

June 30, 2003

Mr. David R. Lewis  
President  
HALCO, LLC  
263 Bradford Drive  
Canfield, Ohio 44406

HSA-10/B80C

Dear Mr. Lewis:

In your June 4 letter to Mr. Richard Powers of my staff, you requested acceptance of a fabricated tubular steel post similar to your previously accepted X-40 and X-48 posts, but with some design modifications. This new design, called the X-44 post, is intended to be used as an alternative to the standard W150 x 13.5 wide flange posts currently used with the G4(1S) guardrail system or to the 150 mm x 200 mm timber posts used with the G4(2W) system. Included with your letter were a copy of a May 2003 report from E-TECH Testing Services, Inc. entitled "NCHRP Report 350 Crash Test Results for the HALCO X-44 Post," and a copy of the crash test videotape.

The HALCO X-44 posts were fabricated from 12-gauge steel plate into a rectangular cross-section with a back flange 152-mm wide, a traffic face 80-mm wide and a depth of 127 mm. The posts were comprised of several pieces of 12-gauge American Association of State Highway and Transportation Officials M180 steel plate fastened together using a "partial punch" technology and galvanized after fabrication. The significant design changes from your earlier posts included the addition of vertical corrugations in the tubular faces and in the backplate to facilitate installation, the elimination of the steel straps at the top and bottom of the original designs, and the inclusion of two internal steel angles to stiffen the post at the ground line. These details and other post dimensions are shown in Enclosure 1. All posts were 1600-mm long, spaced on 1.9-m centers, and embedded approximately 965 mm below grade in an NCHRP Report 350 standard soil. The 12-gauge w-beam rail was offset from the posts with 155 mm x 200 mm x 360 mm Central Fabricator's recycled plastic blocks. These blocks were installed to extend approximately 50 mm above the top of each X-44 post, thus centering the w-beam rail 550 mm above the ground.

A 68.5 m w-beam guardrail installation with X-44 posts was tested with a 2000-kg pickup truck impacting at 100 km/h and an impact angle of 25 degrees. As noted in the report, the test vehicle was contained and smoothly redirected upright with a roll angle of 7.3 degrees and a pitch angle of 5.1 degrees. There was no significant vehicular snagging on the posts. Occupant risk values were below the Report 350 preferred limits with a reported occupant impact velocity (OIV) of 5.0 m/sec and a ridedown acceleration of 11.6 g's, both well below the maximums allowed. The dynamic deflection of the barrier was 0.7 m.

Based on the information you provided, I agree that the HALCO X-44 guardrail post with the Central Fabricators' recycled plastic offset block (or any approved wood or plastic block with a similar or greater depth) may be considered acceptable for use on the National Highway System as a substitute for the steel post and routed wood or plastic offset blocks currently used in the G4(1S) barrier system when such use is requested by the contracting highway agency. As with the earlier X-40 and X-48 posts, this acceptance is only for the use of these posts in the barrier proper. They cannot be used in guardrail terminals unless specifically tested for that

application. Since the X-44 post is a proprietary design, the provisions of Section 635.411 (Material or Product Selection) of Title 23, Code of Federal Regulations apply. A copy of this regulation has been provided with our previous acceptance of the X-48 post.

Sincerely yours,

(original signed by Michael S. Griffith)

Michael S. Griffith  
Acting Director, Office of Safety Design  
Office of Safety

Enclosure

