BECKER
STRUCTURAL ENGINEERS

March 18, 2010

Jay Reynolds
Parks and Public Works Director
Town of Falmouth
101 Woods Road
Falmouth, ME 04105

Subject: River Point Bridge Safety Review
Falmouth, Maine

Dear Mr. Reynolds:

Per your request, Becker Structural Engineers has revisited the River Point Bridge site to review the current condition of the existing bridge. Our previous visits had been focused on demolition and replacement options for the bridge. Our observations of the existing timber structure were limited to what we could see from on top of the bridge and earlier photographs since we did not re-enter the railroad right-of-way. We did not measure deterioration in structural members or perform calculations of member capacity but offer the following comments in regards to safety based on our visual observations and review of prior bridge rating documents:

- The bridge railing is in poor condition and does not meet minimum life safety standards for pedestrians or vehicles. Several top rail sections are loose, deteriorated, and sprouting moss and lichen. The height of the rail meets the Building Code requirements for guards but the spacing of the horizontal rails do not. The code states "open guards shall have balusters or ornamental patterns such that a 4-inch diameter sphere can not pass through any opening up to a height of 34 inches". This provision is to prevent small children from squeezing through railings. A spot check found the rail spacing to be 9". It is difficult to know if the rail posts are structurally adequate for code pedestrian loads without further site investigation and performing calculations. However, it is clear by inspection that the rail system is not adequate to restrain even a small slow moving vehicle.

- Although it appears that some deck boards have been recently replaced, approximately one-third of the remaining deck boards have some section loss resulting from deterioration. Moss, mildew, decay and cracking were observed in these boards.

- The timber crib abutments are in poor condition. Several lower timbers are severely deteriorated to the point that sections of wood can be removed by hand.

- The current condition of the timber stringers is difficult to assess. We could not review the critical top surface of the stringers, where deterioration tends to occur, without removing deck boards. However, we did observe a green mildew growing on

the tops of the stringers in the gaps between deck boards at many locations. This green mildew was also visible on the sides of the exterior stringers.

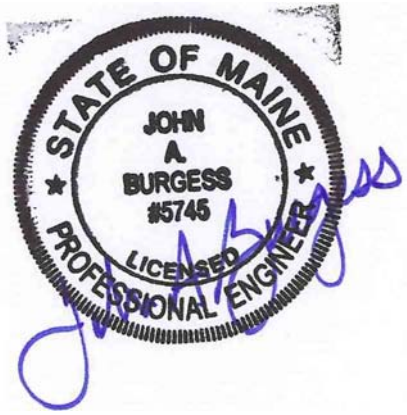
- In June of 2009, Ed Caswell of Caswell Engineering wrote in an email addressed to Jay Reynolds that he recommended that the bridge remain closed to all traffic until the timber sill of Pier #1 was replaced. He noted that if the sill was replaced, the bridge rating would be 2 tons and could not be increased without extensive decking replacement and stringer reinforcement. We observed that repairs have been made to this sill. We assume that the deterioration to the decking and stringers has continued since 2009 and the load rating would be 2 tons or less if calculated today based on measured section loss.

- A small sign mounted on the end rail post on the shopping center side of the bridge states “Motorized Vehicles Prohibited (snowmobiles permitted on marked trails)”. To prevent vehicle access, a locked steel chain has been draped across the bridge entrance. The sign does not directly address pedestrian usage or provide a posted load capacity. While the chain may discourage vehicular use, it also may confuse pedestrians trying to determine if the bridge is open or closed.

In summary, the existing rails are inadequate for safe pedestrian and vehicle use. We recommend that the bridge be closed to pedestrians until the railing is upgraded to meet code geometric and load requirements. In addition, we recommend that a greater physical deterrent than the existing steel chain be installed to prevent accidental vehicle use of the bridge. Possible options include removable bollards or jersey barriers. These could be spaced to allow pedestrians to pass but not vehicles. If the rail system is upgraded for vehicle impact and deteriorated deck boards are replaced, it appears that infrequent and controlled vehicle use could be limited to off-road ATV type maintenance/utility vehicles with a total weight limit of 1½ tons. We recommend that the Town continue to monitor the condition of the bridge on a yearly basis.

If you have questions, please contact us.

Sincerely,
BECKER STRUCTURAL ENGINEERS, Inc.



John A. Burgess, P.E.
Senior Engineer

Attachments: Photographs.

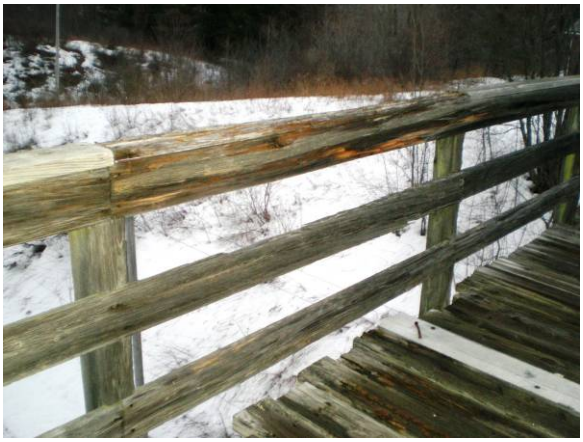


Photo 1 – Deteriorated bridge railing. Spacing of horizontal rails exceeds code required 4” maximum.

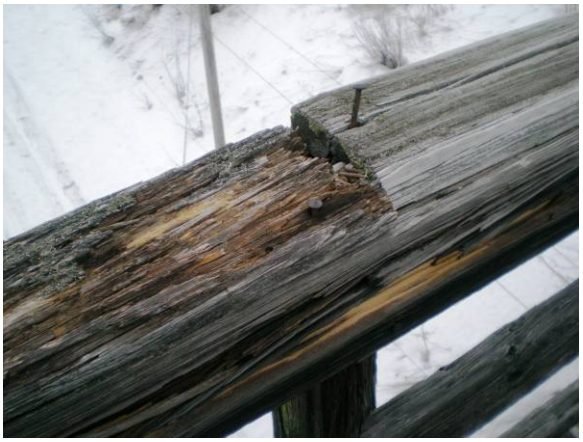


Photo 2 – Top railings are deteriorated and loose at several locations.

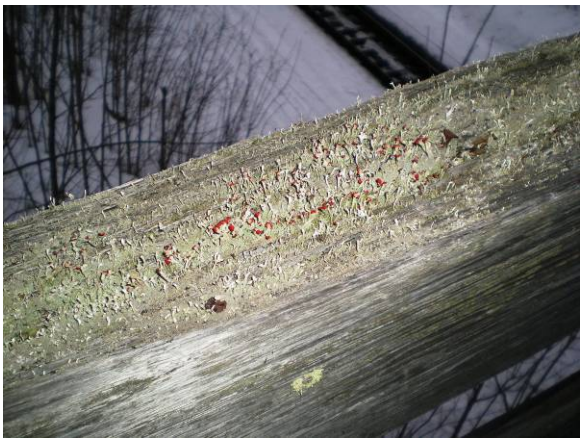


Photo 3 – Lichen and moss growing on top rail.

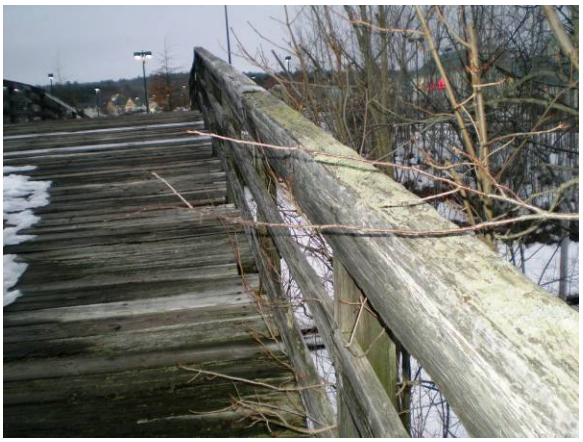


Photo 4 – View of railing looking toward shopping center.

Photo 5 – Moss, mildew, and decay on deck boards.

Photo 6 – Cracked deck board with moss growing.

Photo 7 – Green mildew growing on top surface of stringer as seen between gaps in deck boards.

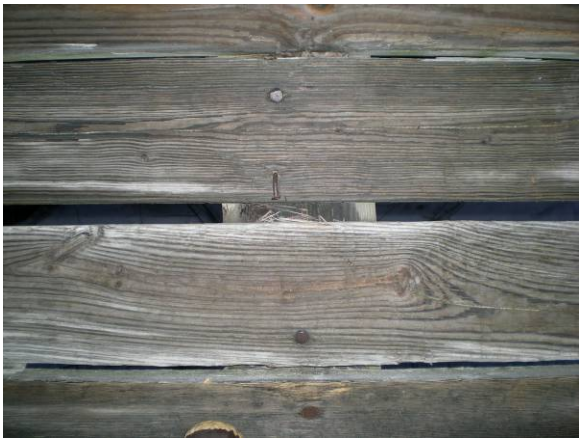


Photo 8 – Moisture tends to collect on top surface of stringers at deck boards.

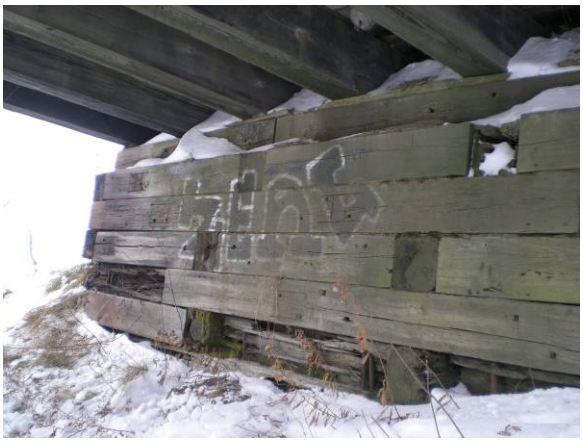


Photo 9 – Severely deteriorated lower timbers of the abutment closest to the shopping center.

Photo 10 – Deteriorated wood can be removed by hand from abutment timbers.

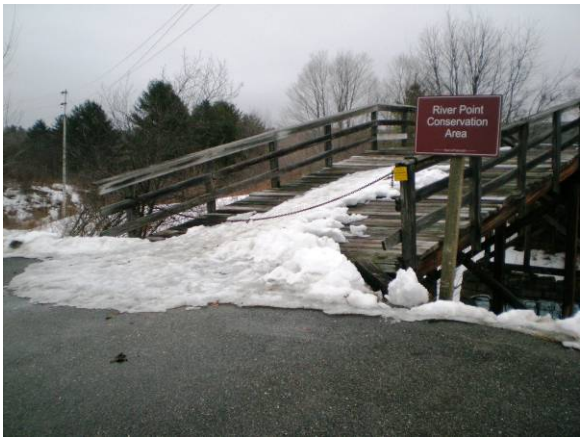


Photo 11 – Chain draped across bridge entrance to prevent vehicle access. Note small sign on end post.

Photo 12 –Small sign on post states “Motorized Vehicles Prohibited” from bridge.