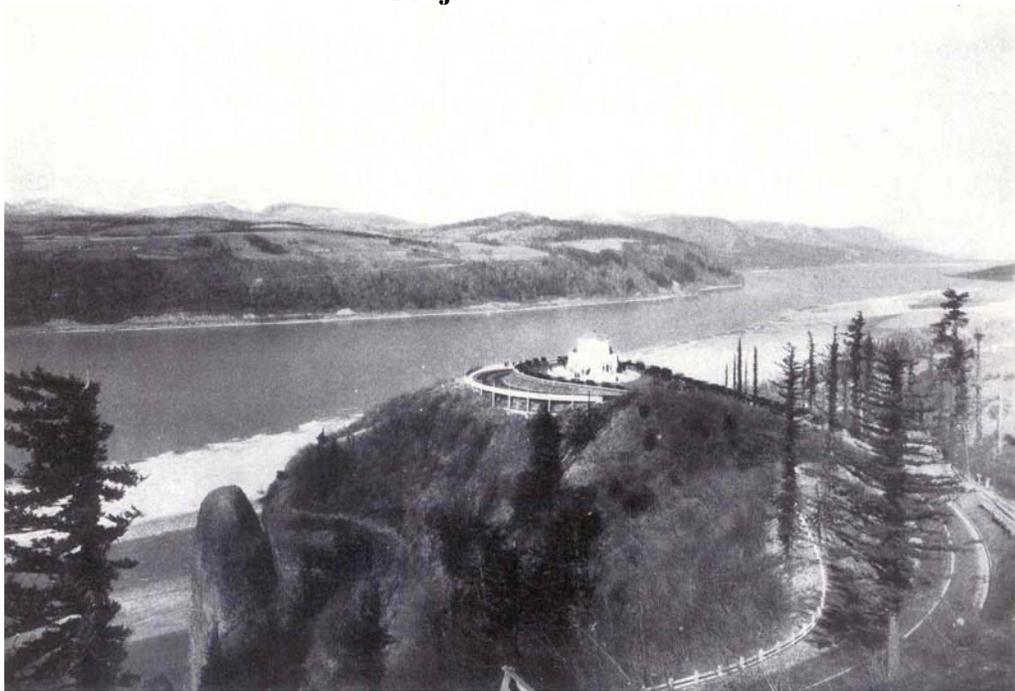


Historic Columbia River Highway (HCRH)
Crown Point Viaduct Restoration

Project Overview



Background Summary

The Historic Columbia River Highway (HCRH) opened in 1915. It is one of only two roads in the United States designated as a National Historic Landmark, a National Scenic Byway (All-American Road), and a National Historic District.

The HCRH is a unique, historic resource and engineering masterpiece that attracts many visitors annually. Visitors come not only to enjoy the natural beauty of the Columbia River Gorge, but also to experience HCRH, a “King of Roads”, which fits into its natural surroundings, provides access to a number of scenic wonders and recreation sites, and enhances the visitor’s experience of the Gorge. Recognizing the importance of preserving this masterpiece, the Oregon Transportation Commission established the following policy:

The Oregon Transportation Commission and its Department of Transportation (ODOT) are dedicated to the goal of preserving and restoring the scenic and unique characteristics, and the historic integrity of the remaining segments of this highway to the extent practical, including use of proper displays and other processes to advise future generations of the significance of this masterpiece. To accomplish this goal, the department will seek funds from appropriate sources.

Whenever maintenance or preservation work is required, the work will, to the extent practical, be aimed at restoring the original appearance of this highway in keeping with its scenic and historic nature.

Whenever restoration of this facility involves rebuilding or major repair, that action will, to the extent practical, result in an appearance approximating the original.

In following these principles, it is recognized that the convenience and safety features of this highway may not reflect current design standards.

The HCRH is now nearly 100 years old. The historic structures throughout the highway are deteriorating rapidly and many have reached a point where maintaining safety and the historic integrity of the structure are not possible with only routine maintenance. The existing historic bridges, viaducts, retaining walls, box culverts, guard rocks, gutters, curbs, and parapets exhibit a wide range of conditions and serviceability. Many of the structures and features have received varying degrees of cosmetic restoration and reconstruction, but many still show signs of age and need repair. If careful restoration is not accomplished soon, the structures and other features may deteriorate to the point that restoration would be impossible and replacement would be required, causing historic integrity to be lost and increasing repair time and costs. Deterioration could cause structures to fail, potentially having significant safety impacts¹.

¹ Historic Columbia River Highway, Historic Features Restoration Project Identification Report, prepared for FHWA



Crown Point Viaduct 1914



Crown Point Viaduct 1914

Project Development

A visible structural evaluation of the pedestrian viaduct (HCRH Mile Post 9.62), which encompasses three-fourths of the Vista House at Crown Point is included for reference only here. Some of the observations of this visual evaluation are contained in the body of this report to give the reader a basic overview of the discovered scope of deterioration related to the viaduct. A more complete scope, base survey maps, summary of environmental, land use permits, and related reference data will be made available when the Request For Proposal (RFP) is released shortly by ODOT at the start of Project Procurement.

Existing Condition

The 93 year-old pedestrian viaduct was constructed in 1914. As-built drawings do not exist for the structure. The historic photographs of the viaduct, contained in this overview are useful for orientation concerning the sequence of construction for the viaduct, adjacent roadway, and Vista House. From these photographs, it was determined that the pedestrian viaduct was constructed before Vista House or the modern highway. A rock revetment, which retains the adjacent roadway, exists under the viaduct.

For ease of reference, the structure has been broken into components consisting of:

- Top of Deck (the surface you walk on)
- Bottom of Deck
- Longitudinal Beams (a reinforced portion of the deck running between columns located below the concrete parapet and the roadway curb)
- Columns
- Parapet (the barrier and luminaire supports)
- Rock Retention (stacked rock retaining wall located under the viaduct, which protects and retains adjacent highway earth embankment)

Visual Observations

Deck

Top of Deck

There are several large areas of delamination in the surface area of the deck. There are also sections of the deck that have different appearances from various repairs over the years that don't match. Several generations of deck repair with varying resulting appearances have been conducted in the past. Records of these repairs are unknown.



Existing and previously repaired Top of Deck surface.

Bottom of Deck

A portion of the bottom surface of deck has been coated with paint. The results of this alternatives analysis are not dependent on the nature of this paint. However, its presence is noted as the need to remove is discussed in the project goals narrative of this report.

Approximately 50% of the bottom surface has deterioration, which can be described as spalling, reinforcement delamination, and deficient past repair.



Bottom of Deck deterioration and paint.

Longitudinal Beams

There are two longitudinal beams. These beams are heavily reinforced portions of the existing deck located under the concrete parapet and roadside curb.

Approximately 50% of the longitudinal beam has deterioration corresponding to that described for the bottom surface of the deck.

These beams have been cracked at a number of locations directly adjacent to supporting columns. In reaction to this cracking, maintenance staff has installed temporary timber posts adjacent to the exterior columns under the parapet at these locations as a precautionary measure to assure that further deterioration will not result in structural collapse.

Finally, there is one location between Columns No. 19 and 20, where the structure has broken and has been strengthened with additional timber posts.



Deterioration in longitudinal beam under parapet.

Note: Location of longitudinal beam above rock revetment and under roadside curb.

Column

There are several large areas of deterioration consisting of delamination and concrete spalls. There are also sections of the columns that have different appearances from various repairs over the years and do not match the appearance of the original concrete.



Concrete deterioration in column and timber post strengthening.

Parapet

Generally, the concrete railing was found to be in good condition. There are cracks through the parapet at the crack locations noted in the longitudinal beam discussion above and in addition the parapet is cracked between Columns No. 19 and 20.

Several of the cracks have been filled with concrete epoxy grout that does not match the appearance of the adjacent concrete.



Broken parapet between columns no. 19 and 20.

Rock Revetment

There is one section of the wall between Columns No. 18 and 19, which has collapsed.



Collapsed portion of revetment

The original revetment consisted of dry stacked basalt stone (reference photos of wall between Columns No. 14 and 18). Large sections of the wall facing stones have been grouted together with concrete cement (reference photo of wall between Columns No. 20 and 21). The grout is not historical.

Project Goals (Possible Design Criteria to be Confirmed at time of RFP)

- The completed project should have a minimal amount of required maintenance for 50 years. The goal is for a permanent repair.
- The design loading would be at 85 lbs per sq.ft. for pedestrians and evaluated for a vehicle wheel load such as a “Tour Bus”. It was noted that curb and parapet damage between columns 19 and 20 are indications of a vehicular overload at this location.
- The structure may not be rehabilitated for seismic forces.
- The top surface of the structure and parapet visible to the visitors has a greater need to maintain the original appearance (dimensions and in kind construction) than the bottom surface. The appearance of the structure from distant vantage points should be maintained. If the column dimensions are increased for additional capacity, it may be preferred to have them increase in depth rather than width.
- Replacement of the entire structure is not an option that will not be considered at this point.
- The barrier will not be improved to withstand vehicle impacts.
- The rehabilitated structure should have a constant color and texture similar to the weathered original existing concrete. All cracks should be repaired and the crack repair blended to match adjoining surface color and texture.
- The grout in the rock revetment is not historical, but need not be removed as it is not visible to visitors. If necessary, establish drain ports through the grouted revetment to provide for relief from hydrostatic pressures.
- Full scope is not yet determined and will be indicated at time of RFP

Rehabilitation Alternatives:

(To be determined by ODOT and Design-Builder)

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To be notified of procurement RFP dates, please send email to the above address, and /or watch for notice in Daily Journal of Commerce, Portland, OR Editions.

Industry Open House for Project Overview: ODOT Region 1, 123 NW Flanders, Portland, OR
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