



Bridges

Reference Details:

Owner City of Everett
Public Works
Department, WA, USA
+++ **Engineer** Hardin
Lawson Associates,
Seattle, WA, USA +++

General Contractor
Atkinson Construction,
Renton, WA, USA

DSI Units DSI USA,
Western Division, Long
Beach, CA, USA

DSI Services Supply,
installation, stressing
and grouting of 80t of
&OSlash;15.2mm strand
with 112 of MA
anchorage



Post-Tensioning of Pacific Avenue Overcrossing with DSI Multistrand MA System

Pacific Avenue Overcrossing, Everett, Washington, USA

Pacific Avenue is a major artery that connects the coastal area along the Pacific Ocean with interstate freeway 5 in the city of Everett, Washington. A railroad track intersects Pacific Avenue and causes severe traffic congestion. The city decided to build a bridge structure that will ensure undisturbed traffic flow over the track with ramp connections to two adjacent streets.

In order to minimize traffic disruptions during construction and to meet a tight schedule, the engineer decided to use a precast concrete structure. Precast bathtub spliced girders were chosen as the preferred method of construction.

Girders were delivered to the job site on special length flat bed trucks from the precast yard. Long girders with lengths up to 32m created unusual logistic transportation conditions. Bridge girders were set on temporary shoring towers and jacked at the center to reduce dead-load moments and stresses. A reverse load was placed on the girders until the cast-in-place deck and post-tensioning were installed on the composite section. This format produced minimum girder depths and 50 percent less post-tensioning. Additional reinforcing and ducts were placed through cast in place pier caps that served also as the closure pour. The top deck is poured over the open girders and post-tensioning strand is pushed through the ducts and connected at the abutments with DYWIDAG MA Anchorages. The stressing operation was performed at both bridge abutments.

Girders were prestressed to compensate for transport loads and dead weight of the in-place deck slab. Post-tensioning the girders provided support for live loads. The bridge is about 229m long, 19m wide, has eight spans (the longest one being 34m) with a six-bathtub girder cross-section. The structure is impressive among precast concrete bridges and for this reason received a 2002 design award from PCI (Prestressed Concrete Institute). It makes a very good promotion for a precast, post-tensioned concrete structure with extreme lengths. The total project, also included two shorter bridges, started in 2000 and was completed by the end of 2001.

Using precast girders held construction time to less than 14 months. A cast-in-place alternative would have required two to four months longer. The total project involved 58 precast prestressed and post-tensioned girders. The total project cost was \$10.2 million with the precast costs being \$1.66 million.