

ZONEGUARD MDS (MINIMUM DEFLECTION SYSTEM)

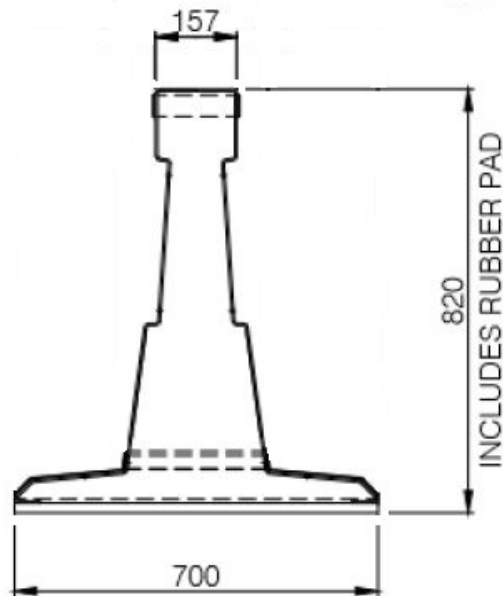
REVISION REGISTER

Revision	Description	Date
1	Issued for use.	08/07/2016
1A	Anchoring details amended	25/01/2017

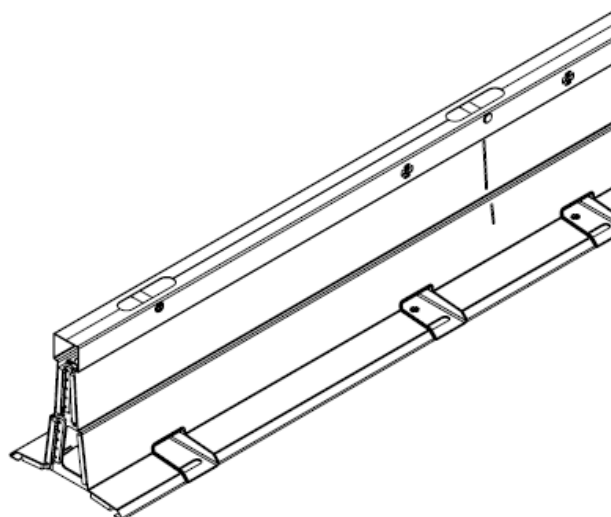
ZoneGuard is a portable steel barrier, which is anchored to the pavement at the ends (and at intermediate anchors if required) and is considered a semi rigid system that is to be used for temporary applications only. It is approved for use by Main Roads WA, with conditions under a separate design sheet.

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:

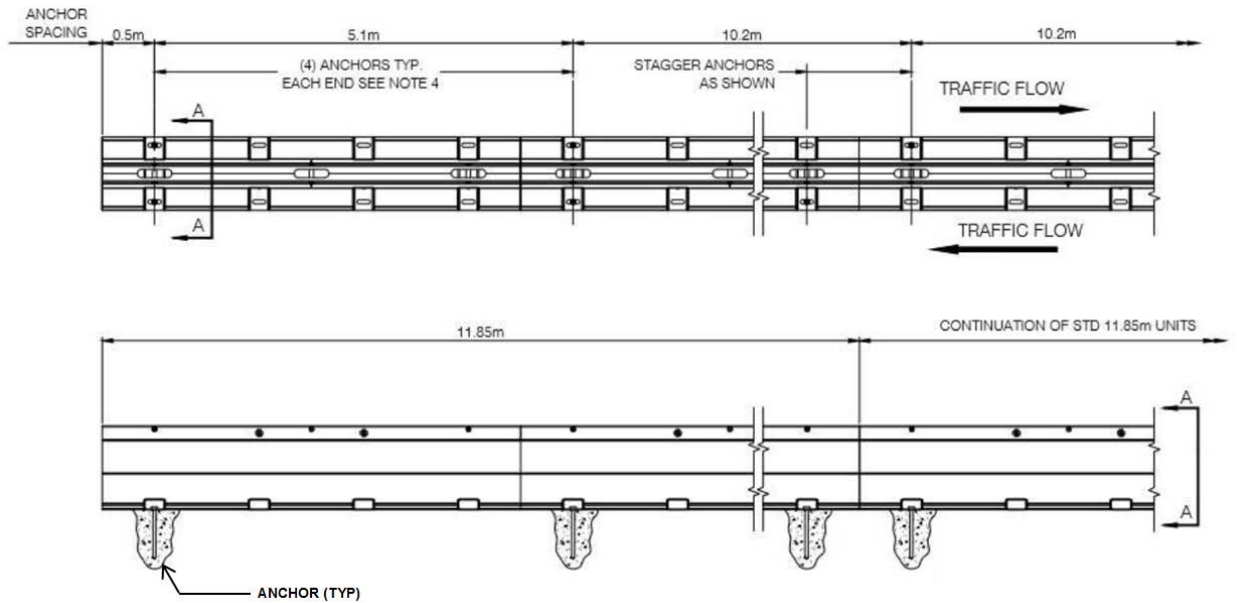


Typical cross section of ZoneGuard



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Oblique view of ZoneGuard



Plan and Elevation of Anchored ZoneGuard MDS End Unit



Photograph of ZoneGuard installation

Ownership: Hill and Smith UK

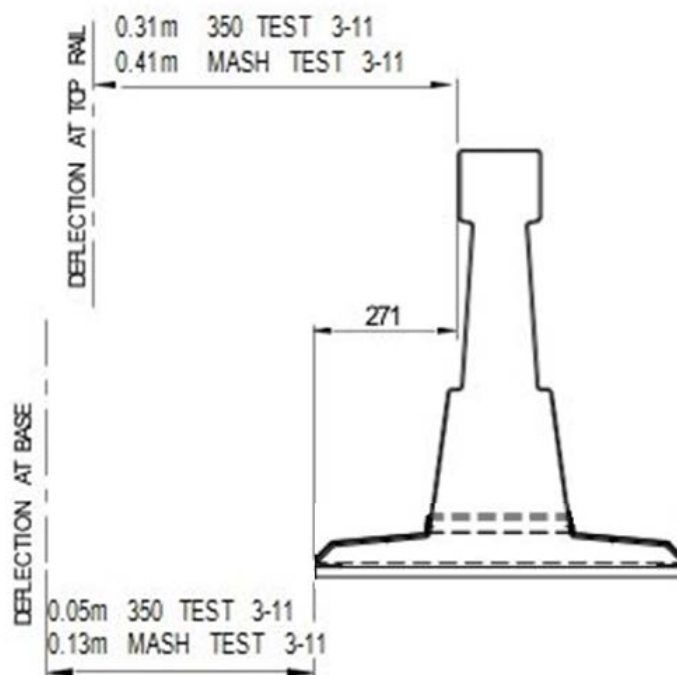
Supplier: Hill and Smith Pty Ltd
Unit 1, 242 New Cleveland Rd
Tingalpa QLD 4173
Phone: 1300 277 683
<http://www.hsroads.com.au/>

ZONEGUARD MDS (MINIMUM DEFLECTION SYSTEM)

Test Level: Approved to NCHRP350 TL3 and MASH TL3.

Test Level	Test Description	Deflection*	
		NCHRP350 - TL3	2000kg vehicle at 100km/h, 25° impact angle
		Base of barrier	0.05m
MASH - TL3	2270kg vehicle at 100km/h, 25° impact angle	Top of rail	0.41m
		Base of barrier	0.13m

*Refer to figure below



ZoneGuard 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:

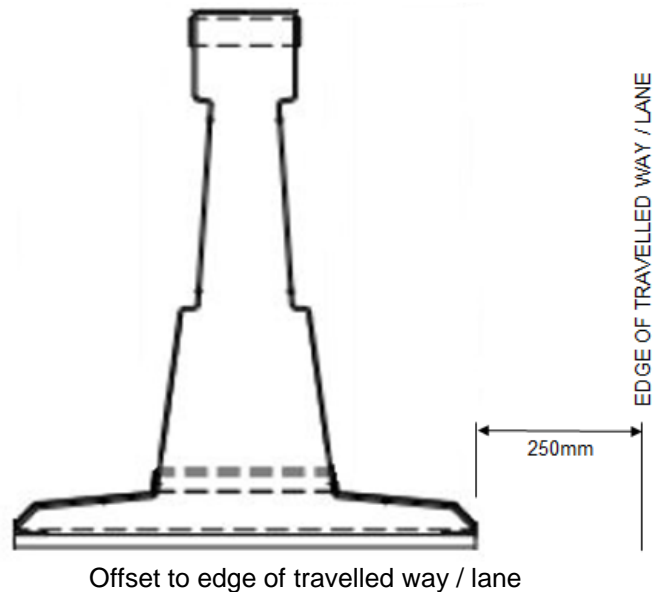
- Standard 11.85m long units are to be used.
- As the barrier is designed to resist loadings by deflecting the units should be free to move but the system **must** be anchored at each end and at intermediate locations.
- The location of pinned intermediate anchors shall be at intervals not greater than 10.2m.
- The system must be anchored using threaded pins epoxied into concrete footing (minimum 150mm thick) as per the ZoneGuard Specification Manual Metric Australian Version May 2014, Rev 7, by Hill & Smith.

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- For other pavement types, refer to Supplier for anchoring details.
- Custom fabricated radii units in 2.5°, 5.0° and 7.5° angles may be used.

Design:

- Design to be in accordance with the ZoneGuard Specification Manual Metric Australian Version May 2014, Rev 7, by Hill & Smith.
- Barrier should be placed a minimum of 250 mm from the edge of travelled way / lane to avoid nuisance impacts (refer to figure below).
- 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 0.7m.



Minimum Length:

60m (including anchored end units).

Terminals permitted:

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

Length of Need:

The beginning of the length of need shall be at the leading end of the crash cushion (for TL3 conditions). If an Absorb 350 terminal is used (for TL2 conditions) the beginning of the length of need shall be at the leading end of the Zoneguard anchored unit.

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 11.85m long units cannot be used on radii less than 200 m.

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- Custom fabricated radii units in 2.5°, 5.0° and 7.5° angles may be used on radii between 200 m and 14 m.
- Cannot be used on radii less than 14 m.
- 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.

References:

Relevant FHWA Approval Letters
Refer to website

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

Code	Description
B176A	ZoneGuard Standard and Minimum Deflection TL-3