



U.S. Department  
Of Transportation  
**Federal Highway  
Administration**

400 Seventh St., S.W.  
Washington, D.C. 20590

June 17, 1994

Refer to: HNG-14/SS-46

Mr. Vincent F. Schimmoller  
Regional Federal Highway Administrator (HRA-08)  
Lakewood, Colorado

Dear Mr. Schimmoller:

This is in response to your May 25 memorandum requesting acceptance of a single unmodified 102-mm by 152-mm western red cedar wood post as meeting breakaway requirements for use on the National Highway System. Transmitted with your memorandum were two reports of tests conducted on the posts at the Federal Outdoor Impact Laboratory (FOIL). The tested posts were full-cut lumber, not "dressed" to a smaller cross section.

Crash testing with a bogie vehicle was conducted to assess the breakaway performance of the subject small sign support mounted in "weak" (S-2) soil. Requirements for breakaway supports are found in the 1985 American Association of State Highway and Transportation Officials' (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. These specifications have been adopted, with minor modifications by the FHWA. Guidelines established in the National Cooperative Highway Research Program Report 350 were used to conduct the tests and to analyze their results.

The distance to the bottom of the sign panel was 2130 mm. A summary of the crash tests is presented below:

Test Number	(Target Values)	93F001	93F002
Vehicle Mass, kg	820	820	820
Impact Speed, km/h	35.0, 100.0	34.1	97.0
Soil Type	N/a	S-2	S-2
Occupant Impact Speed, m/s	Maximum 5.0	1.5	0.8
Vehicle Velocity Change, m/s	Maximum 5.0 (not a requirement)	1.6	1.0
Stub Height, mm	Maximum 100 mm	No stub	No stub

Because S-2 soil is the “worst case” test condition for wood posts, testing in S-1 “strong” soil is not necessary. In both tests the posts broke below the ground line and at the bumper height. The broken part of the post pulled out of the ground leaving no stub projecting above the ground line.

The results of these tests meet the change-in-velocity and stub-heights requirements adopted by the FHWA. The unmodified 102x152-mm western red cedar wood signpost is, therefore, acceptable for use in all soil types on projects on the National Highway System, within the range of conditions tested, if proposed by a State.

Our acceptance is limited to the breakaway characteristics of the signpost and does not cover the structural features. Presumably the State will develop sufficient information on structural design and installation requirements to ensure proper performance, including proper wood grading when specifying the posts.

Sincerely yours,

Seppo I. Sillan, Acting Chief  
Federal-Aid and Design Division

Federal Highway Administration  
HNG-14:Nartimovich:gm:366-1331:6-16-95  
Copies to:

HPD-1 HNG-1 HNG-10 Reader, 3128 File, 3128  
Ras HFL-1 HHS-10 HSR-20 HAD-SD

Geometric and Roadside Design Acceptance letter No. SS-46