

BURLINGTON NORTHERN SANTA FE RAILROAD,
CAJON SUBDIVISION , STRUCTURE 58.1X
Between Cajon Summit and Keenbrook
Devore vicinity
San Bernardino County
California

HAER CA-2259-C
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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
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HISTORIC AMERICAN ENGINEERING RECORD

Burlington Northern Santa Fe Railroad, Cajon Subdivision,
Structure No. 58.1X

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Location: BNSF Railway Company (BNSF) Railroad Structure No. 58.1X, a reinforced-concrete pipe culvert, is located at Milepost 58.1X on Main Track 1, Devore vicinity, San Bernardino County, California. The culvert is bounded by the Union Pacific Railroad to the north and BNSF Main Track 2 to the south.

The culvert lies within the SE $\frac{1}{4}$ of the NW $\frac{1}{4}$ of the NW $\frac{1}{4}$ of Section 24, Township 3 North, Range 6 West, on the 1956 Cajon, California, 7.5-minute U.S. Geological Survey quadrangle (photorevised 1988). Universal Transverse Mercator Coordinates: Zone 11, NAD83, Geodetic Reference System 1980 ellipsoid, 3799293 mN, 458171 mE (inlet); 3799266 mN, 458182 mE (outlet).

Date of Construction: 1913, modified ca. 1986

Architect/Engineer: unknown

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

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. 58.1X 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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I. ARCHITECTURAL AND ENGINEERING INFORMATION

Structure No. 58.1X is a reinforced-concrete pipe culvert located on a small secondary drainage (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).

As originally constructed, the culvert consisted of three 42" reinforced-concrete pipes, arranged horizontally (side-by-side), with reinforced-concrete headwalls and wing walls on the upstream and downstream sides. (*Note:* The use of two or more culvert pipes diverts and channels water from one side of the roadbed to the other while reducing overhead clearance. Generally, a culvert with two or more pipes is built on a major drainage when the height of the roadbed embankment prevents the construction of a culvert with a high overhead clearance [Hay 1953:283].) The total length of the structure was 84'-0". The pipes were likely precast and set in place. Around 1986, the Atchison, Topeka and Santa Fe Railway extended the culvert on the north (upstream) side during construction of a maintenance-road embankment (1988 Capital Budget Bridge Inspection Tour, Bridge Number X58.1, 29 July 1986, Structures Department, BNSF Railway Company [BNSF], Kansas City, Kansas; Bridge List, First District, Los Angeles Division, p. 45, Structures Department, BNSF). In its present configuration, there are three corrugated-metal pipes, each measuring 30" in diameter, on the upstream side that divert water into the original concrete structure. The pipes are positioned vertically but turn at right angles beneath the channel's surface and continue underground where they join with the concrete pipes. The upstream headwall of the original culvert is covered by the maintenance road embankment. The corrugated-metal pipes at the inlet are at a general height of 2' and are spaced about 2' apart. One of the pipes has a metal grating across the top. There are rectangular slots cut into the pipes to facilitate the flow of water into the drainage system below. The center pipe is partially filled with sand and may not be functional. The outlet transition has a headwall and wing walls to hold back the roadbed fill from the three culvert openings, which are 42" in diameter and spaced 2'-0" apart. A concrete apron below the pipe openings prevents scouring around the outlet. The headwall has a length of 18'-6" and a height of 6'-0". The flared wing walls extend 4'-6" from the headwall. The headwall and wing walls have a width of 2'-0", and the beveled corners have a width of 3". The apron is 16'-8" wide and extends 4'-6" beyond the headwall.

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.

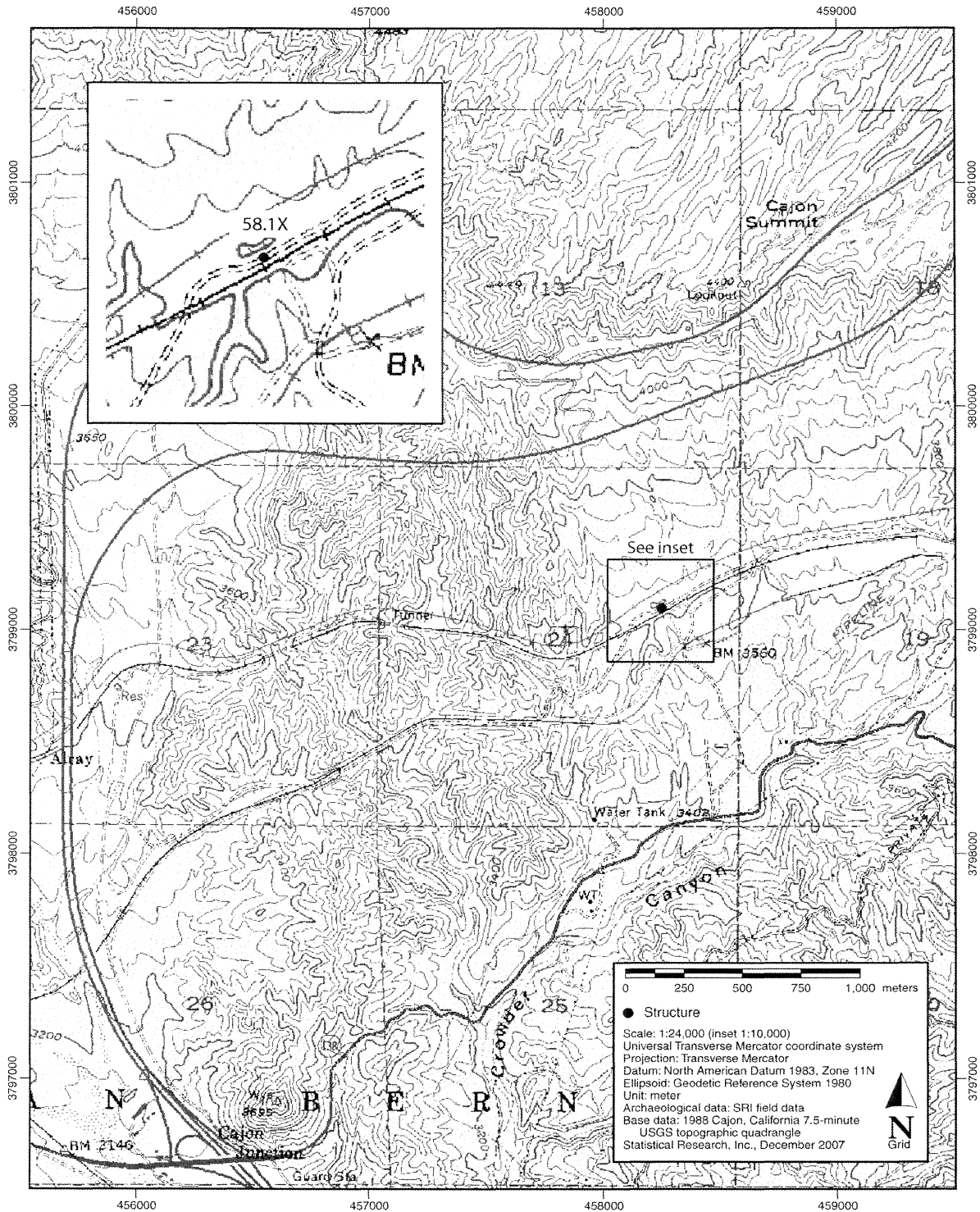


Figure 1. Project location (1956 Cajon, California, 7.5-minute U.S. Geological Survey quadrangle [photorevised 1988]).