EZY-GUARD 4 STEEL RAIL BARRIER

REVISION REGISTER

Revision	Description	Date
1	Issued for use.	13/07/2018
1 A	NCHRP 350 references deleted. Accepted End Treatment updated. 6 m clear span configuration added.	22/03/2022
1 B	Note re Ezy-Guard SMART amended. Deflection and working width updated. Terminals updated. Back to back configuration notes amended. Ezy-Guard HD reference added. 6 m clear span note amended.1 m post spacing configuration added.	19/06/2026

Ezy-Guard 4 is a semi-rigid steel rail barrier system which is accepted for use by Main Roads.

Note that Main Roads no longer accepts the Ezy-Guard SMART barrier for new installations. The Ezy-Guard SMART barrier consists of the same components as Ezy-Guard 4, with the exception of a shorter post (and is installed at a lower height). The Ezy-Guard SMART barrier is no longer provided by the supplier.

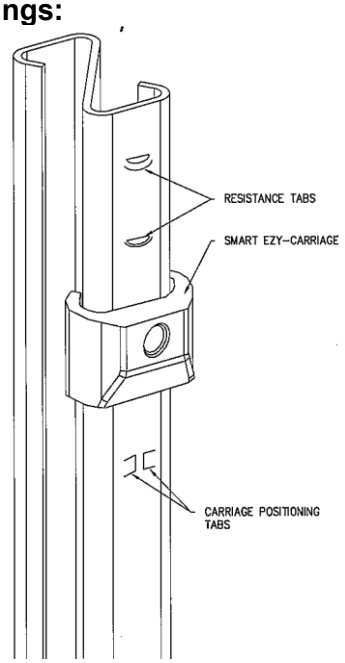
Identification Photographs:

Front View

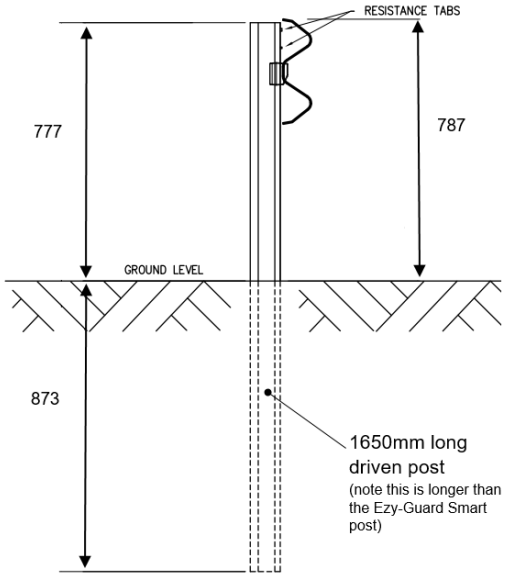
Rear View

EZY-GUARD 4 STEEL RAIL BARRIER

Drawings:



Isometric View –
Z Posts and Ezy-Carriage
(W-beam omitted for clarity)



Typical Cross Section

Ownership: Ingal Civil Products

Supplier: Ingal Civil Products
3 Temperley Close, Welshpool WA 6106
Ph: (08) 9452 9111 Fax: (08) 9358 9111
Website - http://www.ingalcivil.com.au/

Test Level:
MASH TL 3 (2270 kg)

Configuration:
The Ezy-Guard 4 steel rail barrier consists of W-beam rail, which is attached to Z posts at 2000 mm centres. The system does not have blockouts, but a slider carriage (referred to as the “Ezy-Carriage”) to control the release of the rail from the posts during impacts.

The Z Posts are 1650 mm long and driven into the ground so that the height of the top of post is 777 mm above ground. The top of the W-beam rail is at a height 787 mm above ground.

Unless stated in this document the installation shall be in accordance with the Ezy-Guard 4 Product Manual (Release 08/17) available on the Ingal Civil Products website.

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Design Considerations:

Test Deflection:
1.57 m under MASH TL 3 conditions (2270 kg vehicle at 100 km/h and 25°)

Note that this deflection was measured in a crash test performed under controlled conditions. The deflection measured is the horizontal offset between the face of the w-beam rail measured prior to and following vehicle 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.

Working Width:
1.70 m under MASH TL 3 conditions (2270 kg vehicle at 100 km/h and 25°)

Minimum Length:
The minimum length of Ezy-Guard 4 barrier is 56 m (full terminal lengths not included). That is, the minimum length does not include the length of public domain w-beam required for transition to end treatments (if required).

Offset from Kerbing:
As the Ezy-Guard 4 barrier does not include a blockout, a greater offset than public domain w-beam is required. The face of Ezy-Guard 4 barrier is to be placed 300 mm from the face of the kerb to minimise nuisance impacts and allow driving of posts to be clear of the kerb.

Locations offset further from the kerb are not preferred because of the possibility of vehicle either vaulting the barrier or not being redirected by the barrier.

Approach to barrier:
The approach to the barrier should be a trafficable running surface at a slope of 1 in 10 or flatter clear of objects and grade changes to allow an errant vehicle to hit the barrier at an appropriate height.

Height Correction:
If placed less than 3 m from the face of the kerb the mounting height is measured from the pavement surface. At greater offsets the mounting height is measured from the adjacent finished surface levels.

End Treatments:
ET-SS, 4F-T, Quadguard M10 crash cushion and public domain w-beam terminals. Reverse impacts into the transition section to the crash cushion can produce a greater occupant severity value than preferred. Accordingly, the crash cushion may only be used where reverse impacts are highly improbable and a risk assessment has been completed and steps undertaken to mitigate any risks identified.

The Ezy-Guard 4 may transition straight into a 787 mm high version of the trailing end terminal, refer to drawing EZY-SM-106 on the Ingal Civil Products website.

Transitions:
Transitions from Ezy-Guard 4 barrier to thrie-beam or concrete barrier shall be in accordance with Ingal drawing EZY-SM124, which is available on the Ingal Civil Products website.

Delineation:
Refer to Ezy-Guard 4 Product Manual.

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Limitations:

- The Ezy-Guard 4 barrier is a proprietary system that is designed as a “weak” post system, so its installation is restricted to soils equivalent to an AASHTO weak soil or stronger (i.e. CBR ≥ 8).
- The Ezy-Guard 4 barrier configuration of back to back W-beam attached to a single line of posts is available as per Ingal drawing EZY-SM-110 and has a crash cushion as the end terminal. However, approval is required from MRWA Road & Traffic Engineering Branch prior to specifying this configuration.
- The Ezy-Guard 4 barrier configuration using posts on base plates is available. However, approval is required from MRWA Road & Traffic Engineering Branch prior to specifying this configuration.
- The Ezy-Guard HD (Heavy Duty) variant is available. However, approval is required from MRWA Road & Traffic Engineering Branch prior to specifying this variant.
- For treatments in different foundation conditions refer to Ezy-Guard 4 Product Manual.
- The offset from the back of the barrier post to the batter hinge point shall be a minimum of 1.3 m as per the Product Manual.
- The Ezy-Guard 4 configuration of a post embedded 1050mm into the ground with a smaller offset to the hinge point is not approved for use.
- Ezy-Guard 4 post installations in rock as per the product manual are not approved for use.
- The Ezy-Lift is not approved for use.
- The Ezy-Guard 4 barrier configuration utilising a 6 m long clear span is available (Refer to drawing EZY-SM-145). For this configuration the offset to the hinge point must be at least the same as the dynamic deflection (i.e. 1.57 m). This detail is only intended for use in constrained situations, such as avoiding clashes between posts and existing underground services. Approval is required from MRWA Road & Traffic Engineering Branch prior to specifying this configuration.
- The Ezy-Guard 4 barrier configuration utilising a 1 m post spacing is available (Refer to drawing EZY-SM-015). This detail is only intended for use in constrained situations and may reduce performance of the barrier. Approval is required from MRWA Road & Traffic Engineering Branch prior to specifying this configuration.
- Should not be installed behind kerbs if possible. If kerbing is required, then the preferred kerbing is mountable Type A 100 mm. Semi-mountable is acceptable in some situations (speeds < 70 km/hr) but not preferred. Barrier kerbing shall not be used in front of barrier. Refer to Main Roads Standard Drawing 9331-0376 for kerb types.
- Ezy-Guard 4 barrier is not to be used for repairs of damaged sections of public domain or other proprietary w-beam barrier systems.
- The Ezy-Guard 4 barrier configuration utilising a post spacing other than what is stated above is not approved for use.

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References:

Item	Description
1	Barrier system information can be found on Main Roads file 17/2308.

Relevant FHWA Approval Letters:
Not applicable

Drawings:
Refer to Ingal Civil Product drawings EZY-SM-121 and EZY-SM-034 for assembly details.