


**OREGON INVENTORY OF HISTORIC PROPERTIES
SECTION 106 BRIDGE DETERMINATION OF ELIGIBILITY FORM**

Agency/Project: ODOT / Keady Wayside – Cook's Chasm Bridge, Key No. 12812		
Structure Name: Cape Perpetua Half Viaduct Structure Number: 01175 Location: US 101, MP 166.46		City, County: Yachats vicinity, Lincoln County
USGS Quad Name: Yachats, OR (1984 Edition) Township: 15S Range: 12W Section: 3		General Class of Main Structure <input type="checkbox"/> Truss <input type="checkbox"/> Arch <input type="checkbox"/> Moveable <input checked="" type="checkbox"/> Slab/Beam/Girder <input type="checkbox"/> Other
Structural Information: Super Structure: N/A Main Span: RCDG Floor/decking: Concrete Support Structure: Concrete Material: <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Steel <input type="checkbox"/> wood	Dimensions: Roadway Width: 24 feet Structure Length: 76 feet Structural Width: 16'-6" Floor/decking: 12" <input type="checkbox"/> plaque <input type="checkbox"/> sidewalk	Date of Construction: 1931
		Designer: C.B. McCullough Contractor: Tom Lillebo
		Alterations/moved (dates): Steel Guardrail bolted to end piers, unknown date (c. 1980)
		Other Features: Cathodic protection system installed, 1997 Rail type: Open arch masonry faced parapet with concrete cap.
Condition: <input type="checkbox"/> Excellent <input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor		Integrity: <input type="checkbox"/> Excellent <input checked="" type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor
 <p style="text-align: center;">View to southeast.</p>		
Preliminary National Register Findings: <input type="checkbox"/> National Register listed Potentially Eligible: <input checked="" type="checkbox"/> Individually <input type="checkbox"/> As part of District <input type="checkbox"/> Not Eligible: <input type="checkbox"/> In current state <input type="checkbox"/> Irretrievable integrity loss <input type="checkbox"/> Lacks Distinction <input type="checkbox"/> Not 50 Years		
State Historic Preservation Office Comments: <input type="checkbox"/> Concur <input type="checkbox"/> Do Not Concur: <input type="checkbox"/> Potentially Eligible Individually <input type="checkbox"/> Potentially Eligible As part of District <input type="checkbox"/> Not Eligible		
Signed _____ Date _____ Comments:		

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Owner: <input type="checkbox"/> Private <input type="checkbox"/> Local Government <input checked="" type="checkbox"/> State <input type="checkbox"/> Federal <input type="checkbox"/> Other Name: Oregon Department of Transportation Address: 1158 Chemeketa Street NE City, State, Zip: Salem, OR 97301				
Significance: <table style="width: 100%; border: none;"> <tr> <td style="width: 33%; vertical-align: top;"> Technological Significance: <input checked="" type="checkbox"/> Represents the work of a master <input checked="" type="checkbox"/> Possesses high artistic values <input checked="" type="checkbox"/> Represents a type, period or method of construction </td> <td style="width: 33%; vertical-align: top;"> Historical Significance: <input checked="" type="checkbox"/> Associated with significant persons <input checked="" type="checkbox"/> Associated with significant events or patterns <input type="checkbox"/> Contributes to historical district </td> <td style="width: 33%; vertical-align: top;"> National Register Criteria: <input checked="" type="checkbox"/> Criterion A <input checked="" type="checkbox"/> Criterion B <input checked="" type="checkbox"/> Criterion C </td> </tr> </table>		Technological Significance: <input checked="" type="checkbox"/> Represents the work of a master <input checked="" type="checkbox"/> Possesses high artistic values <input checked="" type="checkbox"/> Represents a type, period or method of construction	Historical Significance: <input checked="" type="checkbox"/> Associated with significant persons <input checked="" type="checkbox"/> Associated with significant events or patterns <input type="checkbox"/> Contributes to historical district	National Register Criteria: <input checked="" type="checkbox"/> Criterion A <input checked="" type="checkbox"/> Criterion B <input checked="" type="checkbox"/> Criterion C
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DESCRIPTION: <p>The Cape Perpetua Half-Viaduct #01175 is a two span reinforced concrete deck girder structure, located at MP 166.46 of the Oregon Coast Highway (US 101) in Lincoln County. Each span totals 38 feet, giving the bridge a total length of 76 feet. The bridge has a roadway slab set on reinforced concrete girders that run longitudinally on both sides of the structure. The bridge has no transverse beams, except the abutments. The bridge is tapered at the northern abutment, so the east side of the viaduct spans only 62 feet. The girders are haunched at the central pier on the west side of the bridge, tapering from the standard depth of 49" to a depth of 80". The central pier is 2 feet square, set on a 3 foot square footing.</p> <p>The road deck on the structure is 12 inches thick. The deck is under only the southbound lane of US 101, as the northbound lane is cut into the surrounding hillside of Cape Perpetua. The road deck is cantilevered beyond the support piers on the west side of the structure. The total width of the cantilever is 2'-9" from the outside of the girders. The total width of the structure is 16'-6", including the cantilevered section supporting the balustrade. The road deck and the adjacent roadway cut into the side of the cape was originally surfaced with Macadam paving, similar to the existing asphalt concrete wearing surface on the road deck.</p> <p>The bridge railing is a masonry guardwall with arched openings along its length. The railing is a version of the Standard Parapet Wall seen on drawing number 2028. The parapet is approximately 30 inches high, with a weathered concrete cap rail. The arched openings are four feet long and sixteen inches high, and are elliptical in shape. The parapet wall is anchored at the ends and at the center of the structure by a square pier that is wider than the body of the parapet. The piers have pyramidal concrete caps. The parapet wall is of local basalt stone, cut to fit the arches in a traditional manner. The joints on both sides of the wall are pointed and worked to a beaded joint near the center of the mortar joint.</p> <p>The bridge was constructed by Tom Lillebo under a cooperative agreement between the Bureau of Public Roads and the Oregon State Highway Commission (now the Oregon Department of Transportation). Lillebo constructed a number of bridges throughout the state during the 1920s and 1930s. These bridges were both of reinforced concrete and steel truss construction, some with masonry parapet rails.</p> <p>Alterations to the bridge include the addition of steel W-shaped guardrails bolted to the end piers (c. 1980) and the addition of a cathodic protection system in 1997. The cathodic protection system is divided into three zones to protect the bridge reinforcing bar from further corrosion. Electrical conduit and junction boxes were added to the bridge as part of the cathodic protection program, in addition to the zinc, zinc hydrogel, and aluminum-zinc-indium coatings.</p>				
SIGNIFICANCE: <p>The Cape Perpetua Half-Viaduct #01175 is significant under Criterion A for its association with the Oregon Coast Highway, originally called the Roosevelt Coast Military Highway and currently designated as US 101. The highway was constructed in piecemeal fashion beginning in Clatsop County in 1914. Sections of the highway were constructed to the north and south from the cross-mountain roads. The era of automobile touring in the 1920s added an impetus to the completion of the highway, which was constructed over a twenty year period by the State Highway Department and various counties. Roy Klein, the state highway engineer, repeatedly stated that the highway was the "outstanding and most important objective" of the state's road building program. During the 1931-1932 biennium, rock surfacing was laid on this section of the highway (Waldport - Lane County Line) and the highway alignment was improved from the earlier county road that wound around the cape. The new alignment provided smoother curves and grades, and construction was supervised by the Oregon State Highway Commission but was required to meet the standards of the Bureau of Public Roads as the second longest Federal Aid Highway in the state. The Oregon Coast Highway, when completed, ran the full length of the state and provided a vital transportation link for the coastal communities as well as tourist opportunities for automobile travelers.</p>				

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SECTION 106: SUPPLEMENTAL PHOTOGRAPHS

Structure Name: Cape Perpetua Half Viaduct #01175
Location: MP 166.46, US 101

City, County: Yachats vicinity, Lincoln County



View: Cape Perpetua Half-Viaduct #01175, view from south.

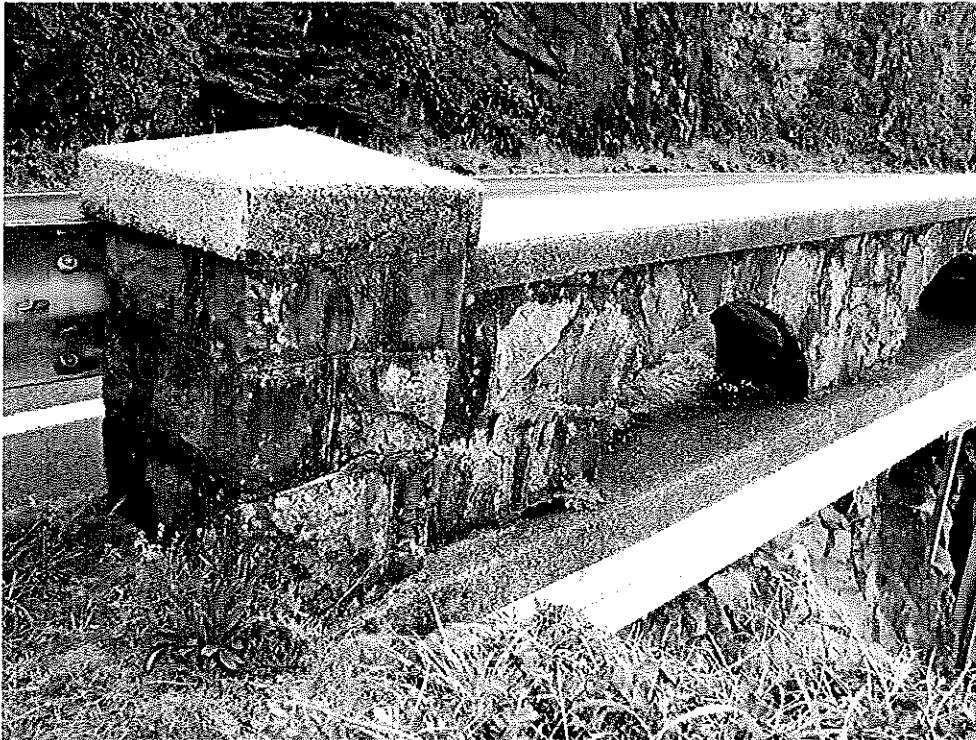


View: Cape Perpetua Half-Viaduct #01175, view to northwest.

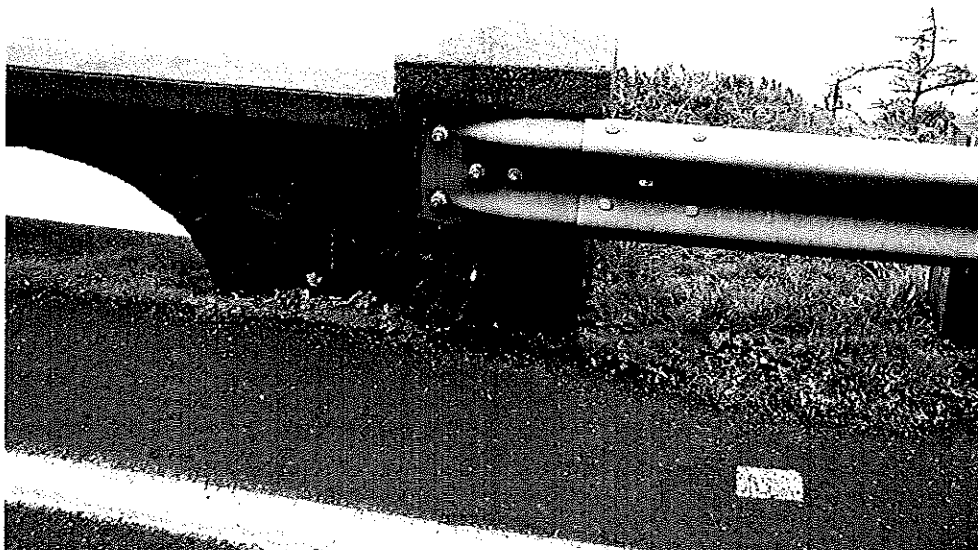
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View: Cape Perpetua Half-Viaduct #01175, detail of northern pier and parapet arch.



View: Cape Perpetua Half-Viaduct #01175, guardrail attachment at north pier (typical).

OREGON INVENTORY OF HISTORIC PROPERTIES
SECTION 106 BRIDGE SUPPLEMENTAL FORMS
 Continuation Sheet

Structure Name: Cape Perpetua Half Viaduct #01175
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(Significance, continued)

The Cape Perpetua Half-Viaduct is also significant under Criterion B for its association with Conde B. McCullough, Oregon's premier bridge engineer. McCullough favored reinforced concrete bridge construction due to its long life and low maintenance costs (when compared to timber structures). While he was better known for his innovative arch designs, McCullough devised a number of innovative structures along the Oregon Coast Highway. The influence of the Historic Columbia River Highway is apparent in this structure, and a similar design was used in Umatilla County near the Washington border on what is today US 730, but was formerly a portion of the Columbia River Highway. The Juniper Point Half Viaduct #01629, also constructed by Tom Lillebo in 1933, utilizes a similar balustrade and crosses a steep slope. The construction of the Columbia River Highway, completed in 1922, promoted bridge designs that blended gracefully with the local site conditions and were always built of reinforced concrete. McCullough transferred the lessons learned from the work on the Columbia River Highway to the Oregon Coast Highway during his involvement in the development of the coastal route extending from the Washington to California border.

The Cape Perpetua Half-Viaduct is also significant under Criterion C as the only example of an open arched masonry balustrade on a coastal bridge. Two other sections of open arched masonry railing exist on US 101, both near Barview in Tillamook County. These other sections are longer than the balustrade on the Cape Perpetua structure, but both sit atop retaining walls of varying lengths. Arched masonry balustrades were utilized extensively along the Historic Columbia River Highway in a successful attempt to incorporate the roadway into the surrounding landscape. Half viaducts were utilized where the mountain slopes were unstable and posed a problem of sliding or falling rock. This trend was continued here on the Oregon Coast Highway, where the roadbed is partially cut into the rock formation of the cape and partly suspended on the half viaduct. The open arch masonry parapet of the Cape Perpetua Half Viaduct is also significant under Criterion C as a late representative of a type and method of construction. The open arched masonry parapet was one of the standard rails used on the Historic Columbia River Highway, and by 1923 a "Standard Parapet Wall" design was developed consisting of a slip-form grout-lock basalt rubble wall with picturesque arched openings and concrete caps. The Cape Perpetua Half Viaduct uses a version of the Standard Parapet Wall, but it is believed to be the last open arched masonry parapet wall on the Oregon Coast Highway. The open arch design improved drainage from the road surface to help prevent pooling and preserved the wall's integrity. With the arrival of the Works Progress Administration in 1933, the style of masonry parapet walls on the Oregon Coast Highway changed to a solid "Park Service Style" of balustrade that was also of basalt, but crenellated and without the projecting piers of the earlier designs. This design became the standard on Bureau of Public Roads projects in 1928, but was not widely used until the WPA projects of the 1930s popularized the crenellated wall design. The majority of the stone features along the Oregon Coast Highway utilize the BPR crenellated design, and WPA projects improved the highway and constructed many of its features. The Cape Perpetua Half-Viaduct predates the WPA program, but only by two years, and is a late example of an arched parapet in Oregon.

CONTEXT:

Measures of Rarity / Uniqueness / Distribution: Slab, Beam, and Girder Bridges

Total number of type built prior to 1940: 505

Total number of type built 1941 to present: 5575

Total number of type built during the year of subject bridge (1931): 16

Total number of type built prior to or during the year of subject bridge: 286

Total number of type that is longer: 3225

Total number of type in same county: 136

Total number of type in region: 2262

Oregon Coast (Clatsop, Tillamook, Lincoln, and Lane Counties): 1098

Oregon Coast (on US 101): 70 in Region 2

Willamette Valley (In Region 2, including Benton, Linn, Marion, Polk, and Yamhill Counties): 1164

Discussion of rarity or Uniqueness

The Cape Perpetua Half Viaduct is one of 70 reinforced concrete deck girder spans on the Oregon Coast Highway in Region 2. However, it is the only structure with an open arched masonry parapet, and one of only three open arched masonry features on the 363 miles of US 101 in Oregon. The other two open arched masonry parapets are on stone retaining walls, not on highway structures. The stone parapet is patterned after designs developed on the Historic Columbia River Highway, and is rare in the coastal context as the vast majority of the stone features along the route are versions of the BPR and NPS crenellated parapet wall.

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Continuation Sheet

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SOURCES:

Hadlow, Robert W. Elegant Arches, Soaring Spans. Corvallis: Oregon State University Press, 2001.
Hadlow, Robert W. Columbia River Highway, National Historic Landmark Nomination. Portland: ODOT, 2000.
Historic American Engineering Record. Oregon Coast Highway Bridges. National Park Service, HAER OR-54, 1992.
Nathe, Richard W. History of State Highways in Oregon. Unpublished Manuscript, ODOT, 1998.
Oregon Department of Transportation. Bridge Data System (Catalogue of Bridge Drawings). Salem: ODOT, 2004.
Oregon State Highway Commission. Yachats to China Creek: Located Line. Map #1B-17-10, December 1926.
Oregon State Highway Commission. Waldport to Lane County Line: Constructed Line. Map #3B-22-21, March 1933.
Oregon State Highway Commission. Tenth Biennial Report, Fiscal Years 1931 and 1932. Salem, OSHC, 1932.
Smith, Dwight A. Columbia River Highway Historic District, National Register Nomination. Salem: ODOT, 1984.

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View: Cape Perpetua Half-Viaduct #01175, view to south under bridge showing cathodic protection conduit.

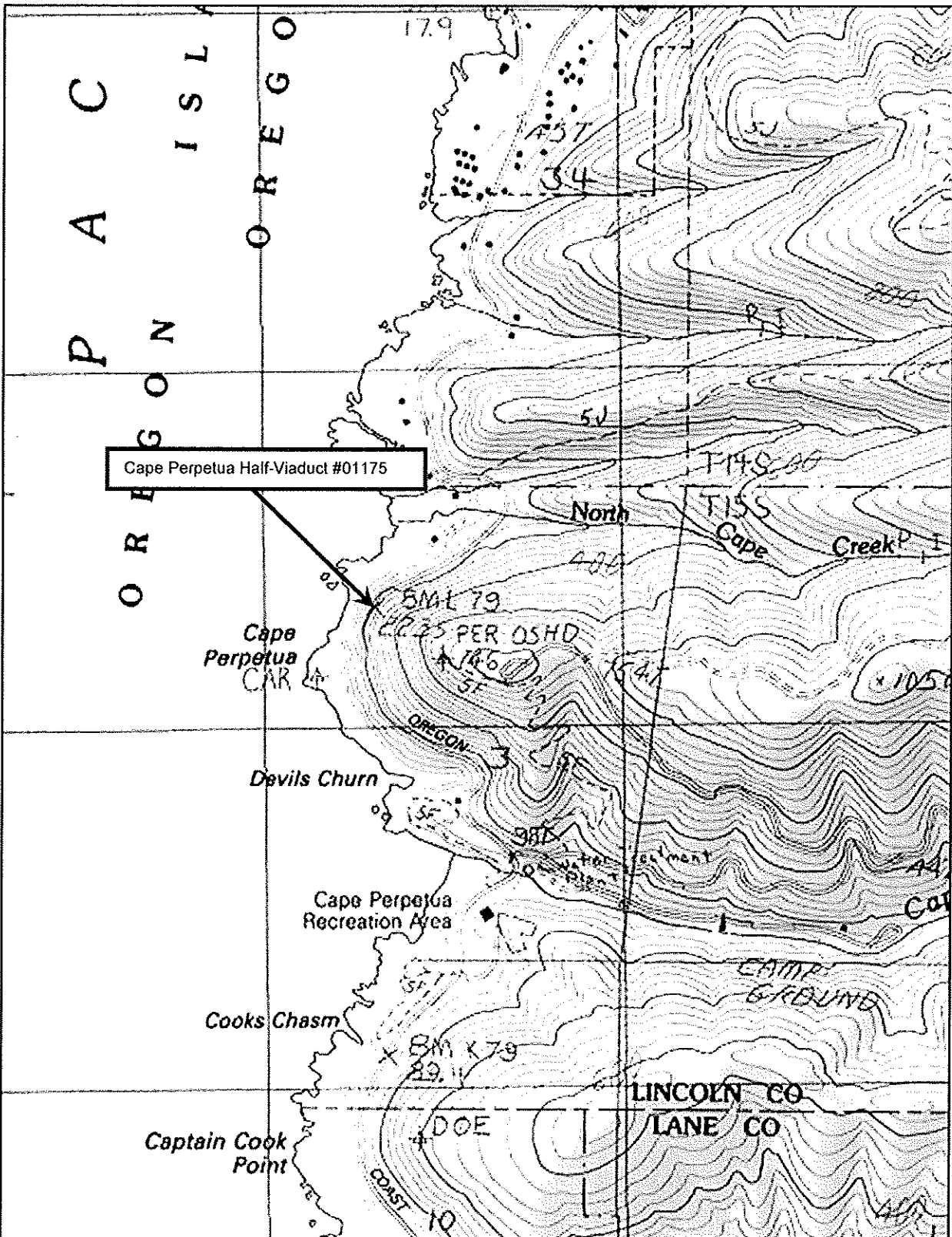


View: Cape Perpetua Half-Viaduct #01175, view to northeast.

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Location Map: USGS Yachats, OR Quadrangle, 1984 Edition.