

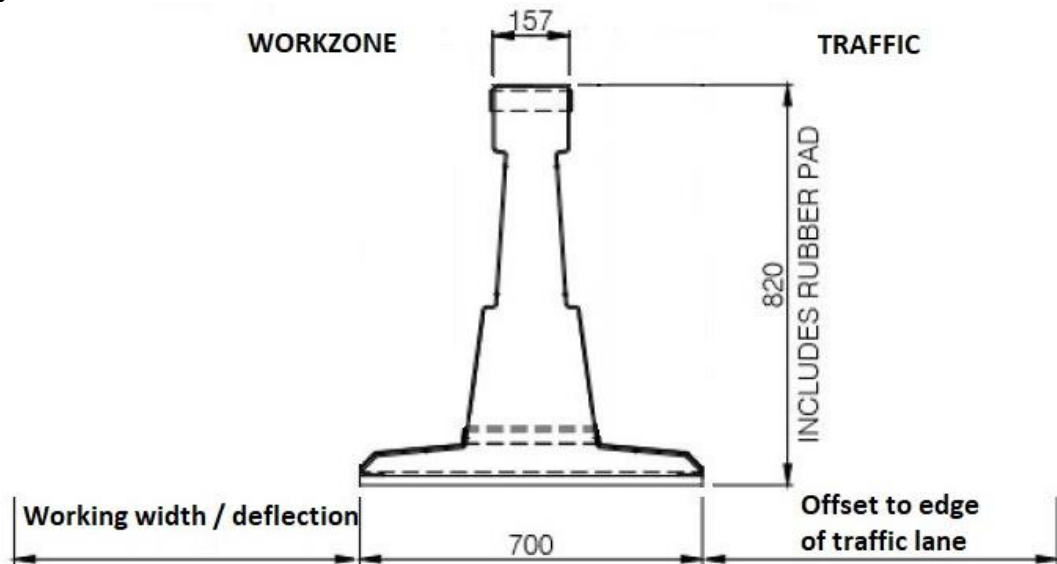
ZONEGUARD

REVISION REGISTER

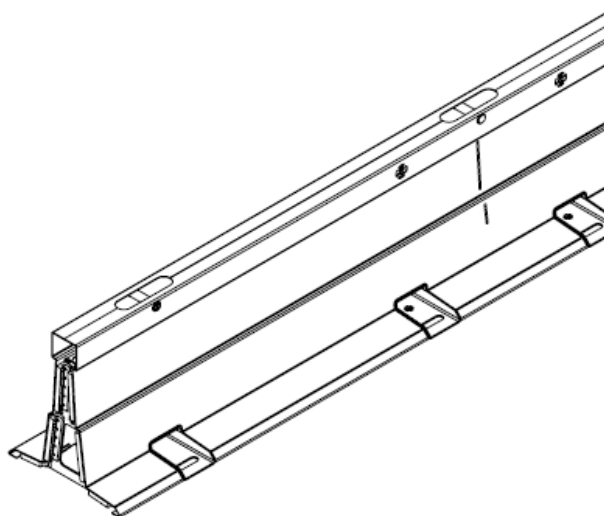
Revision	Description	Date
1	Issued for use.	28/08/2014.
1 A	Updated conditions and terminals.	9/08/2021
1 B	Rubber feet requirement added. Maximum length added.	12/11/2021
1 C	Barrier accepted to MASH TL 4. Accepted terminals updated. Supplier contact details updated. Manual updated.	27/03/2023

ZoneGuard is a portable steel barrier, which is anchored to the pavement at the ends (and at intermediate anchors if required) and is considered a semi rigid system that is to be used for temporary applications only.

Images:

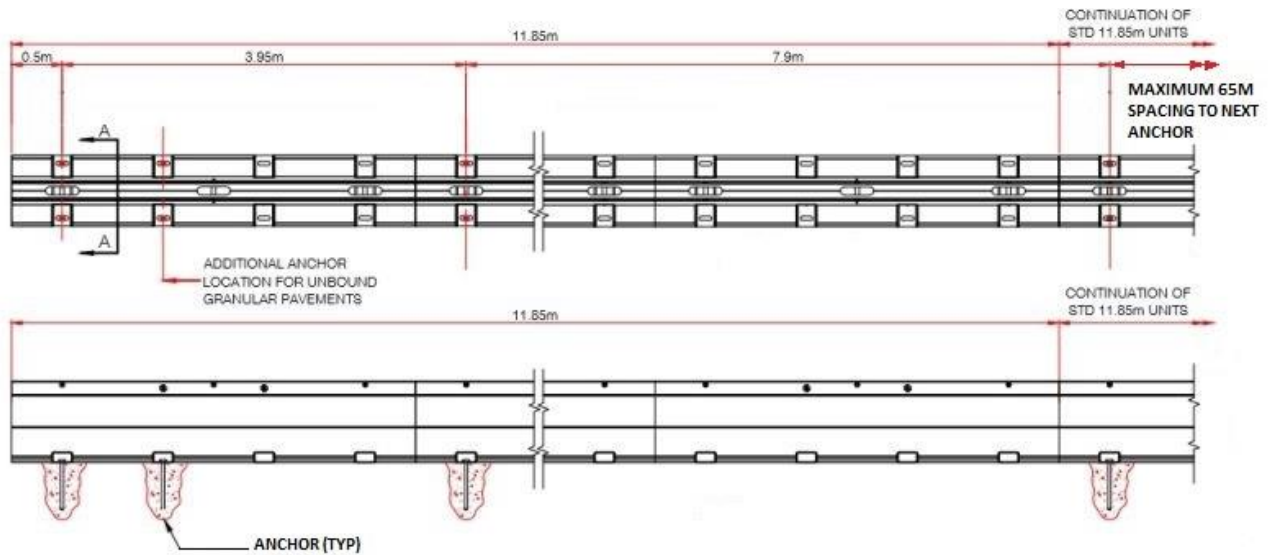


Typical cross section of ZoneGuard



Oblique view of ZoneGuard

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Plan and Elevation of Anchored ZoneGuard End Unit



Photograph of ZoneGuard installation

Ownership: Hill & Smith UK

Supplier: Hill & Smith Pty Ltd T/A HS Roads
Unit 6, 170 Burnside Road
Ormeau, QLD 4208
Email: sales@hsroads.com.au

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Test Level: Approved to MASH TL 3 and MASH TL 4.

Test Level	Test Description	Deflection (measured from base of units)	Working width (measured from base of units)
MASH – TL 3	2,270 kg vehicle at 100 km/h, 25° impact angle	1.9 m	2.6 m
MASH – TL 4	10,000 kg vehicle at 90 km/h, 15° impact angle	2.8 m	3.5 m

Note that the deflections and working widths were measured in crash tests performed under controlled conditions. The dynamic deflection measured is the maximum horizontal offset of the barrier during impact. Designers should be aware that the figures published as a test result may not be the values achieved in the field for all impacts by errant vehicles.

Configuration:

- Standard 11.85m long units are to be used.
- As the barrier is designed to resist loadings by deflecting the units should be free to move but the system **must** be anchored with each end unit anchored and, if required, at intermediate locations.
- Intermediate units should also be anchored, with a maximum spacing of 65m between intermediate anchors.
- The configuration of anchoring shall be as specified in the ZoneGuard Specification Manual Metric Australian & New Zealand Version November 2022, Rev 9, by Hill & Smith.
- Zoneguard units must be installed with rubber feet.

Design:

- Design to be in accordance with the ZoneGuard Specification Manual Metric Australian & New Zealand Version November 2022, Rev 9, by Hill & Smith.
- It is recommended that the barrier (700 mm width) should be offset from the edge of traffic lane by:
 - traffic speed 40 km/h or less - 0.2 m;
 - traffic speed 41 to 60 km/h - 0.3 m;
 - traffic speed 61 to 80 km/h - 0.5 m;
 - traffic speed greater than 80 km/h - 1.0 m.
- Barrier length must be sufficient to adequately protect the hazard.
- The ends of the barrier must be protected with a suitable end treatment.
- Minimum offset between the edge of barrier and the edge of an excavation is 1.9 m.

Minimum Length:

75m (including anchored end units).

Maximum Length:

500m (including anchored end units).

Terminals permitted:

- Absorb-M (max. design speed = 80 km/h, max. posted speed = 70 km/h)

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- TAU-M Crash Cushion. Permitted for use in unidirectional applications only. Not permitted as a departure terminal.
- Quadguard M10 CZ Crash Cushion. Permitted for use in unidirectional applications only. Not permitted as a departure terminal.

The following terminals will not be accepted for temporary installations on Main Roads WA contracts awarded after 1 January 2022.

- TAU-II crash cushion. May only be installed where reverse impacts are highly improbable and a risk assessment has been completed and steps undertaken to mitigate any risks identified.
- Absorb 350 (suitable for TL 2 conditions only – i.e. maximum design speed = 70 km/h, maximum posted speed = 60 km/h)

Points of Redirection:

For MASH TL 3, the leading and trailing points of redirection shall be the interface between the barrier and end treatment.

For MASH TL 4 the leading point of redirection shall be 25 m from the interface between the barrier and end treatment.

For MASH TL 4 the trailing point of redirection shall be 51 m from the interface between the barrier and end treatment.

Limitations:

- The cross slope shall be not greater than 7% for the area between the edge of travelled way and the barrier, and the area immediately behind the barrier for the width of the deflection.
- Cannot be placed adjacent to kerbs or other objects within the deflection limits of the barrier, which may prevent lateral displacement.
- Not to be used on longitudinal slopes greater than 8%.
- Standard 11.85 m long units cannot be used on radii less than 200 m.
- Anchors shall consist of M30 x 300 mm threaded rod with epoxy when installed in concrete pavement.
- Anchors shall consist of M30 x 500 mm pins when installed in deep lift asphalt pavement.
- Refer to the Supplier for anchoring details for other pavement types.
- A Minimum Deflection System, with continuous anchoring requirements is also approved for use by Main Roads WA.
- Objects should not be placed on top of the barrier as they are designed to move under impact. "Anti-Gawk" screens are not to be attached.

Installation and Maintenance Requirements:

In accordance with the ZoneGuard Specification Manual. The holes for the anchors made to accommodate the anchor pins must be repaired.

Parts to be Replaced after Impact:

Units may need to be repaired after impact or replaced depending on the extent of damage.

Parts Typically Re-Useable after Impact:

Undamaged units.

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References:

Relevant FHWA Approval Letters
Refer to website

http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/listing.cfm

Code	Description
B176A	MASH TL 3 approval.

Refer to Main Roads file 12/2016.