

**Commission to Study Henderson Brook Bridge  
in the Allagash Wilderness Waterway  
October 13, 2006**

**MEETING SUMMARY**

**Members in attendance:** Senator John Martin (co-chair), Representative Troy Jackson (co-chair), Senator Dana Dow, Representative Henry Joy, Gary Pelletier, Robert Vigue, Rick Denico, Anthony Hourihan, James Pelletier, and Vern Labbe.

**Members absent:** Representative Ted Koffman and Jamie Fosburgh.

**1. Advanced Engineered Wood Composites (AEWC) Center – Bridge Design**

The director of the AEW Center, Habib Dagher, led the commission on a tour of the Center.

Rigidified inflatable arches, a technology developed at the AEW Center, for bridges and other structures may be applicable to the construction of the new Henderson Brook Bridge (HBB). If the bridge is designed using arches, the design needs to maintain a certain height to span ratio. According to Mr. Dagher, rigidified inflatable arches are stronger than steel and composite materials don't rust like steel. However, according to Roger Gagnon of Gagnon Engineering, even steel pilings will not rust if they are buried in the ground. The arches would be armored underneath to protect the bridge from hydraulic pressure from ice.

The question was posed: Is one pier possible? Not really, the cost of steel is prohibitive. A two-pier design is more logical.

According to Mr. Dagher, federal grant money is available through the federal "Innovative Bridge Research and Development" program. The commission could apply for research and development funding to go towards the cost of bridge construction. Mr. Dagher estimated that the bridge project might qualify for up to \$500,000 in federal funding. The deadline for the grant proposal is August 2007. Bridge construction could begin in spring 2008. However, the commission would like to begin bridge construction next spring – in 2007. Given that timeline, a more feasible and timely option may be to approach Maine's congressional delegation to secure federal funding. The key to the federal funding proposal is to demonstrate that the bridge project is innovative in its materials and/or design.

The AEW Center consulted with Maine's Department of Transportation to estimate the cost of building a replacement bridge:

Average cost of bridge construction (2005): \$173 per square foot

Current inflation rate: approximately 15 percent per year

Cost of bridge construction in 2008:  $\$173 \times (1.15)^3 = \$263$  per square foot

Proposed size of replacement Henderson Brook Bridge = 16 feet x 205 feet

Total cost =  $\$263 \times (16 \text{ feet} \times 205 \text{ feet}) = \$863,000$

Therefore, according to AEWCCenter’s cost estimate, the total cost of a replacement bridge would be \$850,000 to \$1,000,000. With \$500,000 in research and development federal funding possibilities, the out-of-pocket cost is approximately \$500,000.

Eric Cassidy and Habib Dagher discussed some of the Center’s bridge demonstration projects. The AEWCCenter has designed, constructed and monitored numerous demonstration structures. Many of the projects involved the use of Fiber-Reinforced-Polymer (FRP) wood composites. West Seboeis Stream Bridge in West Seboeis, Maine is one example. Built in 1997, the West Seboeis Stream Bridge is a 44-foot structure made with Maine red pine. Another example, which was briefly discussed, is the Crowley Island Bridge in Addison, Maine. It is a glulam-girder/glulam-deck project, which consists of four 48-foot spans.

Mr. Dagher was asked if there is a guarantee on the design life of the wood composites. Laminated beams, like the ones used in these two bridge projects, are guaranteed for 60 to 70 years.

## **2. Gagnon Engineering – Bridge Design**

Roger Gagnon of Gagnon Engineering spoke briefly about his bridge design work for Blanchet Logging and Lumber Company. The Land Use Regulation Commission permit process, with Blanchet as the applicant, began in 1994 with “Amendment B” to “Bridge Construction Permit BCP 3048.” In 1997, “Amendment C” to BCP 3048 sought approval to remove and replace Henderson Brook Bridge. Gagnon Engineering designed the proposed replacement bridge.

According to Gagnon Engineering in 1997, the proposed replacement bridge would:

- Have nominal design capacity of 100 tons, plus a 25% overload design capacity.
- Be constructed approximately 35 feet upstream from the existing bridge.
- Consist of a 200-foot long, 15-foot wide, three-span bridge with two 48-foot-wide concrete wing wall gravel-filled abutments, and two three-foot-six-inch-wide concrete support piers.

The replacement bridge would be approximately three feet higher in elevation than the current bridge with the intent of widening the river channel flow enough to allow for seasonal high water and ice flows to pass underneath without affecting the bridge structure. The flow area proposed for the replacement bridge is 50 percent greater than the current bridge. ***The commission asked staff to include in the commission’s final report a discussion of ice flow and flooding problems at Churchill Dam Bridge to highlight the importance of increasing the flow area of the replacement bridge.***

Mr. Gagnon advised the AEWCCenter to avoid ice at all possible costs. Mr. Gagnon’s cost estimate for a replacement bridge was similar to the AEWCCenter’s -- \$500,000 to \$1,000,000. Mr. Gagnon also agreed with the Center’s assessment on the durability of laminated beams – approximately 60 to 70 years.

Mr. Gagnon expressed concern about the impact of ice (namely jams and washouts) on the south abutment of the replacement bridge. The abutment on the north side of the bridge was not a concern. ***The commission asked Mr. Gagnon to provide them with a cost estimate for***

*development of a location design for the replacement bridge. The estimate would include the cost of the testing necessary (soils work, for example) to move the south abutment to a slightly different location (different than the design location that Gagnon Engineering completed for Blanchet Lumber).*

### **3. Bridge Design – Points of Consensus**

The commission agreed to several basic components of the replacement bridge design. The commission proposes:

- Three-spans
- Two center piers
- Abutments outside the normal high water mark
- Increase flow area by approximately 50 percent (compared to current bridge)
- Consider wood or steel or a combination of both
- Avoid arches

### **4. Economic Analysis**

- The bridge subcommittee provided the full commission an analysis of the economic impact (costs) of Twin Brooks as an alternative site for the bridge. *The estimate of costs associated with construction of a new bridge needs to be updated based on the Department of Transportation's current (2005) average cost of bridge construction.*

*The commission also asked Mr. Gagnon of Gagnon Engineering to provide the bridge subcommittee with a cost estimate for a construction platform for the Twin Brooks location. This amount would be added to the Twin Brooks bridge construction cost estimate.*

- *The bridge subcommittee will also provide at the next meeting an estimate of the economic impact of not having a bridge in T13, R12.*
- Based on data from North Maine Woods, commission staff provided preliminary information on the number of recreational visitors using the Henderson Brook Bridge to access the river and the number of people who cross the bridge for other recreational purposes. *Similar information from the Allagash Wilderness Waterway is also forthcoming.*

Additional information requests:

- *Estimate the cost to the Maine Forest Service for forest fire protection under two scenarios: a) no Henderson Brook Bridge, and b) a replacement bridge at Twin Brooks.*
- *Estimate the additional cost to visitors who are detoured under the two scenarios: a) no Henderson Brook Bridge, and b) a replacement bridge at Twin Brooks.*

### **5. Permitting**

Commission staff contacted Catherine Carroll, Director of the Land Use Regulation Commission (LURC) regarding questions raised at the commission's first meeting.

- The State of Maine has 143/144 interest in T13, R12 and in Henderson Brook Bridge. Irving has 1/144 interest. Would both need to be applicants for a LURC permit?
  - Yes, it is likely that both the State of Maine and Irving would need to co-apply for a LURC permit and both would be subject to the terms and conditions of the permitted activity.
- If the recommendation is to construct a bridge designed in accordance with the 1997 LURC permit granted to Blanchet Logging and Lumber (BCP 3048 and subsequent amendments), can the permit be transferred from Blanchet to either the State of Maine or Irving?
  - No, BCP and subsequent amendments have expired. A new permit would need to be issued to construct a bridge.

Additional information request:

*Blanchet Lumber has indicated that the permit issued by LURC in 1997 (with subsequent amendments) was transferred to the State of Maine.*

- a. Need proof of transfer.*
- b. If such a transfer took place, could the expired permit be reinstated?*
- c. Have there been any changes in statute or rule that would require changes in the application packet for a LURC permit?*

*The commission requested that Catherine Carroll, director of LURC, be present at the commission's next meeting to answer questions.*

Commission staff also contacted Jay Clement at the Army Corps of Engineers regarding questions raised at the commission's last meeting.

- If ownership of the Henderson Brook Bridge continues to be the State of Maine 143/144 interest and Irving Woodlands 1/144th interest, would both need to be listed as applicants for an ACE permit?
  - Mr. Clement would consider the State of Maine the owner/applicant.
- The study commission is discussing the possibility of the State retaining ownership of the bridge with the Bureau of Parks and Lands and entering into a long-term lease arrangement with a private entity. That entity (possibly Irving Woodlands or a group of interested landowners) would then assume responsibility to oversee bridge construction, pay all construction costs, and collect tolls from commercial haulers to recover costs of construction and maintenance. Would such a lease suffice to demonstrate property interest allowing the lessee to be the applicant for any necessary permits from the Army Corps of Engineers?
  - No, the Army Corps would be more inclined to make the State the permit holder.

## **6. Legislative Approval**

- If the State of Maine negotiates an agreement whereby Irving relinquishes their approximately 1% ownership in T13, R12 in exchange for 100% ownership of the bridge, would the transaction need to have legislative approval?

- Jeff Pidot, Deputy Attorney General, has indicated that he believes legislative approval would be required.
- The commission also had questions relating to the State’s ability to contract for bridge construction outside of the competitive bidding process administered through the Bureau of General Services. It may be possible for the State to enter into an agreement with a private entity to construct the bridge without going through the State bidding process if the private entity is responsible for construction costs. Another option may be for the Department of Conservation to apply to construct the bridge using the “design-build” or the “construction-manager-at-risk” method for public improvement construction contracts. The “Alternative Delivery System Review Panel” makes recommendations on such proposals using criteria established in statute (5 MRSA §1743).
  - *The commission asked the Bureau of Parks and Lands member, Vern Labbe, to look into applying for bridge construction using the “design-build” method for public improvement contracts.*

### **7. Possible Boat Launch relocation**

The commission also considered locating a parking area and canoe launch site north of the “bogan” on the northeast side of the bridge. According to the Army Corps of Engineers (ACE), if the proposed area is a wetland then a permit would be required. If it is not a wetland, then ACE does not have jurisdiction over the parking area. According to LURC, it is likely that the proposed locations for the parking area and canoe launch are within a Recreation Protection Subdistrict (P-RR); therefore, a LURC permit would be required.

The commission agreed not to pursue relocation of the canoe launch. Because the proposed replacement bridge would be built upstream (west) of the current bridge, the distance between the current launch and the replacement bridge would increase.

### **8. Bridge Subcommittee**

In addition to the bridge economic impact analysis, the bridge subcommittee will continue to work with the AEWG Center and Gagnon Engineering on bridge design.

### **9. Information requests for next meeting**

Commission chairs and members had several information gathering requests regarding the permitting process and bridge design. They are highlighted in bold italics above. These will be discussed at the Commission’s next meeting on November 17, 2006.

Staff:

Jill Ippoliti, OPLA, 287-1670, email: [jill.ippoliti@legislature.maine.gov](mailto:jill.ippoliti@legislature.maine.gov)

Karen Nadeau-Drillen, OPLA, 287-1670, email: [karen.nadeaudrillen@legislature.maine.gov](mailto:karen.nadeaudrillen@legislature.maine.gov)