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

OMB No. 1024-0018

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES REGISTRATION FORM

RECEIVED
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NATIONAL REGISTER

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1. Name of Property

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historic name: **BULKELEY BRIDGE**

other name/site number: **Bridge No. 980A, Hartford Bridge**

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2. Location

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street & number: Route Interstate-84

not for publication: N/A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

state: CT county: Hartford code: 003 zip code: 06103

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3. Classification

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Ownership of Property: public-state

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.

Signature of certifying official — Date: 10/22/93

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:

✓ entered in the National Register ___ See continuation sheet.	Beth L. Savage	12-10-93
____ 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:

Classical Revival
other: masonry arch

Other Description: N/A

Materials: foundation N/A roof N/A
walls STONE other CONCRETE

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
TRANSPORATION
COMMUNITY PLANNING

Period(s) of Significance: 1908

Significant Dates: 1908

Significant Person(s): N/A

Cultural Affiliation: N/A

Architect/Builder: Edwin D. Graves (chief engineeer)
Edmund M. Wheelwright, architect

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

Description — Bulkeley Bridge
(Bridge No. 980A, Hartford Bridge)
Hartford, Hartford County, CT — 7-1

The Bulkeley Bridge, originally named the Hartford Bridge, is a massive stone structure consisting of a series of nine semi-elliptical arched spans rising from stone piers (Photographs 1 and 2). The arches vary in length from 68 to 119 feet, with a corresponding increase in rise from 20 to 30 feet, so that in the middle of the river channel, closer to the west bank than the east, the crown of the 199-foot-long largest arch is about 45 feet above the river, with the roadway level about 5 feet above that. The bridge has an overall length of 1,192 feet. The arches are built of an ashlar of pink-gray granite from the Stony Creek quarry in Guilford, Connecticut, with a fairly smooth, pebbly surface to the stone and tight, 1/2-inch mortar joints. The voussoirs are squared up so as to bond with the courses of ashlar in the spandrels, with those at the apex of the arch interrupting the top horizontal course so as to create a keystone effect (Photograph 3).

The tall pointed-end battered piers rest on concrete-filled wooden caissons sunk up to 50 feet below the river. Up to the level of the arch spring point, these are built of an ashlar of quarry-faced gray granite from Leete's Island in Guilford, with the coping on the pier and the pilasters separating adjacent arches which are pink granite like the spandrels. The piers are 19 feet wide except for two, the first and fifth from the west, which are 43 feet wide. These larger piers, decorated only with a simple circular disk ornament, define the central portion of the bridge: the bridge is symmetrical between them, with those five arches graduating in length and rising to the largest middle arch. The roadway (Photograph 4) also rises upward in a slight curve to the same midpoint.

A simple roll molding defines the base for the bridge's railing, which is otherwise perfectly plain, with stone sides and thick, square-cornered capstones (Photograph 5). There are two commemorative tablets. On the south side at the western end is a bronze tablet giving the original name of the bridge and the particulars of its construction (Photograph 6). Above the large mid-river pier on the north side, the railing forms an alcove overlooking the river; there a large stone monument bears a bronze tablet commemorating Morgan Bulkeley, the chairman of the commission which built the bridge, for whom it was renamed in 1928 (Photograph 7); Georg Jober sculpted the tablet, which was cast by the American Art Foundry of New York.

The bridge was originally 82 feet wide, accommodating two 10-foot sidewalks and a 60-foot roadway for motor vehicles and trolley traffic. Currently it carries two 53-foot roadways for Route Interstate-84, constructed in 1964, as well as pedestrian sidewalks. The bridge was widened on the north side about 40 feet with concrete extensions to the arches, with all the original stonework re-erected so that the bridge retains its original appearance. The westernmost span has been partly obscured by girder structures that accommodate Interstate 84 interchange ramps, a modification that also resulted in the removal of a portion of the railing.

Summary

The Bulkeley Bridge is significant as a major engineering project and an impressive work of architecture (Criterion C); it also has significance as the largest civic improvement project undertaken in the Hartford area up to that time (Criterion A). Because of its magnitude, as well as the requirements of deep foundations in the river bed and an immense quantity of precisely cut stone, the Bulkeley Bridge presented great challenges in design, construction, and project management. Completed in 1908 at a cost of $3 million, the Hartford Bridge, as it was then known, was the most costly bridge in Connecticut and among the longest stone-arch bridges in the world. Its monumental scale, arched form, graceful geometry, fine stonework, and simple Neo-Classical ornament were intended to create an entrance to Hartford that would be worthy of its status as a prosperous commercial and industrial city. To this end, the project cleared out tenement blocks and built wide, tree-lined boulevards at either end. The Bulkeley Bridge is one of the state's foremost outcomes of the early 20th century "City Beautiful" movement.

Engineering Significance

The Bulkeley Bridge is still one of the largest bridges in Connecticut, and, as supervising engineer Edward W. Bush speculated in 1926, it probably represents "the last stone arch bridge of magnitude that will ever be constructed" anywhere in the world. By the time of its completion in 1908 (it took almost five years to build), concrete and steel had almost entirely replaced stone in the construction of large bridges. Although the Bulkeley Bridge's stone-arch superstructure represented a traditional building technology, the substructure was an engineering challenge met by the latest techniques. Foundations for the piers were constructed by sinking wooden pneumatic caissons into the river bed, a technique in use for less than 20 years at the time. The caissons, watertight wooden boxes open at the bottom, allowed workers, mostly Italian immigrants working in hot, humid, pressurized air, to excavate the bottom sand. When the caissons were at the proper level, they were filled with concrete to provide footings for the

piers. The commission which built the bridge had the advice of Alfred P. Boller of New York City, an eminent engineer and probably the country's leading authority on underwater bridge foundations.

The stone work of the superstructure was undertaken with extraordinary exactitude, each stone individually drawn up and numbered on the plans, then cut, partly by hand and partly by pneumatic machines, in a large stone cutting yard on the east bank. The voussoirs and ring stones, in addition to being shown in the drawings, were cut from zinc templates created directly on a full-scale 28 by 110 feet grid, which was laid out in a nearby loft. The mating surfaces of these stones were hammered to within 1/3 of an inch from a true plane.

Although the structure of the bridge is stone, an immense quantity of concrete was also used, most of it from a floating concrete plant mounted on a 220-foot-long barge. In addition to filling the caissons for the foundation, the entire upper side of every arch was filled with concrete. Since the ring stones were laid as alternating headers and stretchers, the upper side presented a series of "binder" stones projecting upward. When the concrete was poured around them, these binders locked the stonework into the concrete mass above the arch.

The chief engineer for the bridge was Edwin D. Graves (b.1865). Graves, a graduate of the engineering school at the University of Maine, worked as a railroad engineer before coming to Connecticut. He designed three major bridges across the Connecticut River before this one. The strain of building the Hartford Bridge proved too much for him, however, and he became permanently insane in the middle of construction. The bridge was finished under the supervision of deputy engineer John Henderson and engineer in charge of construction Edward W. Bush.

Architectural Significance

The bridge embodies the distinguishing characteristics of Neo-Classical architecture: its tremendous scale, plain but graceful lines, arched form, and simple Classical detailing create the restrained yet monumental appearance which was favored in the early 20th century for important public works of architecture. The designers of the bridge, which included engineer Edwin D. Graves and consulting architect Edmund M. Wheelwright, studied numerous ancient European bridges to refine their sense of design for the Hartford project. They consciously eschewed ornamental elaboration, feeling that it would detract from the aesthetic impact of the bridge's form: "every time we eliminated fussy details, we gained in strength, beauty, and dignity." Wheelwright was a well-known architect from Boston, Massachusetts, where he had a large practice in schools, hospitals, and other institutional buildings.

Historical Background

The old wooden covered bridge which preceded this bridge burned in 1895. Although a temporary iron bridge was soon erected to re-establish Hartford's vital river crossing, a special commission, the Connecticut River Bridge and Highway District Commission, was created by the legislature to find a more permanent solution, under the leadership of former governor Morgan G. Bulkeley. The commission considered stone, truss, and girder designs, but at the urging of the City of Hartford, which voted $1.7 million toward the extra expense, decided on the more costly but more beautiful stone-arch option which, as one Hartford citizen put it, would make for "a bridge which should endure forever and . . . be an ornament [to the city]." Construction was delayed for three years because Springfield interests objected to the lack of a draw span. The engineers finally provided for a bascule at the west end, but then the federal government reversed itself and the west span was built as a fixed arch. The first $500,000 of costs was split among Hartford and four surrounding towns, with the remainder to be borne by Hartford alone. Operating and maintenance costs proved not to be a problem, since the legislation provided for the bridge to receive 50% of the state taxes paid by any electric railway using the

bridge. Since the Connecticut Company was just then putting together a virtual monopoly on the trolley business throughout all of Connecticut, this provision created a recurring windfall.

The civic improvement represented by the Hartford Bridge went well beyond the river crossing itself. On the east side, a scenic new boulevard was constructed to provide an impressive approach to the Capital City. Although now lined with automobile dealerships and other commercial ventures, Connecticut Boulevard even today retains something of the grand scale of the bridge's original east approach. On the west end, the project demolished an extensive area of tenement housing, relocated an entire railroad freight yard, and built a long riverside boulevard which dog-legged over the bridge. Although all this work disappeared with the construction of Interstates Highways 91 and 84, it represented Hartford's largest urban renewal project to that time, an immense "City Beautiful" undertaking, of which the bridge over the Connecticut River was the centerpiece.

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:

_ State historic preservation office
X Other state agency — Connecticut Dept. of Transportation
_ Federal agency — 24 Wolcott Hill Road
_ Local government — Wethersfield, CT 06109
_ University
_ Other -- Specify Repository: _____

10. Geographical Data

Acreage of Property: approx. 3.3

UTM References:

	Zone	Easting	Northing		Zone	Easting	Northing
A	18	694000	4626580	B	__	_____	_____
C	__	_____	_____	D	__	_____	_____

___ See continuation sheet.

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

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

11. Form Prepared By - Reviewed by John Herzan, National Register Coordinator

Name/Title: Bruce Clouette and Maura Cronin

Organization: Historic Resource Consultants Date: March 1, 1993

Street & Number: 55 Van Dyke Avenue Telephone: 203-547-0268

City or Town: Hartford State: CT Zip: 06106

American Enterprise Souvenir Number. Hartford, 1908.

Bush, Edward W. "Historical Notes Relating to the New Hartford Stone Bridge." Typed manuscript, 1926, Connecticut State Library.

Clouette, Bruce, and Matthew Roth. Connecticut's Historic Highway Bridges. Wethersfield: Connecticut Department of Transportation, 1992.

Connecticut Department of Transportation. Historic Bridge Inventory. 1991.

Connecticut River Bridge and Highway District Commission. Records. RG 46, Connecticut State Library.

Construction of the Bulkeley Bridge, East Haddam Bridge, and Connecticut State Bridge, 1903-1913. Photographs. PG 475, Connecticut State Library.

Hartford Evening Post. Souvenir Issue. Hartford, 1908.

"The Stone Bridge at Hartford, Conn." Engineering Record 50 (December 31, 1904): 764-67.

Wright, George E. Crossing the Connecticut . . . With a Full Description of Hartford Bridge. Hartford, 1908.

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

OMB Approval No. 1024-0018

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National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Photographs — Bulkeley Bridge (Bridge No. 980A, Hartford Bridge) Hartford, Hartford County, CT — Photos-1

All photographs:

1. Bulkeley Bridge (Bridge No. 980A, Hartford Bridge)
2. Hartford, Hartford County, CT
3. Photo Credit: HRC, Hartford, CT
4. April, 1992
5. Negative filed with Connecticut Historical Commission Hartford, CT

Captions:

South side of bridge, camera facing northwest from east bank
Photograph 1 of 7

North side of bridge, camera facing west from east bank
Photograph 2 of 7

Detail of typical arch (third arch from east end), south side, camera facing north
Photograph 3 of 7

Roadway, camera facing west from east end
Photograph 4 of 7

Detail of south railing, camera facing southeast
Photograph 5 of 7

Tablet at west end, south side, camera facing south
Photograph 6 of 7

Tablet in north-side alcove, camera facing north
Photograph 7 of 7