H2 Roadside Design Practices and Guidelines

H2.1 Introduction

This section provides the highway designer with Alberta's practices and guidelines governing roadside design.

H2.2 Practices and Guidelines

H2.2.1 Adoption of NCHRP Report 350 In-Service Test Criteria

Alberta Infrastructure and Transportation (INFTRA) or Alberta Transportation (AT) has adopted the roadside hardware crash performance criteria defined in *NCHRP Report 350 - Recommended Procedures for the Safety Performance Evaluation of Highway Features*.

The performance of all longitudinal traffic barrier systems must meet these test levels.

The Alberta Weak Post W-Beam system has not been crash tested or rated according to the *NCHRP Report 350* or *MASH 2009* test levels to date. It is permitted for use on Alberta highways based on previous positive performance and in accordance with the criteria defined in **Section H1.3 & H2.2.2**. However, this system does not have a crash-worthy end treatment and should be removed or replaced if possible. Refer to **Section H3.2.3.1** for further details.

H2.2.2 Barrier Replacement Strategy

Existing non-compliant longitudinal traffic barrier systems, not meeting the *NCHRP Report 350* testing criteria, should be upgraded to current standards during reconstruction and/or widening projects, where possible.

Existing non-compliant longitudinal traffic barrier systems should typically not be replaced as part of a resurfacing project unless:

- the barrier system has deteriorated to a condition that it needs to be replaced
- the height of the barrier system will not meet the required installation tolerances after resurfacing
- maintaining the barrier system will pose operational and/or hazardous conditions
- it is required to accommodate the upgrading of bridge transitions (or rehabilitation).

It may be necessary to replace the barrier system as part of general maintenance activities if the existing system poses significant operational and/or hazardous conditions.

An existing barrier system should be replaced with an approved system as part of the repair activity if it is significantly damaged.

H2.2.3 Roadside Hardware not covered in this Guide

Roadside hardware including longitudinal traffic barriers, end treatments, and crash cushions, not included in this guide should only be used when authorized by Alberta Infrastructure and Transportation.

The preferred list of hardware, presented in this guide, in no way suggests that the non-preferred products (those not specifically listed in this document) are inferior or unsafe. The list was developed to simplify the approach to manage the supply, installation, and maintenance of roadside hardware in a cost-effective and streamlined way. The development of the preferred list does not preclude the introduction of other competitive products that improve cost-effectiveness or safety, and/or the deletion of products from the list, in the future.

H2.2.4 Longitudinal Traffic Barrier System Selection

Designers are encouraged to select the most forgiving longitudinal traffic barrier system that will provide the required Test Level (TL) of protection for the given circumstances and constraints. See **Section H3.2.3.1** for details.

This practice is intended to minimize injuries sustained during traffic crashes. Longitudinal traffic barrier systems with increased flexibility generally absorb more of the impact energy during a collision. This limits the impact effects on the vehicle's occupants.

H2.2.5 Bridge Barrier Selection Requirements

The selection of bridge barriers and roadside hardware connections to bridges is governed by the *Canadian Highway Bridge Design Code (CHBDC)*. The *CHBDC* document should be used in conjunction with this guide.

The *CHBDC* currently uses the Performance Level (PL) rating system to identify the requirements of bridge barriers instead of the more recently developed Test Level (TL) rating specified in *NCHRP Report 350*.

The Federal Highway Administration (FHWA) under *NCHRP Project 22-8* developed the following equivalency relationship between the two rating systems:

- PL-1 bridge barrier is considered to provide equivalent performance to the TL-2 longitudinal traffic barrier
- PL-2 bridge barrier is considered to provide equivalent performance to the TL-4 longitudinal traffic barrier
- PL-3 bridge barrier is considered to provide equivalent performance to the TL-5 longitudinal traffic barrier.

H2.3 References

The following documents were used during the development of this section:

Alberta Infrastructure and Transportation, *Highway Geometric Design Guide*, Edmonton, AB, 1999.

Alberta Infrastructure and Transportation, *Traffic Control Standards Manual*, Edmonton, AB, 1995.

American Association of State Highway and Transportation Officials, *Roadside Design Guide 2002*, Washington, DC, 2002.

Canadian Highway Bridge Design Code (CSA-S6-06)

Transportation Research Board, *National Cooperative Research Program Report 22-8 – Evaluation of Performance Level Selection Criteria for Bridge Railings*, Texas and Lincoln, NB, 1994.

Transportation Research Board, *National Cooperative Research Program Report 230 - Recommended Procedures for the Safety Performance Evaluation of Highway Features*, Washington, DC, 1980.

Transportation Research Board, *National Cooperative Research Program Report 350 - Recommended Procedures for the Safety Performance Evaluation of Highway Features*, Washington, DC, 1993.