



U.S. Department
of Transportation

**Federal Highway
Administration**

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

SEP 1 1992

Refer to: HNG-14

Mr. Robert A. Seavey
Business Development Manager
Composite Products Division
P.O. Box 5445
Norwalk, Connecticut 06856

Dear Mr. Seavey:

Thank you for your letter of August 12 to Mr. Thomas O. Willett requesting the Federal Highway Administration's (FHWA) acceptance of "Timbrex" composite material guardrail blockouts. Timbrex is made from recycled plastic and sawdust using equipment and technology acquired from the Rivenite Corporation. You enclosed two reports in support of your request. The first, dated August 1992, by Charles F. McDevitt of the FHWA and Piyush K. Dutta of the U.S. Army Cold Regions Research Laboratory, describes static tests of the material and a full scale crash test of w-beam guardrail using Timbrex recycled plastic lumber blockouts and posts. The second, dated June 1992, by Joe B. Meyer of the Southwest Research Institute (SWRI), describes a full scale crash test of a modified G4(2W) wood post w-beam with Timbrex blockouts. The blockouts measured 152-mm x 203-mm x 355-mm (6 inches x 8 inches x 14 inches) in both tests.

The test results are summarized here:

Guardrail Type	<u>W-beam w/recycled plastic posts and blockouts</u>	<u>G4(2W)modified w/recycled plastic blockouts</u>
Vehicle Mass, kg (wt, lbs)	816 (1,800)	2009 (4430)
Impact Speed, km/h (mph)	95.7 (59.5)	91.2 (56.7)
Angle, degrees	20	25.7
Occupant Impact Velocity, m/s (fps) (average of film and accelerometer data)		
Forward	6.1 (20.1)	5.2 (17.0)
Lateral	5.1 (16.6)	4.5 (14.7)

Occupant Ridedown Acceleration (g's)

Forward	3.1	4.8
Lateral	9.7	8.4
Maximum Rail Deflection, mm (in)	609 (24)	1100 (43)

The results meet the velocity, acceleration, and post-impact trajectory requirements of National Cooperative Highway Research Program Report 230. Therefore, 152-mm x 203-mm (6-inch x 8-inch) Timbrex blockouts as a one-for-one substitute for wood blockouts on G4(2W) guardrail are acceptable for use on Federal-aid projects, within the range of conditions tested, if proposed by a State.

You also requested acceptance for Timbrex block-outs on w-beam strong steel post guardrail, designed G4(2S). We believe recycled plastic lumber blockouts will probably work satisfactorily in "C" post and wide-flange steel-post guardrail systems. However, we believe this needs to be confirmed through crash tests. Therefore, Timbrex blockouts are not acceptable for use on steel post guardrail systems, including the G4(2S), without further crash testing.

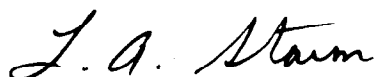
The small car test shows that Timbrex posts are not an acceptable one-for-one substitute for standard wood posts in the G4(2W) barrier since the rail deflection was more than twice what is normally expected under similar test conditions. We recognize that you did not request our acceptance of this substitution. However, since it was covered in the information you submitted we believed we needed to make our position clear. On the other hand, we would consider a new, fully tested guardrail system incorporating Timbrex posts if one is developed. In fact, the design you tested might meet the acceptance requirements, albeit with greater deflection than the G4(2W) system, if fully tested.

From the static testing, we note that there were quality problems with the Timbrex material until the manufacturing process was changed to more carefully control sawdust size. Lacking a material specification, Mobil Chemical should certify that the materials supplied are at least as good as those tested. We would suggest that you work with the States towards developing a material specification to ensure product quality.

Timbrex is a proprietary material. Thus, to be used in a Federal-aid project Timbrex blockouts: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or

that no equally suitable alternate exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411 a copy of which is enclosed.

Sincerely yours,



Lawrence A. Staron
Chief, Federal-Aid and Design Division

Enclosure

Federal Highway Administration
HNG-14:NArtimovich:gm:8-28-92:61331
copies to:
HPD-1 HNG-1 HNG-10 HNG-14 Reader, 3212
Reader, 3206 Reader, 3128 File, 3128

LETTER TO MOBIL CHEMICAL COMPANY

GEOMETRIC AND ROADSIDE DESIGN ACCEPTANCE LETTER NUMBER B-20