

HIGHWAYGUARD

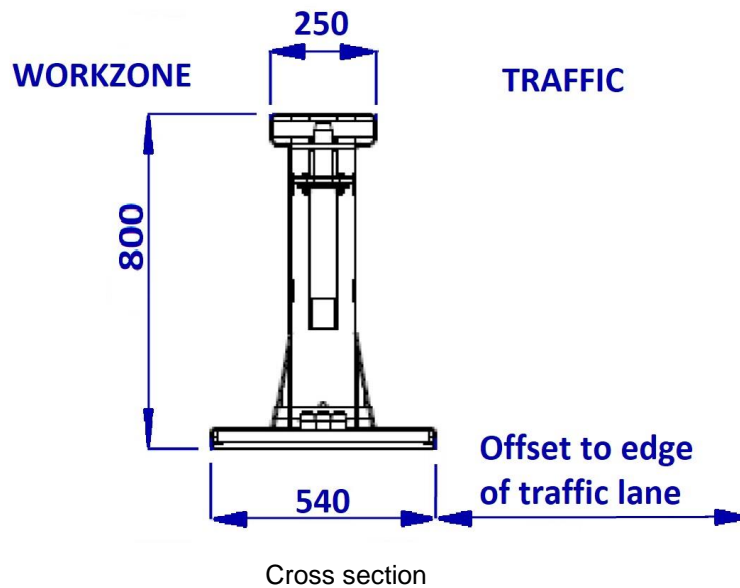
REVISION REGISTER

Revision	Description	Date
1	Issued for use.	10/09/2020.
1 A	Updated conditions, terminals and manual.	9/08/2021
1 B	Permanent use added. Updated conditions, terminals and manual.	11/10/2022
1 C	Updated terminals and manual	22/01/2024

HighwayGuard is a portable steel barrier, which is anchored to the pavement at the ends (and at intermediate anchors) and is considered a semi rigid system that is approved for use in temporary applications.

HighwayGuard may be considered for permanent installation, when crash cushions anchored to concrete slabs are used. However, approval is required from MRWA Road & Traffic Engineering Branch prior to specifying this application.

Images:



Isometric View of 6m long unit

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Photograph of Installation

Ownership:

Ownership
Highway Care International Detling Hill, Detling, Maidstone Kent ME14 3HT, United Kingdom
Supplier
Ingal Civil Products 3 Temperley Close, Welshpool 6106 Ph: (08) 9358 9139 http://www.ingalcivil.com.au/home

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

Test Level	Test Description	Intermediate Anchor Spacing	Deflection	Working Width (measured at base of units)
MASH – TL 3	2,270 kg vehicle @ 100 km/h, 25° impact angle	58 m	1.93 m	2.47 m
MASH – TL 3	2,270 kg vehicle @ 100 km/h, 25° impact angle	42 m	1.71 m	2.25 m
MASH – TL 4	10,000 kg vehicle @ 90 km/h, 15° impact angle	58 m	2.16 m	3.51 m

Note that the deflections and working widths were measured in a crash test performed under controlled conditions.

The deflection values are the horizontal offset between the face of the barrier (in these cases the toe of the barrier on the traffic side) measured prior to and following vehicle impact.

The working width values are the horizontal offset between the face of the barrier (in these cases the toe of the barrier on the traffic side) measured prior to vehicle impact and the maximum lateral position of any major part of the system or vehicle after impact (in the MASH TL 3 case the toe of the barrier on the workzone side and in the MASH TL 4 case the top of the test vehicle).

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Designers should be aware that the working width figure published may not be the working width value achieved in the field for all impacts by errant vehicles.

Configuration:

- The HighwayGuard system consists of 6m and 12m long units. Other components include T-Connectors that allow angles of 2.5°, 5° and 10° to form curved lengths of barrier.
- 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 if required at intermediate locations.
- The location of pinned intermediate anchors shall be at intervals not greater than 58 m.
- Each **end** anchor shall consist of 6# pins.
- Each **intermediate** anchor shall consist of 4# pins.
- The configuration of pins for end and intermediate anchors shall be as specified in the HighwayGuard™ Australia & New Zealand Standard System Product Manual IMP-052 Rev 1.8 – November 2022.

Design:

- Design to be in accordance with HighwayGuard™ Australia & New Zealand Standard System Product Manual IMP-052 Rev 1.8 – November 2022.
- It is recommended that the barrier should be offset from the edge of traffic lane by:
 - traffic speed 40 km/h or less – 0.2m;
 - traffic speed 41 to 60 km/h – 0.3m;
 - traffic speed 61 to 80 km/h – 0.5m;
 - traffic speed greater than 80 km/h – 1.0m
- Barrier length must be sufficient to adequately protect the hazard.

Minimum Length:

120 m (i.e. minimum length tested)

Point of Redirection:

When a crash cushion is connected, the point of redirection for MASH TL 3 conditions shall be the nose of the crash cushion.

The point of redirection for MASH TL 4 conditions shall be 30m from the end of the HighwayGuard Barrier (for both the leading and trailing ends).

Terminals permitted:

- Absorb-M (suitable for maximum design speed = 80 km/h, maximum posted speed = 70 km/h)
- ArmorBuffa (suitable for maximum design speed = 80 km/h, maximum posted speed = 70 km/h)
- TAU-M crash cushion (may only be installed where reverse impacts are not possible).
- Quadguard M10 CZ 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).

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

- TAU-II crash cushion
- Quadguard crash cushion (including CZ version)

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.

Limitations:

- The ends of the barrier should be shielded with a suitable end treatment or by an overlapping barrier.
- 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 or crossfalls greater than 8%.
- May be used where pavement consists of:
 - 200 mm thick reinforced or 250 mm thick unreinforced concrete,
 - 150 mm thick asphalt over 100 mm basecourse,
 - 250 mm thick asphaltFor these pavements anchoring may consist of:
 - 350 mm long M30 asphalt pin, or
 - 460mm long M24 threaded rod with epoxy.For pavements not meeting these requirements design advice shall be sought from the Supplier.
- May be used where pavement consists of:
 - Flush seal over 200 mm basecourse
 - Unsealed 200 mm basecourse.For these pavements anchoring may consist of:
 - 520 mm long M30 flat top pinFor pavements not meeting these requirements design advice shall be sought from the Supplier.
- Cannot be used on radii less than 177 m unless T-Connector units are used.
- 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 HighwayGuard™ Australia & New Zealand Standard System Product Manual IMP-052 Rev 1.8 - November 2022.

The holes in the pavement for the anchors made to accommodate the anchor pins must be repaired to the satisfaction of the road authority.

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:

HighwayGuard™ Australia & New Zealand Standard System Product Manual IMP-052
Rev 1.8 November 2022.

Item	Description
1	Barrier system information can be found on Main Roads file 20/4022.