

X-TENSION 350 TERMINAL

REVISION REGISTER

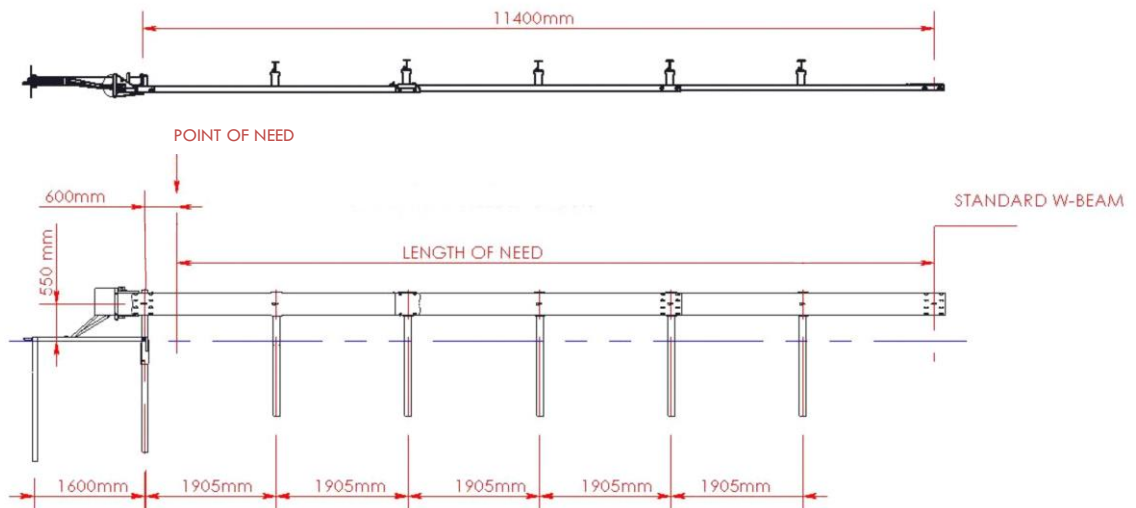
Issue & Revision	Description	Date
1	Issued for use.	27/10/05.
1 A	Revision of Length of Need.	03/03/06.
1 B	Modification to the drawing showing the length of need.	16/06/06.
2	Change in name of terminal and approval in median and flare application.	11/05/09.
3	New MRWA Guideline Drawing for Terminals issued. More details please refer to Drg 201531-0096 and 201531-0097	23/12/2015
3 A	Change in name of terminal and inclusion of lapping diagram	4/07/2016
3.B	X-Tension no longer accepted for new installations after phase out period.	30/03/2020

The X-Tension 350 terminal (formerly called the X-350 and X-Tension) is a gating end treatment which unlike other gating end treatments has a length of need commencing 600 mm downstream of Post #1 and can be installed flared or parallel and as a terminal for median barriers (system width is different in these applications).

With the acceptance of the MAX-Tension Terminal on 30 March 2020, the X-Tension terminal will no longer be accepted for new installations after a "phase out" period of six months from this date (i.e. phase out period ends on 30/9/2020).

Drawing:

Verge Application

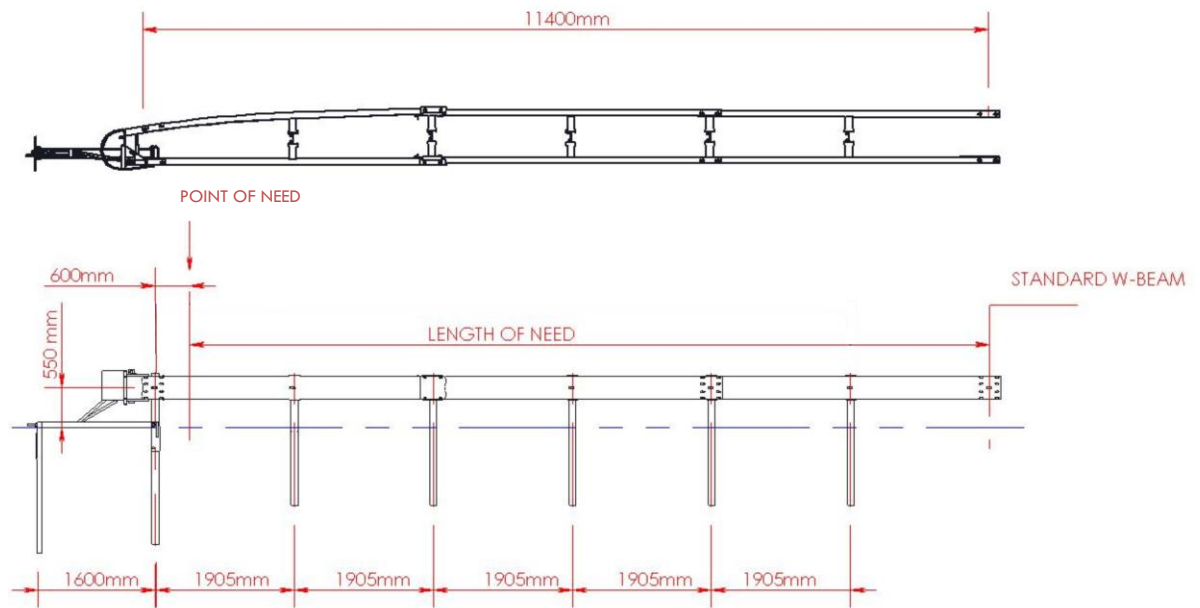


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Note sticker is not to Main Roads WA requirements

Median Application



Ownership: Armorflex
<http://www.armorflex.co.nz/>

Supplier: Australian Construction Products (ACP)
 339 Horsley Rd, Milperra NSW 2214
 Ph: 02 8708 4400 Fax: 02 9792 6272
www.acprod.com.au

Test Level: Tested in accordance with NCHRP 350 to TL3.

TL	Length (m)	Speed (km/hr)	Length of Need (m)*	Allowable Flare (mm)	Post Details	Suppliers Drawing
3	11.4	100km/hr	10.8	Can be installed parallel or on a flare.	**Posts 1-2 are I sections which have a crimp in all four flanges. Posts 3-6 are standard I Beam posts Post 7: standard W-beam post	N/A

* (starts 600 mm downstream from Post 1).

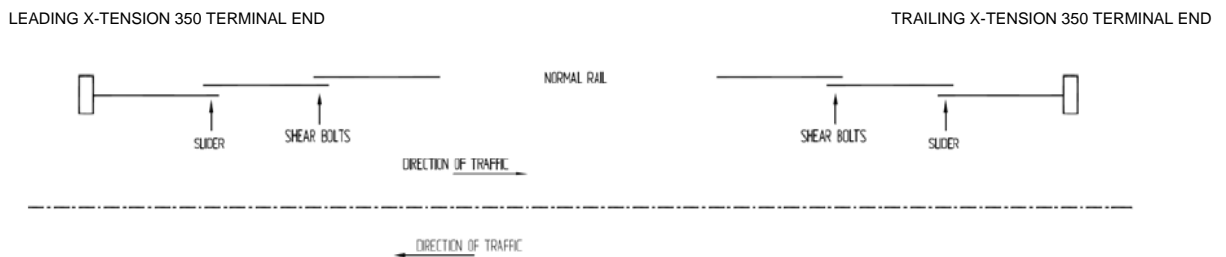
** Upstream of Post 1 is a ground anchor.

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System width for the verge application is 0.48 m and for the median application 0.76 m.

Configuration:

- Solid “P Block” blockout to be used as a replacement for wooden blockout.
- Unit shall be installed with nose cone and bolt protectors.
- A sticker is required on the nose cone the type of which depends on if it is installed in verge situation or median application.
- For verge installations the sticker shall be 500 mm x 250 mm and is to be Black bands on White Class 1 reflective backgrounds with the width marker pattern as shown in Australian Standard 1742.2 Sign D4-3 (L, R).
- For median applications the sticker shall be 500 mm x 250 mm and is to be Black bands on White Class 1 reflective backgrounds with the width marker pattern as shown in Australian Standard 1742.2 Sign D4-2-2.
- When the X-Tension 350 is installed on the departure end of a barrier system the system is to be orientated as per Sketch 1 below.



Sketch 1 – X-Tension 350 Departure End Terminal Layout

Design:

- Design to be in accordance with the X-Tension 350 Installation Manual (December 2015) provided by ACP.

Non Median Application

- Preferred plan layout is to install the terminal at the maximum flare of 1.2 m to reduce nuisance impacts. In constrained situations the flare can be reduced.
- In locations of constrained width or on high embankments where the cost to provide additional width is not warranted then the terminal may be installed parallel to the road
- The right hand side of the head assembly is 50 mm proud of the face of the W-Beam. If the system is installed parallel to the road the barrier should be offset to ensure that the head assembly is clear of the shoulder.
- Grading around the X-Tension 350 is to be as shown on Main Roads Drawings **201531-0096** and **201531-0097**.
- As part of the design, the Designer shall check to ensure that there are no site constraints such as rock, cover to services or pipes or other factors that would preclude the use of the normal post lengths.

Median Application

- During the offset test the small vehicle was spun around and ended up coming to rest offset from the terminal by 3.76 m and approximately 5.7 m downstream of post 1. Therefore it is desirable that an area 4 m wide x 6 m long measure from the end of the terminal be clear of hazards on either side of the terminal.

Limitations:

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- Must be installed on a straight flare or parallel to the travel way.

Installation and Maintenance Requirements:

The terminal shall be installed and repaired after impact in accordance with the installation and repair instructions.

Parts to be Replaced after Impact:

For a side on impact replace W-Beam. For a front on impact rail the impact head, W-Beam and posts may need to be replaced. Assess cable for any damage and replace if necessary.

Parts Typically Re-Useable after Impact:

Head assembly, ground anchor, cable bracket, slider bracket, ground strut and W-Beam.

References:

1. Letter dated 19th August 2005 (refer to file 05/5880) from Armorflex certifying the performance of plastic blockouts as a replacement to timber blockouts.

Relevant FHWA Approval Letters:

(Refer to website http://safety.fhwa.dot.gov/fourthlevel/hardware/term_cush.htm)

Code	Description
CC-91	FHWA approval letter for TL 3.
B-109B	Approval for P Block as a solid blockout.
B-102	FHWA approval letter for flared and median application.