

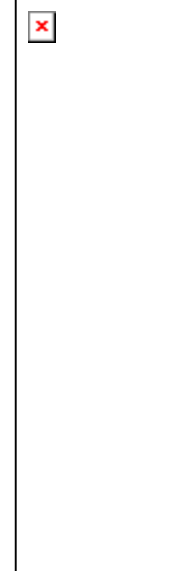
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Technical Memorandum

No. 99-02-DS-02

MINNESOTA DEPARTMENT OF TRANSPORTATION

Engineering Services Division

Technical Memorandum No. 99-02-DS-01

July 14, 1999

TO: Distributions 57, 612, 618, and 650

FROM: David S. Ekern
Director/Assistant Chief Engineer
Engineering Services Division

SUBJECT: Use of the Eccentric Loader Terminal
Expiration

This technical memorandum will expire on January 1, 2002 unless superseded or placed in the Road Design Manual by that date.

Background

One of the provisions of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) is that plate beam guardrail end treatments on all projects advertised for letting after October 1, 1998 must meet the requirements of NCHRP 350. Prior to October 1, 1998, Mn/DOT used the Eccentric Loader Terminal (ELT) on many of its projects. In anticipation of the new standards, Mn/DOT entered into an agreement to test the ELT to those standards. The tests were completed and Mn/DOT has received Federal Highway Administration approval to use the ELT on the National Highway System with some qualifications.

The ELT as tested to the NCHRP 350 criteria differs somewhat from the ELT that was tested to earlier criteria. Two changes were made. The first was the replacement of post number 7 (originally a standard line post) with a fifth wooden CRT (Controlled Release Terminal) post. A CRT post is a 152 mm x 203 mm (6 in. x 8 in.) wooden guardrail post with two 89 mm (3.5 in.) holes drilled in the center of the 200 mm (8 in.) side of the post, one at ground level and another at 406 mm (16 in.) below the surface, to facilitate the fracture of the post upon impact. The second change was a 25 mm (1 in.) extension in the offset distance at post number 2 from 635 mm to 660 mm (25 in. to 26 in.). Existing ELT installations need not be retrofitted to include these changes.

When an end-on test was run with a pickup truck. The truck rode on the top of the rail for approximately 46 m (150 ft.).

Implementation

New installations terminated with an ELT should have a length of need sufficiently long to prevent an impacting vehicle from reaching a bridge end or a shielded, fixed object hazard that is directly behind the guardrail. The length of need should be measured beginning at the third post from the nose of the terminal and should not be less than 45 m (see Standard Plates 8329).

The ELT should not be used with the steel line posts, and shop curved sections should not be used. The ELT should not be used in a very weak soil such as sand.

It is important to emphasize the necessity and importance of the grading around the terminal as shown on Standard Plates 8329. An ELT is a gating terminal, and an impacting vehicle can travel a considerable distance behind and beyond the terminal in an end-on hit. The area behind and beyond the terminal needs to be clear of hazards and relatively traversable.

Questions regarding the implementation of this technical memorandum should be addressed to Andy Halverson, Assistant Design Standards Engineer at 651/296-3023.

Any questions regarding the publication or distribution of this technical memorandum should be addressed to Amr Jabr, Design Standards Engineer at 651/296-3023, or Helen Blair, Administrative Assistant at 651/296-2381.

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Revised: July 27, 2000.

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Mn/DOT Information Center E-mail: info@dot.state.mn.us
395 John Ireland Boulevard • St. Paul, MN 55155-1899

Phone: 800/657-3774.
800/657-3994 (TTY)