

## Accepted Safety Barrier Products

**RDN 06-04**

**December 2020**

### Purpose

This document provides a list of road safety devices that DoT, formally VicRoads, has assessed and considers acceptable for use on the declared road network, subject to appropriate design and installation. For roads not on the declared road network (e.g. local roads), the responsible road authority (e.g. Councils) should be contacted to determine if this list is applicable.

### Key Information

Safety barrier selection and design is an intricate process that requires the application of engineering judgement and risk assessment. Designers should use this list of Accepted Safety Barrier Products in conjunction with;

- the 'Austroads Guide to Road Design (AGRD) - Part 6', 'DoT Supplement to AGRD - Part 6' and Road Design Notes, which describe the steps involved in designing a safety barrier,
- the 'General Conditions of use' and 'Safety Barrier Policies' detailed below,
- the 'Austroads Technical Conditions of Use (TCU)' and 'DoT specific conditions or variants' listed below, which detail any product specific limitations identified through assessment,
- the individual 'Product Installation and Maintenance Manuals', which are provided by the product owner or supplier to help achieve the desirable installation.

Further information on this list, the product assessment process and barrier performance requirements are provided below. Where reference to "VicRoads" approved products is made for the acceptance of Safety Barrier Products, this document shall be deemed to satisfy that requirement. For further clarification, please contact the Road Design & Safe System Engineering team.

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## 1. General Conditions of Use

Safety barrier products must be used in accordance with the following conditions of use;

### 1.1 Acceptance conditions

All products accepted for use by the DoT are listed below and will have a DoT Letter of Acceptance issued to the Proponent (typically the System Supplier). Using a product that is not accepted for use, or using a product outside the parameters for which it has been accepted by DoT, represents an unacceptable risk to road users.

Where a departure from the 'Austroads TCU' or 'DoT Conditions and Variants' is required, users should understand and document the risks and apply engineering judgement.

Acceptance is based on the information supplied by the Proponent at the time of assessment. DoT must be informed of any changes to a product and will determine if a re-assessment is required.

DoT will periodically review all products accepted for use in Victoria based on, but not limited to, the Austroads Safety Barrier Assessment Panel (ASBAP) recommendations, in-service performance, industry use, maintenance and durability requirements and reserves the right to withdraw or modify this acceptance at any time.

Acceptance can be withdrawn at any time if the manufacture, fabrication or quality of the product is deemed inferior or different to the product specified in the drawings and specifications supplied for the assessment.

Suppliers (or proponents) seeking DoT acceptance of a road safety barrier system, product or device which is not included in this document are referred to the ASBAP webpage or to contact the 'Manager - Road Design & Safe System Engineering' at [SafeSystemEngineering@roads.vic.gov.au](mailto:SafeSystemEngineering@roads.vic.gov.au).

## 1.2 System supplier and procurement

This listing nominates a "System Supplier" for each proprietary product. It is a requirement of DoT that proprietary products are sourced from the nominated System Supplier (or their agent).

## 1.3 Acceptance definitions

Acceptance definitions are "Accepted", "Not Accepted", "Legacy", "Phase Out" and "Suspended".

"Legacy" status allows retention of permanent products until the end of service life (refer Section 2.6). "Legacy" status permits use of remaining temporary barrier units. "Phase Out" status applies to temporary products only and means the product will remain in service to a fixed date after which time it will be withdrawn from acceptance.

## 1.4 Accepted Test Level

While the product may have been tested in accordance with different test levels and/or test protocols, the test level specified represents the accepted test level in Victoria.

The minimum test level required for a site must be determined using engineering judgement and information obtained from a site-specific risk assessment. Refer 'DoT Supplement to AGRD – Part 6' for guidance on Test Level selection.

For the design of bridge barriers and 'Performance Level' barriers, no consideration shall be made of test levels or the implied equivalence of test levels to performance levels that is given in table 14.4 of AS5100.1, as per BTN001. Performance Level barriers must be designed to fully comply with the requirements of AS5100.

## 1.5 Austroads Technical Conditions of Use (TCU) and DoT Conditions & Variants

To improve national harmonisation, the Austroads Technical Conditions of Use (TCU) will be adopted by DoT when deemed suitable. Where Austroads has issued multiple revisions of a TCU, the revision specified and linked in this document must be adopted.

Where DoT has specific conditions or variants, they will be detailed in the relevant column (below) or in a Detail Sheet. Where DoT does not have additional product conditions or variants, this column will contain 'Nil' and the Austroads TCU must be adopted.

In special circumstances, the DoT may accept a road safety product that has not been assessed by the ASBAP and therefore does not have an Austroads TCU. As such, a DoT Detail Sheet will be provided and referenced.

## 1.6 Product manuals and marketing information

Users are advised that information published by the system suppliers on their websites, within product manuals and included in promotional material, may not always reflect the actual products accepted or the conditions by which the products are accepted by DoT. This list and information contained within the TCUs and DoT conditions and variants shall take precedence over information published by the System Supplier. This may include variants to products for which DoT remains silent on.

## 1.7 Installation

Road safety devices must be installed in accordance with the Product and Installation Manual.

In addition, products must be installed in accordance with 'Standard Section 708 - Steel Beam Guard Fence' and/or 'Standard Section 711 - Wire Rope Safety Barriers' when relevant.

## 1.8 Repair

Barrier units/components must be traceable in accordance with markings prescribed by Australian/New Zealand Standard "AS/NZS 3845 Road Safety Barrier Systems" and Road Agency specifications.

Damaged components must be replaced or repaired in accordance with the Product and Installation Manual.

## 1.9 Aesthetic barriers

At the time of publishing this list, DoT has not assessed or accepted for use any Aesthetic Road Safety Barriers for use on the declared road network. In accordance with Section 6.6 of Austroads Guide to Road Design (AGRD) Part 6, Aesthetic Barriers might be considered in parks, historical communities, scenic areas or private road developments. If a road asset owner is considering the use of such barriers, it is recommended that the responsible road authority undertakes a site-specific risk assessment considering crash test performance, availability of terminals and whole-of-life costs of the system, in order to make an informed engineering decision. As a minimum, it is recommended that such barriers be crash tested to a recognised crash test criteria, preferably MASH, and consideration should be given to any 'conditions of use' published by the Federal Highway Administration (FHWA).

## 1.10 Worksite safety barrier screens

DoT does not maintain a list of accepted worksite barrier screens (also known as anti-debris or anti-gawk screens). As such, it is ultimately the responsibility of the product owner and contract superintendent to review the project specific use, with due consideration of VicRoads RDN 06-12 – Worksite safety barrier screens.

## 1.11 Truck Mounted Attenuators

Truck Mounted Attenuators (TMAs) must be deployed and operated in accordance with National and State requirements, specifically where operational best practice is prescribed.

The support vehicle mass is the gross weight with ballasts attached. Vehicle mass limits must be in accordance with any National and/or DoT requirements. While heavier support vehicles are likely to have less roll ahead than the tested configuration, the additional mass will increase the transfer of energy into the vehicle occupants during a crash and increase the likelihood of a fatal or serious injury. The support vehicle mass must be between the minimum and maximum mass limits specified above.

TMAs should be located a minimum distance of 30m before the workers or equipment that it is shielding in accordance with the Road Management Act 2004 Code of Practice, Worksite Safety – Traffic Management.

## 1.12 Median gates

All median gate installations must include establishment of an appropriate maintenance plan and operating procedure in collaboration with the System Supplier to ensure reliable use of the product.

## 1.13 Foundations

Local and Utility Authorities must be notified of any proposed installation prior to the commencement of works, as separate approval may be required.

Footing/foundation details and associated technical requirements are outlined within the supplier's Product and Installation Manual. Prior to installing the product, contact "Dial Before You Dig" or visit the website <https://www.1100.com.au>

## 1.14 Terminals

Approved terminals must be installed where the barrier may be impacted by an errant vehicle. Where a departure terminal cannot be impacted, the barrier must be suitably anchored in accordance with the TCU and product manual.

## 1.15 Minimum barrier lengths

Minimum safety barrier lengths are to be in accordance with the DoT Supplement to AGRD Part 6. While barrier lengths shorter than the tested article length shown in the Austroads TCUs 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.

## 2. Safety barrier policies

### 2.1 Speed Limitations - Temporary End Treatments

To improve safety at worksites, DoT requires the following speed limitations on temporary end treatments.

Worksite Posted Speed	Freeways/Highways	Other rural and urban roads (>4000 vehicles)	Other rural and urban roads (<4000 vehicles)	Plastic Terminal Risk Assessment Considerations
100 90	Crash cushion only	Crash cushion only	Crash cushion only	<b>Terminal performance:</b> <ol style="list-style-type: none"> <li>Runout area required</li> <li>Development length required</li> <li>Max operating speed as shown; inc. out of hours</li> </ol>
80	Crash cushion only	Crash cushion only	Crash cushion preferred, or <b>TL-3 Plastic terminal with completed risk assessment</b>	<b>Terminal visibility and impact likelihood:</b> <ol style="list-style-type: none"> <li>Visibility (Sightlines)</li> <li>Traffic Separation (Barrier Offset)</li> <li>Road Geometry (Alignment &amp; Width)</li> <li>Road Conditions (Road Quality &amp; Environmental)</li> <li>Traffic Conditions (Road Type &amp; Work Hours)</li> <li>Traffic Control (Signs &amp; Linemarking)</li> <li>Work Activities (Proximity to Terminal)</li> </ol>
70 60	Crash cushion only	Crash cushion preferred, or <b>Plastic terminal with completed risk assessment</b>	Crash cushion preferred, or <b>Plastic terminal with completed risk assessment</b>	
50 40	Crash cushion only, or As required, for "Short Term" works in accordance with RMA CoP Worksite Safety- Traffic Management	Any accepted safety barrier product	Any accepted safety barrier product	<b>Plastic terminal risk assessments should be checked by a:</b> <ol style="list-style-type: none"> <li>Road Safety Auditor</li> <li>OH&amp;S Co-ordinator, Manager or Equivalent</li> </ol>

### 2.2 Design of Wire Rope Safety Barrier (WRSB)

WRSBs are tested in a single configuration (including post spacing, length of barrier, curvature of barrier, wire rope tension and ambient temperature). For design versatility and assist with broader network maintenance of the barrier system, DoT adopts a harmonised working width for all WRSB products in accordance with the DoT Supplement to AGRD Part 6.

### 2.3 Conditional Acceptance of NCHRP-350 Wire Rope Safety Barriers

As of January 2020, all NCHRP350 TL-4 WRSB products have been updated in line with a MASH reference point. These products 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.

UPDATE: Given the acceptance of multiple MASH WRSB products, all NCHRP WRSB products will be changed to Legacy (no new installations) on 1<sup>st</sup> January 2021. DoT recommends the use of MASH WRSB on all projects.

### 2.4 Motorcyclist friendly covers

Guard fence terminals (e.g. G.R.E.A.Ts) must be fitted with a plastic motorcyclist friendly cover, that covers the impact head, when installed:

- on a Popular Motorcycle Route, as listed in DoT Supplement to AGRD Part 6- Appendix VA,
- on routes with a history of motorcyclist run-off-road crashes,
- on the outside of a tight horizontal curve (below minimum radii),
- at an offset less than 1.0m from the edge of traffic lane.

Plastic motorcycle friendly covers must have a white-on-black retro-reflective hazard marker sticker, which must be applied using an effective epoxy.

## 2.5 MASH Transition

AS/NZS 3845.1:2015 and AS/NZS 3845.2:2017 specify MASH as the current basis for crash testing, thereby superseding NCHRP350. The changes are in response to the ongoing industry progress, market trends and changes in the average vehicle size, plus an increased availability of MASH tested products becoming available to the Australian market.

On 23 April 2018, the Austroads Safety Barrier Assessment Panel (ASBAP) advised industry that all new products being submitted by industry must be in accordance with MASH or an equivalent rating in accordance with the Australian Standard. This decision encouraged progress and increased the number of MASH products available in Australia.

The Department of Transport is also adopting MASH as the nominal standard required for road safety devices in line with the ASBAP and AS/NZS 3845 requirements in accordance with the following timeframes:

### 31 December 2018

- Steel rail barriers and permanent concrete barriers.

### 31 December 2019:

- End Treatments (Guard Fence terminals and Crash Cushions)
- Wire Rope Safety Barriers (WRSB) incl. terminals

### 01 January 2022:

- Temporary barriers incl. terminals.

For temporary barriers, all contracts with a close of tender date of 1<sup>st</sup> January 2022 onwards must use MASH temporary safety devices. While, all contracts signed before the 1<sup>st</sup> January 2022 may continue to use NCHRP350 temporary safety barrier products until practical/physical completion.

## 2.6 Replacement and upgrade of legacy products

Safety barrier systems with a legacy status continue to provide the level of service at which they were originally tested. Unless specified below, legacy status products may be maintained and/or repaired until the end of their service life, or when parts are no longer available.

It is recommended that when long lengths of legacy items are damaged or within the limit of works, an assessment be made on whether an approved system may be installed instead as part of reinstatement works. Refer product specific notes within the 'Discontinued and Legacy products' section.


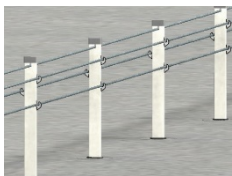




### **Replacement policies:**








Existing MELT, BCTA, BCTB and Flexfence Standard Wire Rope terminals:

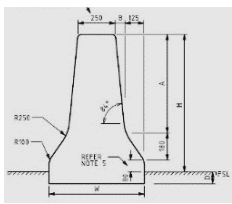

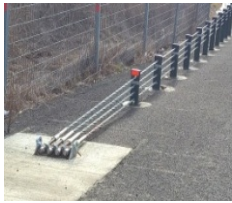




- must be replaced with an approved terminal after impact in the field or when replacement is required due to timber durability issues;
- must be replaced with an approved terminal if they exist within the limit of works for new projects.

Existing Type-B barrier installations, with a mounting height of <686mm to top of rail (lowest height within tolerance using the superseded mounting height of 706mm) must be replaced with an approved barrier system or upgraded using an Abraham Block-out.










### 3. Accepted permanent products








Product Name	System Supplier	Accepted Test Level	Austrroads TCU	System Photo	DoT Conditions and Variants
<b>Permanent - Flexible Longitudinal Barriers</b>					
<b>Briflen MASH</b>	Safe Direction	MASH TL-3	20 Nov 2020		Nil
<b>Sentryline-M</b>	Australian Construction Products	MASH TL-4	20 Nov 2020		Nil
<b>MashFlex</b>	Ingal Civil Products	MASH TL-3	20 Nov 2020		Nil
<b>Flexfence Wire Rope Safety Barrier (4 rope)</b>	Ingal Civil Products	NCHRP TL-4 Conditionally accepted until 31 Dec 2020	01 Jan 2020		Conditionally accepted at MASH TL-3 with a 3.0m working width and deflection, until 31 December 2020. Refer <a href="#">Flexfence Detail Sheet (Jan 2020)</a>
<b>Sentryline II Wire Rope Safety Barrier (4 rope)</b>	Australian Construction Products	NCHRP TL-4 Conditionally accepted until 31 Dec 2020	01 Jan 2020		Conditionally accepted at MASH TL-3 with a 3.0m working width and deflection, until 31 December 2020. Refer <a href="#">Sentryline II Detail Sheet (Mar 2020)</a>
<b>Ezy-Guard Smart &amp; Ezy-Guard 4</b>	Ingal Civil Products	MASH TL-3	20 Nov 2020		<p>EZY-GUARD SMART &amp; 4 shall be <b>transitioned</b> to Type B Guard Fence where a connection to a rigid concrete barrier or bridge end post is required. This transition shall be in accordance with Ingal drawing EZT-SM-020.</p> <p><b>Socketed variant</b> may be used in locations where there are demonstrated maintenance benefits (e.g. narrow flush medians). Concrete socket foundations must be designed to limit the amount of movement during an impact. The tested foundation (300mm Dia x 1000mm Deep) was installed in 100mm deep lift asphalt on 500mm weak soil (32<math>\phi</math> / 75kPa) on 400+mm weak soil (25<math>\phi</math> / 50kPa).</p> <p>The <b>Surface Mount</b> variant should be limited to constrained locations, where a driven post cannot be installed, such as across culverts, shallow rock and shallow underground services. The total length of surface mount posts should be minimised where possible. Seek advice from the Safe System Engineering team where necessary.</p>






Product Name	System Supplier	Accepted Test Level	Austrroads TCU	System Photo	DoT Conditions and Variants
RAMSHIELD	Safe Direction	MASH TL-3	20 Nov 2020		RAMSHIELD shall be <b>transitioned</b> to Type-B Guard Fence where a connection to a rigid concrete barrier or bridge end post is required.
SENTRY W-Beam Safety Barrier	Australian Construction Products	MASH TL-3	20 Nov 2020		SENTRY w-beam barrier shall be <b>transitioned</b> to Type-B Guard Fence where a connection to a rigid concrete barrier or bridge end post is required.  The <b>Surface Mount</b> variant should be limited to constrained locations, where a driven post cannot be installed, such as across culverts, shallow rock and shallow underground services. The total length of surface mount posts should be minimised where possible. Seek advice from the Safe System Engineering team where necessary.
<b>Permanent – Semi-rigid and Rigid Longitudinal Barriers</b>					
Type-B Guard Fence	Public Domain System	MASH TL-2	Nil		Refer <a href="#">Type-B Detail Sheet (April 2019)</a>
BG800 Permanent	Ingal Civil Products	Standard: NCHRP TL-4	20 Nov 2020		Removable anchors, such as the KelKen anchor, must be used on bridges and other structures. Kelken anchor suitable for asphalt and concrete applications. Hilti wedge bolt anchors to be used for MDS on concrete base. Embedment depth to be 200mm in concrete base, plus full depth asphalt if required.
		MDS: MASH TL-3	20 Nov 2020		
SAFETY ROLLER Steel Rail Safety Barrier	KSI Global Australia	MASH TL-4	20 Nov 2020		Nil
Ezy-Guard HC	Ingal Civil Products	MASH TL-4	20 Nov 2020		Note: Ezy Guard High Containment Barrier system has no relation and is not the equivalent of the High Containment (Special) performance level stated in AS5100, VicRoads Bridge Traffic Barrier Performance Levels and Design Loads, and VicRoads Guidelines for Bridge Approach and Departure Barrier
Sentry Thrie-beam Barrier	Australian Construction Products	MASH TL-4	20 Nov 2020		Nil

Product Name	System Supplier	Accepted Test Level	Austrroads TCU	System Photo	DoT Conditions and Variants
<b>F-Shape Concrete Safety Barrier</b>	Public Domain System	MASH TL-3 MASH TL-4 MASH TL-5	Nil		Refer <a href="#">F-Shape Concrete Barrier Detail Sheet (Dec 2019)</a>
<b>Quick-Change Concrete Reactive Tension Barrier System</b>	Lindsay Transport Solutions	NCHRP TL-3	March 2017		Refer <a href="#">Quick-Change Barrier Detail Sheet (Feb 2019)</a> <b>Traffic Management</b> This system is likely to be used for traffic operation improvements during peak periods and therefore must be designed and approved in accordance all Austrroads and VicRoads traffic engineering guidelines <b>Temporary or Permanent use on the Road Reserve</b> Prior to use, the applicant must engage the Road Design & Safe System Engineering (RD&SSE) team for commentary on the proposed solution. Approval from the 'Manager-RD&SSE' must be received prior to use.
<b>Permanent – Wire Rope Safety Barrier Terminals</b>					
<b>Flexfence TL3 End Terminal</b>	Ingal Civil Products	NCHRP TL-3 (Conditionally accepted)	01 Jan 2020		Conditionally accepted at MASH TL-3 with a 3.0m working width and deflection, until 31 December 2020. Refer <a href="#">Flexfence Detail Sheet (Jan 2020)</a>
<b>Sentryline III Terminal End</b>	Australian Construction Products	NCHRP TL-3 (Conditionally accepted)	01 Jan 2020		Conditionally accepted at MASH TL-3 with a 3.0m working width and deflection, until 31 December 2020. Refer <a href="#">Sentryline II Detail Sheet (Mar 2020)</a>
<b>Permanent – Gating Redirective Energy-Absorbing Terminals (G.R.E.A.T)</b>					
<b>MASH Sequential Kinking Terminal</b>	Safe Direction	MASH TL-3	20 Nov 2020		Nil
<b>ET-SS</b>	Ingal Civil Products	MASH TL-2 MASH TL-3	20 Nov 2020		Nil
<b>MAX-Tension</b>	Australian Construction Products	MASH TL-2 MASH TL-3	20 Nov 2020		Nil










Product Name	System Supplier	Accepted Test Level	Austrroads TCU	System Photo	DoT Conditions and Variants
<b>Permanent – Gating Non-Energy Absorbing Terminals</b>					
<b>Trailing Terminal</b>	Public Domain System	Departure only	Nil		Refer <a href="#">SD3544</a>
<b>Permanent – Redirective Crash Cushions / Impact Attenuators</b>					
<b>QuadGuard M10</b>	Ingal Civil Products	MASH TL-3	20 Nov 2020		Nil
<b>QuadGuard Elite M10</b>	Ingal Civil Products	MASH TL-3	20 Nov 2020		Nil
<b>SMART Steel Crash Cushion</b>	LB Australia	MASH TL-2 MASH TL-3	20 Nov 2020		Nil
<b>Universal TAU-M</b>	Australian Construction Products	MASH TL-2 MASH TL-3	20 Nov 2020		Nil
<b>Hercules</b>	Safe Barriers	MASH TL-3	20 Nov 2020		Nil
<b>Permanent – Pole Protector / Single Hazard Protection</b>					
<b>RAPTOR 300 &amp; 600 Single Point Protector Systems</b>	Ingal Civil Products	NCHRP TL-1	11 July 2017		Refer <a href="#">Raptor Detail Sheet (July 2019)</a> Accepted at 80km/h. All installations require prior approval by the Manager – Road Design and Safe System Engineering (M-RD&SSE).
<b>Permanent – Median Gates</b>					
<b>ArmorGuard Gate System</b>	Australian Construction Products	NCHRP TL-3	20 Nov 2020		Nil
<b>BG800 Steel Gate</b>	Ingal Civil Products	NCHRP TL-3	20 Nov 2020		Nil





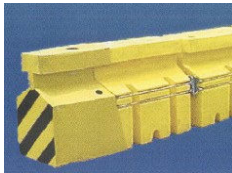





Product Name	System Supplier	Accepted Test Level	Austrroads TCU	System Photo	DoT Conditions and Variants
<b>VEVA3 Median Steel Gate</b>	Traffic Tech	NCHRP TL-3 (EN1317)	20 Nov 2020		Accepted at 100km/h
<b>Permanent - Bollards</b>					
<b>Energy Absorbing Bollard (EAB)</b>	Impact Absorbing Systems	AS3845:1999- Test Level 0: 1600kg car at 50km/h.	Nil		Refer <a href="#">Energy Absorbing Bollard Detail Sheet (Jan 2020)</a> The EAB is recognised for meeting a previous standard: AS3845:1999- Test Level 0: 1600kg car at 50km/h. This standard has been superseded, therefore EAB is not considered a road safety device and should only be used after a site-specific risk assessment. Contact <a href="mailto:SafeSystemEngineering@roads.vic.gov.au">SafeSystemEngineering@roads.vic.gov.au</a> for guidance.
<b>Energy Absorbing Pole/Tree Buffer</b>	Roadside Services & Solutions	MASH TL-1	Nil		Refer <a href="#">Energy Absorbing Pole/Tree Buffer Detail Sheet (May 2019)</a> Proposed locations require approval by M-RD&SSE prior.
<b>Permanent – Motorcycle Safety Products</b>					
<b>Rub Rail</b>	Public Domain System	Conditionally accepted	Nil		Proposed locations require approval by M-RD&SSE prior. Steel rail with bracket installed below W-beam. Can be attached to existing or new Type B guard fence to prevent motorcyclist impacts with the supporting posts. Must be terminated before a G.R.E.A.T
<b>INGAL MPR</b>	Ingal Civil Products	EN1317- 8 Impact Severity Level 1	8 Jan 2017		Accepted on Ezy-Guard Smart/4 Safety Barrier. Conditional acceptance for use on Type B guard fence. Proposed locations require approval by M-RD&SSE prior. Can be attached to existing or new Type B guard fence to prevent motorcyclist impacts with the supporting posts. Must be terminated before a G.R.E.A.T
<b>Biker-Shield</b>	Safe Direction	EN1317- 8 Impact Severity Level 2	5 Dec 2018		Accepted on Ramshield Barrier. Notes: Steel rail with bracket installed below W-beam. Must be terminated before a G.R.E.A.T
<b>PolyBuffer Rail System</b>	DM Plastics & Steel	Conditionally accepted	Nil		Proposed locations require approval by M-RD&SSE prior. Hollow rectangular polyethylene rails that fit under the W-beam to prevent motorcyclist impacts with the steel posts. Suitable on terminals only


Product Name	System Supplier	Accepted Test Level	Austrroads TCU	System Photo	DoT Conditions and Variants
<b>Biker Mate Crash Cushion</b>	Highway Care International	Conditionally accepted	Nil		Proposed locations require approval by M-RD&SSE prior. <u>Notes:</u> UV stabilised polypropylene. Modular form allows stacking to any height. Light and easy to install. Relatively maintenance free.
<b>Stack Cushion</b>	Ingal Civil Products	Conditionally accepted	Nil		Proposed locations require approval by M-RD&SSE prior. <u>Notes:</u> Polystyrene foam cushion made up of two pieces that attach to existing Flexfence WRSB posts to provide a softer impact for errant motorcyclists. Protection is offered to one side of the post only, therefore suitable for verge applications.
<b>Barriacel</b>	LB Australia	Conditionally accepted	Nil		Proposed locations require approval by M-RD&SSE prior. <u>Notes:</u> Patented impact absorbing material technology. Wraps around the post. Available in single or double wrap system.
<b>Motorcycle Friendly (MCF) Post Cushion</b>	RPS Industries	Conditionally accepted	Nil		Proposed locations require approval by M-RD&SSE prior. <u>Notes:</u> Solid wall or split wall urethane coated sleeve made of formulated foam with some absorption capability. Absorbs the impact load according to sleeve thickness. Made to fit Sentryline WRSB but can also fit other WRSB post types.
<b>Impact-Protect</b>	LB Australia	Conditionally accepted	Nil		Proposed locations require approval by M- RD&SSE prior. <u>Notes:</u> Fitted inner layer followed by a series of outer layers made from specially designed impact absorbing core. Layers held with high tenacity 'Cavacon' wrap. Made to fit posts and poles







## 4. Accepted temporary products

Product Name	System Supplier	Accepted Test Level	Austrroads TCU	System Photo	DoT Conditions and Variants
<b>Temporary – Steel longitudinal barriers</b>					
<b>Mobile Barrier MBT-1</b>	Mobile Barriers LLC	MASH TL-3 (with TL-3 rated TMA)	20 Nov 2020		<p><b>Vehicle registration requirements</b></p> <ul style="list-style-type: none"> <li>The operator of the vehicle will need to obtain registration and permits of use through VicRoads Customer Service Centres.</li> <li>Registration will need to cover all configurations of the truck, including all variations of 1-3 units of barrier section/trailer components.</li> </ul> <p><b>Route Planning/Traffic Management</b></p> <ul style="list-style-type: none"> <li>Operators must plan routes to avoid over-length or over-weight non-compliance whilst transporting this vehicle.</li> <li>Operators must comply with VicRoads requirements for Traffic Management Plans must be developed for approval by DoT project team prior to deployment.</li> </ul>
<b>BG 800 Suite of products</b>	Ingal Civil Products	<u>Standard:</u> NCHRP TL-4	20 Nov 2020	 	Nil
		<u>LDS:</u> NCHRP TL-3	20 Nov 2020		Nil
		<u>MDS:</u> MASH TL-3	20 Nov 2020		Nil
<b>Defender Barrier 70</b>	Safe Barriers	MASH TL-2	20 Nov 2020		Nil
<b>Defender Barrier 100 Suite of products</b>	Safe Barriers	<u>Free Standing:</u> MASH TL-3	20 Nov 2020		Nil
		<u>LDS:</u> MASH TL-3	20 Nov 2020		Nil
		<u>High Containment:</u> MASH TL-4	20 Nov 2020		Nil
<b>Highway-Guard LDS Safety Barrier</b>	Highway Care International	MASH TL-3	20 Nov 2020		Nil
<b>HV2 Barrier</b>	Saferoads	MASH TL-3 MASH TL-4	20 Nov 2020		Nil

Product Name	System Supplier	Accepted Test Level	Austroads TCU	System Photo	DoT Conditions and Variants
IronMan Hybrid	Saferoads	NCHRP TL-2 (+10km/h)	20 Nov 2020		Accepted at 80km/h
SafeZone Safety Barrier	Laura Metaal Road Safety	Standard: MASH TL-3 MASH TL-4	20 Nov 2020		Nil
		LDS: MASH TL-3 MASH TL-4	20 Nov 2020		Nil
ZONE-GUARD	Hill and Smith Queensland	Standard: MASH TL-3 NCHRP TL-4	20 Nov 2020		Nil
		MDS: MASH: TL-3	20 Nov 2020		Nil
<b>Temporary – Concrete longitudinal barriers</b>					
JJ Hooks Concrete Safety Barrier	Australian Road Barriers	NCHRP TL-3 (Speed restricted)	5 Sept 2017		Refer <a href="#">JJ Hooks Detail Sheet (Oct 2017)</a> Accepted at 80km/h
JJ Hooks 6m Concrete Safety Barrier	Australian Road Barriers	MASH TL-3	20 Nov 2020		Nil
T-LOK MASH	Saferoads	MASH TL-2 (+10km/h)	20 Nov 2020		Accepted at 80km/h
DB80 K150 (DeltaBloc)	Jaybro	MASH TL-3	20 Nov 2020		Nil
<b>Temporary – Plastic Water-Filled Longitudinal Barriers</b>					
ArmorZone	Ingal Civil Products	NCHRP TL-2	20 Nov 2020		ArmorZone may be considered for operating speeds up to 70km/h (TL-2) with prior approval. Proposed installation require approval by the M-RD&SSE and must demonstrate the following at a minimum: <ul style="list-style-type: none"> <li>1. Consideration of alternate safety barrier options,</li> <li>2. Compliance with the Austroads TCU (e.g. length, deflection, terminals, maintenance),</li> <li>3. Controls to guarantee the product is installed, inspected and maintained in accordance with the requirements of the licensed product supplier.</li> </ul> Please email <a href="mailto:M-RD&amp;SSE">M-RD&amp;SSE</a> .

Product Name	System Supplier	Accepted Test Level	Austrroads TCU	System Photo	DoT Conditions and Variants
<b>ArmorZone MASH</b>	Ingal Civil Products	MASH TL-1 MASH TL-2	20 Nov 2020		Nil
<b>SHIELD 1</b>	National Plastics Group	MASH TL-1	20 Nov 2020		Nil
<b>Ricochet</b>	Advantage Plastics	MASH TL-1	20 Nov 2020		Nil
<b>Lo-Ro Water Cable Barrier</b>	Jaybro Group	MASH TL-2	20 Nov 2020		Nil
<b>Temporary – Gating Non-Redirective End Treatments</b>					
<b>Absorb 350 Crash Cushion</b>	Australian Construction Products	Speed limited	20 Nov 2020		Refer to policy note on speed limitations
<b>Absorb M Crash Cushion</b>	Australian Construction Products	MASH TL-2	20 Nov 2020		Refer to policy note on speed limitations
<b>Triton CET (Concrete End Terminal)</b>	Ingal Civil Products	Speed limited	Nil		Refer <a href="#">Triton CET Detail Sheet (July 2018)</a> For operating speeds of 80km/h, the 100km/h configuration is required and should contain pedestals under all sections, with the first section erected upside-down and a short pedestal.
<b>SLED Plastic Water Filled End Terminal</b>	Saferoads	MASH TL-3	20 Nov 2020		Accepted at 80km/h
<b>Temporary – Redirective Crash Cushion / Impact Attenuator</b>					
<b>QuadGuard CZ</b>	Ingal Civil Products	NCHRP TL-2 NCHRP TL-3	20 Nov 2020		Driveable Pile Anchor installations require approval by the M-RD&SSE.
<b>QuadGuard M10 CZ</b>	Ingal Civil Products	MASH TL-2 MASH TL-3	20 Nov 2020		Nil

Product Name	System Supplier	Accepted Test Level	Austrroads TCU	System Photo	DoT Conditions and Variants
<b>SMART Steel Crash Cushion</b>	LB Australia	MASH TL-2 MASH TL-3	20 Nov 2020		Nil
<b>Universal TAU-II</b>	Australian Construction Products	NCHRP TL-2 NCHRP TL-3	20 Nov 2020		Nil
<b>Universal TAU- M</b>	Australian Construction Products	MASH TL-2 MASH TL-3	20 Nov 2020		Nil
<b>Temporary – Truck Mounted Attenuators (TMA)</b>					
<b>Vorteq</b>	Ingal Civil Products	NCHRP TL-3	Nil		Nil
<b>SafeStop (various)</b>	Ingal Civil Products	NCHRP TL-3	Nil		Nil
<b>MPS-350</b>	Ingal Civil Products	NCHRP TL-3	Nil		Nil
<b>U-MAD (W.A.S.P)</b>	Australian Construction Products	NCHRP TL-2 NCHRP TL-3	Nil		Nil
<b>Scorpion Trailer Attenuator</b>	A1 Roadlines	NCHRP TL-2 NCHRP TL-3	Nil		Nil

Product Name	System Supplier	Accepted Test Level	Austrroads TCU	System Photo	DoT Conditions and Variants
<b>Scorpion Truck Mounted Attenuator</b>	A1 Roadlines	NCHRP TL-2 NCHRP TL-3	Nil		Nil
<b>Scorpion II MASH Trailer Attenuator</b>	A1 Roadlines	NCHRP TL-3	20 Nov 2020		Nil
<b>Scorpion II MASH TMA</b>	A1 Roadlines	MASH TL-2	20 Nov 2020		Nil
		MASH TL-3	20 Nov 2020		Nil
<b>SS180M TMA</b>	Ingal Civil Products	MASH TL-3	20 Nov 2020		Nil
<b>Stuer-Egghe 'Julietta'</b>	J1-LED Intelligent Transport Systems	NCHRP TL-3	20 Nov 2020		Note: Unless the Julietta has received acceptance to MASH before 31 December 2020, the Austrroads status will be made 'phase out'. VicRoads plan on harmonising with Austrroads' transition to MASH, therefore users should consider the potential life of the product. Refer to the Austrroads website for further information or contact <a href="mailto:SafeSystemEngineering@roads.vic.gov.au">SafeSystemEngineering@roads.vic.gov.au</a> .
<b>Verdegro Blade</b>	Innov8 Equipment	MASH TL-3	20 Nov 2020		Nil



## 5. Discontinued and Legacy products

Product Name	System Supplier	Status	Note
<b>Brifen TL-3 Wire Rope Safety Barrier (3 and 4 rope)</b>	Hill and Smith Queensland	Legacy	Brifen TL-3 configuration discontinued in Victoria.
<b>Brifen Wire Rope Safety Barrier (4 rope) TL4</b>	Hill and Smith Queensland	Legacy	
<b>Flexfence 3 Wire Rope Safety Barrier</b>	Ingal Civil Products	Legacy	Consider upgrading. Additional rope and strengthening plate may be retrofitted.
<b>Sentryline II 3 Wire Rope Safety Barrier</b>	Australian Construction Products	Legacy	Consider upgrading. Additional rope may be retrofitted.
<b>Gibraltar 3 Wire Rope Safety Barrier</b>	Tranex Group	Legacy	
<b>Thriebeam G9</b>	Public Domain System	Legacy	Assigned Legacy status in October 2014
<b>T-39 Thriebeam</b>	Ingal Civil Products	Legacy	Assigned Legacy status in April 2018
<b>IronMan Median Gate</b>	Saferoads	Legacy	
<b>Sentryline II Terminal End</b>	Australian Construction Products	Legacy	Consider upgrading to Sentryline III (non-release) terminal when the terminal is in close proximity to the traffic lane.
<b>Flexfence Standard Wire Rope Terminal</b>	Ingal Civil Products	Legacy	Must replace with Flexfence TL-3 terminal following major impact or within limit of works
<b>Gibraltar End Terminal</b>	Tranex Group	Legacy	
<b>Brifen Wire Rope Terminal</b>	Hill and Smith Queensland	Legacy	
<b>BCTA (Approach Breakaway Cable Terminal)</b>	Public Domain System	Legacy	Must replace with "Accepted" G.R.E.A.T following impact or within limit of works
<b>BCTB (Departure Breakaway Cable Terminal)</b>	Public Domain System	Legacy	Must replace with "Accepted" G.R.E.A.T or Trailing Terminal following impact or within limit of works
<b>MELT (Modified Eccentric Loader Terminal)</b>	Public Domain System & proprietary versions	Legacy	Must replace with "Accepted" G.R.E.A.T following impact or within limit of works
<b>SKT350 (Sequential Kinking Terminal)</b>	Safe Direction	Legacy	
<b>FLEAT350 (Flared Energy Absorbing Terminal)</b>	Safe Direction	Legacy	
<b>SKT-SP</b>	Safe Direction	Legacy	
<b>FLEAT-SP</b>	Safe Direction	Legacy	
<b>X-Tension Terminal End</b>	Australian Construction Products	Legacy	

Product Name	System Supplier	Status	Note
<b>X-Tension Median Terminal</b>	Australian Construction Products	Legacy	While the X-Tension Median Terminal is Legacy, it remains the only guard fence terminal that can be used in narrow medians. Where these applications occur, and a MASH Terminal is impractical please contact <a href="mailto:SafeSystemEngineering@roads.vic.gov.au">SafeSystemEngineering@roads.vic.gov.au</a> for advice
<b>TREND 350 End Terminal</b>	Ingal Civil Products	Legacy	
<b>ET 2000 Plus</b>	Ingal Civil Products	Legacy	
<b>Fishtail</b>	Public Domain System	Not accepted	This treatment does not anchor the system and must be replaced with an accepted terminal
<b>Bullnose</b>	Public Domain System	Not accepted	This treatment has not been accepted by DoT
<b>BrakeMaster 350A</b>	Ingal Civil Products	Legacy	Replacement parts may be difficult to obtain, replace with "Accepted" crash cushion following major impact
<b>Tau-II</b>	Australian Construction Products	Legacy	
<b>Tracc</b>	Ingal Civil Products	Legacy	
<b>QuadGuard</b>	Ingal Civil Products	Legacy	
<b>Rubber Crash Cushion</b>	Saferoads	Legacy	Replacement parts may be difficult to obtain, replace with "Accepted" crash cushion following major impact
<b>OmniStop Terminal</b>	Saferoads	Legacy	Consider replacing with "Accepted" G.R.E.A.T following major impact
<b>IronMan Suite of Barriers (unballasted)</b>	Saferoads	Legacy	NCHRP TL-1 NCHRP TL-2 <a href="#">IronMan Suite of Barriers Sheet</a> provided for reference only Only units containing grey/galvanised bulk heads are currently accepted for use. Units containing orange coloured bulkheads or any other variant are not currently accepted.
<b>T-LOK 350 F-TYPE</b>	Saferoads	Legacy	NCHRP TL-2 <a href="#">T-LOK 350 Detail Sheet</a> provided for reference
<b>Energite III Sand Barrel System</b>	Ingal Civil Products	Not Accepted	This treatment has not been accepted by DoT
<b>TRITON Barrier</b>	Ingal Civil Products	Not Accepted	Phased Out - Effective 22 October 2014

## 6. Register of System Suppliers

This list has been provided to help users contact the System Supplier. This list is not exhaustive and may become outdated.

<b>A1 Roadlines Pty Ltd</b>	89 Rushdale Street, Knoxfield VIC 3180 Ph: (03) 9765 9400 <a href="http://www.a1roadlines.com.au">www.a1roadlines.com.au</a> Contact: Janine Bartholomew Email: <a href="mailto:sales@a1roadlines.com.au">sales@a1roadlines.com.au</a>
<b>Australian Construction Products (ACP)</b>	15 National Drive, Hallam, VIC 3803 Ph: +61 3 8773 5301 <a href="http://www.acprod.com.au">www.acprod.com.au</a> Contact: Bruce Grey Email: <a href="mailto:bgrey@acprod.com.au">bgrey@acprod.com.au</a>
<b>Australian Road Barriers</b>	RMB H535, Old Creswick Rd, Ballarat, VIC 3352 Ph: 1800 003 826 Fax: (03) 5339 9273 <a href="http://www.roadbarriers.com.au">www.roadbarriers.com.au</a> Contact: Ben Sexton Email: <a href="mailto:ben@roadbarriers.com.au">ben@roadbarriers.com.au</a>
<b>Advantage Plastics</b>	PO Box 410, 254 Easterbrook Road, RD1 Kaiapoi, 7691, NZ Ph: 0800 668 534 <a href="https://www.advantageplastics.co.nz/">https://www.advantageplastics.co.nz/</a> Contact: David Hickmott Email: <a href="mailto:david@adplasnz.com">david@adplasnz.com</a>
<b>Highway Care International</b>	The Highlands, Detling, Maidstone, Kent, ME14 3HT, United Kingdom <a href="http://www.highwaycareint.com">www.highwaycareint.com</a>
<b>Hill &amp; Smith</b>	1/242 New Cleveland Rd, Tingalpa, QLD 4173 Ph: 1300 277 683 <a href="http://www.hsroads.com.au">www.hsroads.com.au</a> Contact: Warwick Weeks Email: <a href="mailto:sales@hsroads.com.au">sales@hsroads.com.au</a>
<b>Impact Absorbing Systems Pty Ltd</b>	28 Donegal Road, Lonsdale SA 5160 Phone: (08) 8384 7863 <a href="https://www.impactabsorbing.com.au/">https://www.impactabsorbing.com.au/</a>
<b>Ingal Civil Products</b>	35-37 Lakeside Drive, Broadmeadows, VIC 3047 Ph: 03 9358 4100 Fax: 03 9358 4110 <a href="http://www.ingalcivil.com.au">www.ingalcivil.com.au</a> Contact: Ilir Thaqi Email: <a href="mailto:ithaqi@ingalcivil.com.au">ithaqi@ingalcivil.com.au</a>
<b>Innov8 Equipment Pty Ltd</b>	Email: <a href="mailto:sales@innov8equipment.com.au">sales@innov8equipment.com.au</a> Ph: 1300 071 007
<b>J1-LED Intelligent Transport Systems</b>	110 Endeavour Way, Sunshine West VIC 3020 Ph: 1300 884 473
<b>Jaybro</b>	Building A, 1-7 Cyanamid Street, Laverton North, VIC 3026 Ph: 02 9678 1491 <a href="http://www.jaybro.com.au">www.jaybro.com.au</a>
<b>KSI Global Australia</b>	61 Foskew Way, Geraldton, WA 6530 Ph: +61 8 9949 9788 <a href="http://www.ksiglobal.com.au">www.ksiglobal.com.au</a> Contact: John Wheatland Email: <a href="mailto:weaties@midwesttraffic.com.au">weaties@midwesttraffic.com.au</a>

<b>Laura Metaal Road Safety Pty Limited</b>	Level 11, 1 Margaret Street, Sydney, NSW 2000 <a href="http://www.laurametaal.nl/en-au/road-safety">www.laurametaal.nl/en-au/road-safety</a> Contact: Paul Elsdon Mob: 0409 979 200 Email: <a href="mailto:apac@laurametaal.nl">apac@laurametaal.nl</a>
<b>LB Australia</b>	Unit 6/79, Mandoon Road, Girraween, NSW 2145 Ph: (02) 9631 8833 Fax: (02) 9688 4503 <a href="http://www.lbaustralia.com.au">www.lbaustralia.com.au</a> Contact: Paul Hansen Email: <a href="mailto:paul.hansen@lbaustralia.com.au">paul.hansen@lbaustralia.com.au</a>
<b>Mobile Barriers</b>	24918 Genesee Trail Road, Golden, Colorado 80401, USA. Ph: 0432 931 981 <a href="http://int.mobilebarriers.com/">http://int.mobilebarriers.com/</a> Contact: Ben Eizenberg Email: <a href="mailto:ben@mobilebarriers.com">ben@mobilebarriers.com</a>
<b>National Plastic Group</b>	5 Christensen Road, Staplyton, QLD 4207 Ph: 07 3807 0055 Fax: 07 3807 2315 <a href="http://www.nationalplasticsgroup.com.au">www.nationalplasticsgroup.com.au</a> Contact: Nina Adcock Email <a href="mailto:nina@nationalplastics.com.au">nina@nationalplastics.com.au</a>
<b>Roadside Services &amp; Solutions</b>	2A, 841 Mountain Highway, Bayswater VIC 3153 Ph: 1300 022 222 <a href="https://www.roadsideservices.net.au">https://www.roadsideservices.net.au</a>
<b>Safe Barriers Pty Ltd</b>	Ph: 1800 169 799 <a href="https://www.safebarriers.com/">https://www.safebarriers.com/</a> Contact: David Moule Email: <a href="mailto:david.moule@safebarriers.com">david.moule@safebarriers.com</a>
<b>Saferoads</b>	22 Commercial Drive, Pakenham, VIC 3810 Ph: 1800 060 072 Fax: 1800 060 673 <a href="http://www.saferoads.com.au">www.saferoads.com.au</a> Contact: Casey McMaster Email: <a href="mailto:casey.mcmaster@saferoads.com.au">casey.mcmaster@saferoads.com.au</a>
<b>Safe Direction</b>	69 Metrolink Circuit, Campbellfield, Vic, 3061 Ph: 1300 063 220 <a href="http://www.safedirection.com.au">www.safedirection.com.au</a> Contact: James Foden Email: <a href="mailto:JamesF@safedirection.com.au">JamesF@safedirection.com.au</a>

## References

1. Austroads Guide to Road Design: Part 6 - Roadside Design, Safety and Barriers
2. Austroads Technical Conditions of Use (TCU)
3. DoT Detail Sheets
4. DoT Road Design Notes
5. DoT Supplement to AGRD: Part 6 – Section 6.0: Road Safety Barriers
6. DoT Technical Drawings and Specification Clauses
7. Product Installation and Maintenance Manuals.
8. WRSB Maintenance Guidelines (2019) – DoT internal document.

## Revision history

Version	Date	Clause	Description of Change
A-M	On request		
N	Nov 2019	Various	General: Added note to G.R.E.A.T. products that non-MASH tested products will become legacy. Products added: ArmorZone MASH, HV2 MASH, M-SKT ET-SS, MAX-Tension, Scorpion II MASH TMA
O	March 2020	Various	Legacy: ET2000, X-Tension, X-Tension Median, FLEAT-SP, SKT-SP, Trend350, TAU-II, and Quadguard (narrow, wide, high-speed & elite). Conditions added: Flexfence and Sentryline II re-rated to MASH TL-3 Products added: Tau-M, Quadguard M-10, Hercules
16	Dec 2020	Various	See below

### Additional notes on current version:

#### General

- Versioning converted to a numerical system.
- General Conditions of Use moved to Section 1 from Section 6. All conditions have been reviewed and updated. Additional conditions have been moved from existing product Detail Sheets.
- Section 2- Safety Barrier Policies has been provided for transparency. This section publishes several existing internal policy documents.
- Commentary on barrier assessment and comparison has been removed and will be re-published in a separate commentary document (in development).
- Additional guidance on the replacement and upgrade of legacy products provided in Section 2.6 and Section 5.
- 73 existing detail sheets have been reviewed and where DoT had no additional conditions or variants, were superseded by the Austroads TCU. Any DoT conditions and variants have been provided in this document. Only 11 DoT Detail Sheets remain.

#### New products added:

- JJ Hooks 6m Safety Barrier MASH TL-3
- Scorpion II MASH Trailer Attenuator MASH TL-3
- SS180M TMA MASH TL-3
- Brifen MASH TL-3
- Sentryline M MASH TL-4
- MashFlex MASH TL-3
- Tau-M Temporary Crash Cushion MASH TL-3
- Absorb M Temporary Terminal MASH TL-2
- Quadguard Elite M10

#### Products updated:

- ArmorZone MASH TL-1 variant
- SMART Steel Crash Cushion: MASH TL-2 variant
- Scorpion II MASH TMA: MASH TL-2 variant
- Quadguard M-10 MASH TL-2 variant
- Lo-Ro Water Cable Barrier MASH TL-1 variant

## Contact Details

Manager - Road Design and Safe System Engineering (M-RD&SSE)  
Road and Traffic Engineering, Department of Transport  
60 Denmark St, Kew Vic 3101  
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