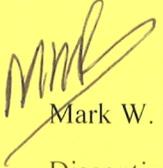


STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION


FROM: Mark W. Richardson, PE, Administrator **DATE:** June 12, 2014
SUBJECT: Discontinuance of Aluminum Bridge Rail and Aluminum Approach Rail **AT:** Department of Transportation
Bureau of Bridge Design
TO: Nancy J. Mayville, PE
Municipal Highways Engineer

This memo is the response to inquiries by yourself and Steve Liakos regarding aluminum bridge rail and whether it should continue to be allowed on new bridges in New Hampshire. The concern regarding safety of this rail was raised since the NHDOT website posts drawings of the current aluminum bridge and approach rail system. This rail system was crash tested in 1978 and it failed to meet the crash test criteria at that time. It was subsequently modified according to recommendations after testing and received "temporary/interim" acceptance by the FHWA (NH Division) in 1990 for use in low-speed applications. The rail system was accepted by FHWA as meeting the design criteria at that time, but it has not been analyzed in its modified configuration or crash tested for the current more stringent AASHTO and FHWA design requirements. However, the aluminum rail system has been utilized in some bridge replacement and rehabilitation projects since that time.

Members of Bridge Design, Bridge Maintenance, and Municipal Highways met on June 10, 2014 to discuss these issues. Steve Liakos noted that consultants developing bridge replacement projects for municipalities frequently include aluminum bridge and approach rail in their design concepts, at the request of the municipality. This rail system is sometimes preferred and requested by the municipality as it is often considered more aesthetically pleasing than other rail systems, as well as for its low maintenance characteristics. Consultants assume that it is acceptable for use since it is still available on the NHDOT Bridge Design website. However, due to the safety concerns associated with installing a bridge rail system on new bridges that does not meet current design criteria (it has never been successfully crash-tested), Steve requested clarification of Bridge Design's position and direction on this issue regarding future use of the aluminum bridge rail system.

Jerry Zoller reviewed the history of this aluminum railing, including the fact that in a letter dated September 21, 1990, the FHWA accepted the Department's interim bridge rail policy that allowed continued use of aluminum rail in "*restricted speed locations that do not warrant bridge rail systems which have passed 60 mph crash tests*". This allowance was to be reconsidered when "*an alternate acceptable system has been proven by crash testing*". During the past 24 years since this temporary acceptance was granted, the Department has continued to allow the use of aluminum bridge and approach rail in specific low-speed areas, often when sidewalks are present. However, other crash tested bridge rail systems have been developed during that time and it is now both necessary and appropriate to reconsider use of the aluminum rail system.

Based on the results of this discussion, it is Bridge Design's position that aluminum bridge and approach rail systems should no longer be used on new bridges (state or municipal), unless specifically allowed in rare instances by the Bridge Design Bureau on a case-by-case basis. It is felt that the greater safety provided by approved/accepted bridge rail systems that meet current standards, outweighs the aesthetic and maintenance benefits of our current aluminum rail system.

Aluminum bridge railing currently in use may remain in place and may be repaired or rehabilitated as needed through rehabilitation projects or Bridge Maintenance activities, as appropriate and as determined during the development of each project. The standard plan sheets for aluminum bridge and approach rail will be removed from Bridge Design's website since it is not an accepted (crash-tested) rail system and thus would have extremely limited (by approval only) use and application. The Department will be pursuing analysis or crash-testing of the aluminum rail system, if funds can be allocated, to determine whether it meets the current FHWA requirements for use in low-speed locations. A NHDOT Design Memorandum presenting this information will be prepared in the next several weeks and will be sent to NHDOT staff and consultants.

I trust that this clarification addresses the concerns expressed on this issue. If you have any questions or if you need additional information, please feel free to contact me.