

1. SITE I.D. NO

## HAER INVENTORY

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

2. INDUSTRIAL CLASSIFICATION

Bridges, Trestles and Aqueducts

3. PRIORITY

1

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

TRUSS: steel

7 6 0 3

5. DATE

1911

6. GOVT SOURCE OF THREAT

OWNER

ADMIN

7. OWNER/ADMIN

Chicago, Milwaukee, and St. Paul and Pacific Railroad Company

8. NAME(S) OF STRUCTURE

Idaho and Washington Northern Railroad *Bridge*

9. OWNER'S ADDRESS

516 West Jackson Boulevard  
Chicago, Illinois 60606

10. STATE

WA

COUNTY NAME

CITY/VICINITY

CONG.

DIST.

STATE

COUNTY NAME

CITY/VICINITY

CONG.

DIST.

COUNTY

0 5 1

Pend Oreille

Metaline Falls

0 5

COUNTY

11. SITE ADDRESS (STREET &amp; NO)

Crossing: Pend Oreille River

S.T.R. 13 38N 43E

off of route 31

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 EASTING NORTHING SIGN

1 1 4 6 9 9 5 0 5 4 0 2 9 2 0

SCALE  1:24  1:62.5 OTHER QUAD NAME Metaline, Washington

UTM ZONE EASTING NORTHING SIGN

SCALE  1:24  1:62.5 OTHER QUAD NAME15. 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

October 1979

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

In 1911, the Idaho and Washington Northern Railroad erected a two span riveted deck truss across the Pend Oreille River just south of Metaline. The bridge was an important connecting link in the railroad's 9.5 mile line between Ione and Metaline Falls which was completed in the same year. The single track grade, supported by one 145 foot shore span, and one 280 foot channel span, rises 140 feet above the fast moving river. The bottom chord of the shore arm conforms to the steep contours of the land. The span over the channel is a Pratt truss with horizontal bars intersecting the 2nd, 4th, 5th and 7th panels.

The significance of the bridge lies in the method that was used to erect the steel structure in the rugged, inaccessible terrain. An article in a January 1911 issue of Engineering News reported that the bridge was "constructed under rather exceptional conditions, which led to a novel solution." Because of the location of the crossing, which

18. ORIGINAL USE

railroad

PRESENT USE

railroad

ADAPTIVE USE

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 REFERENCES—HISTORICAL REFERENCES, PERSONAL CONTACTS, AND/OR OTHER

"An Unusual Case of Bridge Erection by the Cantilever Method," Engineering News, Vol. 64, No. 2 (1911 January), p. 46.  
Cheever, Bruce Bissell, The Development of Railroads in the State of Washington, Bellingham: Western Washington College of Education, 1949.

Derluth, August, The Milwaukee Road, New York: Creative Age Press, 1948.

(CONT OVER)

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

21. HCRS REGION

N W

22. PUBLIC ACCESSIBILITY

 YES, LIMITED  YES, UNLIMITED  
 NO  UNKNOWN23. EDITOR  
INDEXER

24. LOCATED IN AN HISTORIC DISTRICT?

 YES  NO NAME

DISTRICT I.D. NO

Description (continued)

traverses water that reaches depths of up to 200 feet, with a swiftly moving current, it was not feasible to build falsework. Consequently, the erectors, McCreary and Willard of Spokane, Washington resorted to the cantilever method of construction. The conditions of building the Metaline Falls Bridge were identical to conditions for cantilever construction, outlined by the prominent bridge engineer, J.A.L. Waddell in his book on bridge engineering published in 1916. "The conditions which generally call for cantilever construction are deep gorges to be crossed by single spans, and the impracticability of using falsework because of danger from washout." Although cantilever construction had been used for long span trusses throughout the fourth quarter of the 19th century, Waddell was extremely cautious about the wide use of this method of construction. "Cantilever bridges are a type of structure eminently suitable for certain conditions, but they should never be adopted unless those conditions exist, because they are inferior in rigidity to simple truss bridges and usually require more metal for their construction."

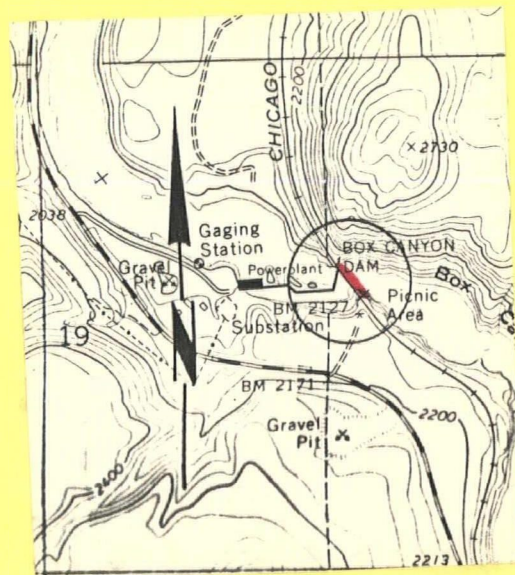
In this particular instance the construction of the Metaline Falls truss was further complicated by the fact that only one bank was readily accessible. Under normal circumstances, a bridge erected by the cantilever method is constructed from both sides of the bank, and converges in the middle of the river, "so that the maximum projection (will) be about half the length of the span." However, in order to erect the railroad bridge in this way, it would have been necessary to transport the materials to the other side of the river by building an expensive "cableway plant." In light of these factors, the engineers decided to erect the bridge from one bank. The shore span which weighs about 300 tons, was designed to serve as an anchor arm during the construction of the channel crossing. In addition, the shore arm was loaded with 600 tons of steel rails as counterweight for the 700-ton channel span. The shore span and channel span share a common shoe for the purpose of transmitting the bottom chord compression of the channel span to the shore span during erection. During construction, the top chords were joined by tie-bars which were removed when the channel span was finally brought to bearing on the opposite abutment.

The steel, fabricated by the Pennsylvania Steel Company of Steelton, Pennsylvania was set by a derrick car which travelled along the top chord. The bridge was owned by the Idaho and Washington Northern Railway until 1916 when the railway company was sold to the expanding empire of the Chicago, Milwaukee, and St. Paul Railroad.

REFERENCES (CONTINUED)

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

25. Photos and Sketch Map of Location



United States Department of the Interior  
National Park Service

National Register of Historic Places  
Inventory—Nomination Form

For NPS use only  
received  
date entered

Continuation sheet

Item number

Page

Multiple Resource Area  
Thematic Group

Name Historic Bridges and Tunnels in Washington State Thematic Resources  
State Washington

Nomination/Type of Review

Date/Signature

21. F Street Bridge

Entered in the  
National Register

Keeper

Arlene Byers 7/16/82

Attest

22. West Monitor Bridge

Entered in the  
National Register

Keeper

Arlene Byers 7/16/82

Attest

23. Curlew Bridge

Entered in the  
National Register

Keeper

Arlene Byers 7/16/82

Attest

24. Orient Bridge

Substantive Review

Keeper

Emma Jane Saxe 7-6-82

Attest

Emma Jane Saxe 7-6-82

25. Prosser Steel Bridge

Entered in the  
National Register

Keeper

Arlene Byers

Attest

26. Middle Fork Nooksack River  
Bridge

Entered in the  
National Register

Keeper

Arlene Byers 7/16/82

Attest

27. Idaho and Washington Northern  
Railroad Bridge

Entered in the  
National Register

Keeper

Arlene Byers 7/16/82

Attest

28. Elwha River Bridge

Entered in the  
National Register

Keeper

Arlene Byers 7/16/82

Attest

29. Snake River Bridge  
(Lyons Ferry)

Substantive Review

Keeper

Emma Jane Saxe 7-6-82

Attest

Emma Jane Saxe 7-6-82

30. Aurora Avenue (George Washington  
Memorial)

Entered in the  
National Register

Keeper

Arlene Byers 7/16/82

Attest

NATIONAL REGISTER OF HISTORIC PLACES

82004270

EVALUATION / RETURN SHEET

Working No. W382-1706

Fed. Reg. Date: 2-1-83

Date Due: 7/1/82 - 7/15/82

Action:  ACCEPT 7/16/82

Entered in the National Register  RETURN  REJECT

Idaho and Wash. Northern RR Bridge  
(Hist. Bridges/Tunnels in WA State  
TR), Pend Oreille County,  
WASHINGTON,

- resubmission
- nomination by person or local government
- owner objection
- appeal

Federal Agency: \_\_\_\_\_

Substantive Review:  sample  request  appeal  NR decision

Reviewer's comments:

Recom./Criteria \_\_\_\_\_  
 Reviewer \_\_\_\_\_  
 Discipline \_\_\_\_\_  
 Date \_\_\_\_\_  
 see continuation sheet

Nomination returned for:  technical corrections cited below  
 substantive reasons discussed below

1. Name

2. Location

3. Classification

Category	Ownership	Status	Present Use
	Public Acquisition	Accessible	

4. Owner of Property

5. Location of Legal Description

6. Representation in Existing Surveys

has this property been determined eligible?  yes  no

7. Description *Please fill in blank*

Condition		Check one	Check one
<input checked="" type="checkbox"/> excellent	<input type="checkbox"/> deteriorated	<input type="checkbox"/> unaltered	<input type="checkbox"/> original site
<input type="checkbox"/> good	<input type="checkbox"/> ruins	<input type="checkbox"/> altered	<input type="checkbox"/> moved date _____
<input type="checkbox"/> fair	<input type="checkbox"/> unexposed		

Describe the present and original (if known) physical appearance

- summary paragraph
- completeness
- clarity
- alterations/integrity
- dates
- boundary selection

United States Department of the Interior  
National Park Service

## 8. Significance

Period \_\_\_\_\_ Area of Significance—Check and justify below \_\_\_\_\_

Specific dates \_\_\_\_\_ Builder/Architect \_\_\_\_\_

Statement of Significance (in one paragraph)

- summary paragraph
- completeness
- clarity
- applicable criteria
- justification of areas checked
- relating significance to the resource
- context
- relationship of integrity to significance
- justification of exception
- other

## 9. Major Bibliographical References

## 10. Geographical Data

*Please provide acreage & VBI*

Acreage of nominated property \_\_\_\_\_

Quadrangle name \_\_\_\_\_

UMT References \_\_\_\_\_

Verbal boundary description and justification

## 11. Form Prepared By

## 12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

national  state  local

State Historic Preservation Officer signature \_\_\_\_\_

Title \_\_\_\_\_ date \_\_\_\_\_

## 13. Other

- Maps
- Photographs
- Other

Questions concerning this nomination may be directed to \_\_\_\_\_

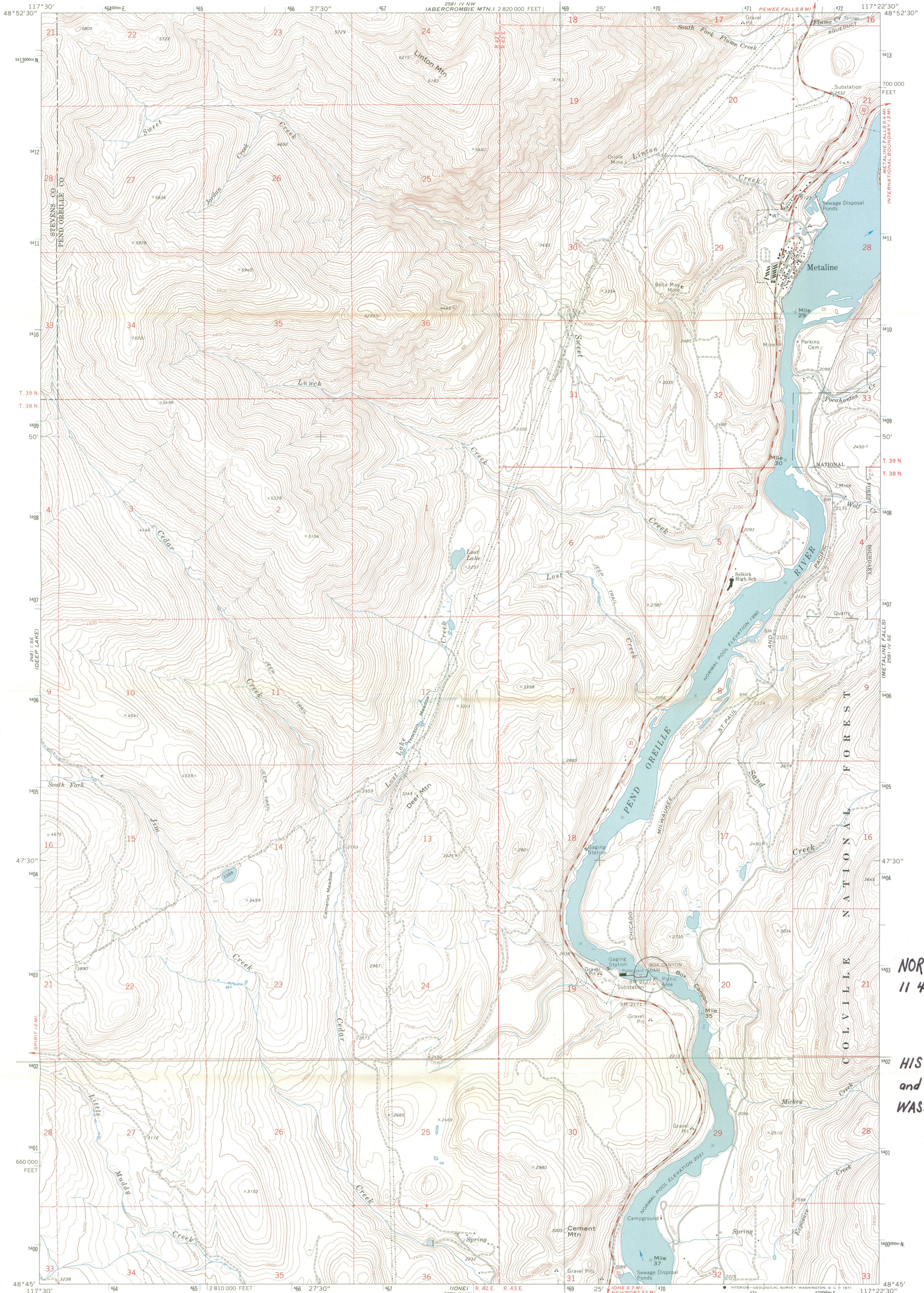
Signed \_\_\_\_\_ Date \_\_\_\_\_ Phone: 202 272-3504

Comments for any item may be continued on an attached sheet



Idaho and Washington Northern Rialroad  
side elevation, looking northeast

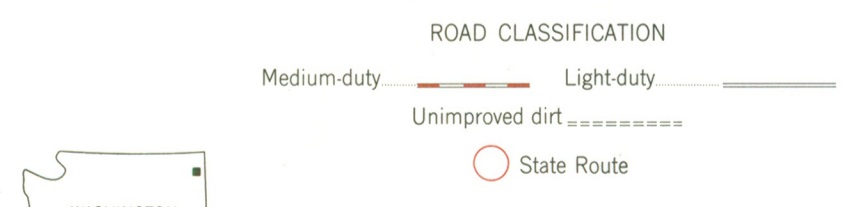
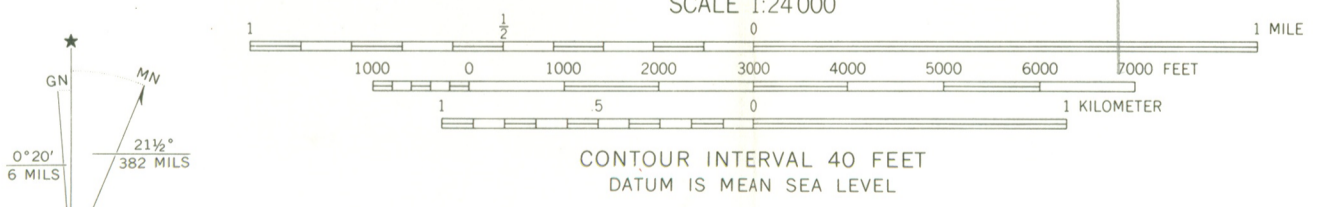
40



NORTHERN RR BRIDGE  
11 469950 5402920

HISTORIC BRIDGES  
and TUNNELS of  
WASHINGTON STATE

Mapped, edited, and published by the Geological Survey  
Control by USGS and USC&GS  
Topography by photogrammetric methods from aerial  
photographs taken 1966. Field checked 1967  
Polyconic projection. 1927 North American datum  
10,000-foot grid based on Washington coordinate system,  
north zone  
1000-meter Universal Transverse Mercator grid ticks,  
zone 11, shown in blue



METALINE, WASH.  
N4845—W11722.5/7.5

