



January 10, 2013

Mr. Thomas P. Donald, PE  
Director of Bridge Project Development  
Massachusetts Department of Transportation  
Ten Park Plaza  
Boston, MA 02116

Attention: Mr. Joseph Pavao, Jr., PE

**Re: Chatham – Bridge St. over Mitchell River  
Bridge No. C-07-001, Project File No. 603690  
Reuse of Wood Railing**

Dear Mr. Pavao:

As requested, URS has evaluated the idea of detaching the top horizontal member (top rail) of the pedestrian rail along the sidewalk of the subject bridge and incorporating it into the new bridge. The pedestrian railing is an important safety feature of the bridge, serving to prevent people from accidentally falling into the waterway below. Pedestrians gain close recreational access to the waterway by leaning against the top rail while viewing the scenic landscape or fishing from the bridge.

The pedestrian rail dates to the early 1980s when the existing bridge was constructed. Like the other portions of the bridge constructed at that time, URS understands that the pedestrian rail consists of treated southern yellow pine. At past public forums in connection with the current bridge project, some members of the public remarked that the top rail has personal significance to them notwithstanding the significance of the bridge as a whole. Community members cited their longtime family experiences of fishing off the sidewalk and several of them had created their “own” notches in the top rail where multiple generations rest their fishing poles when dropping a line.

URS measured the top rails on each side of the bridge as part of our effort. In addition to the rail dimensions, URS also measured the distance between adjacent support posts and identified where angle points exist between adjoining segments. As visible in the photograph (next page), the spacing between adjacent posts is irregular.

### **Considerations**

In conducting this evaluation, URS considered 2 primary technical and functional factors, which are:

- Fit
- Structural Dependability

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**Fit**

The bridge replacement project is being designed to have a linear sidewalk of consistent width with no angle points. It is also being designed to have constant spacing between adjacent posts.



Mitchell River Bridge showing Sidewalk Angle Points and Irregular Post Spacing

Because the existing bridge has several angle points, including right angles, there would not be sufficient straight rail to compose a full new top rail for the new bridge. The inconsistent spacing between the existing posts presents another concern in that the bolt holes for the new posts and those of the existing posts would not be aligned similarly positioned. Therefore, several new bolt holes would be required in the existing rail and many existing holes would need to be plugged, creating visual discontinuity.

Reuse of the top rail would require supplementation with appropriate lengths of new rail. One possible reuse pattern would be to position the old railing adjacent to the new draw span and going as far back toward the abutments as the suitable material would allow. The transition from reused to new materials would be noticeable.

**Structural Capability**

As noted, it is believed that the existing railing is approximately 30 years old, though some portions may have been replaced over the years. Based on our visual observations, the railing appears to be in fair condition. However, no testing has been performed to confirm the strength or soundness of the existing rail, and due to the railing being derived from multiple sources (i.e., more than one tree) and with different exposure conditions, there is no way to reliably comment on the suitability of the railing for reuse from a structural perspective. We can presume that the wood has deteriorated to some extent since it was first constructed. In addition, knowing that reuse of the railing would require drilling new holes while plugging other holes with filler, we can also surmise that the railing would be weaker upon resetting than it is in its current state. Consequently, URS cannot offer a professional

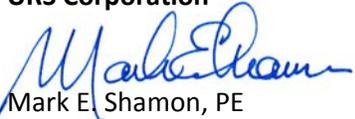
judgment that the existing railing has the structural capacity to permit it to be reused in this setting for the intended purpose.

**Conclusions/Recommendation**

The existing railing lengths and bolt patterns are inconsistent with the proposed design. We are also very concerned about the age and likely deterioration of the existing rail. As a result, URS does not recommend removing and resetting the top pedestrian rail for use on the new Mitchell River Bridge.

Sincerely,

**URS Corporation**



Mark E. Shamon, PE

Vice President, Project Principal