

ZION-MOUNT CARMEL HIGHWAY,
UPPER PINE CREEK BRIDGE
Spanning Pine Creek on Zion-
Mount Carmel Highway at east end of
Zion-Mount Carmel Highway Tunnel
Zion National Park
Springdale vicinity
Washington County
Utah

HAER No. UT-39-J

HAER
UTAH
27-SPDA.V,
3J-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
P.O. Box 37127
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Location: The bridge is located along the Zion-Mount Carmel Highway, immediately east of the main tunnel's east portal, Springdale vicinity, Washington County, Utah.

UTM: 12/327850/4120060
USGS Quad: Springdale East, UT

Date of Construction: 1929

Type of Structure: Vehicular bridge

Use: Vehicular bridge

Designer/Engineer: U.S. Department of Agriculture, Bureau of Public Roads; U.S. Department of the Interior, National Park Service.

Builder: Nevada Contracting Company, Springville, UT

Owner: National Park Service.

Significance: The Upper Pine Creek Bridge is significant for its association with the Zion-Mount Carmel Highway, constructed by the National Park Service and Bureau of Public Roads in 1927-30. The highway is listed on the National Register of Historic Places and is considered significant in the contexts of tourism and engineering. The bridge, as an integral and necessary component of the highway and a contributing historic structure, is also significant.

Project Information: Documentation of the Zion-Mount Carmel Upper Pine Creek Bridge is part of the National Park Service Roads and Bridges Recording Project, conducted in the summer of 1993 under the co-sponsorship of Zion National Park and HABS/HAER.

Michael F. Anderson, HAER Historian, August, 1993.

INTRODUCTION

The 25-mile long Zion-Mount Carmel Highway connects southern Utah's principal north-south transportation arteries: Interstate 15 and Highway 89. Completed in 1930, it immediately served a number of regional transportation needs, including an all-weather road from Kane County and other points east of the Wasatch mountain range to the nearest railhead at Cedar City, and a well-graded modern highway for the growing number of tourists to southern Utah. The Upper Pine Creek Bridge spans the narrow but deep upper Pine Creek gorge and was necessary to carry the roadway from the main tunnel to the slickrock country to the east.

HISTORICAL CONTEXT

Popular needs and demands for better east-west transportation in southern Utah lagged fifty years behind the earliest settlement in the region. Mormon colonizers migrating south from Salt Lake City had settled the Virgin River Valley and Zion Canyon by the early 1860s, but for several generations had more pressing concerns than construction of a road to the east. Cattle ranching and subsistence farming in the semiarid high desert region kept the settlers busy close to home, while trade and communication typically led west and north whence the pioneers had come: to the string of towns connecting the western boundary of the Mormon State of Deseret.

By the turn of the twentieth century, citizens of Rockville and Springdale immediately west of Zion Canyon had satisfied their few needs for access to the high plateau country. John Winder, a settler in the region since the 1880s, had improved an old Southern Paiute trail to the east rim which served cattlemen as well as operators of the Zion cableworks--the astonishing aerial bridge built in 1901 to transport lumber from the rim to the valley below. The road leading to the base of this trail at the lower cableworks (today's Weeping Rock area) was little more than a set of wagon ruts to be sure, but sufficed for driving cattle between summer and winter ranges and for moving lumber and supplies to and from the cable system.

Demands for better roads, not only in the Zion region but everywhere in the United States, awaited the dawn of the automobile age. As the nation awoke to the scenic splendors of the American West and coincidentally fell in love with the automobile, motor enthusiasts lobbied in varied ways for better conduits to the national parks and forests. Motorists and businessmen alert to the possibilities of tourism first raised

the cry in southwestern Utah in the 1910s, and it was not long before the State of Utah and the federal government responded with a decades-long program to improve transportation to and within Zion National Park.

A number of factors combined by 1920 to argue for a road passing through Zion National Park and connecting Highway 91--the "Arrowhead Trail"--25 miles to the west with Highway 89 equidistant to the east. Population and business growth in Kane County argued for an all-season, all-weather road across the north-south mountain range (the Hurricane Fault region) to the nearest railhead at Cedar City, Utah. Development of local scenic wonders--Zion, Cedar Breaks, Bryce, and North Rim of the Grand Canyon--and the emergence of a "Grand Circle" tourism route which connected the nascent parks suggested a shorter more scenic vacation if a road could be built through Zion. These factors, and a growing desire among locals for tourist dollars, led to the location, survey, and construction of the Zion-Mount Carmel Highway in the years 1923-1930.

HISTORY OF THE STRUCTURE

The preliminary location of the Zion-Mount Carmel Highway completed by Bureau of Public Roads (BPR) Highway Engineer R. R. Mitchell in late 1925 contemplated use of the existing bridge over the Virgin River, approximately 1000' upstream of the park's south checking station, as a starting point, and a road up the north talus slope of Pine Creek Canyon to the base of the Great Arch. Had Mitchell's location been followed, none of the three bridges along the initial 8.5 miles of roadway would have been built.¹ As it turned out, the location's unsatisfactory grades, lines, and tunnel led to another investigation in June 1926, and a resurvey in November 1926. This resurvey resulted in the location eventually followed, and required the placement of bridges spanning the Virgin River near the park's south entrance station, lower Pine Creek approximately 0.6 miles upstream of its mouth, and upper Pine Creek gorge immediately east of the main tunnel's east portal.²

¹ R. R. Mitchell, Associate Highway Engineer, "Location Report Zion Park-Mt. Carmel Road: Zion Park Section," manuscript, 1926, Zion Tunnel and Road Reports File, Park Administrator's vault, Zion National Park (ZNP), 3.

² R. A. Brown, Associate Highway Engineer, "Final Construction Report on East Rim Road Route #1," manuscript, 1931, Zion Tunnel and Road Reports File, Park Administrator's vault, ZNP, 7-9.

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The Bureau of Public Roads opened bids for the construction of Section 3 of the Zion-Mount Carmel Highway 27 September 1928, and awarded the contract to construct the 3.63 miles of roadway to the Nevada Contracting Company. This work was to include whatever type of bridge structure would be required to span the upper Pine Creek gorge, and unlike the separate contract for the North Fork Virgin River Bridge and lower Pine Creek Bridge, the NPS and BPR seemed unconcerned about the span's type or aesthetic appearance.³

The Nevada Construction Company decided to move east in its construction of Section 3 roadway as soon as the main bore of the Zion Tunnel could be completed to the east portal. Tunnel crews finished the portal on 19 October 1928, and the next day started work on a temporary, 100' wooden bridge to span the immediate gorge. When this was completed the following month, a steady flow of construction equipment, trucks, shovels, supplies, and electric lines poured over to accommodate work on the roadway. The contractor replaced the temporary structure with the current permanent bridge between 1 April and 23 July 1929, at a cost of \$22,795.36.⁴

Periodic inspections by 1957 had revealed spalling and cracking on concrete portions of some bridges within the park. These problems were thought to be the result of freezing and thawing as well as "alkali reactive aggregates," and that the deterioration might be slowed by the application of hot linseed oil and paint. Despite the deterioration, the superintendent concluded that they were in "fairly good condition" considering their age. The inspections probably referred more to the bridges built by the State of Utah east of the upper Pine Creek Bridge which, by 1993, had deteriorated to the point where they had to be replaced.⁵ There is little evidence of deterioration to this structure, and its 20' roadway remains adequate because it flows immediately from the 20' roadway of the highway tunnel. There was no evidence found that the upper Pine Creek Bridge has been altered significantly since its completion in 1929.

³ Brown, "Final Construction Report," 17-18 and attached Section 3 Final Inspection Report.

⁴ Brown, "Final Construction Report," 48-50.

⁵ ZNP Superintendent's Monthly Narratives, March 1957, history boxes, ZNP archives.

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DESCRIPTION

The upper Pine Creek Bridge is a 128.5', 4-span, steel I-beam and concrete deck bridge. It consists of concrete abutments poured into the solid rock at either side of the gorge, and three sets of simple, tapered concrete piers with ornamented caps (two piers per set flush with each side of the deck) sunk into cellular concrete foundations. The piers and concrete cross members are skewed in the direction of the intermittent creek flow. Five rows of steel I-beams with connecting cross members span the concrete cross members. The poured-in-place concrete deck is edged with flanking solid concrete guardrails with recessed bands on the outside. The guardrail on the north side curves to the north to form a guard rail for a small parking lot. A newer, larger parking lot and 1960s wooden guard house are located immediately southeast of the bridge.

⁶ Brown, "Final Construction Report," attached Section 3 Final Inspection Report; Field observations, 3 July 1993.

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Anderson, Michael F. Field observations, 3 July 1993.

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#1." Manuscript, 1931.

Mitchell, R. R. "Location Report Zion Park-Mt. Carmel Road: Zion
Park Section." Manuscript, 1926.

ZNP Superintendent's Monthly Narratives, March 1957.

ADDENDUM TO

ZION-MOUNT CARMEL HIGHWAY, UPPER PINE CREEK BRIDGE

Spanning Upper Pine Creek on Zion-Mount Carmel Highway at east end of

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