

STATE OF NEW HAMPSHIRE
INTER-DEPARTMENT COMMUNICATION

Appendix 11-08



DATE: April 8, 2008

FROM: Ronald Grandmaison, P.E. AT (OFFICE): Bureau of Highway Design
Final Design Supervisor

SUBJECT: RECOMMENDATIONS FOR THE INSTALLATION
OF STEEL POST GUARDRAIL ON
NEW HAMPSHIRE HIGHWAYS



TO: William J. Cass, PE THRU: Craig A. Green, PE
Director of Administrator,
Project Development Bureau of Highway Design

MEMORANDUM

This memo is intended to document the Department's position with regard to the substitution of steel guardrail posts versus the current use of standard wooden posts for permanent guardrail installations. Based upon current criteria, steel guardrail posts for permanent installations may only be used if "specifically approved by the Chief Engineer" per Standard GR-2 (Standard Plans for Road and Bridge Construction, NHDOT 2001). Due to insect infestations and advanced deterioration, wooden guardrail posts installed along the state highway system over the last 5 to 7 years have resulted in a reduced effectiveness of the guardrail system and has required Operations to replace the deteriorated post systems. This has prompted the Bureau of Turnpikes to propose the use of steel posts to increase the longevity and service life of the guardrail systems.

Input from the Bureaus of Highway Design, Construction, Highway Maintenance, and Turnpikes is supportive for the wholesale use of the steel post systems. In support of the change, steel posts with composite blockouts meet NCHRP 350 Test Level 3 approval; offer comparable performance with increased longevity, comparable cost, improved insect and weather resistance, and reduce costs for disposal of replaced wooden posts. The intent of this memo is not to deviate from our standard seven-foot post installation even though six-foot steel posts meet NCHRP 350 Test Level 3 criteria (use of steel posts less than seven feet in length should continue to be considered on a case-by-case basis only with the approval of the Chief Engineer).

In a review of neighboring State agencies, the Vermont Agency of Transportation permits the use of steel post guardrail systems on a case-by-case basis, considering such issues as performance, maintenance, life cycle cost, aesthetic compatibility, and compatibility with non-motorized users of the highways. The committee that completed this research for the Agency in 1999, noted the only significant disadvantage was that the "broad metal band presented by the W-beam rail can negatively affect aesthetics". The Maine Department of Transportation replied to our e-mail inquiry stating that the majority of their in place W-beam guardrail systems consist of steel post systems. Maine's standard specification for guardrail allows the use of either wood or steel post.

In summary, some of the notable benefits of the steel post guardrail system compared to the current wood post system include the following, but are not limited to:

- Increased longevity
- Insect Resistance
- Effective hazard protection
- Comparable installation costs (due to improved efficiency for installation rates)
- Metal salvage value of steel posts
- No disposal fees (as with current wood posts) for disposal of old posts
- Ease of post replacement (Steel posts bend under impact, wood breaks. Less effort to pull and replace.)

Though I agree with Caleb's cost comparison of the recent Bow-Hopkinton and Hopkinton-New London projects (memo dated March 3, 2008), I was recently asked by the Bureau of Construction to consider CWS's request to use six-foot steel posts on the Hopkinton-New London project. Their claim was that the standard steel post length was six-foot and, as stated above, met NCHRP 350 Test Level 3 criteria. After conferring with District and other Design personnel, it was highly recommended that the Department deny CWS's request for six-foot post. The post embedment depth resulting in the seven-foot posts was due to steep back slopes present throughout the project and the reduced lateral support resulting from less post embedment. The Department's standard typically reduced the embankment support behind the guardrail section in support of the longer post embedment. NCHRP 350 crash testing occurred on an airfield, perfectly flat, with adequate lateral support in all directions.

With your concurrence, it is the intent of this memo to make the use of seven-foot steel post guardrail the standard in all future, and possibly current, roadway projects. In addition, any complete runs of existing guardrail requiring replacement will be replaced with steel post systems. For additional information or clarification, please feel free to contact me.

RJG/rjg

cc: J. David Brillhart, Asst. Commissioner
William Janelle, Asst. Director of Project Development
Lyle "Butch" Knowton, Director of Operations
Harvey Goodwin, Administrator, Bureau of Turnpikes
Caleb Dobbins, Administrator, Bureau of Highway Maintenance