

QUADGUARD ELITE M10 CRASH CUSHION

REVISION REGISTER

Issue & Revision	Description	Date
1	Issued for use.	22/07/2022

The Quadguard Elite M10 system is a fully re-directive and non-gating crash attenuator that incorporates energy absorbing high density polyethylene cylinders. The Quadguard Elite M10 system includes a Monorail that is anchored to the foundation.

Following impact the system may “restore” itself as the cylinders return to their original shape. A “restored” system may not be suitable for further impacts. When “restoring” the system may eject the impacting vehicle in the reverse direction.

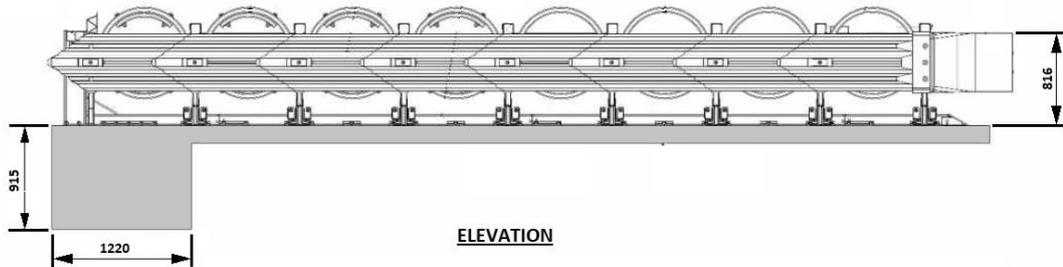
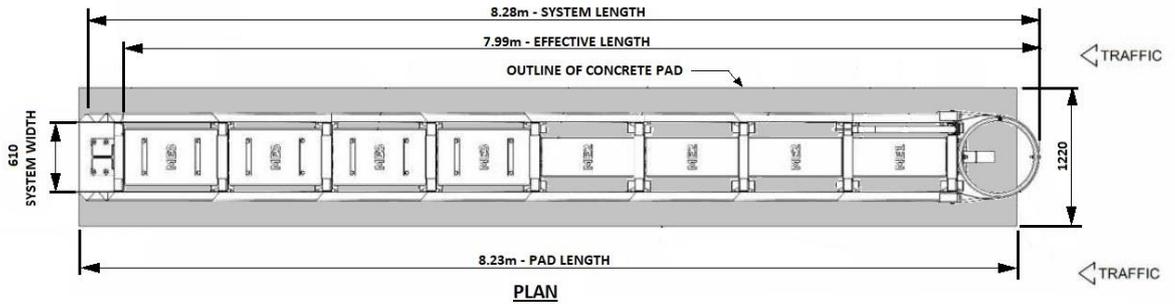
The Quadguard Elite M10 crash cushion may shield hazards up to 610mm wide, while the wider variant, the Quadguard Elite M10 Wide crash cushion may shield hazards up to 1755mm wide.

Images:

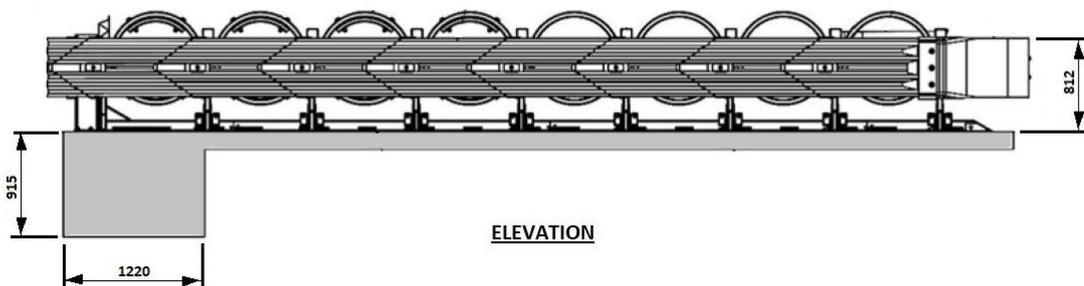
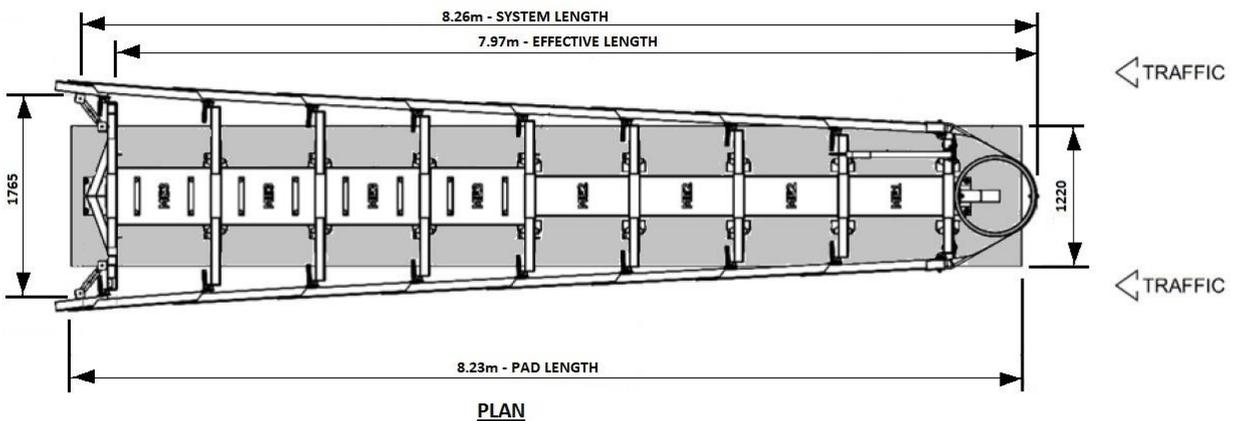


Photographs of Quadguard Elite M10 Crash Cushion (MASH TL 3 – 8 bays)

QUADGUARD ELITE M10 CRASH CUSHION



Quadguard ELITE M10 Crash Cushion Configuration (MASH TL 3 – 8 bays)



Quadguard ELITE M10 Wide Crash Cushion Configuration (MASH TL 3 – 8 bays)

Ownership: Trinity Industries Inc. USA
www.highwayguardrail.com

Supplier: Ingal Civil Products
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Ph: (08) 08 9358 9139
Website - <http://www.ingalcivil.com.au/>

QUADGUARD ELITE M10 CRASH CUSHION

Test Level: Tested in accordance with MASH TL 3

Test Level	Design Speed (km/h)	Number of bays	System length (m)	System width (mm)
MASH TL 3	100	8	8.28	610
			8.26 (Wide)	1765 (Wide)

Configuration:

- Quadguard Elite M10 crash cushions may be transitioned to Constant Slope or Type F permanent concrete barriers.
- Quadguard Elite M10 crash cushions may be transitioned to thrie beam or w-beam barriers, but only where reverse direction impacts are highly improbable and a risk assessment has been completed and steps undertaken to mitigate any risks identified.
- All supplied units to have the yellow nose assembly.

Design:

- Design to be undertaken in accordance with the *Quadguard Elite M10 (24") Product Description Assembly Manual (Revision B, June 2020)* or the *Quadguard Elite M10 Wide (69") Product Description Assembly Manual (PN 626821, June 2020)*.
- No item that can affect the height at which a vehicle could impact the unit at shall be placed 15 m prior to the unit or along the length of the unit to the rear of the backstop. For kerbing in this area, it is Main Roads preference is to use Mountable Type M kerbing (i.e. flush), however Mountable Type A kerbing is permitted if required for drainage purposes.
- As the panels slide rearward during an impact, the hazard width must not prevent the panels from this movement.
- The foundation acceptable to Main Roads for permanent Quadguard Elite M10 crash cushions is a reinforced 28 MPa concrete pad (150 mm thick with anchor block or 200 mm thick without anchor block), with M20 x 180mm Gr8.8 chemical anchors. Refer *Quadguard Elite M10 (24") Product Description Assembly Manual (Revision B, June 2020)* or the *Quadguard Elite M10 Wide (69") Product Description Assembly Manual (PN 626821, June 2020)*.

Limitations:

- Not to be used on crossfalls steeper than 8%.
- A hazard free area should be provided as shown in Figure 1.
- During crash testing the 2270P test vehicle rebounded at 31.7km/h following impact, coming to rest 20.7m upstream of the crash cushion nose. Designers to consider this performance aspect.
- Risk assessment of rebounding errant vehicles should be undertaken.
- Device has demonstrated risk of stored energy - system specific training and maintenance procedures must be followed at all times.
- As the Quadguard Elite M10 system may rebound impacting vehicle or may store energy from impacts (considered a risk to maintenance personnel) they shall only be specified at locations that are approved by the Main Roads WA Road and Traffic Engineering Branch.

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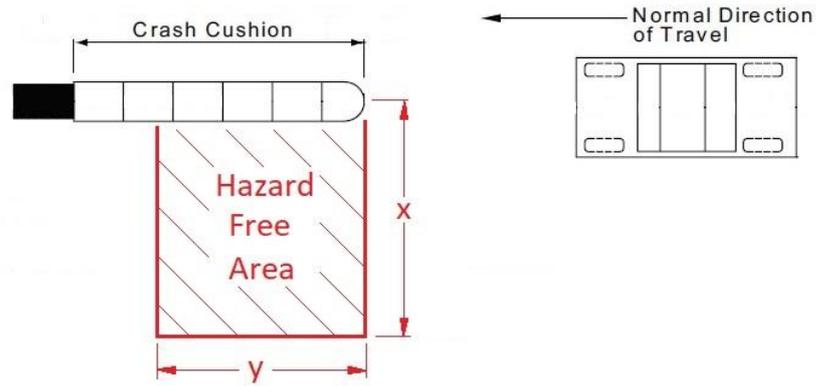


Figure 1: Hazard free area for crash cushion

Test Level	x (m)	y (m)
MASH TL 3	5.4	4.5

Installation:

Installation to be in accordance with the *Quadguard Elite M10 (24") Product Description Assembly Manual (Revision B, June 2020)* or the *Quadguard Elite M10 Wide (69") Product Description Assembly Manual (PN 626821, June 2020)*.

Parts to be Replaced After impact:

Damaged cylinders and sliding panels.

Parts Typically Re-useable After Impact:

Undamaged cylinders and sliding panels.

References:

Website - <http://www.ingalcivil.com.au/>

Refer to Main Roads WA file 20/4019