

DESIGN BULLETIN #64/2012 (Revised November 2012)

Alberta Weak Post W-Beam Barrier System And Impact Attenuators Alberta Transportation Roadside Design Guide, November 2007

November 20, 2012 Amendment to Design Bulletin #64/2012

Where existing turn down end treatments need to be re-built and/or replaced due to being hit by an errant vehicle, the replacement with a crashworthy end treatment is subject to funding availability.

Summary

This Bulletin is being issued as a revision and/or update to the Alberta Transportation's Roadside Design Guide, November 2007 (AT RDG). The following applies to roadways that are managed and under the authority of Alberta Transportation:

- Turn down end treatment that was commonly used for W-Beam guardrails on Alberta Transportation Highways will no longer be acceptable for new installations or replacement of existing ends. Crash-worthy end systems should be used.
- At isolated fixed hazards that warrant an impact attenuator, sand barrel products are not to be used at new installations unless specifically approved by the department.
- On all installations where existing Alberta Weak Post W-Beam system is being replaced or reinstalled, the system should be upgraded if possible to a barrier system meeting current standards compliant with NCHRP 350 Report or MASH 2009 criteria.

Impact Attenuators (End Treatments)

Impact attenuators include crash worthy ends for longitudinal barrier systems, attenuators for fixed objects and mobile attenuators which may be used for work zones or other temporary applications.

The turn down end treatment that was commonly used for W-Beam guardrails in Alberta is considered non-crash-worthy and should be removed at an appropriate time and replaced with crash-worthy end systems meeting current standards regardless of the design speed, design AADT, test level requirement, roadside and/or median application. The appropriate time for removal and replacement of turn down ends is when systems require complete or substantial replacement due to grading construction or relocation.

****Note:** Where existing turn down end treatments need to be re-built and/or replaced due to being hit by an errant vehicle, the replacement with a crashworthy end treatment is subject to funding availability.

AT RDG Section H3.2.3.2 provides a Barrier Replacement Strategy for Alberta highways. Turn

down ends will no longer be acceptable for new installations or replacement of existing ends. There is no approved crash-worthy end for the Alberta Weak Post W-Beam system and therefore there are several options available including removable of the entire system and replacement with a system that is crash-worthy (such as a High Tension Cable Barrier system) or if this is not feasible then the transition of the existing system to a Strong Post system and then the installation of a crash-worthy end to the Strong Post W-Beam system. The approved transition is shown in standard drawing RDG-B1.9:

<http://www.transportation.alberta.ca/Content/docType233/Production/RDG-B1-9.pdf>

For W-Beam systems, the preferred end treatment is the FLEAT or FLEAT-MT (for medians) however other accepted crash-tested systems may be permitted also if tested at the appropriate level for the design speed.

For Box Beam systems the turn down end treatment is no longer acceptable. The Bursting Energy Absorbing Terminal or accepted equivalent must be used.

The following standard drawings are obsolete and are shown in this link:

<http://www.transportation.alberta.ca/3514.htm>

TEB 3.10 W-Beam Guardrail Strong Post End Treatment Turn Down (1.9 m Spacing – With Blocks)

TEB 3.12: W-Beam Guardrail Weak Post End Treatment Turn Down (3.8 m Spacing – No Blocks)

TEB 3.26 Median Box Beam Guardrail Installation Detail for End Treatment

TEB 3.37 Standard Box Beam Guardrail Installation Detail for End Treatment

** The above Note has been added to the above standard drawings.

At isolated fixed hazards that warrant an impact attenuator (without a longitudinal system), examples may be bridge piers or non-breakaway sign supports at a gore point etc, the product must have been crash-tested and approved for the design speed. The department's preferred system is the REACT or REACT 350 WIDE (if the hazard is considered too wide for the basic REACT product). Equivalent systems may be considered by the department.

Sand Barrel products are not to be used at new installations because of Alberta's climatic conditions combined with practicality of maintenance unless specifically approved by the department. Existing sand barrels should ultimately be replaced and upgraded with the department's preferred system as indicated.

Alberta Weak Post W-Beam System

As indicated in the AT RDG, the Alberta Weak Post W-Beam system has not been crash tested or rated according to NCHRP Report 350 or MASH 2009 test levels. Based on its past performance (acceptable in-service experience) it is permitted for use on Alberta highways. It is assumed to be rated at Test Level 3 (TL-3). However, on all installations where existing Alberta Weak Post W-Beam system is being replaced or reinstalled, the system should be upgraded if possible to a barrier system meeting current standards compliant with NCHRP 350 Report or MASH 2009 criteria's. Even if the existing longitudinal barrier system is not replaced, the ends should be made crash worthy. Conditions where existing non-compliant barrier systems should typically not be replaced are indicated in AT RDG section H2.2.2

As indicated in the AT R DG, section H3.2.3.1, "Longitudinal traffic barrier systems that are more forgiving are preferred because they may reduce injuries and fatalities when crashes occur, provided that suitable operating space is, or can be made, available". High Tension Cable Barrier (HTCB) is generally a suitable alternative to the Weak Post W Beam system and in many cases may be used in place of a Strong Post W Beam system (depending on the deflection room available). HTCB is the most forgiving barrier system.

Note: Further updates/revisions to the Alberta Roadside Design Guide will be issued by this Design Bulletin and or Design Bulletin 63.

Implementation

The revisions/updates to the guideline as indicated in this Design Bulletin are to be implemented as per the usual practice.

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