

AESTHETIC MODIFICATIONS TO TYPICAL PRECAST BRIDGE PRODUCTS

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EXPANDED ABSTRACT

Oregon Department of Transportation (ODOT) is well into their Bridge Replacement Program. ODOT contracted with the Oregon Bridge Delivery Partners (OBDP) to help with the program management. The program has adopted aesthetic standards that bridge designers must consider during the structure type selection.

Bridge design is typically based on functionality considerations such as vertical and horizontal clearance, roadway alignment, span-to-depth ratio, and environmental constraints. Architectural input is rarely incorporated into the structure type selection.

The aesthetic standards established by OBDP include parabolic sight lines to be incorporated in the superstructure geometry. For example, the depth of the superstructure at the supporting pier shall be 1.3 times the depth at midspan and the transition between these depths shall follow a parabolic shape and extend into the span a distance of 20% of the total span length. An architectural guideline has been developed for all bridges constructed in the Columbia River Gorge Corridor.

The precast industry in Oregon has recently incorporated these requirements into the fabrication of typical linear elements such as girders and box beams. The Newport Avenue Bridge in Bend, Oregon included parabolic spread box beams. In fact, the engineer took advantage of the voided element to incorporate unsightly utilities across the bridge. The MLK Bridge Replacement project in Portland Oregon has included spread box beams with a parabolic soffit and sloped sides and dentil work to enhance the exterior aesthetics. The design build project that includes the north and south bound I-5 bridge replacements over the McKenzie River near Eugene, Oregon has detailed 72 bulb tee girders with an 18-inch parabolic haunch near the girder ends. Other projects have incorporated precast fascia elements that are supported from the deck to hide the linear elements while resulting in a structure with parabolic sight lines. These precast panels can incorporate many types of exposed aggregate finishes, custom form geometry to simulate fractured stone, and stains to improve the appearance of these bridges.

This presentation will include fabrication and construction for many projects that have included the aesthetic modifications to typical precast bridge elements in the State of Oregon.

Keywords: High Strength Concrete; Producer Project Report; Creative/Innovative Solutions; Aesthetics; Construction; Coatings and Colors; Design-Build; Hauling and Transporting; Plant Production; High Performance Concrete