



# Product Guide

*Committed to Your Safety*

FEATURING  
**MASH COMPLIANT**  
PRODUCTS

[www.ingalcivil.com.au](http://www.ingalcivil.com.au)

## Roadside Safety Barriers

### EZY-GUARD SMART INGAL CIVIL PRODUCTS



**MASH TL3 COMPLIANT**

**MASH TL3: 2,270kg Utility @ 100km/h**

- Can be mounted as post on base plate.
- Consideration for Motorcyclists.

### EZY-GUARD 4 INGAL CIVIL PRODUCTS



**MASH TL3 COMPLIANT**

**8,000kg Truck + 2,270kg Utility**

- Fewer components for rapid installation.
- Locally designed and manufactured.

### EZY-GUARD HC INGAL CIVIL PRODUCTS



**MASH TL3 COMPLIANT**

**MASH TL4 COMPLIANT**

- High containment.
- Easy to transport and simple to install.

### EZY-GUARD LDS INGAL CIVIL PRODUCTS



**MASH TL4 COMPLIANT**

**MASH TL4: 10,000kg Truck + 2,270kg Utility**

- MASH TL4 compliant.
- Ideal for locations where low deflections are a priority.

### EZY-GUARD HD INGAL CIVIL PRODUCTS



**MASH TL3 COMPLIANT**

- MASH TL3 compliant.
- Heavy duty configuration.

### EZY-GUARD BRIDGE BARRIER



**MASH TL2/TL3 OPTIONS**

- Integrated components designed for Bridge Barriers.
- Can be bolted directly to the bridge structure.

# Innovative Engineering

## Mashflex® TL4 Wire Rope Safety Barrier



**MASH TL3 COMPLIANT**

**MASH TL4 COMPLIANT**

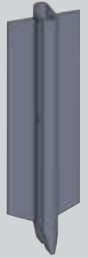


MashFlex uses recycled plastics.

- Crash tested to MASH TL3 and TL4.
- Superior 4 rope system.
- Machine swaged, stainless steel fittings for dependable in-service performance.
- Variable post spacing to suit deflection requirements.
- Posts can be powder-coated.
- Point of need for MashFlex system is 11.73m.

The **MashFlex Driven Sleeve** is an alternative to the typical concrete post footing where a steel sleeve foundation is driven into the ground.

- No post concrete required.
- Rapid installation.
- Minimal spoil removal.
- Hot Dip Galvanised to AS/NZS 4680.



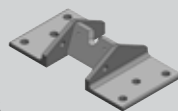
## ET-SS Guardrail End Terminal



**Front Anchored Technology**

**MASH TL2/TL3 COMPLIANT**

- Surface mounted option uses baseplated posts.
- Concrete anchor post option for locations where the anchor post can't be installed.
- Optional protective covers available for fire protection and vulnerable road users.



## TREND® Median Median Attenuating TREND® Terminal



**MASH TL3 COMPLIANT**

- Designed to provide superior protection for drivers and passengers in the event of a median impact crash.
- Suitable for back-to-back guardrail installations.
- Upon impact, a cutter-bolt shears the slots and the shaper-fins deform the rail, absorbing the kinetic energy.

## Ingal RBT Rigid Barrier Transition



**MASH TL3 COMPLIANT**

- Transition for connecting a range of semi-rigid barriers to a rigid concrete structure.
- Upstream end of the transition connects directly to Ezy-Guard 4, Ezy-Guard HC or Ezy-Guard LDS systems.

## Ingal MPR Motorcyclist Protection Rail



**MASH TL3 COMPLIANT**

**EN1317-8 COMPLIANT**

- Quick installation on new or retrofit projects.
- No modification required to traditional guardrail barriers.
- Mounting bracket allows the MPR to be raised to match alterations in the level of the road surface.

# Committed to Your Safety

## QuadGuard® M10 Crash Cushion



**MASH TL2 COMPLIANT**

**MASH TL3 COMPLIANT**

- Self-supporting steel nose.
- Tension strut backup with monorail guide stabilisers.
- Damaged cartridges are replaceable.
- Potentially reusable after an impact.

## QuadGuard® Elite M10 Crash Cushion



**MASH TL3 COMPLIANT**

- Severe-duty, self-restoring crash cushion.
- Consists of a flex-belt nose and High Density Polyethylene (HDPE) cylinders surrounded by a framework of steel Quad-Beam™ panels.

## QuadGuard® M Wide Extra Wide Crash Cushion



**MASH TL3 COMPLIANT**

- Able to effectively shield hazards up to 1755mm wide. Wider hazards may be accommodated by flaring outward with guardrail or concrete barrier.
- Shares components with the QuadGuard® M10, including the energy absorbing cartridges.

## QuadGuard® CZ M10 Relocatable/Temporary Work Zone QuadGuard



- A development of the QuadGuard® M10, adapted for temporary installation (available in 610mm wide, TL2/TL3).
- Use of steel baseplates brings the anchors outside of the system, allowing quick and easy installation and removal.

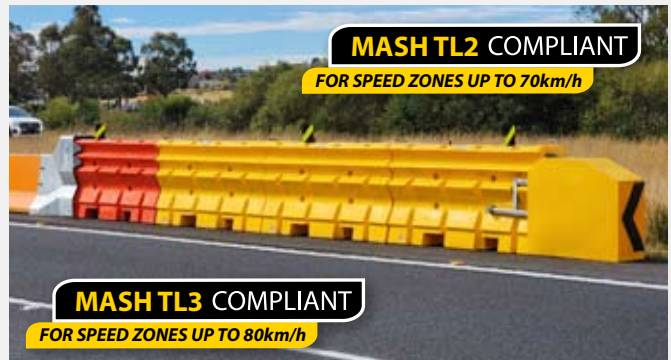
## ArmorZone™ Work Zone Temporary Barrier



**MASH TL2 COMPLIANT**

- Provides work zone protection to temporary construction sites and other roadside activities.
- Economical to transport, fast to install and relocate.
- Water filled barrier rapidly deployed by only 2 personnel.

## ArmorBuffa™ Temporary End Treatment



**MASH TL2 COMPLIANT**

**FOR SPEED ZONES UP TO 70km/h**

**MASH TL3 COMPLIANT**

**FOR SPEED ZONES UP TO 80km/h**

- Temporary end treatment for F-Type concrete barriers and HighwayGuard steel barriers.
- Cross slopes of up to 8% (5° or 1:12 slope) can be accommodated with the standard hardware.

# Dependable and Reliable

## Raptor<sup>®</sup> Pole Protection Crash Cushion



**MASH TL1 COMPLIANT**

- Designed, tested and accepted to MASH TL1 criteria.
- Reduces the impact severity of errant vehicles with a utility pole or tree.
- Usable in places typically impossible to protect.
- Zero maintenance, UV Stabilised PE (UV8), expected lifespan 25 years.
- Installation and repairs can be done under 30 minutes.

## BG800<sup>®</sup> High Performance Portable Steel Safety Barrier



**MASH TL3 COMPLIANT**

- Unique connector design allows installation of up to 300 metres of barrier per hour (quicker to install than concrete barrier).
- Proven to withstand multiple design impacts without need for major repair or replacement.
- Available in 6 and 12 metre section lengths with special angle sections for tight radii.
- Transport 4 times more barrier per load than concrete.

## HighwayGuard<sup>®</sup> Standard Portable Steel Safety Barrier



**MASH TL3 COMPLIANT**

**MASH TL4 COMPLIANT**

- Fully tested and compliant at 58m anchor spacing providing rapid deployment.
- Flexible deployment, reconfiguration and removal made easy using patented T-connector, allowing for simple installation at challenging site conditions.
- Single 6m module can be installed in 6, 12 or 18m lengths.
- Wheelset option - ability to add wheels for easy mobility.

## SafeStop SS180M<sup>®</sup> Truck Mounted Attenuator



**MASH COMPLIANT**

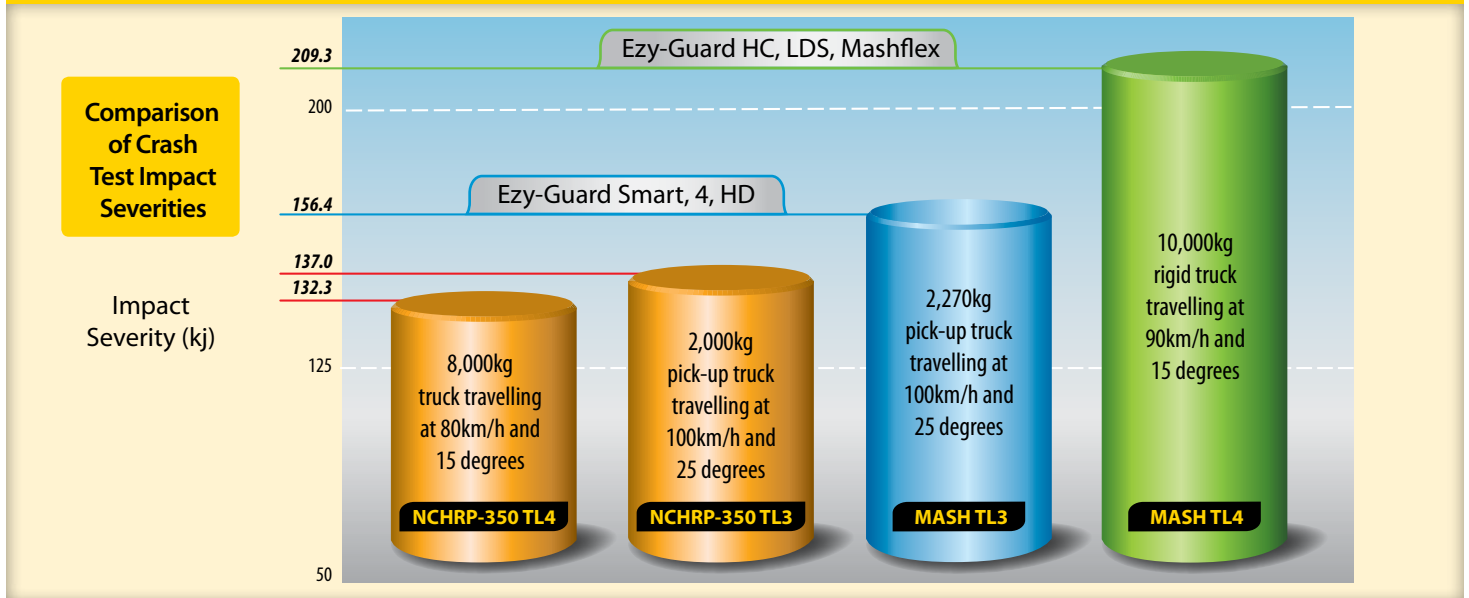
- MASH Test Level 3 (100km/h) safety.
- High visibility with a full 24v Electrics and LED lighting.
- Simplified cable-free design with replaceable, energy absorbing cartridges.
- Short height while in storage mode ideal for garage storage and low overpasses.
- Potentially reusable steel support frame.

## Committed to Your Safety

Established in 1933, Ingal Civil Products is Australia's leading manufacturer and distributor of safety barrier systems for roads and carpark applications throughout the Asia-Pacific region. As a division of Industrial Galvanizers Corporation Pty Ltd, we are part of a large network of companies specialising in engineered steel products and galvanizing services whilst employing over 8000 people in more than 20 countries.

At Ingal Civil Products we pride ourselves on having made a significant contribution to the safety of our roads. Our product range includes road safety barriers, carpark & industrial barriers, workzone & traffic control products, delineation and fencing products. We are the market leader for safety barrier systems and continue to service our customers through our ongoing program of research and development.

## Roadside Safety Barrier Testing Standards Explained



Since its introduction in 1999, the Australian/New Zealand Standard AS/NZS 3845 has utilised the NCHRP Report 350 guidelines as the basis for testing protocols to assess safety barrier related hardware and devices. In the recent revision of this Standard, Part 1:2015 and Part 2:2017 recognised the introduction of the Manual for Assessing Safety Hardware (MASH) guidelines, and updated to MASH as the basis for crash testing.

- MASH TL1 COMPLIANT**
- MASH TL2 COMPLIANT**
- MASH TL3 COMPLIANT**
- MASH TL4 COMPLIANT**

In an effort to encourage installation of MASH compliant devices, the Austroads Safety Barrier Assessment Panel (ASBAP) updated its assessment criteria to be in accordance the MASH guidelines as per AS/NZS3845 Parts 1 and 2. The Panel set a staged transition period due to conclude at the end of December 2020, and this was recommended to the various state road authorities.

MASH SUMMARY				
Test Level	Maximum Test Vehicle Mass	Impact Speed	Impact Angle	Crash Energy
TL-1	Pickup - 2270kg	50kph	25	39kJ
TL-2	Pickup - 2270kg	70kph	25	77kJ
TL-3	Pickup - 2270kg	100kph	25	156kJ
TL-4	Single Unit Truck - 10000kg	90kph	15	209kJ

Ingal Civil offer the full range of MASH Compliant products for your project

[www.ingalcivil.com.au](http://www.ingalcivil.com.au)

Head Office: Sydney  
57-65 Airds Road, Minto, NSW 2566  
Ph: +61 2 9827 3333 • Fax: +61 2 9827 3300  
Local call (within Australia) 1300 446 425

- Sydney (02) 9827 3333
- Melbourne (03) 9358 4100
- Perth (08) 9452 9111
- Wagga 0427 779 588
- Brisbane (07) 3489 9120
- Adelaide/NT 0438 153 482
- Newcastle 0400 235 883
- sales@ingalcivil.com.au