NPS Form 10-900
(Rev. Aug. 2002)

OMB No. 1024-0018
(Expires Jan. 2005)

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES REGISTRATION FORM

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 any 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 (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name: Bridge 26

other names/site number: New Haven-Weybridge Rattling Bridge;

2. Location

street & number: Town Highway 11 (Morgan Horse Farm Road) over the Otter Creek not for publication N/A

city or town: Weybridge and New Haven vicinity: N/A

state: Vermont code: VT county: Addison code: 001 zip code: 05472 and 05753

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, 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. I recommend that this property be considered significant ____ nationally X statewide ____ locally. (See continuation sheet for additional comments.)

Suzanne C. Jamele, National Register Specialist 4-21-06
Signature of certifying official Date

Vermont State Historic Preservation Office
State or Federal Agency or Tribal government

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

_____ _____
Signature of commenting official or other official and title Date

_____
State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this 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
for Edson H. Beall	6·7·06

5. Classification

Ownership of Property: (Check as many boxes as apply)
____ private
__x__ public-local
____ public-state
____ public-Federal

Category of Property: (Check only one box)
____ building(s)
____ district
____ site(s)
__x__ structure(s)
____ object(s)

Number of Resources Within Property:

	Contributing	Noncontributing
buildings:	____	____
districts:	____	____
sites:	____	____
structures:	__1__	____
objects:	____	____
total:	__1__	____

Number of Contributing Resources Previously Listed in the National Register: __0__

Name of Related Multiple Property Listing: Metal Truss, Masonry, and Concrete Bridges in Vermont
(Enter "N/A" if property is not part of a multiple property listing.)

6. Function or Use

Historic Functions: (Enter categories and subcategories from instructions)

Category:	Subcategory:
Transportation	Road-Related

Current Functions: (Enter categories and subcategories from instructions)

Category:	Subcategory:
Transportation	Road-Related

7. Description

Architectural Classification: (Enter categories from instructions)

other: riveted lattice truss with double diagonals, also called a double-intersection Warren truss

Materials: (Enter categories from instructions)
foundation: concrete abutments
roof:
walls:

other: steel structural elements

Narrative Description: (Describe the historic and current condition of the property on one or more continuation sheets.)
See continuation sheet.

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)

__x__ 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.
__x__ 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.)

_____ A. Owned by a religious institution or used for religious purposes.
_____ B. Removed from its original location.
_____ C. A birthplace or a 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 with the past 50 years.

Areas of Significance: (Enter categories from instructions)	**Period of Significance:**
Transportation	1908 - 1955
Engineering	

Significant Person: (Complete if Criterion B is marked above)	**Significant Dates:**
N/A	1908

Cultural Affiliation:
N/A

Architect / Builder:
American Bridge Company
United Construction Company

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

9. Major Bibliographical References

Bibliography:
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.) 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 for the National Register.
____ Designated a National Historic Landmark.
____ Recorded by Historic American Buildings Survey No. _____
____ Recorded by Historic American Engineering Record No. _____

Primary Location of Additional Data:
__x__ State Historic Preservation Office.
__x__ Other state agency: Vermont Agency of Transportation
_____ Federal agency.
__x__ Local government.
_____ University.
_____ Other. Name of repository: _____

10. Geographical Data

Acreage of Property: Less than one

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

	Zone	Easting	Northing		Zone	Easting	Northing
1.	18	644614	4881342	2.			
3.				4.			

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

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

11. Form Prepared By

Name / Title: William J. Thrane, Intern, and Robert L. McCullough

Organization: Vermont Agency of Transportation, Historic Bridge Program Date: August, 2000; revised 2005

Street & Number: National Life Building, Drawer 33 Telephone: 802-828-3615

City or Town: Montpelier State: VT Zip Code: 05633-5001

12. 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)

13. Property Owner

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

Name / Title: Town of New Haven and Town of Weybridge

Organization: _____ Date: _____

Street and Number: 78 North Street (New Haven) Telephone: 802-453-3516

Street and Number: 1727 Quaker Village Road (Weybridge) Telephone: 802-545-2450

City or Town: New Haven State: VT Zip Code: 05472

City or Town: Weybridge State: VT Zip Code: 05753

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.). A federal agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number.

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to Keeper, National Register of Historic Places, 1849 "C" Street NW, Washington, DC 20240.

Narrative Description

Bridge 26, fabricated in 1908 by the American Bridge Company, carries Town Highway 11 (Morgan Horse Farm Road) across the Otter Creek at Huntington Falls, between the towns of New Haven and Weybridge in Addison County. The approach from the north is in New Haven, and the descending road is Town Highway 7 (Pearson Road), which curves sharply to the west before turning south and entering the bridge. From the Weybridge or southerly approach, travelers can turn from Morgan Horse Farm Road to the adjoining Huntington Falls picnic area, overlooking a hydroelectric facility and dam, the latter approximately 350 feet downstream from the crossing. The bridge retains an exceptionally high degree of integrity in terms of location, design, setting, materials, workmanship, feeling and association. A builder's plate confirms the bridge's date and provenance, and the structure has been scheduled for rehabilitation and limited highway use under the Vermont Historic Bridge Program's Preservation Plan for Metal Truss Bridges. The two towns have jointly enrolled Bridge 26 in that program.

Bridge 26 is a single span, riveted lattice through truss with two sets of diagonals in each truss. Structures of this type are often called double-intersection Warren trusses, but occasionally the description "triangular truss" is also used. The design typically dispenses with vertical members, except at the hips (first bearing points from the ends) for bridges with trapezoidal profiles, and relies instead on webs with sets of diagonals alone. Bridges with two sets of diagonals were especially common, but many railroads also built bridges employing three, and sometimes four, sets of diagonals to achieve greater rigidity; a desire for precautionary redundancy may have influenced some engineers as well. Occasionally, short vertical struts are used for bridges with two sets of diagonals, extending from the bottom chords on through trusses (or top chords on deck trusses) to the intersections of diagonals, and halving panel lengths of the floor system in the process.

Bridge 26 illustrates the common trapezoidal through-truss design that employs only full-depth vertical members at the bridge hips and no intermediary vertical struts. The bridge spans 149 feet with eight panels; the trusses are approximately twenty feet in depth; the single-lane roadway is sixteen feet wide (17 ½ feet center-of-truss to center-of-truss); and portal clearance is approximately 16 ½ feet (lower at the corners because of curved portal bracing). The bridge's moderately-sized chords and diagonals give the bridge a light, graceful form that distinguishes it as a holdover from earlier, 19th century bridge-fabricating techniques that were already becoming obsolete by the time this bridge was erected. The bridge's deck of loosely-fastened timber planks, set transversely across stringers, rattles noisily as cars traverse the span, giving the crossing its current popular name.

The top chords of Bridge 26 are box girders with a lattice underside, and the bottom chords are I-section girders with angles forming the girder flanges; stay plates spaced 40 inches apart form the girder webs. Diagonal web members are channel girders with paired angles joined, in alternating sequence, by

Narrative Description (continued)

stay plates or lattice bars. Hip verticals are paired angles connected by stay plates and, on the bridge's northerly panels, reinforced by bolted channel beams. Girders fashioned from angles connected by lattice bars brace the top chords laterally at each panel, and these girders and top chords are also reinforced by tie-rod cross bracing. Portals are braced laterally by two sets of paired angles with a web of single angles aligned diagonally and joined to the upper and lower angles by small gusset plates. The floor system consists of I-section girders with paired angles as upper and lower flanges and a solid plate web. Surviving original stringers are channel girders, but most have been replaced by rolled I-beams; floor beams and stringers are reinforced by tie-rod cross-bracing. A railing, 18 inches in depth, with single angles as upper and lower chords and a web of lattice bars, is probably original to the bridge. The substructure consists of two reinforced concrete abutments, one of which (southerly) is in poor condition.

Statement of Significance

Bridge 26 is being nominated pursuant to the existing multiple property submission titled "Metal Truss, Masonry, and Concrete Bridges in Vermont," and under the property type, "metal truss bridges." The crossing is significant as a rare, surviving example of a truss type, the riveted lattice truss, widely used during the late 19th century but becoming obsolete by the time of its construction in 1908. Moreover, the bridge straddles significant developments in the bridge manufacturing business during a period when its fabricator, American Bridge Company, sought to solidify a monopoly it began establishing in 1900, the year it acquired twenty-eight bridge-manufacturing companies and captured a substantial share of the nation's bridge business.

In addition, Bridge 26 was built during an important period of highway and bridge improvements in Vermont beginning in 1892 with the appointment of the Vermont Highway Commission and formation of the Vermont League of Good Roads. The structure exemplifies the type of bridge purchased directly by towns from bridge manufacturers before Vermont's legislature authorized state aid for local bridge projects in 1912, and before state engineers began influencing the design of local bridges after federal aid became available in 1916. Locally, too, the bridge stands at a river crossing, Huntington Falls, that became part of the Waltham Pike, opened after 1805 and one of the first roads to traverse Weybridge.

Riveted lattice truss bridges are described by various terms. Those with two sets of diagonals in each truss are often called double-intersection Warren trusses, a description that can be traced to J.A.L. Waddell's important 1916 treatise, *Bridge Engineering*. Waddell indicates the term was originally applied to triangular trusses in which the web triangles are equilateral, but he also explains that general usage had expanded this definition to include any triangular truss. By distinguishing between single and double intersection versions, Waddell isolated the number of points at which diagonals intersect panels. The Warren truss can be traced to an 1848 English patent by James Warren and Willoughby Monzani, who designed a triangular truss web with a single set of diagonals set in opposite directions and with no vertical posts.

Nevertheless, a nearly identical design had been developed at least a year earlier (and apparently without knowledge of developments in England), by an American engineer, Squire Whipple, who published his analysis in an 1847 book titled *A Work on Bridge Building*. Thus, the credit to Warren is not fully justified. In addition, Warren's name has become attached to bridges with three and sometimes four sets of diagonals, awkwardly called triple and quadruple intersection webs, even though Waddell describes those trusses with four sets of diagonals as triangular lattice trusses (they are also called Hilton trusses). The confusion regarding panel intersections becomes even greater if panels are subdivided (and doubled in number) by struts.

Statement of Significance (continued)

Consequently, a preferable alternative is to describe such bridges as riveted lattice trusses, just as the Berlin Iron Bridge Company did in some of its late 19th century catalogs. Such riveted lattice trusses can be distinguished easily by identifying the number of diagonal sets in each truss: two, three or four.

Riveted lattice truss bridges with two sets of diagonals proved serviceable on highways as well as railroads, and such bridges were commonly built on Vermont roads during the last two decades of the nineteenth century and first decade of the twentieth century. In fact, an identical bridge across Otter Creek was constructed a few miles downstream at Weybridge Lower Falls, probably during the same period. There, it became known as the East Iron Bridge, possibly to distinguish it from another iron bridge at those falls. The Vermont Construction Company in St. Albans, the state's lone fabricator of metal truss bridges and a subsidiary of the R. F. Hawkins Iron Works in Springfield, Massachusetts, also utilized riveted lattice truss bridges extensively, one of which survives in Wilmington. However, as Waddell observes, stress distributions in the design are ambiguous and the bridges are thus "statically indeterminate." In addition, although economy in the use of metal is achieved, the design is complicated and requires extensive fieldwork, negating any cost-savings in materials.

The years between 1892 and 1916 mark a vigorous but transitional period of road and bridge construction in Vermont. Bridge salesmen often convinced town selectmen to purchase iron (and later steel) bridges directly from manufacturers, and company representatives heavily influenced the bridge designs selected by these local officials. That practice had begun in Vermont as early as 1860 in isolated locations but did not become common until the mid-1880s. After 1892, increasing emphasis on the improvement of rural roads, spurred by programs such as Rural Free Delivery and, during the first decade of the twentieth century, by the prospects for automobile travel, encouraged communities to devote greater attention to methods of road construction and to bridge design. Professional engineers gradually assisted towns in this process and were represented by the Vermont Society of Engineers, which organized in 1912. Nevertheless, more traditional methods of bridge construction also persisted, and timber bridges were built during this period as well. By 1900, though, engineers had demonstrated that two metal types, the Warren truss and the Pratt truss, offered structural and economic efficiencies that surpassed other designs. Yet less efficient types of metal truss bridges continued to be built, Bridge 26 among them, suggesting the continuing influence of manufacturing companies and their representatives. Consolidation of regional operations by the American Bridge Company during this period, a topic worthy of continued study, may have influenced choice of the design as well. In any case, the design proved sufficiently serviceable to endure what will soon be a century of use.

The crossing at Huntington Falls, also known as Weybridge Upper Falls, became part of the Waltham Turnpike, linking the Center Turnpike in Middlebury with Vergennes. The Waltham Turnpike Company

Statement of Significance (continued)

acquired its charter in 1805, but construction of the road progressed slowly and did not achieve completion until 1808. General Samuel Strong of Vergennes served as one of the company's incorporators and became a principal owner. Turnpike companies typically placed toll houses and gates near bridges, and at Huntington Falls the house stood at the top of the hill on the northerly side of the crossing, in New Haven, on what is now Pearson Road. By 1821, though, most of the road had been opened to public use, and by 1828 the company declared the entire route free. Only the toll house and a small parcel of land remained in company ownership. Local records refer to the turnpike as a plank road, but installation of the planks probably did not occur until after 1828. In addition, Huntington Falls developed more slowly than Lower Weybridge Falls, which grew into a substantial industrial site and village center. Not until 1884, the year a dam was constructed by the Green Mountain Pulp Company, did the upper site begin to serve industrial purposes. Today, the hydro-electrical generating plant at the upper falls is the principal remnant of that industry.[1]

Local records indicate that Weybridge, rather than New Haven, assumed responsibility for construction of Bridge 26, and annual reports for the years 1907 and 1908 show substantial payments to United Construction Company, totaling at least $2,200. Records also show modest contributions to the project from the town of New Haven. Annual reports for 1904 also show payments to United Construction Company for an iron bridge, possibly that at Weybridge Lower Falls. That large construction firm, based in Albany, New York, began capturing a substantial share of the bridge construction business after 1900, through informal collaboration with American Bridge Company.

1. Frederick Wood's 1919 treatise, The Turnpikes of New England, describes the Waltham Turnpike as connecting Center Turnpike in Middlebury with the courthouse in Vergennes. However, I have not been able to verify that a courthouse was built in Vergennes

Section 9: Major Bibliograpic References

Bibliography

Comp, T. Allan and Donald R. Jackson. Bridge Truss Types: A Guide to Dating and Identifying. Nashville, Tennessee: American Association of State and Local History, n.d.

Condit, Carl. American Building Art: The Nineteenth Century (New York: Oxford University Press, 1960.

Farnsworth, Harold, and Robert Rodgers. New Haven in Vermont, 1761-1983. New Haven, Vermont: published by the town, 1984.

Lichtenstein and Associates, Inc. "State of Vermont Agency of Transportation Historic Metal Truss Bridge Plan for New Haven Bridge No. 26, Town Highway 7 Over Otter Creek, New Haven, Vermont." Unpublished report available from the Vermont Historic Bridge Program, Vermont Agency of Transportation.

Town of New Haven. Annual Reports, 1908; 1909.

Town of Weybridge. Annual Reports, 1905 (8-9); 1908 (10-11); 1909 (10-11).

Waddell, J.A.L. Bridge Engineering. New York: John Wiley & Sons, Inc., 1916.

Washington, Ida. History of Weybridge, Vermont. Burlington, Vermont: Queen City Printers for the Weybridge Bicentennial Committee, 1991.

Whipple, Squire. A Work on Bridge Building: Consisting of Two Essays, the One Elementary and General, the Other Giving Original Plans and Practical Details for Iron and Wooden Bridges. Utica, New York: H.H. Curtiss, Printer, 1847.

Wood, Frederick J. The Turnpikes of New England and Evolution of the Same Through England, Virginia and Maryland. Boston, Massachusetts: Marshall Jones Company, 1919.

Section 10: Geographical Data

Verbal Boundary Description

The boundary of the property is the bridge and its abutments. The bridge carries Town Highway 11 (Morgan Horse Farm Road) in Weybridge and Town Highway 7 (Pearson Road) in New Haven across Otter Creek between the towns of New Haven and Weybridge.

Boundary Justification

The boundary includes all the land historically associated with the bridge.

Section 12: Photograph Labels

The following information is the same for all photographs:

Name of Property:	Bridge 26
Location:	New Haven and Weybridge, Addison County, Vermont
Credit:	Robert McCullough
Date:	October, 2005
Negatives:	Filed at the Vermont Division for Historic Preservation

Photograph No. 1:	View from Town Highway 11 (Morgan Horse Farm Road), looking northerly
Photograph No. 2:	View from Town Highway 7 (Pearson Road), looking southerly.
Photograph No. 3:	View of Bridge 26 in elevation, looking westerly