, 1,055-foot long steel plate girder bridge, which is curved at a 700-foot radius and is designed in accordance with AASHTO's Guide Specifications for Horizontally Curved Highway Bridges.

The solution called for a top-to-bottom tunnel to pass beneath westbound SR 526 followed by a steel plate girder bridge to span I-5. Expansion of SR 526 became necessary to create an additional lane for the new ramp. INCA prepared an access points decision report, required by FHWA, because the interchange provided additional access to the existing freeway. A technical advisory committee, consisting of federal, state, city, and Boeing representatives, evaluated several alternative designs for the new ramp. Coordination efforts were extensive between the City of Everett, WSDOT, and FHWA (the approving authority).

The bridge is a 5-span, 1,055-foot long steel plate girder bridge curved on a 700-foot radius. Supports for the structure consist of compound-radiused concrete columns atop 10-foot diameter drilled concrete shafts. The bridge deck and traffic barrier are composed of 5,000 psi concrete with a width of 25 feet between barriers.

The top-to-bottom underpass is unique in design. The tunnel roof was built on grade and opened to traffic and then excavated below to build the tunnel inside. Secant pile walls along the length of the tunnel and its approaches perform a twofold purpose:

- ▶ A foundation is provided for the tunnel roof that spans between secant pile walls.
- ▶ The piles serve as a retaining wall to prevent the soil surcharge of the adjacent SR 526 lanes from sloughing onto the tunnel and depressed roadway of the approaches.

Key Features:

- ▶ Conceptual design and analysis
- ▶ Plans, Specifications, and cost estimates
- ▶ Curved steel plate girder bridge
- ▶ Retaining and noise walls
- ▶ 600-long tunnel
- ▶ Signage and signalization
- ▶ AASHTO specification conformance
- ▶ Multiple agency coordination
- ▶ Unique and innovative design for the top-to-bottom underpass
- ▶ Cut-and-cover tunnel roof built on grade, opened to traffic, and then excavated below to build the tunnel

In addition to secant pile walls, 2,800 linear feet of concrete sound walls were built along SR 526 to redirect freeway noise away from residences. Along the right shoulder of the eastbound lane, 1,650 linear feet of cast-in-place walls were built on spread footings. On the right shoulder of the westbound lanes are 1,150 linear feet of precast wall on 30-inch diameter drilled concrete shafts. At the east abutment of the bridge where it merges with I-5, over 1,050 linear feet of reinforced earth walls were built.

This project was awarded the "1997 Washington Quality Initiative Achievement Award."

