NPS Form 10-900-a
(8-86)

OMB Approval No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number _____ Page _____

SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 04001094 Date Listed: 9/29/04

Bridge No. 455 | Hartford | CT
Property Name | County | State

N/A
Multiple Name

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

Entered in the National Register

Signature of the Keeper

9-29-04
Date of Action

==========

Amended Items in Nomination:

8. Statement of Significance: Period of Significance:

The period of significance for this property's historical and engineering significance under criteria A and C is 1929

This was confirmed with CTSHPO staff by telephone.

DISTRIBUTION:
National Register property file
Nominating Authority (without attachment)

NPS Form 10-900
(Oct. 1990)

OMB No. 10024-0018

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

1. Name of Property

historic name BRIDGE NO. 455

other names/site number N/A

2. Location

street & number Route 159 at Stony Brook ☐ not for publication

city or town Suffield ☐ vicinity

state Connecticut code CT county Hartford code 003 zip code 06078

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this ☒ 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 ☒ meets ☐ does not meet the National Register criteria. I recommend that this property be considered significant ☐nationally ☒ statewide ☐ locally. (☐ See continuation sheet for additional comments.)

08/10/04

Signature of certifying official/Title Date

J. Paul Loether, Division Director, Connecticut Commission on Culture & Tourism
Deputy State Historic Preservation Officer

State or Federal agency and bureau

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

Signature of certifying official/Title Date

State or Federal agency and bureau

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

Entered in the National Register 9-29-04

5. Classification

Ownership of Property
(Check as many boxes as apply)

- ☐ private
- ☐ public-local
- ■ public-State
- ☐ public-Federal

Category of Property
(Check only one box)

- ☐ building(s)
- ☐ district
- ☐ site
- ■ structure
- ☐ object

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

Contributing	Noncontributing	
		buildings
		sites
1		structures
		objects
1	0	Total

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

N/A

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions
(Enter categories from instructions)

TRANSPORTATION: road-related

Current Functions
(Enter categories from instructions)

TRANSPORTATION: road-related

7. Description

Architectural Classification
(Enter categories from instructions)

Other: open-spandrel concrete arch

Materials
(Enter categories from instructions)

foundation N/A
walls N/A
roof N/A
other N/A

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

Description:

Bridge No. 455 carries Route 159 some 55 feet above the water level of Stony Brook in Suffield, Connecticut (Photographs 1-3). Completed in 1929, the bridge is an open-spandrel reinforced-concrete arch, 132 feet in length, with a rise of 34 feet. There are four 14-foot concrete-girder approach spans at the south end of the arch and five at the north end, giving an overall length for the structure of 259 feet. The roadway, which consists of two vehicular lanes, is 28 feet wide. The aptly named Stony Brook runs in a rocky, densely wooded ravine at this point, with ledge outcroppings visible along the stream banks. The general area is residential in use.

The arch ribs, which are four feet thick at the springing points and 2 ½ feet at the crown, are spaced 21 feet on center and are connected by a series of six square cross-ties (Photograph 4). A series of tall, tapering square columns rise from the arch ribs to support the 40-inch-deep transverse beams that carry the concrete-slab roadway. Because the roadway is wider than the arch, part of the travel lanes and the bridge's railings are cantilevered on 5 ½-foot extensions of the floor beams, which are shaped as coved brackets. The columns, including those that support the girder approach spans, are articulated with simple bases and capitals. The tops of the openings between columns are straight for most of their length, curving down at the ends to join the columns just above the capital moldings; they could be regarded as flat-topped arches. Originally the bridge had concrete railings made up of square balusters; these have been replaced by railings with a steel tube atop a concrete base.

The bridge shows evidence of repeated episodes of repair to the concrete, the first of which occurred in 1940. In addition to a lack of color match, some of the repairs call attention to themselves because they extend a few inches above the surface of the original concrete, a sort of raised patch.

Next page: Proposed Bridge over Stony Brook: General Drawing, April 28, 1928, Connecticut Department of Transportation File 111-04. The notations reflect some concrete repair undertaken in 1940.

8. Statement of Significance

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

- ■ **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.
- ■ **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 a ll 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, 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)

ENGINEERING
TRANSPORTATION

Period of Significance
1915-1935

Significant Dates
1929

Significant Person
(Complete if Criterion B is marked above.)
N/A

Cultural Affiliation

Architect/Builder
Connecticut Highway Department, engineers

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

9. Major Bibliographic 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 Building Survey # _____
- ☐ recorded by Historic American Engineering Record # _____

Primary location of additional data:

- ■ State Historic Preservation Office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Name of repository:

Connecticut Historical Commission,
59 South Prospect Street, Hartford, CT 06106

Statement of Significance:

Summary

The Route 159 bridge in Suffield is significant as a typical example of open-spandrel concrete-arch construction (Criterion C) and as a product of the early efforts of the State of Connecticut to build a modern highway system (Criterion A). The open-spandrel design represents the acme of concrete-bridge engineering because it was used for the longest and most expensive projects; this bridge is one of six remaining in Connecticut. Although it has undergone subsequent repairs and changes, the bridge continues to exhibit the key characteristics of the type: slender arch ribs, rows of support columns, and a setting within a deep rocky ravine that called for a high-level crossing. Route 159 was an important road in the 1920s, and this bridge was the largest of several improvements undertaken to raise it to a standard consistent with its role as a major Trunk Line highway. As the number of bridges from the 1920s diminishes, those that survive, especially impressive ones like Bridge No. 455, assume a greater importance in memorializing the establishment of the state highway system, an important episode in Connecticut transportation history.

Engineering Significance

Reinforced-concrete was the principal bridge-building material of the early 20th century because it was exceptionally strong, inexpensive, and (it was thought) virtually maintenance-free. Of the several types of concrete bridges, the open-spandrel form, in which the roadway was supported on a system of columns and cross beams resting on arch ribs, was used for the longest spans, typically over deep ravines. Compared with the simple, filled-spandrel arch, the open-spandrel form demanded more calculations on the part of the designers and much more effort in building the forms for the ribs, columns, cross-ties, and floor beams. However, by minimizing the dead load of the structure to only what was structurally necessary, it saved a great deal of money, both in material costs and because the footings could be less massive. As a result, the open-spandrel design allowed for much longer arches. The labor-intensity of concrete construction was not an objection, so long as the total cost of the bridge remained low, since local contractors and workers received the money rather than out-of-state bridge companies.

The impressive size, soaring arch ribs, and open, airy appearance were also regarded as aesthetic achievements by the engineers of the period. In its 40-year retrospective, published in 1935, the Connecticut Highway Department stated its preference for arches wherever conditions would allow because of their "more than ordinary artistic worth."

The Stony Brook crossing was well-suited to the open-spandrel form. Although not a large stream, the brook runs through a ravine that is about 300 feet wide and 55 feet deep. Some of the length was achieved with embankments at the ends of the bridge and approach spans, but still some 130 feet had to be bridged at a high level. A truss would have required the construction of large, tall, and expensive end piers to effect the crossing. In contrast, an arch provides the necessary height by virtue of its form and so could use relatively small footings set into the bedrock on either side of the stream.

Transportation History Significance

Bridge No. 455 recalls the intensive program of road improvements in the early 20th century that created Connecticut's state-highway system. In 1907 the Connecticut Highway Department was given the task of constructing and maintaining major "Trunk Line" routes that would serve individual regions within the state as well as the state as a whole, and in 1915 the Department was given responsibility for bridges on Trunk Line Routes. The Department's first priority was the Connecticut shore line, but in the late 1920s and 1930s, it turned its attention to improving inland routes as well. The course followed by Route 159 had been the principal north-south route along the western bank of the Connecticut River since colonial times, connecting Hartford with Windsor, Windsor Locks, Suffield, and points north in Massachusetts. In the 1920s the state widened the road and built substantial new bridges over the Farmington River in Windsor (since replaced) and Stony Brook in Suffield.

The previous bridge on the site had been a narrow 19th-century iron bridge that crossed the stream at a much lower level. By using the open-spandrel design to achieve a higher crossing level, the state engineers were able to eliminate steep hills at either end of the bridge, reduce the curve in the roadway, and provide unlimited vertical clearance for trucks. Its two 14-foot travel lanes provided what was regarded as a wide roadway in those days. The new bridge also had a substantially higher load capacity than its predecessor. In short, the Highway Department had created a structure that could reasonably be expected to provide good service well into the foreseeable future.

10. Geographical Data

Acreage of Property less than one

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

1	18	696610	4647650	**3**			
	Zone	Easting	Northing	Zone	Easting	Northing	
2				**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 Bruce Clouette, Historian

organization Public Archaeology Survey Team, Inc. date March 31, 2003

street & number P.O. Box 209 telephone 860-429-1723

city or town Storrs state CT zip code 06268

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 SHPO or FPO for any additional items.)

Property Owner

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

name Connecticut Department of Transportation

street & number 2800 Berlin Turnpike telephone 860-594-3000

city or town Newington state CT zip code 06141-7546

Bibliography:

Clouette, Bruce, and Matthew Roth. Connecticut Historic Bridge Inventory. Connecticut Department of Transportation, 1990.

_____. *Connecticut's Historic Highway Bridges.* Newington, Conn.: Connecticut Department of Transportation, 1991.

Condit, Carl W. *American Building: Materials and Techniques from the First Colonial Settlements to the Present.* Chicago: University of Chicago Press, 1968.

Connecticut Department of Transportation. Drawing File 111-04.

Connecticut Highway Commission, *Annual Report, 1929*, Table 24; *1930*, Table 24.

_____. *Forty Years of Highway Development in Connecticut, 1895-1935.* New Haven: Connecticut Tercentenary Commission, Publication No. 46, 1935.

Hool, George A., and W. S. Kinne. *Reinforced Concrete and Masonry Structures.* New York: McGraw-Hill Book Company, 1924.

Legat, Arthur W. *Design and Construction of Reinforced Concrete Bridges.* London: Concrete Publications, 1948.

McCullough, Conde B. *Economics of Highway Bridge Types.* Chicago: Gillette Publishing Co., 1929.

Urquhart, Leonard C., and Charles-Edward O'Rourke. *Design of Concrete Structures.* New York: McGraw-Hill Book Company, 1926.

Waddell, J. A. L. *Economics of Bridgework.* New York: John Wiley and Sons, 1921.

Verbal Boundary Description:

The nominated property includes the bridge, abutments, and piers.

Boundary Justification:

The nominated property embraces the entire historic structure.

All Photographs:

1. Bridge No. 455
2. Suffield, Hartford County, CT
3. PAST, Inc. Photo
4. March 2003
5. Negative filed with PAST, Inc., Storrs, CT

Captions:

East side of bridge, camera facing west
Photograph 1 of 4

West side of bridge, from south end, camera facing northeast
Photograph 2 of 4

Roadway level, from north end, camera facing southwest
Photograph 3 of 4

Underside of bridge, looking from north end, camera facing southwest
Photograph 4 of 4