Detail Sheet

FLEXFENCE TL4
4 Wire Rope Barrier System - Permanent

Product summary

Status	Conditionally Accepted
Category	Permanent – Flexible Longitudinal Barriers
Test Level	MASH TL3: **100km/h**
Supplier	Ingal Civil Pty Ltd
Description	FLEXFENCE TL4 4 Rope Barrier System is a permanent longitudinal barrier.

Introduction and purpose

This detail sheet is intended to supplement *VicRoads Road Design Note 06-04 - Accepted Safety Barrier Products*. Please refer to RDN 06-04 for the current VicRoads acceptance status, information on the product assessment process and general acceptance conditions.

The technical details within this document have been extracted from information submitted to VicRoads by the Supplier and the recommended 'Conditions for Use' from the Austroads Safety Barrier Assessment Panel (ASBAP).

VicRoads requirements take precedence over the product manual and Austroads conditions. Where a departure from these requirements is required, users should understand the risks and document their engineering decisions.

For more detailed product information, refer to the individual product manual or contact the System Supplier.

Technical information

The FLEXFENCE TL4 4 Rope Barrier System should be designed, installed and maintained in accordance with the following VicRoads conditions for use.

These conditions for use have been based on an Austroads assessment of technical performance against AS/NZS 3845 and contain VicRoads specific requirements when necessary.

Summary Conditions for Use

Accepted configuration	FLEXFENCE TL4 4 Rope Barrier System – Permanent Consisting of 4 x 19mm, pre-stretched wire rope cables supported on a slotted post. Wire rope heights are 480, 560, 640 and 720mm. A wire rope hook is used with the top rope at each post. The 1,230mm long Sigma posts are set into sockets in a 600mm deep concrete footing, 300mm in diameter. A post stiffener is required for each socket. Rope tension is 25 kN
Variants	Type 3 Anchor Block. Driven post sleeve (refer 'other considerations and comments').
Deflection	3.0 metres
Product manual reviewed	February 2014 (Release 02/14)
ASBAP issue	30 May 2017

Refer VicRoads conditions for use (below).

VicRoads Conditions for Use

Tested design requirements

Containment level	Speed (km/h)	Vehicle mass (kg)	Point of Redirection (m)		Tested article length (m)	Post/Pin Spacing (m)	Dynamic deflection (m)	Working width (m)	Notes
			Leading	Trailing					
MASH TL-3[1]	100	2270	Interface between barrier and terminal 12.6 metres from the anchor point.		95	3.0[2]	3.0[1]	3.0[1]	Refer below

Notes: 1. This product is conditionally accepted to MASH Test Level 3 with a dynamic deflection and working width of 3.0 metres.
2. VicRoads adopt a standardised post spacing of 3.0m and 2.0m, refer VicRoads Supplement to AGRD Part 6, Section 6.3.16.6.

Approved Terminals and Connections

Crash Cushions or Terminals must be fitted to both ends of a barrier	
Public Domain Products	
W-Beam Guardrail	Not Permitted
Thrie-Beam Guardrail	Not Permitted
Type F Concrete Safety Barrier	Not Permitted
Proprietary Products	
FLEXFENCE TL3 Terminal End	• Refer FLEXFENCE TL4 product manual.

Design Guidance

Minimum installation length	95 metres between terminal ends (tested article)
System width (m)	0.30 at post 1.0 at terminal
Installation	This product must be installed and maintained in accordance with the Product Manual and Road Agency specifications. Road Agency specifications and standards shall have precedence.
Minimum distance to excavation	3.0m minimum distance between the edge of the barrier and the edge of excavation. (Being the largest predicted dynamic deflection). Refer Section V6.3.15.5 of VicRoads Supplement to AGRD Part 6.
Slope limit	Side slope limit: 10 Horizontal to 1 Vertical (10%).
Systems conditions	1. Installation on top of a kerb is not recommended, however if installed on top of a kerb, all system components must be free to operate. Refer VicRoads Supplement to AGRD Part 6. 2. To be installed in soil that meets or exceeds AASHTO Grade B standard.
Minimum installation distance from batter hinge point of the slope (m)	1.0 – Refer VicRoads Supplement to AGRD Part 6, Section 6.3.6 and V6.3.15.5.
Gore area use	Permitted
Pedestrian area use	Permitted – consider potential for snagging and deflection.
Cycleway use	Permitted – consider potential for snagging and deflection.
Frequent impact likely	Not Permitted
Remote location	Not Permitted
Median use	Permitted

Foundation pavement conditions

Submitted Foundation Pavement Conditions					
Pavement	**Use**	**Accepted Speed (max)**	**Post/Pin spacing (m)**	**Pavement construction**	**Post/pin type**
Concrete	Permitted with coring holes	100 km/h	3.0m	Minimum AASHTO Standard Soil strength	Posts set into plastic sleeve in a concrete footing, 600mm deep and 300mm in diameter.
Deep lift asphalt	Permitted with coring holes	100 km/h			
Asphalt over granular pavement	Permitted	100 km/h			
Flush seal over granular pavement	Permitted	100 km/h			
Unsealed compacted formation	Permitted	100 km/h			

Other considerations and comments

Conditional Acceptance

FLEXFENCE TL4 has been updated in line with a MASH reference point. This product will be conditionally accepted at MASH Test Level 3 with a predicted dynamic deflection and working width of 3.0 metres. New WRSB designs must adopt this dynamic deflection and working width value in order to safeguard the design so that upcoming MASH WRSB products may be substituted at installation.

Unless stated otherwise, this conditional acceptance will remain in place until six months after the acceptance of a (first) MASH WRSB system in Victoria. At this time, the conditional acceptance will be changed to Legacy (no new installations) unless the product is assessed and accepted to MASH.

Terminal anchor dimensions

Where no geotechnical investigation is undertaken to determine an approved alternative anchor, the manufacturer's nominated default anchor, the TYPE 3 anchor, shall be used (dimensions (mm) 800Wx3000Lx1100D).

Where poor soil conditions are present, Type 1 anchor should be considered. Refer to manufacturers manual.

NOTE: pier anchor WR-STD-55 NOT ACCEPTED FOR USE IN VICTORIA.

Driven Post Sleeve

Due to its nature, necessary assessments and soil tests must be undertaken prior to installation of the Driven Post Sleeve system.

All Locations;

- Dynamic Cone Penetration Testing (DCPT) requirements; shall be undertaken at 500m intervals. Within 1m below the finished surface, test shall be 10 blows or greater per 100mm penetration. All tests shall be undertaken in accordance with AS1289.6.3.2. Test results shall be provided to the Superintendent for review 7 days prior to installation. The Superintendent may request additional testing if any of the test sites fail the DCPT test at no cost to the Principal.
- Full compliance of Specification 711 shall be practiced.

Where new earthworks (greenfield) is required;

- Driven post sleeves must be installed in granular fill constructed in accordance with VicRoads Specification 204- Type A material.
- Installation shall not commence until approval from the Superintendent has been obtained.

Minimum length of barrier

Refer VRS to AGRD Part 6; While shorter lengths than the tested article length are possible, the designer must consider how this will affect other performance values (e.g. deflection). Designers should consult with the product supplier or mitigate the risk through additional controls, such as reducing the posted speed.

In general, an alternate barrier type should be considered when shorter than the following: 60m.

Post spacing

VicRoads adopt a standardised post spacing of 3.0m and 2.0m, refer VicRoads Supplement to AGRD Part 6, Section 6.3.16.6.

Installation

Must conform to the requirement listed in references below, including full compliance of Specification 708.

Terminal not designed to release cables, catch ropes can be omitted.

Damaged Components

Damaged components must be replaced. Repaired components must not be used.

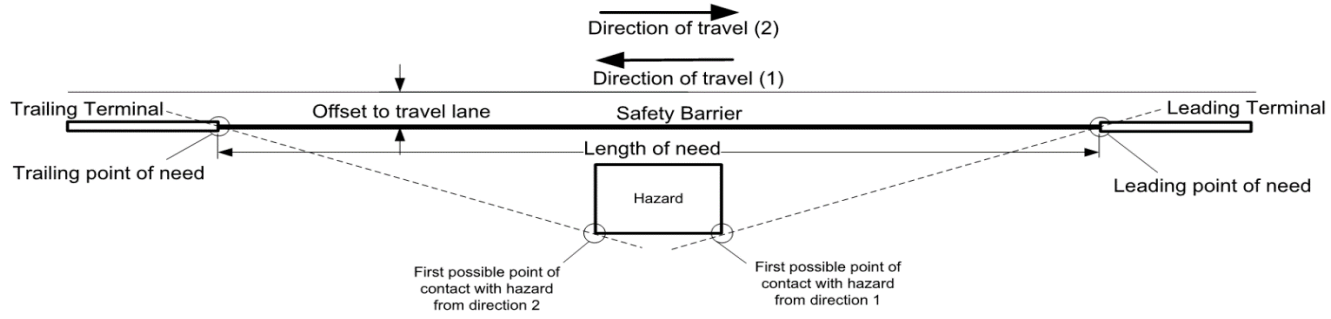
References

- Product and Installation Manual - refer licensed product supplier website.
- VicRoads Road Design Note 06-04 Accepted Safety Barrier Products.
- VicRoads Road Design Note 06-02 The Use of Wire Rope Safety Barriers (WRSB).
- VicRoads Standard Drawing SD2001 – Kerb types
- VicRoads Standard Drawing SD3573 – Guidance on the verge and permissible slopes
- VicRoads Standard Section 204 – Earthworks
- VicRoads Standard Section 711 – Wire Rope Safety Barrier (WRSB).
- VicRoads Supplement to Austroads Guide to Road Design – Part 6.

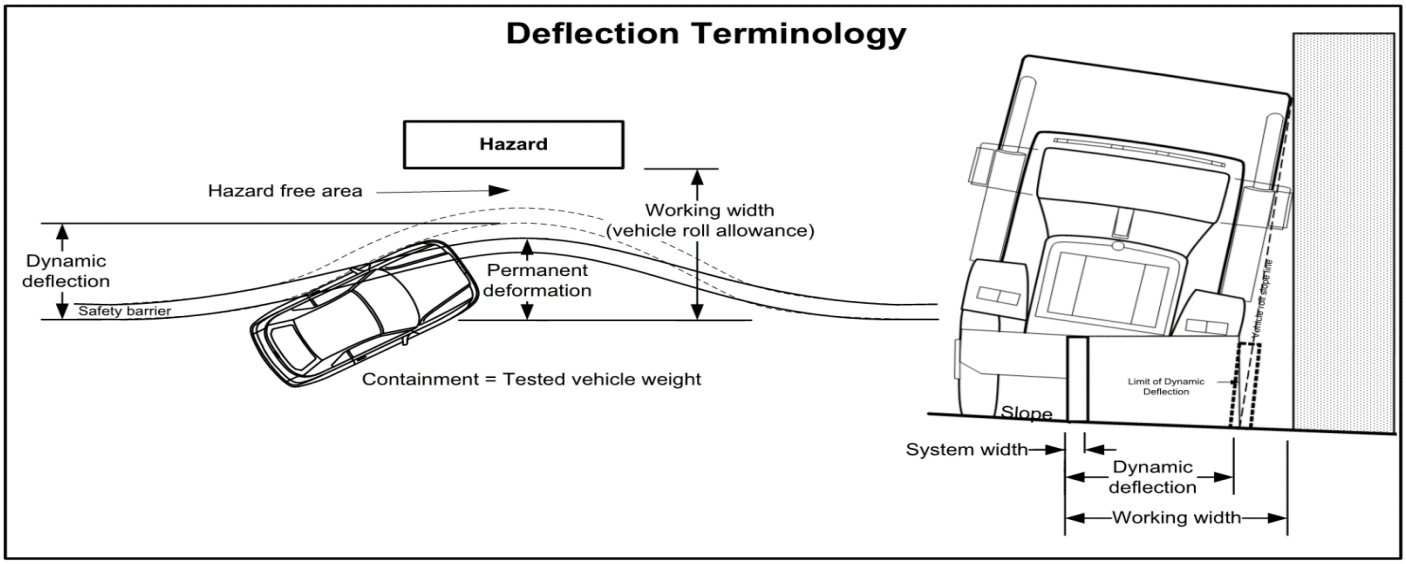
Detail Sheet – Update Summary

Issue	Approved	Amendment
June 2017	M-RS&T	First edition
Jan 2020	M-SSE	New document format Conditional Acceptance in line with a MASH reference point.

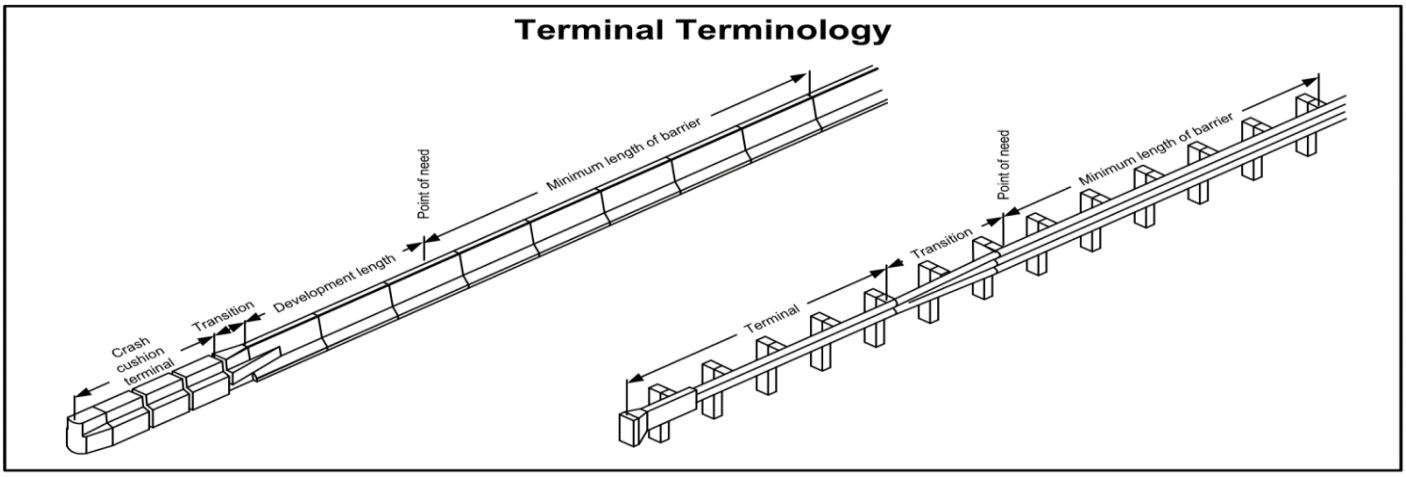
Design Terminology



Deflection Terminology



Terminal Terminology



Flare Terminology