New Hampshire DOT
Department of Transportation

THE STATE OF NEW HAMPSHIRE
DEPARTMENT OF TRANSPORTATION

JEFF BRILLHART, P.E.
ACTING COMMISSIONER

Bureau of Bridge Design
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December 18, 2014

Mr. Chris Bisignano, P.E.
Supervisory Bridge Management Specialist
First Coast Guard District
Battery Building, Room 301
1 South Street
New York, NY 10004-1466

RE: NEW CASTLE – RYE X-A001(146), 16127
Replacement of the Single Leaf Bascule Bridge with a Fixed Structure
NH 1B Bridge over Little Harbor (Wentworth Bridge)

Dear Mr. Bisignano:

I am writing in regards to the above referenced bridge replacement project. The attached document presents the Department's reasoning regarding the type of replacement structure proposed at this location to carry NH Route 1B over Little Harbor between the Towns of New Castle, NH, and Rye, NH. As you know, the existing structure is a single leaf bascule movable bridge, which provides unlimited vertical clearance when opened to allow taller vessels access to the inland area of the Portsmouth estuary. However, the existing lift bridge has limited utility given the limited use and notification lead times required to facilitate a lift.

In considering options for replacement structures, it was necessary and prudent to evaluate the type of bridge to be constructed, e.g., a movable span or a fixed span. Based on the information available to us and feedback received through public participation, the New Hampshire Department of Transportation is recommending a fixed structure at this location due to substantial cost difference associated with a moveable bridge structure and the minimal number of requested bridge openings, averaging only 2 lifts per year.

The Department has estimated that an additional $8.8 million in capital costs would be required to construct a new bascule bridge at this location, along with the future maintenance and operation costs ($1.1 million in 2014 dollars) typically needed for movable bridges. When considering the difficult financial challenges currently faced by the Department and the limited utility of the existing bascule bridge, it has become necessary to make the difficult decision for the preferred alternative to be a fixed structure. This decision is supported by the fact that there is limited water depth in the back channel, which makes navigation in this area unlikely by boats requiring additional vertical clearance, along with the extremely low number of requested bridge openings noted above

(average of 2 per year). Thus, the anticipated use of the inland marine estuary area by larger vessels is not sufficient to justify the significant increase in the capital, maintenance, and operational costs that would be needed for a movable bridge at this location.

The Department has been requested by Public Advisory Members (PAC) to re-evaluate the roadway profile and the superstructure depth currently proposed to determine the extent of any feasible increase in the underclearance that could be provided for marine vessels. The effort is limited by the need to minimize slope impacts to adjacent properties and environmental resources. It is estimated that an increase of about 1 foot could be obtained over the 13.0 feet vertical clearance currently provided.

We recognize that there has been much discussion and debate between a fixed structure and a moveable structure. We wanted to inform you of the Department's preferred alternative as early as possible. If you have questions or comments regarding this decision and any of the supporting information, please feel free to contact me as needed.

Sincerely,

Mark W. Richardson, P.E.
Administrator

MWR/lrl
Attachments

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STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION

FROM:	Victoria, Chase Bob Landry	**DATE:**	December 18, 2014
SUBJECT:	**New Castle - Rye 16127** **Bridge replacement of the Single Leaf Bascule Br. No. 066/071 carrying NH Route 1B over Little Harbor** **Fixed Structure versus Bascule Structure**	**AT:**	Department of Transportation Bureau of Bridge Design
TO:	David J. Brillhart, PE Assistant Commissioner	**Through:**	William J. Cass, PE Director of Project Development

DJB 12/18/14

Concur w/ recommendation for Fixed span. WJC

The above-referenced project has progressed through the TS&L effort, environmental review, and public participation to determine that the existing single leaf bascule bridge (Br. No. 066/071, Wentworth Road Bridge) carrying NH Route 1B over Little Harbor between the towns of New Castle and Rye needs to be replaced. This single leaf bascule bridge is a 6-span, 254-foot, steel girder bridge has an open grid deck constructed in 1942 with a roadway width of 24 feet and a 3-foot sidewalk on the north side for a total out-to-out width of 30 feet 10 inches. This was New Hampshire's first Defense Access Bridge built with federal funding under President Roosevelt's Defense Highway Act of 1941. The Town of New Castle is an archipelago with only two entry routes. This bridge carries one of these two routes, making it a vital piece of infrastructure for the local community.

In addition, the bridge is one of two bascule bridges in NH, the other being the Hampton Harbor bridge carrying NH Route 1A over the Hampton River. It is important to note that during the Scammel Bridge replacement project (US Route 4 over Bellamy River), there were commitments to saving / preserving the New Castle-Rye Bridge as part of the environmental process (as noted in 1994 MOA and letter between O'Leary and Muller).

Based on in-depth inspection performed by HDR and HTA in January 2011, the current condition of the bridge indicates that the existing structure cannot be prudently rehabilitated and that the most sensible option is a bridge replacement alternative. This determination to replace the existing bascule structure was challenged by the NH State Historic Preservation Office (NHSHPO), who sought the input of the Advisory Council on Historic Preservation (ACHP). In its March 3, 2014 response, the ACHP confirmed the determination that FHWA is proposing to move toward demolishing the bridge in favor of a new one, and that the original 1994 MOA included a provision outlining how consultation would need to occur should the bridge need to be demolished. FHWA can choose to amend the existing MOA, or elect to proceed with the new Section 106 consultation and MOA development, but should clarify the connection between the 1994 MOA and the proposed MOA.

There are two distinct replacement alternatives under consideration: 1) single leaf bascule structure similar to the existing; or 2) fixed structure at the current profile and with a marine vertical opening increase of 3", from 13'-5" to 13'-8" at mean high water (MHW), obtained by a decrease in structure depth (the evaluation of alternatives did review a fixed structure with an increased marine vertical opening of 6'-3", but the environmental and property impacts removed it from selection.).

The Department undertook an outreach process that included formation of a Public Advisory Committee (PAC), three public information meetings and a public comment period during which the Department received input on a preferred bridge design from nearly 30 individuals and organizations. The Public Advisory Committee was comprised of representatives as follows: Town of New Castle Selectboard, Town of Rye Administrator, New Castle and Rye Police and Fire Departments, New Castle Historic Society, the businesses of Wentworth-by-the-Sea Hotel and Wentworth-by-the-Sea Country Club, Manager of the Wentworth Homeowners Association, Portsmouth Harbormaster, NH State Senator, NH House Representative, a Rye resident and abutter, and the Rockingham Planning Commission. Through dialogue with the PAC and the public, the project has developed agreement upon many of the project features. These include shifting the sidewalk to the ocean side of the roadway, solid deck versus open grid, closure periods for construction, and other items. There was initial consensus favoring a bascule replacement structure, however, near the end of the public process, the costs of this option were challenged by an interested individual because the fixed structure was much less expensive. Consequently a Cost Benefit Analysis of the fixed vs bascule bridge was requested by the Town of Rye Selectboard.

Both alternatives equally provide for roadway benefits as both will accommodate vehicular traffic, bicyclists and pedestrians. The two major differences between the bridge alternatives are that a fixed structure may restrict marine traffic access to the back channel harbor due to its limited under clearance, and that the fixed structure is significantly less costly in both the initial capital cost and future operation and maintenance costs of the bascule structure.

Some of the pros of the Fixed Alternative are:

- Fixed structure cost of approximately $8.8 million less ($7.0 M versus $15.8 M) in Capital Cost, and per the Benefit Cost Analysis, $1.1 M in 2014 dollars for future Operation and Maintenance Cost for a combined Life Cycle cost of $9.9 million in 2014 dollars.
- Fixed structure is preferred by the Town of Rye (as documented in letter dated June 13, 2014).
- Fixed structure allows for the Portsmouth water line to go under the bridge deck to New Castle versus being required to go on the harbor floor, a much less expensive operation.
- Fixed structure improves the ability of USACOE to dredge the back channel harbor versus the existing structure given the proposed width between the piers.
- Based on current use (or lack of use seeing that the structure lifts 2 times per year on average), Fixed structure would not restrict access to back channel harbor by marine vessels.

Some of the pros of the Bascule Alternative are:

- Bascule structure maintains the only remaining unlimited (though there is an overhead electrical line with a 65' vertical clearance just downstream of the structure) marine access point into the back channel harbor.
- Bascule structure is preferred by the Town of New Castle (as documented in letter dated June 16, 2014). Although subject to change given Portsmouth's need to replace its water line onto the bridge.
- The bascule structure would provide flexibility to provide safe harbor without height restrictions to vessels during inclement weather. This flexibility is currently limited by the depth of the back channel harbor and the notification time associated with lifting the structure.
- A bascule structure would have more resiliency to climate change and rise in sea level, as the bridge can lift to allow vessels through if higher sea levels reduce the under clearance.
- Bascule structure improves the ability of USACOE to dredge the back channel harbor versus the existing structure given the proposed width between the piers.

Based on all things considered:

1. The significant increase ($9.9 million) in Life Cycle Cost (Capital Cost and O & M Cost combined in 2014 dollars) between the Fixed structure and the Bascule structure (Fixed structure being less);
2. Existing limited number of lifts per year averaging two (2);
3. Limited water depth within the back channel harbor that limits the use of boats requiring a lift to get under the existing or proposed structure; and
4. The incremental utility provide by the Bascule structure over the Fixed structure,

NHDOT recommends that a Fixed Structure be the Department's preferred alternative to address this redlisted structure.

This selection does have hurdles in two areas:

1. The project needs to obtain a United States Coast Guard Permit and given that we are removing the last lift bridge entrance into the back channel harbor, this may be challenged by the marine users and by the property owners within the back channel harbor, including the Witches Cove Marina and Chandler's Loft that have the potential for lost business opportunities if dredging of the back channel harbor becomes a reality.
2. The project will require a Section 106 Memorandum of Agreement from FHWA in consultation with NHSHPO. Given that this is one of two remaining bascule structures in the State, their agreement on this alternative may be a challenge. NHSHPO may also determine that changing the type of structure and limiting marine traffic access may have an effect on the historic resources within the back channel harbor. The two alternatives are very much similar in profile and massing, which should make an argument against the impact relating to the type of structure easier to refute. If required by NHSHPO, an evaluation of the existing bascule bridge's relationship to and/or limiting marine traffic access to the back channel harbor's historic resources would require further documentations and evaluations that could be extensive and time consuming.

If you have any questions or additional comments that you would like us to consider, please feel free to ask or express them.

Thank you

M. Richardson, V. Chase, R. Landry, K. Naji (FHWA)

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