

IRONMAN BARRIER

REVISION REGISTER

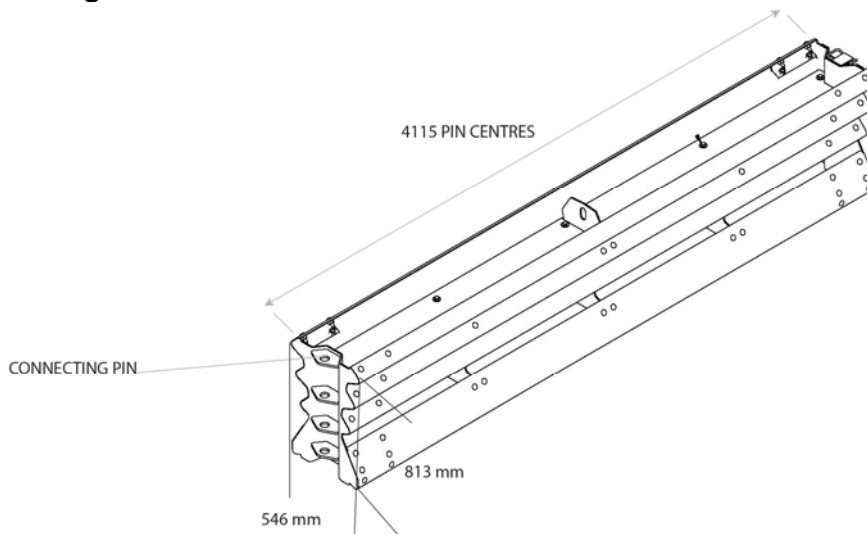
Revision	Description	Date
1	Issued for use.	9/09/2008
1A	Photographs added. Test level reduced	19/12/2013

Ironman is a semi-rigid temporary barrier system. The system is known in the US as the Vulcan system.

Identification Photographs:



Drawing:



Drawing shows nominal 4 m unit. The 12 m nominal unit which has 11750 mm pin centres is also acceptable.

Ownership & Supplier

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Test Level:

Limited crash testing has been undertaken to NCHRP TL 3. Acceptance for use is only to NCHRP TL 2 (when ends connected to Quadguard crash cushions) or to NCHRP TL 1 (when ends are freestanding).

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Configuration:

Units must be interconnected using the pins and requires a sufficient length to resist impact. The approved system configurations are shown in Table 1.

Table 1 Approved System Configuration

Item	System Anchorage	
	Tethered to anchored Quadguard CZ	Freestanding
Test Level	TL 2 i.e. design speed = 70 km/h, posted speed = 60 km/h	TL 1 i.e. design speed = 50 km/h, posted speed = 40 km/h
Point of Need	At the commencement of the Quadguard CZ unit (refer to Figure 3 of the Ironman Barrier Installation Manual).	24 m from the commencement of the barrier (refer to Figure 2 of the Ironman Barrier Installation Manual).
Minimum length of barriers	58 m, excluding crash cushions	74 m
Terminal conditions	Terminal shall use the mounting plate and transition as per FHWA approval letter B-134a with the exception that the three sections of Ironman Barrier immediately upstream from the transition are not required to be anchored to the pavement. In situations where reverse direction impacts are unlikely (e.g. dual carriageway applications on the verge) then the downstream terminal may be an anchored end. Refer to Figure 22 of the Ironman Barrier Installation Manual. The point of need in the reverse direction is from the start of the anchor.	Placed beyond the clear zone.
Deflection	1.25 m	1.0 m
Working Width (includes the width of the system)	1.80 m	1.55 m
Units	Only heavy duty units are acceptable. These units are marked with an orange powder coating to the bulkheads and also have orange pins (refer Identification Photographs). The 4 m nominal units or 12 m nominal units are acceptable but the different length units shall not be used together other than for curves. The units shall not be anchored to the pavement other than as required for terminals.	

Note all references to figures in the Ironman Barrier installation manual are correct for Version 1.2.8 dated January 2010.

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Deflection:

Refer to Table 1. The amount of deflection is dependent on the anchorage conditions and the barrier length. For lengths longer than the tested lengths deflections may be greater.

In the freestanding configuration impacts prior to the point of need will result in greater deflections.

Minimum Length:

As per Table 1.

Offset from Kerbing:

Kerbing is not to be placed in front of the barrier. Refer to Clause 3.9 of AS / NZS 3845.

Kerbing should not be placed behind the barrier within the deflection limits of the system.

Barrier shall not be placed on top of kerbing as this reduces the effectiveness of the profile.

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.

Vehicle Roll:

Where the hazard being protected extends above the height of the barrier the Designer should ensure that adequate separation from the face of the barrier to the hazard is provided to allow for the roll of high vehicles (such as trucks) hitting the hazard.

End Treatments:

As per Table 1.

Limitations:

- As the system deflections there must be adequate room to accommodate the working width of the system. This area must be flat (1 in 10 or less) to prevent barrier lean and possible roll.
- Objects should not be placed on top of the barrier as they are designed to move under impact. "Gawk" screens are not to be attached.
- Without the use of special units the tightest radius that the barrier can be installed in is 38 m.
- Installations shall not consist of intermixing of 4 m and 12 m long nominal units other than for curved installations.
- Not to be used on crossfalls or longitudinal grades greater than 5%.

References:

Relevant FHWA Approval Letters:

(Refer to website http://safety.fhwa.dot.gov/roadway_dept/road_hardware/listing.cfm Temporary Concrete/Steel Barriers)

Code	Description
B-134D	TL4 Approval.
B-134A	Transition designs for Vulcan barrier.
B-134	TL3 Approval.

Drawings:

Not applicable.