HAER INVENTORY

Historic American Engineering Record
Department of the Interior, Washington, D.C. 20240

1. SITE I.D. NO

2. INDUSTRIAL CLASSIFICATION: Bridges, Trestles, and Aqueducts

ARCH: steel

165.10 1650001150

3. PRIORITY: 1

7596

5. DATE: 1921

4. DANGER OF DEMOLITION? (SPECIFY THREAT) ☐ YES ☐ NO ☒ UNKNOWN

6. GOVT SOURCE OF THREAT: OWNER ADMIN

7. OWNER/ADMIN: State Department of Transportation

8. NAME(S) OF STRUCTURE: Fairfax Bridge

9. OWNER'S ADDRESS: Highway Administration Building
Olympia, Washington 98504

10. STATE: WA COUNTY: 053 COUNTY NAME: Pierce CITY/VICINITY: Melmont CONG. DIST.: 03

STATE COUNTY COUNTY NAME CITY/VICINITY CONG. DIST.

11. SITE ADDRESS (STREET & NO.)
Crossing: Carbon River

5.2 miles south of Wilkeson /11.6 N of Rainier Park

12. EXISTING SURVEYS ☐ NR ☐ NHL ☐ HABS ☐ HAER—I ☐ HAER ☐ NPS ☐ CL6
☐ CONF ☐ STATE ☐ COUNTY ☐ LOCAL ☐ OTHER

13. SPECIAL FEATURES (DESCRIBE BELOW)
☐ INTERIOR INTACT ☐ EXTERIOR INTACT ☐ ENVIRONS INTACT

14. UTM ZONE 10 EASTING 572900 NORTHING 5209990 SIGN
SCALE ☐ 1:24 ☒ 1:62.5 ☐ OTHER
QUAD NAME: Lake Tapps, Washington

UTM ZONE EASTING NORTHING SIGN
SCALE ☐ 1:24 ☐ 1:62.5 ☐ OTHER
QUAD NAME

15. CONDITION 70 ☐ EXCELLENT 71 ☐ GOOD 72 ☐ FAIR 73 ☐ DETERIORATED 74 ☐ RUINS 75 ☐ UNEXPOSED 76 ☐ ALTERED 82 ☐ DESTROYED 85 ☐ DEMOLISHED

16. INVENTORIED BY: Lisa Soderberg
AFFILIATION: HAER/Washington State Bridge Inventory
DATE: March 1979

17. DESCRIPTION AND BACKGROUND HISTORY, INCLUDING CONSTRUCTION DATE(S), HISTORICAL DATE(S), PHYSICAL DIMENSIONS, MATERIALS, EXTANT EQUIPMENT, AND IMPORTANT BUILDERS, ENGINEERS, ETC.

In 1921, a riveted steel arch was built jointly by the County and State across the Carbon River providing the link which enabled the construction of the first road to Fairfax. Previously a train, which passed through Fairfax only twice a day, was the town's primary route to the outside world. The only other alternative to this sporadic transportation service was walking to Melmont where there was a wagon road to other towns. Needless to say, the construction of the steel arch which was purported to be the highest span in the state at the time of tis construction, was a vital transportation link to this remote town.

The 494 foot structure consists of a 240 foot three-hinged braced rib steel arch, two 14 foot steel towers, and 16 timber trestle approach spans. The chords of the ribs are composed of channels. They are braced with two angles that are latticed in a Warren truss configuration. The vertical members of the towers and spandrel columns are made up of two latticed channels. The 17.4 foot wide roadway rests on a Warren stiffening truss. The steel was (CONT OVER)

18. ORIGINAL USE: vehicular
PRESENT USE: vehicular
ADAPTIVE USE:

19. REFERENCES—HISTORICAL REFERENCES, PERSONAL CONTACTS, AND/OR OTHER

State Department of Transportation bridge files.
J.A.L. Waddell, Bridge Engineering, 2 Vols., (New York, 1916) 1:617-636.

(CONT OVER)

20. URBAN AREA 50,000 POP. OR MORE? ☐ YES ☒ NO

21. NPS REGION: NW

22. PUBLIC ACCESSIBILITY ☐ YES, LIMITED ☒ YES, UNLIMITED ☐ NO ☐ UNKNOWN

23. EDITOR INDEXER

24. LOCATED IN AN HISTORIC DISTRICT? ☐ YES ☒ NO NAME DISTRICT I.D. NO

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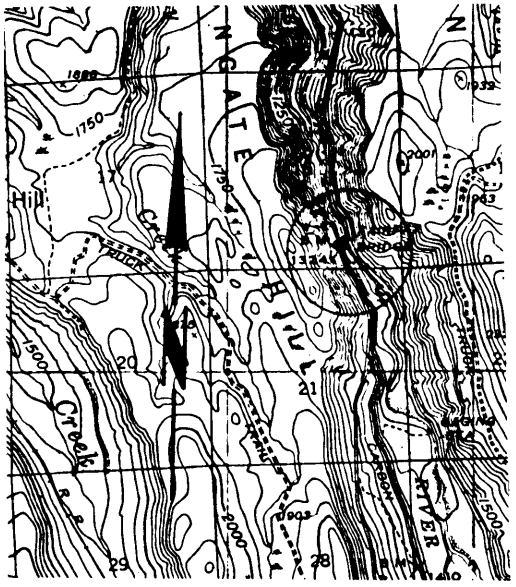
Description (continued)
fabricated by the Minneapolis Steel and Machinery Company. The arch rests on concrete footings. In 1945, the timber approaches and the timber deck were reconstructed.

The unusual power of the bridge lies in the visibility of the structure's function, explicity delineated through the slender arched steel forms. The Fairfax Bridge is one of two three-hinged lattice arches remaining within the State. However, even during the time of its construction, the steel arch was used in the United States only when very specific conditions prevailed. In his book Bridge Engineering, J.A.L. Waddell explains the reason for the paucity of arches in the United States. "Arches are employed very generally in Europe on account of their superior appearance as compared with simple-truss bridges, and because of the powerful influence of the old masonry arch upon the minds of European bridge designers, regardless of the consideration of economy. American engineers, on the other hand, have been indifferent to the question of aesthetics, and have preferred simple spans to arches mainly for reasons of simplicity and economy, but sometimes on account of their greater rigidity. Another reason why the arch has not been used much in American practice is that the conditions which make it economical are not met with as frequently in this country as in Europe. For deep gorges with rocky sides, or for shallow streams with rock bottom and natural abutments, arches are eminently proper and economical." The conditions that made the bridge type economical in Europe were mirrored in the deep canyon of the Carbon River.

The Fairfax Bridge is a rare example within the State of a three-hinged lattice arch, and embodies a steel arch type that was widely used by American engineers. The three-hinged arch, with a hinge at the crown and at the two abutments is the least rigid of all arch structures. However, there is no ambiguity of stress distribution in the three-hinged arch, and the method of stress calculation is relatively simple.



ABSTRACT

HAER NO | LC | TECH REPORT | HIST REPORT | CONTEMP PHOTO | HIST PHOTO | CONTEMP DRWG | HIST DRWG | COLOR PLATE | PHOTOGRAM | SW | FILM