NH Division of Historical Resources
Determination of Eligibility (DOE)

Date received:	Jan. 19, 2006	Inventory #:	DOV0158
Date of group review:	Jan. 25, 2006	Area:	Newington-Dover Project Area (ND)
DHR staff:	Beth	Town/City:	Dover
Property name:	General John Sullivan Bridge	County:	Strafford
Address:	over Little Bay, parallel to the Spaulding Turnpike		
Reviewed for:	[X]R&C [ ]PTI [ ]NR [ ]SR [ ]Survey [ ]Other NH DOT/FHWA: Newington-Dover, NHS-027-1(37), 11238		

Individual Properties

NR	SR
[X]	[X]Eligible
[ ]	[ ]Eligible, also in district
[ ]	[ ]Eligible, in district
[ ]	[ ]Not eligible
[ ]	[ ]More information needed
[ ]	[ ]Not evaluated for individual eligibility

Districts

NR	SR
[ ]	[ ]Eligible
[ ]	[ ]Not eligible
[ ]	[ ]More information needed
[X]	[X]Not evaluated @ district

Integrity: [X]Location [X]Design [X]Setting [X]Materials
[X]Workmanship [X]Feeling [X]Association

Criteria: [X]A. Event [ ]B. Person [X]C. Architecture/Engineering
[ ]D. Archaeology [ ]E. Exception

Level: [X]Local [X]State [X]National

STATEMENT OF SIGNIFICANCE:
☐ **IF THIS PROPERTY IS REVIEWED IN THE FUTURE, ADDITIONAL DOCUMENTATION WILL BE NEEDED.**

Final information has been received regarding the eligible boundary for the Sullivan Bridge, which includes the bridge itself, its abutments and approach roads. Judging from other current project information on file at the DHR, these resources are between station 615+- in Dover and station 590 in Newington.

☒ **ENTERED INTO DATABASE**

ACREAGE:	approximately 2.5 acres
PERIOD OF SIGNIFICANCE:	1934 to 1956 (NR 50-year cut-off date)
AREA OF SIGNIFICANCE:	engineering, transportation
BOUNDARY:	as noted above and on page B1.
SURVEYOR:	Preservation Company: December 1991 and November 2004
FOLLOW-UP:	Notify surveyor and agencies.

Final DOE approved by:

E Z Murphy

(June 2006)

NHDHR Determination of Eligibility / Effect (36 CFR Part 800)

Project:	Newington-Dover, NHS-027-1(37), 11238	**Inventory #:**	DOV0158
Date of group review:	December 8, 2005	**Area:**	Newington-Dover Project Area
Participants:	FHWA, NHDOT, NHDHR	**Town / City:**	Dover
Property name:	General John Sullivan Bridge	**County:**	Strafford
Address:	Over Little Bay, parallel to the Spaulding Turnpike		
Agency:	NH DOT	**Reviewed for:**	R&C

Individual Properties

NR SR
[x] [x] Eligible (district N/A)
[ ] [ ] Eligible, also in district
[ ] [ ] Eligible, only in district
[ ] [ ] Not evaluated for individual eligibility
[ ] [ ] Listed in the National or NH Registers of Historic Places

Districts

NR SR
[ ] [ ] Eligible
[ ] [ ] Not eligible

[x] [x] Not evaluated as a district
[ ] [ ] Listed in the National Register of Historic Places

Integrity: [x] Location [x] Design [x] Setting [x] Materials [x] Workmanship [x] Feeling [x] Association

Criteria: [x] A (Event) [ ] B (Person) [x] C (Architecture/Engineering) [ ] D (Archaeology) [ ] E (Exception)

Level: [ ] Local [x] State [ ] National

Significance: Built in 1934 under difficult weather and tidal conditions, the General Sullivan Bridge was the keystone of a project that was then regarded as "the most unique and outstanding along the line of bridge and highway construction that has ever been proposed in the history of the State." Design and construction of the bridge were noteworthy achievements, described in articles in engineering journals of the time.

The General Sullivan Bridge was the first span in New Hampshire to be designed as a continuous arched truss, without structural breaks at its supporting piers. This design employed newly developed sophistication in analyzing stresses in continuous structures. The General Sullivan Bridge was designed by Fay, Spofford and Thorndike, bridge design specialists from Boston. Founded in 1914, this partnership was one of the most prolific American bridge engineering firms of the 1920s and 1930s. Charles M. Spofford was an authority in structural analysis who had authored a textbook, *The Theory of Structures* (1911, 1915, 1928), which outlined some of the methods of analysis for statically indeterminate structures that were employed in the design of the bridge, specifically the 'Method of Least Work." In 1929, Fay, Spofford and Thorndike had designed a direct prototype for the Sullivan Bridge--the Lake Champlain Bridge, between Chimney Point in Addison, Vermont, and Fort Frederick at Crown Point, New York.

The Sullivan Bridge restored a long-disused travel route in southern New Hampshire. Until the bridge opened, all traffic from Portsmouth to Concord traveled first to Dover, then proceeded west through Barrington on Route 9 to join the New Hampshire Turnpike Road (Route 4) in Northwood. The Sullivan Bridge and a companion structure, the Scammell Bridge, provided a new connection with the eastern end of the old turnpike at Cedar Point in Durham. Conducting traffic along the old route through Durham, Lee, and Nottingham, the bridge thus restored usefulness to the full length of the turnpike, and re-established an important transportation network. When New Hampshire's bridges were evaluated for historical and engineering significance in 1982, the General Sullivan Bridge attained a numerical score of 28 points, one of the highest rankings achieved by any New Hampshire bridge.

Eligible Acreage: Approximately 2.5 acres, which includes the bridge itself, its abutments and approach roads.

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36 CFR 800.5 Criteria of Effect & Adverse Effect

☒ **36 CFR 800.5(a): Apply criteria of adverse effect.** In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified historic properties, the agency official shall apply the criteria of adverse effect to historic properties within the area of potential effects. The agency official shall consider any views concerning such effects which have been provided by consulting parties and the public.

☒ **Effect:** The undertaking may alter National Register-qualifying characteristics and features of
Section 106: [ ] location [x] design [x] setting [ ] materials [ ] workmanship [ ] feeling [x] association
Section 4(f): [x] use

☒ **36 CFR 800.5(a)(1): Criteria of adverse effect:** an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling and association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. Adverse effects on historic properties include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;
(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;
(iii) Removal of the property from its historic location;
(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(June 2006)

NHDHR Determination of Eligibility / Effect (36 CFR Part 800)

Project:	Newington-Dover, NHS-027-1(37), 11238	**Inventory #:**	DOV0158
Date of group review:	December 8, 2005	**Area:**	Newington-Dover Project Area
Participants:	FHWA, NHDOT, NHDHR	**Town / City:**	Dover
Property name:	General John Sullivan Bridge	**County:**	Strafford
Address:	Over Little Bay, parallel to the Spaulding Turnpike		
Agency:	NH DOT	**Reviewed for:**	R&C

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36 CFR 800.5(a)(1): Criteria of adverse effect, continued:

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

☐ **36 CFR 800.5(b): Finding of no adverse effect:** [*Otherwise adverse effects may be considered not adverse when*] the agency official, in consultation with the SHPO/THPO, may propose a finding of no adverse effect when the undertaking's effects do not meet the criteria of paragraph (a)(1) of this section or the undertaking is modified or conditions are imposed, such as the subsequent review of plans for rehabilitation by the SHPO/THPO to ensure consistency with the *Secretary's Standards for the Treatment of Historic Properties* (36 CFR Part 68) and applicable guidelines, to avoid adverse effects.

☐ **No historic properties affected:** there are no historic properties present ***OR*** historic properties are present, but the undertaking will not alter any characteristics that would qualify the property for the National Register.

36 CFR 800.5(c): Consulting party review. If the agency official proposes a finding of no adverse effect, the agency official shall notify all consulting parties of the finding and provide them with the documentation specified in § 800.11(e). The SHPO/THPO shall have 30 days from receipt to review the finding.

Comments: (All alternatives) The General Sullivan Bridge will be preserved for public use (see Mitigation section, below). Most of the construction work will be within the NH DOT right-of-way. Because Hilton Park has been determined not to be eligible for the National Register, construction easements and staging within the west side of the park will not constitute adverse effects.

Mitigation: Any adverse effects resulting from reconfiguration of the abutment and wingwall to accommodate the widening of the connector road under the Little Bay Bridges, and removal of the roadway and the approach embankment on the Dover side, will be greatly ameliorated by the rehabilitation of the General Sullivan Bridge for public recreational use, pedestrians, and bicyclists, resulting in an overall beneficial effect.

NH Division of Historical Resources

Determination of Eligibility (DOE)

Date received: January 20, 2005 Inventory #: DOV0158

Date of group review: January 26, 2005 Area: Newington-Dover Project Area

DHR staff: Garvin Town/City: Newington, N. H./Dover, N. H.

Property name: General John Sullivan Bridge County: Rockingham/Strafford

Address: N/A

Reviewed for: [ ]R&C [ ]PTI [X]NR [ ]SR [ ]Survey [ ]Other

Individual Properties		Districts	
NR	SR	NR	SR
[X]	[X]Eligible	[ ]	[ ]Eligible
[ ]	[ ]Eligible, also in district	[ ]	[ ]Not eligible
[ ]	[ ]Eligible, in district	[ ]	[ ]More information needed
[ ]	[ ]Not eligible	[ ]	[ ]Not evaluated @ district
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[X]Workmanship [ ]Feeling [X]Association

Criteria: [X]A. Event [ ]B. Person [X]C. Architecture/Engineering
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Level: [X]Local [X]State [X]National

STATEMENT OF SIGNIFICANCE:

☐ **IF THIS PROPERTY IS REVIEWED IN THE FUTURE, ADDITIONAL DOCUMENTATION WILL BE NEEDED.**

Built in 1934 under difficult weather and tidal conditions, the General Sullivan Bridge was the keystone of a project that was then regarded as "the most unique and outstanding along the line of bridge and highway construction that has ever been proposed in the history of the State." Design and construction of the bridge were noteworthy achievements, described in articles in engineering journals of the time. ¶The General Sullivan Bridge was the first span in New Hampshire to be designed as a continuous arched truss, without structural breaks at its supporting piers. This design employed newly developed sophistication in analyzing stresses in continuous structures. The General Sullivan Bridge was designed by Fay, Spofford and Thorndike, bridge design specialists from Boston. Founded in 1914, this partnership was one of the most prolific American bridge engineering firms of the 1920s and 1930s. Charles M. Spofford was an authority in structural analysis who had authored a textbook, *The Theory of Structures* (1911, 1915, 1928), that outlined some of the methods of analysis for statically indeterminate structures that were employed in the design of the bridge, specifically the "Method of Least Work." In 1929, Fay, Spofford and Thorndike had designed a direct prototype for the Sullivan Bridge—the Lake Champlain Bridge, between Chimney Point in Addison, Vermont, and Fort Frederick at Crown Point, New York. ¶The Sullivan Bridge restored a long-disused travel route in southern New Hampshire. Until the bridge opened, all traffic from Portsmouth to Concord traveled first to Dover, then proceeded west through Barrington on Route 9 to join the New Hampshire Turnpike Road (Route 4) in Northwood. The Sullivan Bridge and a companion structure, the Scammell Bridge, provided a new connection with the eastern end of the old turnpike at Cedar Point in Durham. Conducting traffic along the old route through Durham, Lee, and Nottingham, the bridge thus restored usefulness to the full length of the turnpike. When New Hampshire's bridges were evaluated for historical and engineering significance in 1982, the General Sullivan Bridge attained a numerical score of 28 points, one of the highest rankings achieved by any New Hampshire bridge.

☐ **ENTERED INTO DATABASE**

ACREAGE: Less than one acre

PERIOD OF SIGNIFICANCE: 1934-1955 (arbitrary 50-year cutoff date)

AREA OF SIGNIFICANCE: Engineering, transportation

BOUNDARY: The footprint of the bridge, including the abutments

SURVEYOR: Frank Griggs and Carol Hooper, the Preservation Company

FOLLOW-UP: The inventory form needs to be edited for spelling, grammar, and phraseology. The accounts of the structural analysis and construction of the bridge need proper citations. Footnotes need to be integrated, especially a series of unconnected and discontinuous notes on page 9 of 48./ The abutments and causeway of the bridge, which are part of the project, need to be described. The forms needs additional information on the firm of Fay, Spofford, (continued)

and Thorndike. Under the National Register Statement of Significance, discuss the importance of Fay, Spofford and Thorndike, especially Charles M. Spofford. Discuss the design of the bridge as an early example of the application of the Method of Least Work and the Method of Three Moments to the analysis of a structurally continuous truss. The form should address the construction of the bridge as a response to a challenging set of circumstances, including rapid tidal currents, extreme cold, and ice floes. In sum, the form should discuss the national level of significance of the General Sullivan Bridge as the second and more highly refined example by Fay, Spofford, and Thorndike of a statically indeterminate continuous truss. The form also needs to supply more information on fabricators Lackawanna Steel Construction Company and Crandall Engineering Company (substructure).

Final DOE approved by:

1. add info Fay Spofford & T. esp Spofford (sign) – Background
2. Design – [illegible] u of Mg 3 moment – [illegible] statically indeterminate analysis of continuous truss – [illegible]
   & Spofford's contribution [illegible] continuous – Champlain – compiled.
3. challenging circumstances
4. more info on Lackawanna & Crandall.