

Marine View Drive (SR 509) Bridge Replacement

Des Moines, Washington

Owner: City of Des Moines

Description: The Marine View Drive Bridge (SR 509) was first identified in 1989 as a box-culvert replacement in the Des Moines Creek Restoration Project. The 4-foot by 6-foot concrete box-culvert was built under embankment fill approximately 60-feet high, which separated Des Moines Beach Park from Des Moines Creek Park. Urban development resulted in an increased volume of water discharge to the existing culvert and as a result, the culvert acted as a high velocity fish barrier.

INCA Engineers, Inc., A Tetra Tech Company (INCA) provided plans, specifications, and estimates for construction of a bridge to replace the existing culvert. The design resolved several issues and included a pedestrian trail to connect parks, fish passage to the upper reaches of the creek, increased hydraulic capacity, and a utility corridor for the Midway Sewer District's proposed 48-inch diameter sewer outfall. The project incorporated a concrete bridge, retaining walls, pedestrian trail, stream relocation, landscaping, storm drainage, paving, curbs and gutters, and other improvements. The street drainage design included modifications to the existing drainage system in the immediate vicinity of the bridge improvement.

INCA's structural engineers recommended a drilled shaft technique instead of a conventional tie back soldier pile wall for the bridge design, resulting in a 40% cost savings to the City of Des Moines. This unique top-down construction technique minimized traffic disruptions and impacts to existing utilities.

INCA developed a 3-dimensional computer model of the constructed project that took the viewer from the beginning of the pedestrian trail, along the creek, and under the bridge, including a view from the pedestrian trail of the underside of the bridge. This tool was instrumental in coordinating efforts with the Washington State Department of Transportation for approval of the preliminary bridge plan.

Identified as part of a mitigation package for salmon recovery, INCA updated the original designs for the bridge to meet current bridge standards and completed final contract documents in 2½ months, an aggressive schedule since the bridge layout required abutments over 50-feet tall. INCA completed the bridge plans and specifications on time and the City was able to advertise for construction in accordance with its schedule.

This project received ACEC's Engineering Excellence Award "Bronze for Original or Innovative Application of New or Existing Techniques" 2008 and ASCE's "Award of Excellence" 2007.

