

Rural Opportunities, Tenures and Engineering Division Engineering Branch

Guidance for Selecting Bridge Guardrail Containment Level and Determining Need for Bridge Approach Barriers on FSRs

This document provides guidance for Professional Engineers for determining:

- the bridge guardrail containment level (CL-1, CL-2, and CL-3) for new and replacement Forest Service road (FSR) bridges, and
- the need to install bridge approach barriers and establishing the priorities for their installation.

1.0 Guidance on Selecting Bridge Guardrail Containment Level for New Bridges

The bridge guardrail containment level (CL-1, CL-2, and CL-3) on new and replacement Forest Service road (FSR) bridges can be selected on the basis of the site specific bridge characteristics listed in column 2 of attached Table 1. These bridge characteristics were summarized and adapted from two ministry reports: *Phase III – Guideline for Barrier Selection and Design* dated August 2011¹ and *Bridge Approach Barriers on Forest Service Roads – January 2016.*²

The bridge characteristics include: (1) traffic mix and level of pedestrian use; (2) bridge deck height (or height of approach); (3) design vehicle speed; (4) bridge deck width (with consideration of approach roadway width relative to bridge deck width); and (5) approach road curvature.

The responsible Professional Engineer can adjust the recommended bridge guardrail containment levels for new bridges shown in Table 1 if it is determined that a lower or higher bridge guardrail containment level is appropriate for the bridge site. The Professional Engineer should document the rationale for any deviation from the guidance provided in Table 1.

2.0 Guidance on Determining Need for Bridge Approach Barriers for New and Existing Bridges

Where needed, bridge approach barriers (BABs) should provide a smooth transition from the approach road onto the bridge. The intent of BABs is to keep errant light vehicle traffic from sudden impacts and to assist those vehicles in maintaining direction of travel onto the bridge deck.

BABs are part of the total bridge barrier system. As shown in column 3 of Table 1, determining the need to install BABs should consider the selected or existing bridge guardrail containment level, and the results of an assessment of bridge characteristics, site specific hazards (e.g., approach road geometry and roadway height above the watercourse), extent of hazard zones, and level of risk to public safety.

The standard to which BABs are installed is left to the judgement of the responsible Professional Engineer. For additional information on types of bridge approach barriers, refer to the ministry document, "Considerations for Use of Ministry Standard Designs - STD-EC-010-05 (May 2019) and STD-EC-010-15 & 16 (September 2017) - Bridge Approach Barriers for FSR Bridges."

https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-resource-use/resourceroads/bridge-design-construction/bridge_approach_barrier_considerations.pdf

¹ <u>FLNRORD "Guideline for Barrier Selection and Design" (2011) by Associated Engineering Ltd.</u>

² FLNRORD "Bridge Approach Barriers on FSRs" (2016) by Gary McClelland, PEng

Table 1

Guidance for Selecting Bridge Guardrail Containment Level and

Determining Need for Bridge Approach Barriers on FSRs

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5. Approach road curvature: Adverse geometry and/or visibility.		 Bridge deck width: Increased deck width or multi-lane bridge (≥ 8.0 m); 	
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NOTES

- * The responsible Professional Engineer can adjust the recommended bridge guardrail containment levels for new and replacement bridges shown in Table 1 if it is determined that a lower or higher bridge guardrail containment level is appropriate for the bridge site. The Professional Engineer should document the rationale for any deviation from the guidance provided in Table 1. Where vertical grade exceeds the area-specific average (e.g., > 4%), apply professional judgement to determine whether a higher standard bridge guardrail containment level is appropriate.
- ** There are infrequent situations where the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) may be responsible for a Very High Public Use FSR, notwithstanding that Very High Public Use roads should be administered by the Ministry of Transportation and Infrastructure (TRAN). In these infrequent situations, the responsible Professional Engineer should consider the need for a higher standard than CL-3 (e.g., TRAN standard barriers that have been crash tested to appropriate AASHTO MASH Test Levels TL-1 and TL-2). Additionally, this may also require the need for BABs to meet TRAN standards including an engineered and crash tested transition from the BAB to the bridge barrier.