NPS Form 10-900
(Oct. 1990)

OMB No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

1412

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "X" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (Form 10-900-a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

Historic name: CHICAGO & NORTH WESTERN RAILROAD BRIDGE

Other names/site number: C&NW BRIDGE: MISSOURI RIVER BRIDGE

2. Location

Street & number: North of U.S. Highway 14/83 ☐ not for publication

City or town: Pierre ☒ vicinity

State: South Dakota Code: SD County: Hughes Code: 065 Zip code: 57501

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this X nomination ____ request for determination of eligibility X meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ____ meets ____ does not meet the National Register criteria. I recommend that this property be considered significant ____ nationally ____ statewide X locally. (____ See continuation sheet for additional comments.)

Jay D. Vogt — 10-05-98

Signature and title of certifying official — Date

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (____ See continuation sheet for additional comments.)

Signature of the Keeper — Date of Action

4. National Park Service Certification

I hereby certify that the property is:

- ✓ entered in the National Register
  - ____ See continuation sheet.
- ____ determined eligible for the National Register
  - ____ See continuation sheet.
- ____ determined not eligible for the National Register.
- ____ removed from the National Register.
- ____ other, (explain:) _____

Signature of the Keeper — Date of Action

Edson H. Beall — 11-19-98

C&NW Bridge
Name of Property

Hughes, South Dakota
County and State

5. Classification

Ownership of Property
(Check as many boxes as apply)

- [xx] private
- [ ] public - local
- [ ] public - State
- [ ] public - Federal

Category of Property
(Check only one box)

- [ ] building(s)
- [ ] district
- [ ] site
- [xx] structure
- [ ] object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
		buildings
		sites
1		structures
		objects
1		Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)

Historic Railroads of S.D.

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions
(Enter categories from instructions)

TRANSPORTATION: Rail-related

Current Functions
(Enter categories from instructions.)

TRANSPORTATION: Rail-related

7. Description

Architectural Classification
(Enter categories from instructions)

OTHER: Pennsylvania truss bridge

Materials
(Enter categories from instructions.)

foundation stone

walls

roof

other steel

wood

Narrative Description

(Describe the historic and current condition of the property on one or more continuation sheets.)

C&NW Bridge
Name of Property

Hughes, South Dakota
County and State

8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- [xx] **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] **B** Property is associated with the lives of persons significant in our past.
- [xx] **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] **D** Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:

- [ ] **A** owned by a religious institution or used for religious purposes.
- [ ] **B** removed from its original location.
- [ ] **C** a birthplace or grave.
- [ ] **D** a cemetery.
- [ ] **E** a reconstructed building, object, or structure.
- [ ] **F** a commemorative property.
- [ ] **G** less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

TRANSPORTATION
ENGINEERING

Period of Significance

1906-1947

Significant Dates

1906
1907

Significant Person
(Complete if Criterion B is marked above)

N/A

Cultural Affiliation

N/A

Architect/Builder

Builders: Pennsylvania Steel Co.
Arthur McMullen & Co.

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

Bibliography
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

- [ ] preliminary determination of individual listing (36 CFR 67) has been requested
- [ ] previously listed in the National Register
- [ ] previously determined eligible by the National Register
- [ ] designated a National Historic Landmark
- [ ] recorded by Historic American Buildings Survey # _____
- [ ] recorded by Historic American Engineering Record # _____

Primary location of additional data:

- [xx] State Historic Preservation Office
- [ ] Other State agency
- [ ] Federal agency
- [ ] Local government
- [ ] University
- [ ] Other

Name of repository:

C&NW Bridge
Name of Property

Hughes, South Dakota
County and State

10. Geographical Data

Acreage of Property Approximately 4 acres.

UTM References
(Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing		Zone	Easting	Northing
1	14	390840	4914700	2			
3				4			

☐ See continuation sheet

Verbal Boundary Description
(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared by

Name/Title: Mark Hufstetler / Historian
Organization: Renewable Technologies, Incorporated Date: March 1, 1998
Street & Number: 511 Metals Bank Building Telephone: (406) 782-0494
City or Town: Butte State: Montana Zip code: 59701

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A USGS map (7.5 or 15 minute series) indicating the property's location.

A Sketch map for historic districts and properties having large acreage or numerous resources.

Photographs

Representative black and white photographs of the property.

Additional items
(Check with the SHPO or FPO for any additional items.)

Property Owner

(Complete this item at the request of SHPO or FPO.)

Name: Dakota, Minnesota & Eastern Railroad Corporation
Street & Number: 337 22nd Avenue South; P.O. Box 178 Telephone: (605) 697-2400
City or Town: Brookings State: South Dakota Zip code: 57006

CHICAGO & NORTH WESTERN RAILROAD BRIDGE
HUGHES COUNTY, SOUTH DAKOTA

Location:

Additional County: Stanley Code: 117

Narrative Description:

The Chicago & North Western (C&NW) Railroad Bridge is a half-mile-long structure spanning the Missouri River in central South Dakota. Built for the C&NW in 1906-07 as part of that railroad's new line to the Black Hills, the structure now carries the trains of the Dakota, Minnesota & Eastern (DM&E) Railroad, which acquired the former C&NW route in 1986. The bridge is on an approximate east-west alignment, with the east end slightly farther north than the west. The bridge's east abutment is immediately northwest of the city of Pierre, the capital of South Dakota and the seat of Hughes County; the west abutment is just northeast of the town of Fort Pierre, the seat of Stanley County. While the structure was historically outside the developed limits of both towns, recent residential development now adjoins both ends of the bridge. A modern, four-lane vehicular bridge carrying U.S. Highways 14 and 83 roughly parallels the railroad bridge approximately 1000 feet to the south. Beyond the built-up areas, surrounding land is fertile river bottomland, with agricultural areas bounded by riverside cottonwood trees. Beneath the bridge, the river channel is actually occupied by the upper reaches of Lake Sharpe, a modern reservoir formed by 1960s-era dam construction along the Missouri. The current water level, however, is not appreciably higher than the historic river.

The bridge itself is a multi-span pin-connected Pennsylvania through truss, with a steel superstructure. The Pennsylvania design, which saw substantial use nationally during the late nineteenth and early twentieth centuries, was intended for long-span applications requiring heavy carrying capacities. The truss is a variant of the near-ubiquitous Pratt design, which was characterized by the presence of relatively-heavy vertical members designed to handle the compressive stress of a bridge load. Pennsylvania trusses are distinguished from simple Pratts by the presence of sub-struts and other structural refinements, and often (as in this example) by the use of a polygonal upper chord. The C&NW bridge features four such Pennsylvania spans, along with a fifth span fitted as a swing bridge. (A swing span is mounted on a central pier which allows it to rotate open, allowing high-clearance boats to pass.) The swing span is the second through span from the east end. The bridge also includes multiple-span approaches on both ends. Overall, the structure is approximately 2200 feet long and 20 feet wide.

CHICAGO & NORTH WESTERN RAILROAD BRIDGE
HUGHES COUNTY, SOUTH DAKOTA

The bridge superstructure rests on massive piers faced with ashlar granite, with concrete caps and apparently a concrete core. The vertical distance from the base of the pier foundation to rail level is 87½ feet; the rail height is 20 feet above the river's high-water level. The piers include a cutwater design at the upstream end. The pier beneath the center of the swing span is round.

The bridge's four non-swing spans are identical. Each is 350 feet long, and displays a 12-panel Pennsylvania truss configuration. Maximum truss depth is 58½ feet. Design details of typical superstructure elements are outlined below (a wide variety of other structural assemblies are also present):

upper chords: two back-to-back channel girders with continuous cover plate along top flanges and V-lacing along bottom flanges
lower chords: two back-to-back channel girders joined with V-lacing at top and bottom flanges
major verticals: two parallel channel sections joined with lattice bracing at top and bottom
diagonals: two parallel channel sections joined with lattice bracing at top and bottom
laterals: two pairs of riveted back-to-back angles, joined with V-lacing to form I-section member
floor system: I-beam girder stringers bolted to brackets riveted to I-beam girder floor beams
decking: open

The swing span is approximately 445 feet long, and has a maximum truss depth of 72 feet. Most of the machinery formerly used to rotate the span has been removed, although large gears remain evident above the center pier. A steel stairway near the center of the swing span accesses the upper reaches of the truss, and the location of the former machinery.

Metal builder's plates on end chords of the east and west trusses identify the superstructure as a product of the Pennsylvania Steel Company, Steelton, Pa.

As built, the bridge had a 696-foot-long timber trestle approach at the east end, and a 48-foot timber trestle approach on the west. Both approaches, however, were reconfigured in the 1920s (see below). Much of the former east approach was replaced with fill in 1920, and the remainder of the east approach now consists of a two-span steel plate deck girder structure on concrete piers. Builder's plates on the girders identify the girders as 1928 products of the American Bridge Company. The west approach still includes a short timber section, but now consists primarily of a single-span plate deck girder. The builder's plate on this girder is from the Lassig Bridge and Iron Works, Chicago, Illinois.

CHICAGO & NORTH WESTERN RAILROAD BRIDGE
HUGHES COUNTY, SOUTH DAKOTA

The plaque includes a date from the 1890s (the last digit is not clear), indicating that this approach span is a "recycled" component, originally built for use elsewhere.

There are cantilevered "handcar refuge" areas at several locations along the bridge length. A series of wooden telegraph crossarms is cantilevered out from the north end of the structure.

The bridge retains a very high level of integrity; it remains in its original location, and all major structural components appear to retain their historic materials, configuration, and appearance. The structure's one significant modification-the replacement and shortening of its approach spans-apparently occurred in the 1920s, well within the bridge's period of significance.

CHICAGO & NORTH WESTERN RAILROAD BRIDGE
HUGHES COUNTY, SOUTH DAKOTA

Narrative Statement of Significance:

In accordance with the guidelines established in the Multiple Property Documentation form for "Historic Railroads of South Dakota," the Chicago & North Western Bridge is eligible for listing in the National Register of Historic Places with statewide significance under Criteria "A" and "C." The bridge is significant under Criterion A for its association with the development and expansion of the Chicago & North Western Railway in South Dakota. The C&NW played an extremely strong role in the initial settlement of much of South Dakota, and for decades thereafter remained a dominant economic force in the state. This bridge was initially constructed by the C&NW as part of its ambitious project to construct an east-west main line across South Dakota to the Black Hills, and the bridge was the most complex and visible component of that undertaking. The completed line was a major economic force in the state for decades, and remains among the most important of the state's railroad corridors. The bridge was also the first permanent crossing of the Missouri River in central South Dakota, and as such was an important transportation link for residents of Pierre, Fort Pierre, and the surrounding region.

The bridge is eligible under Criterion C as a well-preserved example of early twentieth-century railroad bridge engineering, and of period moveable bridge design. This is the only swing bridge known to remain in South Dakota, and is probably among the largest such structures to survive nationally. It is also among the state's largest and most sophisticated bridge designs overall.

Historical information: By the end of the nineteenth century much of eastern South Dakota was crisscrossed by a web of newly-built railway lines, Relatively few railroads, however, ventured into the western half of the state, in part because key portions of the region were occupied by Indian reservations and thus closed to white settlement. The Missouri River, which roughly bisected the state into eastern and western halves, also served as an early barrier to early east-west transportation in the state.

As the twentieth century began, however, reductions in the size of South Dakota Indian reservations resulted in the "opening up" of large blocks of land west of the Missouri to settlement by Euro-Americans. Almost immediately, the state's two dominant railroads-the C&NW and the Milwaukee Road-began the construction of trackage into western South Dakota. Both railways already operated east-west routes reaching as far as the Missouri River, and planned to extend those lines to Rapid City, the urban gateway to the resource-rich Black Hills region.[1]

The C&NW had completed its cross-state line as far west as the Missouri River town of Pierre in 1880, and had long wanted to continue construction

westward to Rapid City. By 1905, political and economic circumstances finally allowed work on the Rapid City extension to proceed, and that September the railroad announced its intention to build westward from Pierre.[2] Most of the planned line involved relatively simple and straightforward roadbed construction through the arid, barren hills of west-central South Dakota, but the project also mandated the completion of one massive and expensive engineering feature: a bridge across the Missouri River at Pierre.

Construction work at the Missouri River bridge site began soon after the C&NW's line extension project was announced. The railroad began by incorporating a "paper" subsidiary, the "Pierre & Fort Pierre Bridge Railway," to undertake the actual bridge construction.[3] This step was common among many railroads when building new lines or major structures, presumably because it simplified accounting and other legal issues. During November and December 1905, the railroad constructed a temporary wood-pile trestle across the river near the bridge site, to facilitate the construction process. A temporary "laborers' camp" of flimsy wooden shacks was also built nearby. Throughout the winter, the C&NW delivered massive shipments of construction material to the location, to be used both for the bridge and for the line extension to Rapid City.[4]

Construction activity on the permanent bridge itself apparently did not begin until the summer of 1906. Work that year was concentrated on the bridge's substructure, which consisted of eight massive piers faced with granite from Ortonville, Minnesota. Pier construction required the erection of large pressurized caissons, which were sunk to shale bedrock some forty feet below the river level. The first caisson reached bedrock in September 1906, and work on the piers continued into the fall and winter. As with all phases of the bridge project, substructure construction was performed by contractors under the supervision of railway engineers.[5] The prime contractor for the substructure was Arthur McMullen & Company, of New York City.[6]

Design and erection of the bridge superstructure was contracted to the Pennsylvania Steel Company, of Steelton, Pennsylvania. The firm was a very prominent steelmaker and bridge builder during the late nineteenth and early twentieth centuries. Individual truss members were fabricated at Pennsylvania Steel's plant, and shipped by rail to the construction site. The trusses themselves were assembled on-site during the summer and fall of 1907. At the peak of the construction effort, some 200 workers were employed at the bridge site.[7]

As work on the bridge progresses, other construction crews labored on the new C&NW line west from the river to Rapid City. Trackage from Fort Pierre to Rapid City was opened in July 1907, hastening pressure for completion of the Missouri River bridge. The wait was brief, however: the bridge was completed in late September, and began hosting scheduled trains early the following month.[8]

CHICAGO & NORTH WESTERN RAILROAD BRIDGE
HUGHES COUNTY, SOUTH DAKOTA

From the beginning, the new bridge was a vital transportation link in central South Dakota. The structure was the only local crossing of the Missouri until the completion of a nearby highway bridge in 1926, and consequently saw heavy use by local residents. For a time, the railway operated frequent shuttle service over the span for the benefit of area residents. Daily long-distance passenger and freight services also utilized the bridge, connecting Rapid City and Pierre with Minnesota and the Midwest.[9] The bridge's swing span, however, saw far less use. The moveable span, mandated by federal navigation requirements, was intended to allow high-clearance riverboat traffic to continue operating past the bridge, but by 1907 the era of commercial riverboats on the upper Missouri was virtually over. Much of the operating machinery for the swing span was ultimately removed, and the bridge can no longer be opened.

Few other changes to the bridge have occurred during the ensuing ninety years. During the 1920s an improvement program replaced most of the structure's timber-trestle approaches with fill, and the remaining approach areas with deck girder spans. Changes in the traffic carried by the bridge also took place. Passenger rail service through Pierre ended in 1961, and freight traffic declined to the point where the route was in danger of abandonment in the 1980s. As an alternative to abandonment, in 1986 the C&NW sold its line through Pierre to a new entity, the Dakota, Minnesota & Eastern Railroad (DM&E).[10] Under DM&E stewardship, traffic on the route has grown, and is expected to increase still further. Consequently, the immediate future of the railroad bridge at Pierre seems very secure.

Endnotes for Section 9

1. Herbert S. Schell, *History of South Dakota,* 3rd ed. (Lincoln: University of Nebraska Press, 1975), 250-253. For a broad, popular discussion on the state's rail history, also see Rick Mills, *Railroading in the Land of Infinite Variety: A History of South Dakota's Railroads* (Hermosa, South Dakota: Battle Creek Publishing Company, 1980).

2. Harold H. Schuler, *A Bridge Apart: History of Early Pierre and Fort Pierre* (Pierre, South Dakota: State Publishing Company, 1987), 62.

3. "Pierre and Fort Pierre Bridge Railway: Bridge Over Missouri River at Pierre, So. Dak." (Blueprints, dated 1906). Engineering Department files, Dakota, Minnesota & Eastern Railroad, Brookings, South Dakota.

4. Schuler, 62-63. For an excellent oral history of this period, see Historical Society of Old Stanley County, *Prairie Progress in West Central South Dakota* ([Fort Pierre, South Dakota]: the Society, 1968), 674-680.

5. Ibid.

6. *Engineering News* 59 (March 5, 1908): 243.

7. Schuler, 63-64.

8. Ibid.

9. Ibid.

10. Mills, 169-170.

CHICAGO & NORTH WESTERN RAILROAD BRIDGE
HUGHES COUNTY, SOUTH DAKOTA

Bibliography:

Casey, Robert J. *Pioneer Railroad: the Story of the Chicago and North Western System.* New York: Whittlesey House, [1948].

Engineering News 59 (March 5, 1908): 243.

Historical Society of Old Stanley County. *Prairie Progress in West Central South Dakota.* [Fort Pierre, South Dakota]: the Society, 1968.

Mills, Rick. *North Western Rails.* Hermosa, South Dakota: the author, 1988.

_____. *Railroading in the Land of Infinite Variety: A History of South Dakota's Railroads.* Hermosa, South Dakota: Battle Creek Publishing Company, 1990.

"Pierre and Fort Pierre Bridge Railway: Bridge Over Missouri River at Pierre, So. Dak." Blueprints. 1906. Engineering Department files, Dakota, Minnesota & Eastern Railroad, Brookings, South Dakota.

Quivik, Frederic L., et.al. "Historic Bridges in South Dakota." Report prepared by Renewable Technologies, Inc. for the South Dakota Department of Transportation, 1990.

Schuler, Harold H. *A Bridge Apart: History of Early Pierre and Fort Pierre.* Pierre, South Dakota: State Publishing Company, 1987.

Schell, Herbert S. *History of South Dakota,* 3rd ed. Lincoln: University of Nebraska Press, 1975.

CHICAGO & NORTH WESTERN RAILROAD BRIDGE
HUGHES COUNTY, SOUTH DAKOTA

Verbal Boundary Description:

The bridge is located in the Southwest quarter of Section 32, Township 111 North, Range 79 West. The boundary consists of a rectangle, measuring 2250 feet east-west and 70 feet east-west, and centered on the bridge superstructure.

Boundary Justification:

The boundary is constructed to include the area occupied by the bridge superstructure and substructure, as well as a 25-foot buffer of land immediately surrounding the structure.

CHICAGO & NORTH WESTERN RAILROAD BRIDGE
HUGHES COUNTY, SOUTH DAKOTA

Index to Photographs

Photographer: Mark Hufstetler
Date: August 23, 1997
Location of original negatives: South Dakota State Historic Preservation Office, Pierre

Photograph Number	Description	Direction of View
1	Elevation view, from west bank	SE
2	View from east bank, showing swing span	NW
3	View of west portal	ENE
4	Truss interior detail, east span	W
5	Detail of intermediate pier and truss end	S
6	Detail of typical pin connection	N