

ZONEGUARD MDS (MINIMUM DEFLECTION SYSTEM)

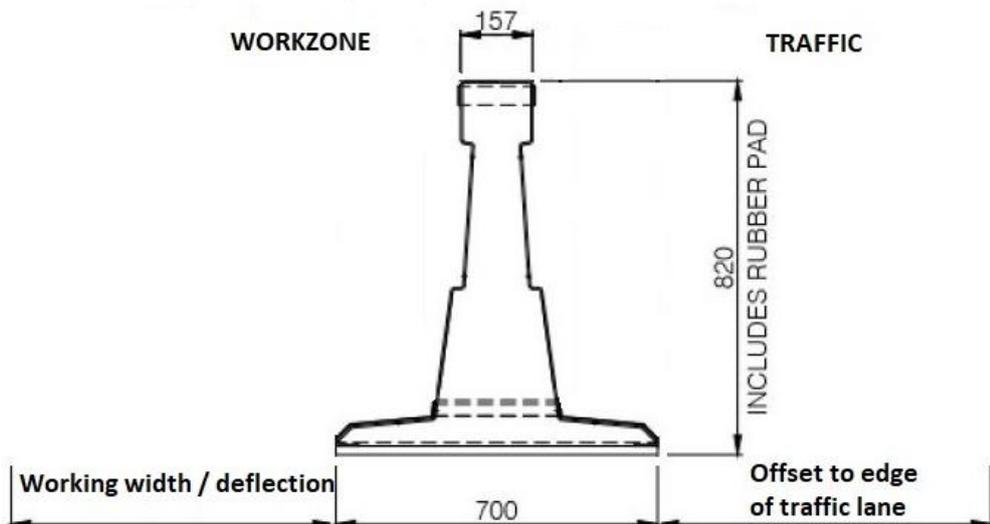
REVISION REGISTER

Revision	Description	Date
1	Issued for use.	08/07/2016
1 A	Anchoring details amended.	25/01/2017
1 B	Updated conditions and terminals.	9/08/2021
1 C	Accepted terminals updated. Supplier contact details updated. Manual updated.	27/03/2023

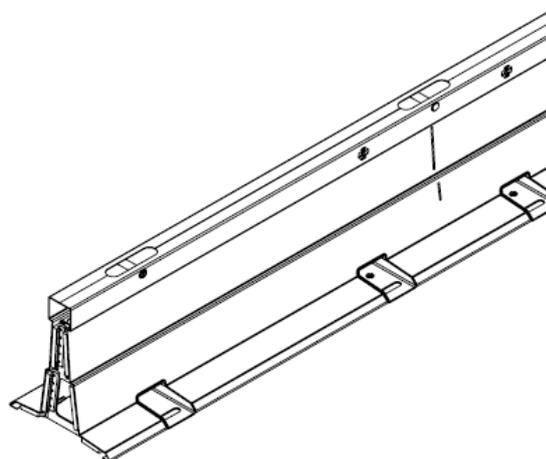
ZoneGuard is a portable steel barrier, which is anchored to the pavement at the ends (and at intermediate anchors if required) and is considered a semi rigid system that is to be used for temporary applications only. It is approved for use by Main Roads WA, with conditions under a separate design sheet.

ZoneGuard MDS (Minimum Deflection System) is a variant of ZoneGuard, with anchors at 10.2m spacing to reduce deflections. The ZoneGuard MDS is also considered a semi rigid system that is to be used for temporary applications only. It is approved for use by Main Roads WA, under the following conditions.

Images:

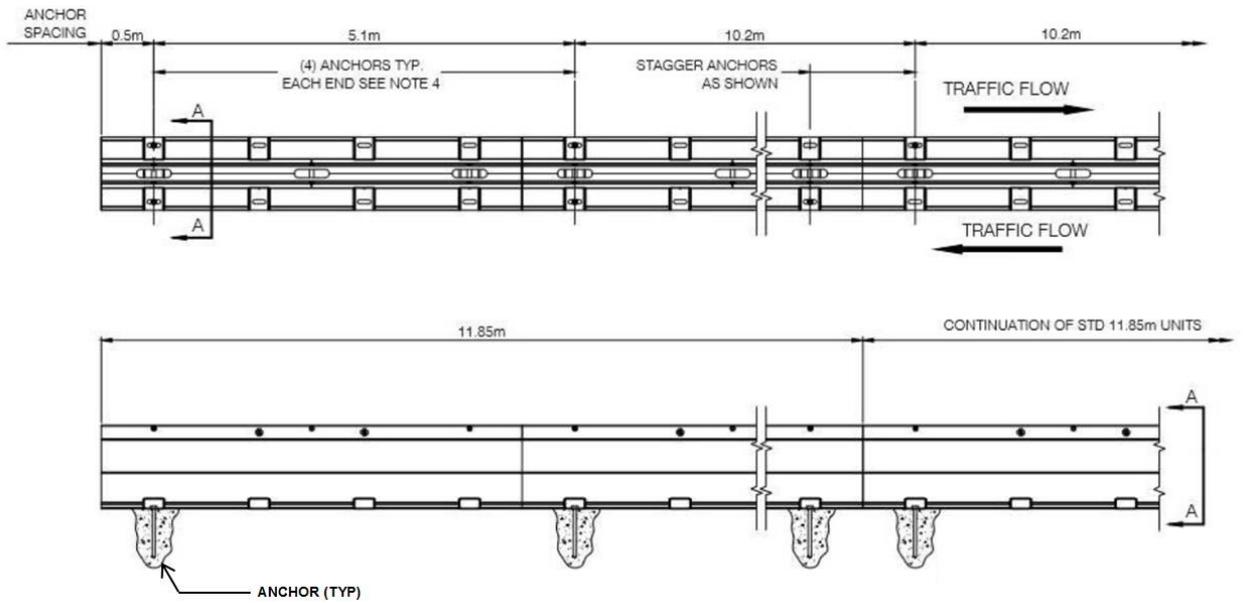


Typical cross section of ZoneGuard MDS



Oblique view of ZoneGuard MDS

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Plan and Elevation of Anchored ZoneGuard MDS End Unit



Photograph of ZoneGuard installation

Ownership: Hill and Smith UK

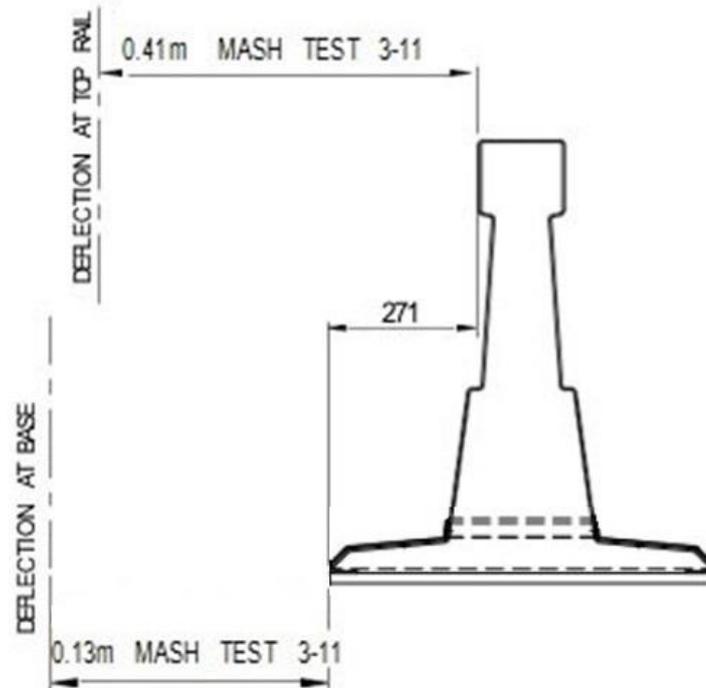
Supplier: Hill & Smith Pty Ltd T/A HS Roads
Unit 6, 170 Burnside Road
Ormeau, QLD 4208
Email: sales@hsroads.com.au

Test Level: Approved to MASH TL 3.

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Test Level	Test Description	Deflection*	
MASH – TL 3	2270 kg vehicle at 100 km/h, 25° impact angle	Top of rail	0.41 m
		Base of barrier	0.13 m

*Refer to figure below



ZoneGuard MDS Test Deflection

Note that this deflection was measured in a crash test performed under controlled conditions. The dynamic deflection measured is the maximum horizontal offset of the barrier during impact. Designers should be aware that the deflection figure published as a test result may not be the deflection value achieved in the field for all impacts by errant vehicles.

Configuration:

- Standard 11.85 m 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 at each end and at intermediate locations.
- The location of pinned intermediate anchors shall be at intervals not greater than 10.2 m.
- 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.

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:

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- 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 - 0.5m;
- 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 0.7 m.

Minimum Length:

60 m (including anchored end units).

Terminals permitted:

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

- Absorb 350 (suitable for TL 2 conditions only – i.e. maximum design speed = 70 km/h, maximum posted speed = 60 km/h)
- TAU-II crash cushion.
- Quadguard crash cushion (including CZ version)

Points of Redirection:

For MASH TL 3, the leading and trailing points of redirection shall be 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 minimum 150 mm thick concrete.
- Anchors shall consist of M30 x 500 mm pins when installed in deep lift asphalt pavement (minimum 45 mm AC14, 150 mm AC20, 260 mm sub-base).
- Refer to the Supplier for anchoring details for other pavement types.
- 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.

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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.

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 16/1110.