

BURLINGTON NORTHERN SANTA FE RAILROAD,
CAJON SUBDIVISION , STRUCTURE NO. 59.8X
between Cajon Summit and Keenbrook
Devore vicinity
San Bernardino County
California

HAER CA-2259-G
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
PACIFIC WEST REGIONAL OFFICE
National Park Service
U.S. Department of the Interior
1111 Jackson Street, Suite 700
Oakland, CA 94607

HISTORIC AMERICAN ENGINEERING RECORD

Burlington Northern Santa Fe Railroad, Cajon Subdivision,
Structure No. 59.8X

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Location: BNSF Railway Company (BNSF) Railroad Structure No. 59.8X, a reinforced-concrete arch culvert, is located at Milepost 59.8X on Main Track 1, Devore vicinity, San Bernardino County, California. The culvert is bounded by the Union Pacific Railroad to the north, BNSF Main Track 2 to the south, and Interstate 15 to the west.

The culvert lies within the SE ¼ of the NW ¼ of the SW ¼ of Section 23, Township 3 North, Range 6 West, on the 1956 Cajon, California (photorevised 1988), 7.5-minute U.S. Geological Survey quadrangle. Universal Transverse Mercator Coordinates: Zone 11, NAD83, Geodetic Reference System 1980 ellipsoid, mN 3798866, mE 455715 (inlet); mN 3798829, mE 455729 (outlet).

Date of Construction: 1913

Architect/Engineer: unknown

Builder: Atchison, Topeka and Santa Fe Railway (AT&SF)

Present Owner: BNSF

Present Use: Culvert on Main Track 1.

Significance: The section of railroad through Cajon Pass provided a vital link between the greater Los Angeles area and distant markets. In 1998, the California State Historic Preservation Office determined the historic route of the AT&SF (now BNSF) railroad alignment through Cajon Pass to be eligible for listing in the National Register of Historic Places under Criteria a and c. By connecting Los Angeles and San Bernardino to markets throughout the United States, the railroad dramatically affected demographic, commercial, and cultural trends in southern California. Furthermore, construction of the long, winding alignment through rugged and often steep terrain represents a significant engineering feat for its time. Structure No. 59.8X contributes to the function and significance of the railroad line by mitigating the effects of erosion on the integrity of the system.

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Statistical Research, Inc.
Tucson, Arizona

Date: March 2008

I. ARCHITECTURAL AND ENGINEERING INFORMATION

Structure No. 59.8X is a reinforced-concrete arch culvert located on a major drainage approximately 2,500' northeast of the former Alray Station (Figure 1). A culvert is a structure designed to protect the roadbed from the erosive effects of storm runoff by carrying water safely under the track. Culverts are placed at points along the roadbed where the railroad intersects normally dry channels. The size of a culvert is determined by the anticipated rate of flow during periods of heavy rainfall (Hay 1953:282, 284; Webb 1932:249).

The structure consists of an inlet transition on the north side of the roadbed embankment that diverts and channels water under the track through a skewed arched opening. Both the inlet and outlet transitions of this reinforced-concrete arch culvert have headwalls, wing walls, and aprons. The headwalls and wing walls hold back the roadbed fill from the culvert openings, and the aprons prevent scouring around the inlet and outlet. Each arched opening has a height of 12'-0", and the bottom width of the culvert barrel is 12'-0". Inside the culvert, the concrete floor has a slight downward slope that corresponds to the slope of the channel it drains. The overall length of the culvert, from inlet transition to outlet transition, is 82'-6". The headwall on the upstream side has a length of 17'-9" and a height of 14'-7". Headwall width is 2'-0". The wing walls, which have a width of 2'-0", are asymmetrical; the west wall protrudes perpendicular to the retaining wall, whereas the east wall flares away from the retaining wall at a wide angle. The west wing wall has a length of 16'-0" and is tapered, with a maximum height of 13'-3" and minimum height of 3'-3". The east wing wall has a length of 18'-9" and is tapered, with a maximum height of 13'-3" and a minimum height of 3'-3". The wings begin 1'-4" below the headwall. The edges of the headwall and wing walls are beveled with a width of 3". On the downstream side of the culvert, the headwall and wing walls have the same dimensions but in reverse profile (i.e., the east wing wall is perpendicular to the headwall, whereas the west wing wall is flared). Below the concrete apron on the downstream side, there is a drop of about 6' down to the main drainage.

II. REFERENCES CITED

Hay, William W.

1953 *Railroad Engineering, Volume One*. John Wiley & Sons, New York, and Chapman and Hall, London.

Webb, Walter L.

1932 *Railroad Construction: Theory and Practice*. 9th ed. John Wiley and Sons, New York.

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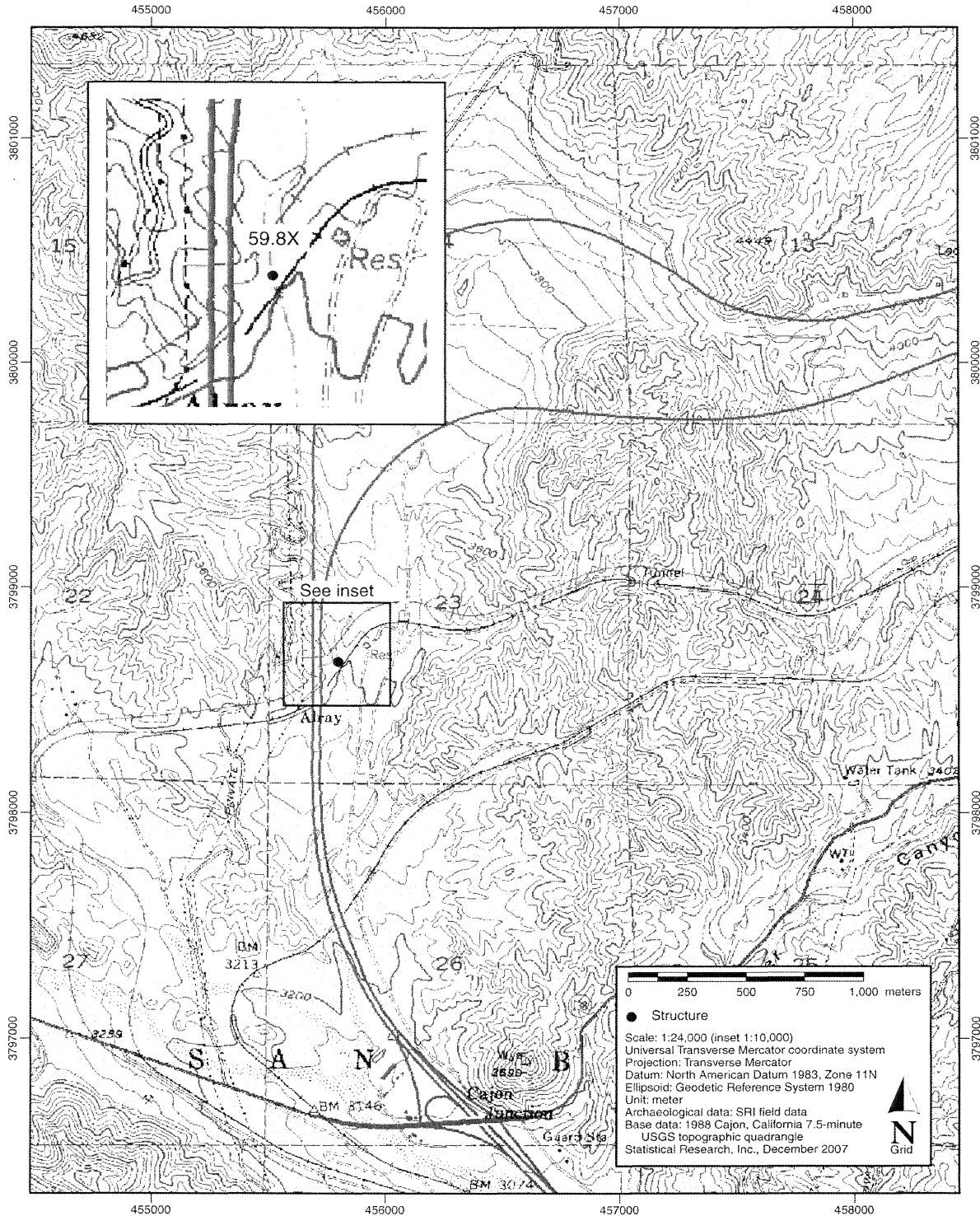


Figure 1. Project location (1956 Cajon, California, 7.5-minute U.S. Geological Survey quadrangle [photorevised 1988]).

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David G. De Vries, photographer

June 2007

CA-2259-G-1 CONTEXT VIEW, TO THE SOUTHEAST. [32]

CA-2259-G-2 NORTH ELEVATION. [30]

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CA-2259-G-4 DETAIL OF FORM BOARD IMPRINTS IN CONCRETE CONSTRUCTION. [31]



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HAERL NO. CA - 2259 - C - 2



KODAK 400TMY

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