

# Accepted Safety Barrier Products

RDN 06-04

May 2019

## Purpose



This Road Design Note (RDN) lists the safety barrier products that 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), it is advisable to contact the responsible road authority (e.g. Councils) to determine if this RDN is applicable.

Safety barrier selection and design is an intricate process that frequently requires the application of engineering judgement and risk assessment. Designers should use this document in conjunction with the *Austroads Guide to Road Design Part 6* &

*VicRoads' Supplement to AGRD Part 6*, which describes the considerations involved in designing the roadside to include a safety barrier, the *VicRoads Detail Sheets*, which detail any product specific limitations identified through assessment, and the individual *Product Manuals*, which are provided by the product owner/supplier to achieve a desirable installation – refer **Section 5**.



Details of the assessment process, barrier performance and general acceptance conditions are provided in **Section 4** and **Section 5** of this RDN. Links to individual product detail sheets are provided within the "Additional Information" column

## 1. Accepted permanent and temporary safety barrier products

Product Name	System Supplier	Performance (Test Level and Accepted Speed)	Additional Information	Image
<b>1.1. Permanent – Flexible longitudinal barriers</b>				
<b>Flexfence Wire Rope Safety Barrier (4 rope)</b>	Ingal Civil Products  <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-4: 100km/h	<i>Flexfence WRSB 4 Rope Detail Sheet</i>  <i>Road Design Note 06-02</i>	
<b>Sentryline II Wire Rope Safety Barrier (4 rope)</b>	Australian Construction Products Pty Ltd (ACP)  <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-4: 100km/h	<i>Sentryline II WRSB 4 Rope Detail Sheet</i>  <i>Road Design Note 06-02</i>	



Product Name	System Supplier	Performance (Test Level and Accepted Speed)	Additional Information	Image
<b>Ezy-Guard SMART</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> TL-3: 100km/h	<i>EzyGuard SMART Detail Sheet</i>	
<b>Ezy-Guard 4</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> TL-3: 100km/h	<i>EzyGuard 4 Detail Sheet</i>	
<b>RAMSHIELD</b>	Safe Direction <i>Proprietary System</i>	<u>MASH:</u> TL-3: 100km/h	<i>RAMSHIELD W-Beam Guardrail Barrier Detail Sheet</i>	
<b>Sentry Barrier W-Beam System</b>	Australian Construction Products Pty Ltd (ACP) <i>Proprietary System</i>	<u>MASH:</u> TL-3: 100km/h	<i>Sentry W-Beam Barrier Detail Sheet</i>	

## 1.2. Permanent – Semi-rigid and Rigid longitudinal barriers


<b>Type-B Guard Fence (W-Beam)</b>	Public Domain System	<u>MASH:</u> TL-2: 70km/h  Designers should consider the use of a MASH TL-3 product.  Transitions to concrete in accordance with <b>SD 4081</b> are accepted at 100km/h pending results of the Austroads transition project.	<i>Type B Guard Fence Detail Sheet</i>  SD 3661  <i>Road Design Note 06-08</i>	
<b>BG800 Permanent</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> TL-3: 100KM/H	<i>BG 800 Detail Sheet</i>	







Product Name	System Supplier	Performance (Test Level and Accepted Speed)	Additional Information	Image
<b>SAFETY ROLLER Steel Rail Safety Barrier</b>	KSI Global Australia Pty Ltd <i>Proprietary System</i>	<u>MASH:</u> TL-4: 100km/h	<i>Safety Roller Barrier Detail Sheet</i>	
<b>Ezy-Guard HC</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> TL-4: 100km/h	<i>Ezy-Guard HC Detail Sheet</i>	
<b>F-Shape Concrete Safety Barrier (rigid)</b>	Public Domain System	<u>MASH:</u> TL-3: 100km/h TL-4: 100km/h TL-5: 100km/h  Test level subject to height, installation and manufacture.	Standard Drawings for Roadworks (SD3901 to SD3905)	
<b>Quick-Change Concrete Reactive Tension Barrier System</b>	Supplier Lindsay Transport Solutions <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-3: 100km/h	<i>Quick-Change Detail Sheet</i>	

### 1.3. Permanent – Wire rope safety barrier terminals

<b>Flexfence TL3 End Terminal</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-3: 100km/h	<i>Flexfence WRSB 4 Rope Detail Sheet</i>	
<b>Sentryline III Terminal End</b>	Australian Construction Products Pty Ltd (ACP) <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-3: 100km/h	<i>Sentryline II WRSB 4 Rope Detail Sheet</i>	




Product Name	System Supplier	Performance (Test Level and Accepted Speed)	Additional Information	Image
<b>1.4. Permanent – Gating redirective energy-absorbing terminals (G.R.E.A.T)</b>				
<b>ET 2000 Plus</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2: 70km/h (variant) & TL-3: 100km/h	<i>ET 2000 Plus Detail Sheet</i>	
<b>FLEAT-SP</b>	Safe Direction Pty Ltd <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2: 70km/h (variant) & TL-3: 100km/h	<i>FLEAT-SP Detail Sheet</i>	
<b>SKT-SP</b>	Safe Direction Pty Ltd <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2: 70km/h (variant) & TL-3: 100km/h	<i>SKT-SP Detail Sheet</i>	
<b>X-Tension Terminal End (X-350)</b>	Australian Construction Products Pty Ltd (ACP) <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-3: 100km/h	<i>X-Tension Terminal End Detail Sheet</i>	
<b>X-Tension Median Terminal End</b>	Australian Construction Products Pty Ltd (ACP) <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-3: 100km/h	<i>X-Tension Terminal End Detail Sheet</i>	
<b>TREND 350 End Terminal</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-3: 100km/h	<i>TREND 350 End Terminal Detail Sheet</i>	
<b>1.5. Permanent – Gating non-energy absorbing terminals</b>				
<b>Trailing Terminal</b>	Public Domain System	<b>Departure only</b>	<i>Trailing Terminal Detail Sheet</i>  <i>SD 3544 -Trailing Terminal</i>	





Product Name	System Supplier	Performance (Test Level and Accepted Speed)	Additional Information	Image
<b>1.6. Permanent – Redirective crash cushions / Impact attenuators</b>				
<b>QuadGuard (narrow &amp; wide systems)</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2: 70km/h, & TL-3: 100km/h	<i>QuadGuard Detail Sheet</i>  <i>QuadGuard Wide Detail Sheet</i>	
<b>QuadGuard High Speed</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-3+: 110km/h	<i>QuadGuard HS Detail Sheet</i>	
<b>QuadGuard Elite</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2: 70km/h (variant) & TL-3: 100km/h	<i>QuadGuard Elite Detail Sheet</i>	
<b>SMART Steel Crash Cushion</b>	LB Australia Pty Ltd <i>Proprietary System</i>	<u>MASH:</u> TL-3: 100km/h  <u>NCHRP350:</u> TL-2: 70km/h (variant) & TL-3: 100km/h	<i>SMART Cushion Detail Sheet</i>	
<b>TRACC Crash Attenuation Barrier</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2: 70km/h (variant) & TL-3: 100km/h	<i>TRACC Crash Cushion Detail Sheet</i>	
<b>Universal TAU-II</b>	Australian Construction Products Pty Ltd (ACP) <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2: 70km/h (variant) & TL-3: 100km/h	<i>Universal TAU-II Detail Sheet</i>	

Product Name	System Supplier	Performance (Test Level and Accepted Speed)	Additional Information	Image
<b>1.7. Permanent – Pole protector / Single hazard protection</b>				
<b>Raptor 300 &amp; 600 Single Point Protector Systems</b>	Ingal Civil Products  <i>Proprietary System</i>	Accepted: 80km/h  <u>MASH</u> : Not rated  <u>NCHRP350</u> : TL-1: 50 km/h  <b>Proposed locations require prior approval by the Manager - SSE</b>	<i>Raptor Detail Sheet</i>	
<b>1.8. Permanent – Median gates</b>				
<b>ArmorGuard Gate System</b>	Australian Construction Products Pty Ltd (ACP)  <i>Proprietary System</i>	<u>MASH</u> : Not rated  <u>NCHRP350</u> : TL-3: 100km/h	<i>ArmorGuard Gate Detail Sheet</i>	
<b>BG800 Steel Gate</b>	Ingal Civil Products  <i>Proprietary System</i>	<u>MASH</u> : Not rated  <u>NCHRP350</u> : TL-3: 100km/h	<i>BG 800 Steel Gate Detail Sheet</i>	
<b>VEVA3 Median Steel Gate</b>	Traffic Tech Pty Ltd  <i>Proprietary System</i>	Accepted: 100km/h  <u>MASH</u> : Not rated  <u>NCHRP350</u> : Not rated  <u>EN1317</u> : TB51: 100km/h	<i>VEVA3 Median Steel Gate Detail Sheet</i>	
<b>1.9. Permanent – Bollards</b>				
<b>Energy Absorbing Bollard (EAB)</b>  (previously named "OmniStop" Bollard)	1. Roadside Services & Solutions Pty Ltd  2. Impact Absorbing Systems Pty Ltd  <i>Proprietary System</i>	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.  <b>Contact SSE for guidance.</b>	<i>Energy Absorbing Bollard Detail Sheet</i>	



Product Name	System Supplier	Performance (Test Level and Accepted Speed)	Additional Information	Image
<b>Energy Absorbing Pole/Tree Buffer</b>	Roadside Services & Solutions Pty Ltd	<b>Accepted for trial: 50km/h</b> <u>MASH:</u> Not rated  <u>NCHRP350:</u> Not rated	<i>Energy Absorbing Pole/Tree Buffer Detail Sheet</i>	

### 1.10. Temporary – Steel longitudinal barriers

<b>Mobile Barrier MBT-1</b>	Mobile Barriers LLC  <i>Proprietary System</i>	<u>MASH:</u> TL-3: 100km/h (with TL-3 rated TMA)  <u>NCHRP350:</u> Not rated	<i>Mobile Barrier MBT-1 Detail Sheet</i>	
<b>BG 800</b> <i>Suite of products include Standard, LDS (low deflection system) and MDS (minimum deflection system)</i>	Ingal Civil Products, &  <i>Proprietary System</i>	<u>Standard:</u> MASH: TL-3 100km/h NCHRP350: TL-4 100km/h  <u>LDS &amp; MDS:</u> MASH: Not rated NCHRP350: TL-3 100km/h	<i>BG800 Detail Sheet</i>	 BG 800 Standard or LDS  BG 800 MDS
<b>Defender Barrier 70</b>	Safe Barriers Pty Ltd  <i>Proprietary System</i>	<u>MASH:</u> TL-2: 70km/h  <u>NCHRP350:</u> Not rated	<i>Defender Barrier 70 Detail Sheet</i>	
<b>Defender Barrier 100</b> <i>Suite of products include FS (free standing), LDS (low deflection system) and HC (high containment)</i>	Safe Barriers Pty Ltd  <i>Proprietary System</i>	<u>Free Standing:</u> MASH: TL-3: 100km/h  <u>Low Deflection System:</u> MASH: TL-3: 100KM/H  <u>High Containment:</u> MASH: TL-4: 100km/h	<i>Defender Barrier 100 Detail Sheet</i>	

Product Name	System Supplier	Performance (Test Level and Accepted Speed)	Additional Information	Image
<b>IronMan Hybrid</b>	Saferoads Pty Ltd <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2 (+10km/h): 80km/h	<i>IronMan Hybrid Detail Sheet</i>	
<b>ZONEGUARD</b> <i>Suite of products include Standard and MDS (minimum deflection system)</i>	Hill and Smith Queensland <i>Proprietary System</i>	<u>Standard:</u> MASH: TL-3 100km/h NCHRP350: TL-4 100km/h  <u>MDS:</u> MASH: TL-3 100km/h	<i>ZONEGUARD Detail Sheet</i>	



### 1.11. Temporary – Concrete longitudinal barriers

<b>JJ Hooks Concrete Safety Barrier</b>	Australian Road Barriers Pty Ltd <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2 (+10km/h): 80km/h	<i>JJ Hooks Detail Sheet</i>	
<b>T-LOK MASH</b>	Saferoads Pty Ltd <i>Proprietary System</i>	<u>MASH:</u> TL-2 (+10km/h): 80km/h  <u>NCHRP350:</u> Not rated	<i>T-LOK MASH Detail Sheet</i>	
<b>DB80 K150 (DeltaBloc)</b>	Orange Hire <i>Proprietary System</i>	<u>MASH:</u> TL-3: 100km/h  <u>NCHRP350:</u> Not rated	<i>DB80 Detail Sheet</i>	




### 1.12. Temporary – Plastic water-filled longitudinal barriers

<b>ArmorZone</b>	Ingall Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2: 70km/h	<i>ArmorZone Detail Sheet</i>	
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Product Name	System Supplier	Performance (Test Level and Accepted Speed)	Additional Information	Image
<b>SHIELD 1</b>	National Plastics Group <i>Proprietary System</i>	<u>MASH:</u> TL-1: 50km/h  <u>NCHRP350:</u> Not rated	<i>SHIELD 1 Detail Sheet</i>	
<b>RICOCHET</b>	Advantage Plastics <i>Proprietary System</i>	<u>MASH:</u> TL-1: 50km/h	<i>RICOCHET Detail Sheet</i>	

### 1.13. Temporary – Gating non-redirective end treatments





<b>Absorb 350 Crash Cushion</b>	Australian Construction Products Pty Ltd (ACP) <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> (Refer speed limitations)	<i>Absorb 350 Detail Sheet</i>  Always consider use of non-gating redirective crash cushions over these devices	
<b>TRITON CET (Concrete End Terminal)</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> (Refer speed limitations)	<i>TRITON CET Detail Sheet</i>  Always consider use of non-gating redirective crash cushions over these devices	
<b>SLED Plastic Water Filled End Terminal</b>	Saferoads Pty Ltd	<u>MASH:</u> (Refer speed limitations)  <u>NCHRP350:</u> Not rated	<i>SLED Detail Sheet</i>  Always consider use of non-gating redirective crash cushions over these devices	





### 1.14. Temporary – Redirective crash cushion / Impact attenuator

<b>QuadGuard CZ (Construction Zone)</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2: 70km/h, & TL-3: 100km/h  CZ Driveable Pile Anchor System: <b>Interim Acceptance</b>	<i>QuadGuard CZ and DPA System Detail Sheet</i>	 CZ 
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Product Name	System Supplier	Performance (Test Level and Accepted Speed)	Additional Information	Image
				CZ (Driveable Pile Anchor)
<b>SMART Steel Crash Cushion</b>	LB Australia Pty Ltd <i>Proprietary System</i>	<u>MASH</u> : TL-3: 100km/h  <u>NCHRP350</u> : TL-2: 70km/h, & TL-3: 100km/h	<i>SMART Cushion Detail Sheet</i>	
<b>Universal TAU-II</b>	Australian Construction Products Pty Ltd (ACP) <i>Proprietary System</i>	<u>MASH</u> : Not rated  <u>NCHRP350</u> : TL-2: 70km/h, & TL-3: 100km/h	<i>Universal TAU-II Detail Sheet</i>	

## 2. Accepted motorcycle safety products / Truck Mounted Attenuators (TMA)






Product Name	Licensed Supplier	Status in Victoria	Description	Additional Information	Image
<b>2.1. Permanent - Motorcycle Safety Products</b>					
<b>Rub Rail</b>	Public Domain System	<b>Accepted on a trial basis only</b>  Proposed trial site locations require approval by Manager-SSE prior.	Steel rail with bracket installed below W-beam.  <b>Must be terminated before a G.R.E.A.T</b>	Can be attached to existing or new Type B guard fence to prevent motorcyclist impacts with the supporting posts.  Refer VicRoads Standard Drawings for Roadworks.	
<b>INGAL MPR</b>	Ingal Civil Products <i>Proprietary System</i>	<b>Accepted on Ezy-Guard Smart/4 safety barrier</b>  <b>Accepted for use on Type B guard fence - on a trial basis only.</b>  Proposed trial site locations require approval by Manager-SSE prior.	UNE 135900 Impact Severity Level 1  Steel rail with bracket installed on post.  <b>Must be terminated before a G.R.E.A.T</b>	<i>Ingal MPR Detail Sheet</i>  Can be attached to existing or new Type B guard fence to prevent motorcyclist impacts with the supporting posts.	
<b>Biker-Shield</b>	Safe Direction Pty Ltd <i>Proprietary System</i>	<b>Accepted on Ramshield safety barrier</b>	EN1317- 8 Impact Severity Level 2  Steel rail with bracket installed on w-beam.  <b>Must be terminated before a G.R.E.A.T</b>	<i>Bike-Shield Detail Sheet</i>	
<b>PolyBuffer Rail System</b>	DM Plastics & Steel Pty Ltd <i>Proprietary System</i>	<b>Accepted on a trial basis only</b>  <b>Suitable on terminals only</b>  Proposed trial site locations require approval by Manager-SSE prior.	Hollow rectangular polyethylene rails that fit under the w-beam to prevent motorcyclist impacts with the steel posts.  <b>Suitable on terminals only</b>	Can be used for existing or new G.R.E.A.T. terminals to prevent motorcyclist impacts with the supporting posts.  Refer Licensed Supplier Installation Manual and Specification.	




Product Name	Licensed Supplier	Status in Victoria	Description	Additional Information	Image
<b>Biker Mate Crash Cushion</b>	Highway Care International <i>Proprietary System</i>	<b>Accepted on a trial basis only</b>  Proposed trial site locations require approval by Manager-SSE prior.	UV stabilised polypropylene  Modular form allows stacking to any height.  Light and easy to install. Relatively maintenance free.	Can be attached to square and round posts.  Refer Licensed Supplier Installation Manual and Specification.	
<b>Stack Cushion</b>	Ingal Civil Products <i>Proprietary System</i>	<b>Accepted on a trial basis only</b>  Proposed trial site locations require approval by Manager-SSE prior.	Polystyrene foam cushion made up of two pieces that attach to existing Flexfence WRSB posts to provide a softer impact for errant motorcyclists.	No dismantling of the existing wire rope system required for Stack Cushion attachment.  Protection is offered to one side of the post only, therefore suitable for verge applications.  Refer Licensed Supplier.	
<b>Barriacel</b>	LB Australia Pty Ltd <i>Proprietary System</i>	<b>Accepted on a trial basis only</b>  Proposed trial site locations require approval by Manager-SSE prior.	Patented impact absorbing material technology.  Wraps around the post. Available in single or double wrap system.	Used on Brifen WRSB but can also be used on other WRSB post types.  No dismantling of the existing wire rope system to attach.	
<b>(Motor Cycle Friendly) MCF Post Cushion</b>	RPS Industries <i>Proprietary System</i>	<b>Accepted on a trial basis only</b>  Proposed trial site locations require approval by Manager-SSE prior.	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>Solid wall type:</b> wire ropes would need to be detached from post to replace cushion.  <b>Split wall type:</b> no need to detach wire ropes from post. Ideal for retro fitting existing WRSB installations (see image on right).  Refer Licensed Supplier	



Product Name	Licensed Supplier	Status in Victoria	Description	Additional Information	Image
<b>Impact-Protect</b>	LB Australia Pty Ltd <i>Proprietary System</i>	<b>Accepted on a trial basis only</b>  Proposed trial site locations require approval by Manager-SSE prior.	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.	Can be retro fitted to existing post installations.  Refer Licensed Supplier.	

## 2.2. Temporary - Truck Mounted Attenuators (TMA)

<b>Vorteq</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-3: 100km/h	Trailer Mounted Attenuator suitable for work zone protection.	A safety "shunt forward" distance must be adopted. For operational practices refer to the supplier.	
<b>SafeStop (various)</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-3: 100km/h	Truck Mounted Attenuator suitable for work zone protection.	A safety "shunt forward" distance must be adopted. For operational practices refer to the supplier.	
<b>MPS-350</b>	Ingal Civil Products <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-3: 100km/h	Truck Mounted Attenuator suitable for work zone protection.	A safety "shunt forward" distance must be adopted. For operational practices refer to the supplier.	
<b>U-MAD (W.A.S.P)</b>	Australian Construction Products Pty Limited (ACP) <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2 70km/h TL-3: 100km/h	Truck Mounted Attenuator suitable for work zone protection.	A safety "shunt forward" distance must be adopted. For operational practices refer to the supplier.	
<b>Scorpion Trailer Attenuator</b>	A1 Roadlines Pty Ltd <i>Proprietary System</i>	<u>MASH:</u> Not rated  <u>NCHRP350:</u> TL-2 70km/h TL-3: 100km/h	Truck Mounted Attenuator suitable for work zone protection.	A safety "shunt forward" distance must be adopted. For operational practices refer to the supplier.	

Product Name	Licensed Supplier	Status in Victoria	Description	Additional Information	Image
<b>Scorpion Truck Mounted Attenuator</b>	A1 Roadlines Pty Ltd <i>Proprietary System</i>	<u>MASH:</u> Not rated <u>NCHRP350:</u> TL-2 70km/h TL-3: 100km/h	Truck Mounted Attenuator suitable for work zone protection.	A safety “shunt forward” distance must be adopted. For operational practices refer to the supplier.	
<b>Stuer-Egghe ‘Julietta’</b>	J1-LED Intelligent Transport Systems	<u>MASH:</u> Not rated <u>NCHRP350:</u> TL-3: 100km/h	Truck Mounted Attenuator suitable for work zone protection.	A safety “shunt forward” distance must be adopted. For operational practices refer to the supplier.	
<b>Verdegro Blade</b>	Innov8 Equipment Pty Ltd	<u>MASH:</u> TL-3: 100km/h	Truck Mounted Attenuator suitable for work zone protection.	A safety “shunt forward” distance must be adopted. For operational practices refer to the supplier.	

### 3. Discontinued safety barrier products in Victoria

Product Name	Licensed Supplier	Status in Victoria	Additional Information	Image
<b>3.1. Permanent Longitudinal Barriers - Discontinued</b>				
<b>Brifen TL-3 Wire Rope Safety Barrier (3 and 4 rope)</b>	Hill and Smith Queensland <i>Proprietary System</i>	Legacy  (maintain only)	Brifen TL-3 configuration discontinued in Victoria	
<b>Brifen Wire Rope Safety Barrier (4 rope) TL4</b>	Hill and Smith Queensland <i>Proprietary System</i>	Legacy  (maintain only)	No longer accepted in Victoria	
<b>Flexfence 3 Wire Rope Safety Barrier</b>	Ingal Civil Products <i>Proprietary System</i>	Legacy  (maintain only or upgrade to TL4 where possible)	3 rope WRSB Systems discontinued in Victoria	
<b>Sentryline II 3 Wire Rope Safety Barrier</b>	Australian Construction Products Pty Ltd (ACP) <i>Proprietary System</i>	Legacy  (maintain only or upgrade to TL4 where possible)	3 rope WRSB Systems discontinued in Victoria	
<b>Gibraltar 3 Wire Rope Safety Barrier</b>	Tranex Group Pty Ltd <i>Proprietary System</i>	Legacy  (maintain only)	3 rope WRSB Systems discontinued in Victoria	



Product Name	Licensed Supplier	Status in Victoria	Additional Information	Image
<b>Thriebeam G9</b>	<i>Public Domain System</i>	Legacy October 2014  (maintain only)	No longer accepted in Victoria	
<b>T-39 Thriebeam</b>	Ingal Civil Products <i>Proprietary System</i>	Legacy April 2018  (maintain only)	Product not tested to MASH.  NCHRP350: TL-4  <i>T-39 Thriebeam Detail Sheet</i>	
<b>IronMan Median Gate</b>	Saferoads Pty Ltd <i>Proprietary System</i>	Legacy  (maintain only)		

### 3.2. Permanent End Treatments - Discontinued




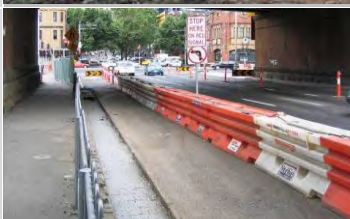
<b>Sentryline II Terminal End</b>	Australian Construction Products Pty Ltd (ACP) <i>Proprietary System</i>	Legacy  (Upgrade to Sentryline III terminal where possible)	No longer accepted in Victoria	
<b>Flexfence Standard Wire Rope Terminal</b>	Ingal Civil Products <i>Proprietary System</i>	Legacy  (Upgrade to TL3 terminal where possible)	No longer accepted in Victoria	
<b>Gibraltar End Terminal</b>	Tranex Group Pty Ltd <i>Proprietary System</i>	Legacy  (maintain only)	3 rope WRSB Systems discontinued in Victoria	



Product Name	Licensed Supplier	Status in Victoria	Additional Information	Image
<b>Brifen Wire Rope Terminal</b>	Hill and Smith Queensland <i>Proprietary System</i>	Legacy (maintain only)	No longer accepted in Victoria	
<b>BCTA Approach Breakaway Cable Terminal</b>	Public Domain System	Legacy Replace with "Accepted" G.R.E.A.T following impact or maintenance	Only Gating Redirective Energy Absorbing Terminals (G.R.E.A.T.) are accepted for use on new projects and installations	
<b>BCTB Departure Breakaway Cable Terminal</b>	Public Domain System	Legacy Replace with "Accepted" G.R.E.A.T or Trailing Terminal following impact or maintenance	Replaced by the Trailing Terminal.	
<b>MELT (Modified Eccentric Loader Terminal)</b>	Public Domain System <i>(Including proprietary versions)</i>	Legacy (August 2013) Replace with "Accepted" G.R.E.A.T or Trailing Terminal following impact or maintenance	Only Gating Redirective Energy Absorbing Terminals (G.R.E.A.T.) are accepted for use on new projects and installations	
<b>SKT350 (Sequential Kinking Terminal)</b>	Safe Direction Pty Ltd <i>Proprietary System</i>	Legacy (maintain only) Replace with "Accepted" SKT-SP or other G.R.E.A.T following impact.		
<b>FLEAT350 (Flared Energy Absorbing Terminal)</b>	Safe Direction Pty Ltd <i>Proprietary System</i>	Legacy (maintain only) Replace with "Accepted" FLEAT-SP or other G.R.E.A.T following impact.		

Product Name	Licensed Supplier	Status in Victoria	Additional Information	Image
<b>BrakeMaster 350A</b>	Ingal Civil Products <i>Proprietary System</i>	Legacy (maintain only)		
<b>Rubber Crash Cushion</b>	Saferoads Pty Ltd <i>Proprietary System</i>	Legacy (maintain only)		
<b>OmniStop Terminal</b>	Saferoads Pty Ltd <i>Proprietary System</i>	Legacy (maintain only)  Where possible, replace with “Accepted” G.R.E.A.T following impact or maintenance		

### 3.3. Temporary Barriers – Discontinued

<b>IronMan Suite of Barriers (unballasted)</b>	Saferoads Pty Ltd <i>Proprietary System</i>	Legacy (maintain only)	TL-1: 50km/h & TL-2: 70km/h  <i>IronMan Suite of Barriers Sheet</i>	
<b>T-LOK 350 F-TYPE</b>	Saferoads Pty Ltd <i>Proprietary System</i>	Legacy (maintain only)	TL-2: 80km/h  <i>T-LOK 350 Safety Barrier Detail Sheet</i>	
<b>Energite III Sand Barrel System</b>	Ingal Civil Products <i>Proprietary System</i>	Not Accepted	No longer accepted for use in Victoria	
<b>TRITON</b>	Ingal Civil Products <i>Proprietary System</i>	Not Accepted  Phased Out - Effective 22 October 2014		

## 4. Assessment process

The assessment of road safety barrier systems, end treatments and related road safety devices is undertaken nationally by the Austroads Safety Barrier Assessment Panel (ASBAP) of which VicRoads is a member.

Suppliers (or proponents) seeking acceptance for use on State-controlled roads in Victoria of a road safety barrier system, product or device which is not included in this document are referred to the ASBAP webpage and secretariat for an Assessment Submission Package<sup>1</sup>.

Where an assessment by ASBAP results in a recommendation for “acceptance”, the recommendation together with any conditions of acceptance will be published by Austroads. VicRoads will be cognisant of the recommendations of the ASBAP process.

Suppliers (or proponents) seeking to use a road safety barrier system, product or device on State-controlled roads in Victoria, which has been accepted by ASBAP, should submit an application to VicRoads **Manager– Safe System Engineering**. It should be noted that whilst VicRoads will be cognisant of the recommendations of the ASBAP, VicRoads reserves the option to reject, restrict or condition the use of any road safety barrier system, product or device for use on State-controlled roads in Victoria.

VicRoads may rescind or modify at any time any product acceptance. This is particularly the case should the status of the acceptance be modified by the ASBAP or should acceptance be modified in any way in other jurisdictions.

<sup>1</sup> <http://www.austroads.com.au/road-construction/barrier-assessment>

## 5. General acceptance conditions

1. While the product may have been tested at alternative test levels, the Performance (Test Level and Accepted Speed) specified in this RDN represents the accepted test level and speed in Victoria. Accepted test levels may vary from State to State. Refer product detail sheets for tested performance.

2. **SYSTEM PERFORMANCE:** Generally, there are three main crash testing and impact parameter protocols that are adopted. These are (i) the Manual for Assessing Safety Hardware (MASH), and/or (ii) the National Cooperative Highway Research Program Report 350 (NCHRP350), and/or (iii) the European Normative EN1317 (EN1317).

In accordance with AS/NZS 3845.1:2015 and AS/NZS 3845.2:2017, MASH is the current basis for crash testing protocol, therefore it is VicRoads preference to select products that have undergone the full suite of MASH testing.

In an effort to encourage installation of MASH crash tested devices, and in line with the changes to the Standard, the Austroads Safety Barrier Assessment Panel (ASBAP) has also updated its product submission criteria; refer [website](#).

**CAUTION - COMPARISON OF PERFORMANCE:** Results obtained from crash tests (e.g. deflection, working width) conducted under different testing protocols cannot be easily compared. Comparisons made based on impact energy (where vehicle mass, speed and impact angle are critical considerations) are possible, but such comparisons do not result in an equal level of predictable performance that crash tests provide. More often than not, real world barrier impacts are different to crashed tests scenarios where mass, speed and impact angle can vary and therefore affect performance characteristics.

For example, deflection for a TL-3 system tested to NCHRP350 is not expected to be the same as the deflection of the same TL-3 system tested to MASH because of the differences in impact energy. Refer Table 1 and Figure 1 (below) for a summary of impact conditions.

Table 1: NCHRP350 Test Matrix				
Test Level	Vehicle Mass (kg)	Speed (km/h)	Angle (degrees)	Energy (kJ)
1	820	50	20	9.3
	2000	50	25	34.5
2	820	70	20	18.1
	2000	70	25	67.5
3	820	100	20	37
	2000	100	25	137.8
4	820	100	20	37
	2000	100	25	137.8
	8000	80	15	132.3
MASH Test Matrix				
1	1100	50	25	18.9
	2270	50	25	39.1
2	1100	70	25	37.1
	2270	70	25	76.6
3	1100	100	25	75.8
	2270	100	25	156.4
4	1100	100	25	75.8
	2270	100	25	156.4
	10,000	90	15	209.3

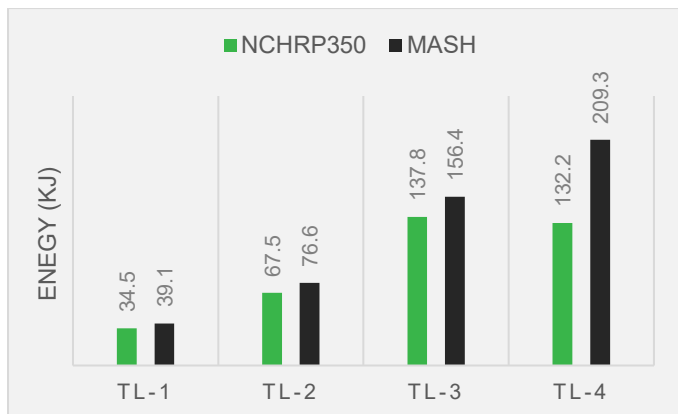
Source: AS/NZS 3845.1:2015

Due to the difference in crash tests, it is very difficult to make performance comparisons and VicRoads advises that designs using a specific accepted system should, in general preferential order, be based on:

- Crash tested system performance data, then, if applicable or desired -
- Interpolations or extrapolations away from crash tested system performance data or conditions, which can be based upon any of the following:
  - a) in-service performance data,
  - b) research and development testing, and/or
  - c) engineering simulation.

Any interpolations or extrapolations derived by the system owner (often published within their product manuals) are the responsibility of the system owner, and caution should be applied with any use.

**Figure 1: Comparison of impact severity for longitudinal barriers**



Source: AS/NZS 3845.1:2015

3. All performance speed acceptances published are Operating Speed, not Posted Speed. Operating Speeds are determined as follows:
  - Urban Road: Operating Speed = Posted Speed Limit
  - Rural Road: Operating Speed = Posted Speed Limit + 10km/h
4. Acceptance definitions are “Accepted”, “Not Accepted”, “Legacy”, “Phase Out” and “Suspended”. “Legacy” status allows retention in service only until the end of service life of the product and permits continued use of temporary barriers classified as “Legacy”. “Phase Out” status means the product will remain in service to a fixed date after which time it will be withdrawn from acceptance. VicRoads acceptance of these products may be revised pending the outcome of ASBAP’s assessment or otherwise.
5. All products accepted for use in the state of Victoria are listed in this Road Design Note. Products accepted for use in other States that do not appear in this Road Design Note are not accepted for use in Victoria.
6. At the time of publishing this Road Design Note, VicRoads has not assessed or accepted for use any Aesthetic Road Safety Barriers for use outside the declared road network. In accordance with Section 6.6 of Austroads Guide to Road Design Part 6, Aesthetic Barriers might be considered in parks, historic 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 against recognised crash test criteria such as in MASH<sup>2</sup>, NCHRP

Report 350 or EN1317 and consideration should be given to any 'conditions of use' published by the Federal Highway Administration (FHWA).

7. VicRoads does not maintain a list of accepted worksite barrier screens (also known as anti-debris or anti-gawk). As such, it is ultimately the responsibility of the contract superintendent to review the project specific use, with due consideration of VicRoads RDN 06-12 – Worksite safety barrier screens.
8. **WARNING:** Users of Accepted Safety Barrier Products contained within this Road Design Note are advised that information published by manufacturers and suppliers on their websites, within product manuals and advertising/promotional material, may not always reflect either the actual products accepted or the conditions by which the products are accepted for use in Victoria. The letter of acceptance issued to the system supplier, this Road Design Note and information contained within the VicRoads Product Detail Sheets shall take precedence over information published by the manufacturer/ supplier. This may include variants to products for which the letter of acceptance, Road Design Note or Product Detail Sheets remain silent on.  
  
Using a product that is not accepted for use or using a product outside the parameters for which it has been accepted by the State Road Authority represents an unacceptable risk to road users and the community.
9. This Road Design Note nominates a Licensed Supplier for each proprietary product. It is a requirement of VicRoads that proprietary products installed on VicRoads declared roads are sourced from the nominated licensed system supplier.

For more information please visit VicRoads website or contact Manager – Safe System Engineering.



## 6. References

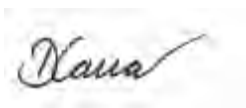
- Supersedes Road Design Note 06-04 L (June 2018)
- Austroads Guide to Road Design: Part 6 - Section 6.0: Road Safety Barriers.
- Supplier Product Manuals available on websites.
- VicRoads Detail Sheets.
- VicRoads Road Design Notes.
- VicRoads Standard Drawings and Specification Clauses
- VicRoads Supplement to AGRD: Part 6 – Section 6.0: Road Safety Barriers.
- WRSB Maintenance Guidelines – July 2013.

## 7. For further information please contact

VicRoads Safe System Engineering Team  
 60 Denmark Street, Kew, 3101  
 Telephone: (03) 8391 7194  
 Email: SafeSystemEngineering@roads.vic.gov.au

**Road Design Notes are subject to periodic review and may be superseded.**

Approved by



**Daniel Cassar**

Manager – Safe System Engineering.  
 Road and Traffic Design, VicRoads

### Road Design Note 06-04 – Revision Summary

Issue	Approved	Date	Amendment
A-I	<i>On request</i>		
J	M-SSD	Oct 2016	Major change
K	M-SSD	Oct 2017	Major change
L	M-SSD	Jun 2018	<u>Notes added:</u> -Purpose -System Performance -Performance Comparison <u>Products added:</u> -Sentry Barrier -Veva Median Gate -Defender Barrier 70 -SLED Terminal
M	M-SSE	May 2019	<u>MASH Changes:</u> -Longitudinal steel barriers transitioned to MASH -Guard Fence (Type B) rated to MASH TL-2. -T-39 Thriebeam rated Legacy -EzyGuard 4 rated to MASH TL-3 <u>Products added:</u> -Defender Barrier 100 -Biker-Shield -Quick Movable Barrier -Ricochet Plastic <u>Products updated:</u> -EAB -SMART Cushion rating -Armorzone supplier -Raptor supplier <u>Products removed:</u> -BarrierGuard 800

## Appendix A – Proprietors, suppliers and industry contacts

<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>Boylan Group</b>	198 Power Street Glendenning, NSW, 2761 Ph+ 1300 500 55 <a href="http://www.boylan.net.au">www.boylan.net.au</a> Contact: Damien Jurina Email: <a href="mailto:damienj@boylan.net.au">damienj@boylan.net.au</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>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>KSI Global Australia</b>	61 Foskew Way, Geraldton 6530 Western Australia 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>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>Orange Hire</b>	71 Lavarack Ave, Eagle Farm, QLD 4009 <a href="http://www.orangehire.com.au">www.orangehire.com.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>	Unit 2, 5 Simpson Close, Smeaton Grange, NSW 2567 Ph: 1300 063 220 <a href="http://www.safedirection.com.au">www.safedirection.com.au</a> Contact: Terry Colquhoun Email: <a href="mailto:terryc@safedirection.com.au">terryc@safedirection.com.au</a>