



FEMA

Critical Waterline Seismic Retrofit Success

Lacey, WA - Holmes Island lies within the waters of beautiful Long Lake in western Washington State. Less than 30 homes are on the island, with only one road and bridge for access and one pipeline for its water source. That waterline follows along Holmes Island Road and across the bridge.

In the summer of 1995, a project was undertaken by the City of Lacey, Public Works Department. Approximately 200 feet of pipeline were replaced on each side of the bridge and across totaling 450 foot. Flexible joints were designed to rotate, extend, retract and twist. Connections were high density 8-inch sleeved polyethylene water main pipes that were run through 10 inch steel pipes for extra protection. The total cost for this project, funded through the Water Utility Funds for Capital Improvement, was \$162,000.

In the event of an earthquake, these pipes move along with the bridge and avoid rupturing, which would cause loss of water to the island and thousands of dollars in repair. "It would cost \$4,000 for one coupling alone," states Mark Russell, Design and Construction Manager for the City of Lacey, Public Works Department. "A temporary system would cost \$15,000 to \$20,000."

The Holmes Island Bridge and waterline were tested on February 28, 2001, when a strong 6.8 earthquake struck the Puget Sound Region of Western Washington.

Approaches to the bridge slumped 6 to 12 inches, and bridge supports were pulled away from the banks. The ground all along the road moved at least that much. The water main pipes dropped 8 inches. Because of the flexible expansion capability of the waterline under the road, no pipes were broken and water supply was never compromised.

The City of Lacey is currently seeking \$50,000 in Federal funds to replace a portion of the waterline that is out of alignment from the earthquake. Had the city not planned ahead, they could have spent up to \$20,000 for a temporary "fix" and still would have to spend the \$162,000 or more dollars for a new pipeline. More importantly, the residents of Holmes Island did not lose their water source, and now have reassured confidence that their lives will not be compromised from loss of water.



Thurston County,
Washington



Quick Facts

Sector:

Public

Cost:

\$162,000.00 (Actual)

Primary Activity/Project:

Retrofitting, Structural

Primary Funding:

Local Sources