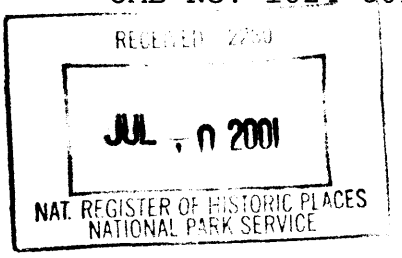
NPS Form 10-900
(Rev. 8-86)

OMB No. 1024-0018



853

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

==========
1. Name of Property
==========
historic name: **MINORTOWN ROAD BRIDGE**

other name/site number: Bridge No. 5065

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2. Location
==========
street & number: Minortown Road over Nonewaug River

not for publication: N/A
city/town: Woodbury vicinity: N/A

state: CT county: Litchfield code: 005 zip code: 06798

==========
3. Classification
==========
Ownership of Property: public-local

Category of Property: structure

Number of Resources within Property:

Contributing	Noncontributing	
_____	_____	buildings
_____	_____	sites
1	_____	structures
_____	_____	objects
1	0	Total

Number of contributing resources previously listed in the National Register: 0

Name of related multiple property listing: N/A

4. 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 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 _X_ meets ____ does not meet the National Register Criteria. ____ See cont. sheet.

John W. Shannahan 07/05/01

Signature of certifying official Date

John W. Shannahan, Director, Connecticut Historical Commission

State or Federal agency and bureau

In my opinion, the property ____ meets ____ does not meet the National Register criteria. ___ See continuation sheet.

Signature of commenting or other official Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby certify that this property is:

Edson H. Beall 8/17/01

✓ ____ 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 Keeper Date of Action

6. Function or Use

Historic: TRANSPORTATION Sub: road-related

Current: TRANSPORTATION Sub: road-related

7. Description

Architectural Classification:

Other: lenticular pony truss

Other Description: N/A

Materials: foundation _____ roof _____
walls _____ other METAL: iron
_____ STONE

Describe present and historic physical appearance. X See continuation sheet.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties: state.

Applicable National Register Criteria: A,C

Criteria Considerations (Exceptions) : N/A

Areas of Significance: ENGINEERING
INDUSTRY

Period(s) of Significance: 1878-1900 _____

Significant Dates: 1890

Significant Person(s): N/A

Cultural Affiliation: N/A

Architect/Builder: Berlin Iron Bridge Company (fabricator)

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.
X See continuation sheet.

Minortown Road Bridge is a single-span wrought-iron lenticular pony truss built in 1890 by the Berlin Iron Bridge Company for the Town of Woodbury, Connecticut (Photographs 1-4). It crosses the Nonewaug River in a rural residential area of the town, at a point close to the intersection of Minortown Road and U.S. Route 6. The bridge measures 64 feet long and is a single lane wide; it carries the roadway at a level 10 to 12 feet above the river. The bridge's trusses no longer function as the bridge's load-bearing system. Instead, a modern timber-beam bridge has been inserted within the bridge's original 16-foot roadway, along with a stout wooden guardrail, leaving the trusses carrying only their own weight. The trusses are mounted on new concrete footings that sit atop the original rubble stone abutments (Photograph 5).

All the joints in the four-panel truss are pinned, except for the end-post connections, distinctive to Berlin Iron Bridge Company, wherein the threaded ends of the lower-chord components are secured with large nuts (Photographs 6-8). The curved upper chord consists of a 6" by 10" box girder built up of plates, angles, and, on the open underside, lacing bars. The end posts were originally similar but have been replaced by box girders welded together from channels, lacing, and plate. The lower chord consists of a double chain of 2" eyebars. The lower chord imparts the bridge's distinctive lens-shaped profile by slanting up to meet the upper chord at the top of the end posts. All vertical members are lattice girders. The middle panels have cross-bracing consisting of 1" tension rods with turnbuckles. At the end panels, a pair of angles (now reinforced with welded-on stay plates) runs between the end posts and the lower joints to provide longitudinal stiffening. The original floor system is now represented only by remnants at the lower joints. The ends of the original floor beams are in place, secured to the joints by U-shaped hangers threaded to receive nuts; the hangers pass through cut-outs in the floor-beam flanges (Photograph 8). As built, the bridge had a wood-plank deck carried on timber stringers, which in turn rested upon plate-girder beams that tapered to greater depth in the center; the beams were stabilized by rod cross-bracing beneath the roadway.

The visual impact of the added structural system is not great due to the dark color of the beams and the fact that they extend only about two feet below the truss, which is about eight feet in depth at the center. In addition to those already noted, changes from the bridge's original appearance include removal of a wood-slat guardrail and the addition of angle-section longitudinal stiffeners between the lower joints of the middle panels.

Summary

The Minortown Road Bridge is significant as a representative example of late 19th-century bridge engineering (Criterion C) and as a product of the Berlin Iron Bridge Company, a major manufacturing concern and Connecticut's only large 19th-century bridge fabricator (Criterion A). Although the Berlin Iron Bridge Company built hundreds of bridges throughout the Northeast, relatively few have survived to the present; Minortown Road Bridge is one of only about 17 remaining lenticular trusses in the company's home state of Connecticut. The Minortown Road Bridge embodies many distinctive characteristics of the early years of metal-truss design, including wrought iron as the principal material, pinned connections, and an unusual truss pattern. By 1900, all of these features had virtually disappeared from American bridge building. In their place, a standardized design emerged for small highway bridges based on the use of steel members, riveted connections, and only two major truss patterns, the Warren and the Pratt trusses. The Minortown Road Bridge represents a rare survivor of the era before standardization prevailed.

Engineering Significance

The Minortown Road Bridge's lenticular truss was one of a myriad of patented designs that characterized the American bridge industry in its formative stage. In part, such designs were an attempt to improve the technology of bridge building, but they also served to distinguish the products of one fabricator from another. Berlin Iron Bridge's design offered some savings of material over a comparably sized Pratt truss, though the savings must have been largely offset by the greater complexity in fabricating the curved top chord's multiple angles. Equally important, the design's unique profile provided something distinctive that Berlin agents could point out when trying to convince local highway officials of their product's superiority.

In other respects, the Minortown Road Bridge is similar to the vast majority of its metal-truss contemporaries. In the early 1890s, steel was still in the process of replacing wrought iron for structural forms, so most bridges of the 1880s and early 1890s were built with wrought-iron members. Similarly, pinned connections were only beginning to give way to riveted joints. Pinned connections were popular because they simplified the erection of the bridge, requiring only large wrenches to join prefabricated members instead of the more demanding technique of field riveting. Many engineers also claimed

that pinned joints allowed forces to be transferred less ambiguously, though all agreed that riveted bridges were more rigid.

The Berlin Iron Bridge Company

Connecticut's leading manufacturer of bridges began as an offshoot of the tinware industry, which was centered around the Town of Berlin. Roys and Wilcox, an East Berlin maker of tinners' tools and other metal-forming mechanisms, set up a company in 1868 to market sheet-iron products made with its rolling machines. The Corrugated Metal Company, as it became known, produced roofing material and metal-clad fire doors and shutters. The company soon became involved in structural ironwork when it began to provide roof trusses as well as the exterior material. The enterprise was not particularly successful until a new investor in 1877, S. C. Wilcox, realized that the plant had the capacity to manufacture highway bridges. The following year, the Corrugated Metal Company purchased rights to William Douglas's patented "parabolic" truss and produced the first of the lenticular bridges that would soon dot the landscape of the Northeast. Douglas, educated at West Point, joined the company as treasurer and executive manager and continued to refine his design; he was awarded a second patent in 1885, by which time the company had changed its name to the Berlin Iron Bridge Company.

The late 19th century was a good time to be in the iron bridge business. As the industry developed, the price of iron trusses steadily dropped until they were competitive with wooden spans, especially when their superior durability and resistance to damage during floods was figured in (wooden bridges typically lasted only 20 to 30 years). The only other alternative, for shorter spans only, was building arches in stone, which remained very expensive. Throughout America, local highway officials opted to replace their wooden bridges with iron, and firms such as the Berlin Iron Bridge Company were happy to oblige.

At its height, the Berlin Iron Bridge Company was probably the largest structural fabricator in New England. Some 400 workers were employed at its East Berlin plant (no longer extant), with an equal number in the field during the erection season. There is no definitive count of the company's bridges, though at least 600 are known to have been completed during its first ten years, and the company itself claimed at least 1,000. Most were in the Northeast, though even today Berlin trusses survive as far away as Texas. A few multiple-span bridges were of tremendous size, but most were a single span in length, with

through-trusses used in crossings over 100 feet and pony trusses, such as the Minortown Road Bridge, for shorter spans. The lenticular design accounted for the bulk of the company's output, although it also produced other bridge types, specialized industrial structures such as dock cranes, and ironwork for roofs and buildings.

The Berlin Iron Bridge Company was absorbed in 1900 by the American Bridge Company, a largely successful attempt by J. P. Morgan to monopolize the country's structural fabricating industry. Almost immediately, some former Berlin Iron Bridge employees started a new firm, the Berlin Construction Company, which soon regained much of its predecessor's influence in the New England bridge market; it remains in business today as Berlin Steel.

Of the hundreds of bridges known to have been built in Connecticut by the Berlin Iron Bridge Company, no more than 17 lenticular trusses survive, and two of these face imminent demolition. Although they are similar, no two surviving bridges are exactly alike, and so each is important in illustrating the variations within the company's basic design. Among small bridges of the Minortown Road type, for example, there appear two types of end connections, pinned and threaded, and two types of vertical members, tapered posts that fit inside the upper chord and straight lattice girders (as here) that are secured on the outside of the upper chord; the rationale for the choice of these variations in details is not readily apparent. The survival of resources such as the Minortown Road Bridge thus helps to more fully document an important chapter in Connecticut's industrial history.

Historical Background

Like many small-town officials in the late 19th century, the selectmen of Woodbury had undertaken a program to replace the town's wooden bridges with more permanent structures. By the time this bridge was built, Woodbury already had three other Berlin Iron Bridge Company spans in place, so it is not surprising that officials again turned to the company for the Minortown Road project, as well as for another bridge (no longer in place) that was replaced at the same time. At the time, Minortown Road was not a minor town road; it was a local connection between Woodbury center and the outlying village of Minortown, and at the east end of the bridge another road (long since abandoned) led southward to the main route between Woodbury and points to the east. According to the town's 1891 annual report, the town paid

$625 for the bridge, which probably represents the cost of the ironwork, with the town paying separately for abutment construction and erection labor. In testimonials written for the company's 1889 catalog, Woodbury officials offered high praise for their Berlin bridges:

> We hereby certify that the iron bridge erected by your company last fall continues to give the best of satisfaction and, as agents of the town, we shall recommend the erection of iron, instead of wood, as our bridges need replacing in the future. . . . [Woodbury's Berlin bridges] have stood the test of three years travel and show no sign of wear or need of repair.

W. A. Strong, one of Woodbury's selectmen, summed up his recommendation with a terse statement that was, in the context of parsimonious New England towns, the highest of compliments:

> Our taxpayers are satisfied they have value received for their money.

Integrity

The extent of alterations on this bridge raise questions of its retention of integrity. Remaining Berlin bridges mostly fall into two categories: near-original bridges that have become so deteriorated that they are out of service, or bridges (like this one) that have some sort of supplementary structural system. In comparative terms, the vast majority of construction details in this bridge have been preserved in place, including the entire lower joints, and the original proportions have been maintained. The replaced end posts are similar to the original in size and shape. Losses have been confined to the earlier wooden guardrail and the floor system, and the only additions that might be mistaken for original materials are the added middle-panel longitudinal stiffeners. Visually, the bridge reads as a well-maintained lenticular truss, and thus preserves all the historical associations, as well as most of the original engineering features, associated with the Berlin Iron Bridge Company.

9. Major Bibliographical References

_X_ See continuation sheet.

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:

X State historic preservation office — Connecticut Historial Commission
X Other state agency — 59 South Prospect Street
_ Federal agency — Hartford, Connecticut 06106
_ Local government
_ University — Conn. Dept. of Transportation
_ Other -- Specify Repository: _____ — Newington, Connecticut 06111

10. Geographical Data

Acreage of Property: less than one acre

UTM References:	Zone	Easting	Northing		Zone	Easting	Northing
A	18	652060	4604180	B	__	_____	_____
C	__	_____	_____	D	__	_____	_____

___ See continuation sheet.

Verbal Boundary Description: ___ See continuation sheet.
The nominated property includes the bridge, abutments, and roadway.

Boundary Justification: ___ See continuation sheet.
The boundary includes only the components of the bridge itself.

11. Form Prepared By

Name/Title: Bruce Clouette and Hoang Tinh, reviewed by John Herzan, Conn. Hist. Commission
Organization: Historic Resource Consultants Date: April 8, 1998

Street & Number: 55 Van Dyke Avenue Telephone: 860-547-0268

City or Town: Hartford State: CT Zip: 06106

Berlin Iron Bridge Company. Catalog, 1889.

Clouette, Bruce and Matthew Roth. ***Connecticut's Historic Highway Bridges***. Connecticut Department of Transportation: 1991.

Connecticut Department of Transportation. Historic Bridge Inventory. 1991.

Darnell, Victor. "Lenticular Bridges from East Berlin, Connecticut," ***Industrial Archeology*** 5 (1979): 19-32.

Roth, Matthew. ***Connecticut: An Inventory of Historic Engineering and Industrial Sites***. Society for Industrial Archeology: 1981.

"The Plant of the Berlin Iron Bridge Company," ***Engineering News*** 3 (October 3, 1891): 87-91.

Woodbury, Town of. ***Annual Report***, 1891, p.9.

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Photographs **Minortown Road Bridge (Bridge No. 5065)** **Photos-1**
Woodbury, Litchfield County, CT

All photographs:

1. Minortown Road Bridge
2. Woodbury, Litchfield County, CT
4. April, 1998
5. Negative filed with PAST, Inc. Storrs, CT

Captions:

North end of bridge, camera facing southeast
Photograph 1 of 8

South end of bridge, camera facing northwest
Photograph 2 of 8

West elevation, camera facing northeast
Photograph 3 of 8

East elevation, camera facing south
Photograph 4 of 8

South abutment, showing repointed masonry, added concrete footing for wood-beam load-bearing component, new bearing for trusses, camera facing east
Photograph 5 of 8

Detail of nuts securing lower chord, northeast end post, camera facing east
Photograph 6 of 8

Detail of typical upper joint, east side, camera facing east
Photograph 7 of 8

Detail of typical lower joint, showing remnant of floor beam suspended from hanger, east side, camera facing north
Photograph 8 of 8