

Roads

Master Specification

RD-BF-D1 Design of Roadside Safety Barriers

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RD-BF-D1 Design of Roadside Safety Barriers

1 General

- 1.1 When a requirement for a safety barrier is established (reference "Considerations for the Installation of Safety Barriers on Rural Roads in S.A." 1987 DoT) and investigations to eliminate the hazard by other means have failed or are not feasible, the appropriate type of barrier will need to be determined. As all barriers are a hazard in themselves, end treatments will also require consideration.
- 1.2 For further information the Australian/New Zealand Standard (AS/NZS 3845:1999) Road Safety Barrier Systems is recommended reading.
- 1.3 There are nominally three types of barrier: rigid, semi-rigid (non-rigid), and flexible.

2 Rigid Barriers

- 2.1 Rigid barriers are required over bridges and overpasses, and suitable transitions to semi-rigid or flexible barriers on the road approaches need to be installed. These barriers are generally constructed from steel box beams.
- 2.2 Concrete Barriers ("New Jersey" F-type) may be installed in medians and road edges where:
 - a) there is limited space;
 - b) there is a high heavy vehicle content (which needs to be constrained); or
 - c) there are few transitions to flexible systems are necessary.
- 2.3 Note: End treatments (e.g. crash attenuators) may be very expensive.
- 2.4 Transitions from semi-rigid (W-Beam) to a rigid system are detailed in the Standard Drawings for Guard Fences and Barriers Section, Road Design Standards and Guidelines document. There is no suitable transition available for Wire Rope Safety Barriers (WRSBs) unless by overlap of two systems.

3 Semi-Rigid (Non-Rigid) Barriers

- 3.1 The W-Beam safety barrier is a semi-rigid barrier designed in tension. The barrier therefore deflects (1.0 m behind barrier clearance required) and will require space behind the posts to develop passive resistance. This barrier may be considered where:
 - a) horizontal curves are min. 46 mR (unless pre-rolled);
 - b) transitions to rigid systems are required;
 - c) widening is available for end treatments (e.g. breakaway terminals);
 - d) critical clearances to kerbs and channels can be met;
 - e) clearance of 0.5m-1.0 m from guard fence post to edge of embankment can be met (Note: Specially designed posts (e.g. cranked) may be required when formation width is limited and passive resistance cannot be developed by soil pressure behind the posts. Cranked posts are expensive items.); or
 - f) absolute protection from commercial vehicles is not necessary.
- 3.2 Departmental Standard Drawings 4050 sh 4, 27, 29-35 contained in this document provide installation details.

4 Flexible Barriers

- 4.1 Flexible barriers are designed in tension and therefore deflect. It is desirable that (min.) 1.5 m be allowed behind flexible barriers for deflection.

- 4.2 The flexible barrier of choice for safety, ease of maintenance and aesthetics is the Wire Rope Safety Barrier.
- 4.3 Transitions directly from flexible systems to rigid systems are not yet available. Two systems (Flexible and Semi-rigid) may overlap preceding a transition to a rigid barrier.
- 4.4 This barrier may be considered where:
- a) minimum length at full height is 24 m;
 - b) vertical curves are greater than 3000 mR;
 - c) horizontal curves greater than 200 mR, depending on the wire rope system used (this can be reduced to absolute min. 50 mR by reducing post spacing, which effectively doubles cost);
 - d) transitions are not required to rigid or semi-rigid systems;
 - e) adequate room is available for anchorages;
 - f) space is not constrained (allowance for horizontal deflection absolute minimum 3.14m median width at 2.4 m post spacing);
 - g) absolute protection from commercial vehicles is not necessary;
 - h) the road formation width is limited; or
 - i) views / sight distance are important issues.
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