



EXECUTIVE SUMMARY

This complex and high-profile project on the northern Oregon coast replaced six aging bridges in the span of two construction seasons for the City of Astoria. It was complicated by existing infrastructure, marine wildlife, lack of as-built plans, and more.

The City of Astoria is the site of America's oldest settlement west of the Rocky Mountains. The City was founded in 1811, and its historic working waterfront originally featured many canneries used to package and ship an abundant fishery harvest. Astoria is a rare western continental town that existed prior to the completion of a railroad to its town site. Its elevated streets and associated street right-of-way extend into the Columbia River on bridges that are integrated into the adjacent pile-supported waterfront piers. In 1898, a railroad was completed along the waterfront, creating an intersection with each city street.

Today, the canneries are not as numerous, and trucks now haul freight to and from the piers. The railroad trestle is now used as a riverfront trail and supports the Astoria Waterfront Trolley, a popular tourist attraction. The new bridges are America Disability Act (ADA)-compliant, multimodal transportation facilities supporting pedestrians, bicyclists, vehicles, and rail users. In addition, they are critical to support the vibrant waterfront economy of Astoria.

The bridges are bordered on three sides with timber pile-supported buildings and wharf infrastructure, and the fourth side is the historic district of downtown Astoria. They are also intersected at right angles by a railroad trestle requiring unique bi-directional framing. Each is essentially a unique jigsaw puzzle piece. Over time, the existing waterfront timber piles have seen multiple replacements, creating a labyrinth of old decaying timber piles beneath the bridge sites. In order to fit each bridge into this maze of existing (and abandoned) waterfront infrastructure (which has no as-built drawings), a three-dimensional (3D) laser scan was used to create survey topography. This data gave the design team a measurable 3D understanding of each bridge site necessary to fit the new structure into its unique location.

The bridges were designed with precast concrete superstructures and pile caps supported upon steel pile foundations to meet a 75-year design service life in a marine environment (cathodic protection was used throughout). The bridges provide the only access to the waterfront businesses, which are heavily dependent upon tourist patronage. The design incorporated constructability considerations for accelerated and staged bridge construction to maintain access to all businesses.

The project incorporated context-sensitive design features appropriate for the Astoria Downtown Historic District, including decorative lighting, roadway and pedestrian railings, and integral colored and board-formed textured concrete.

The end result: Six new bridges that fit seamlessly into their built environment and serve as key links in Astoria's rapidly revitalizing waterfront area.