

MASH TL3 BRIFEN WIRE ROPE SAFETY BARRIER

REVISION REGISTER

Revision	Description	Date
1	Issued for use.	25/03/2021

The MASH TL3 BRIFEN wire rope system is a flexible barrier system that contains four wire ropes and is accepted for use by Main Roads. The system consists of a barrier that is accepted to test level MASH TL 3 and a terminal (the MASH BRIFEN end terminal) that is also accepted to test level MASH TL 3.

The MASH TL3 BRIFEN wire rope system consists of circular section steel posts. Each wire rope is secured to each post with a plastic retainer clip that features a zip tie and clamps around the post.

Note that the Brifen wire rope systems compliant to NCHRP 350 were previously accepted by Main Roads and widely installed, but they are no longer accepted for new installations.

Main Roads experience is that wire rope barriers have high ongoing maintenance costs, so from an asset management perspective they are not preferred.

Images:

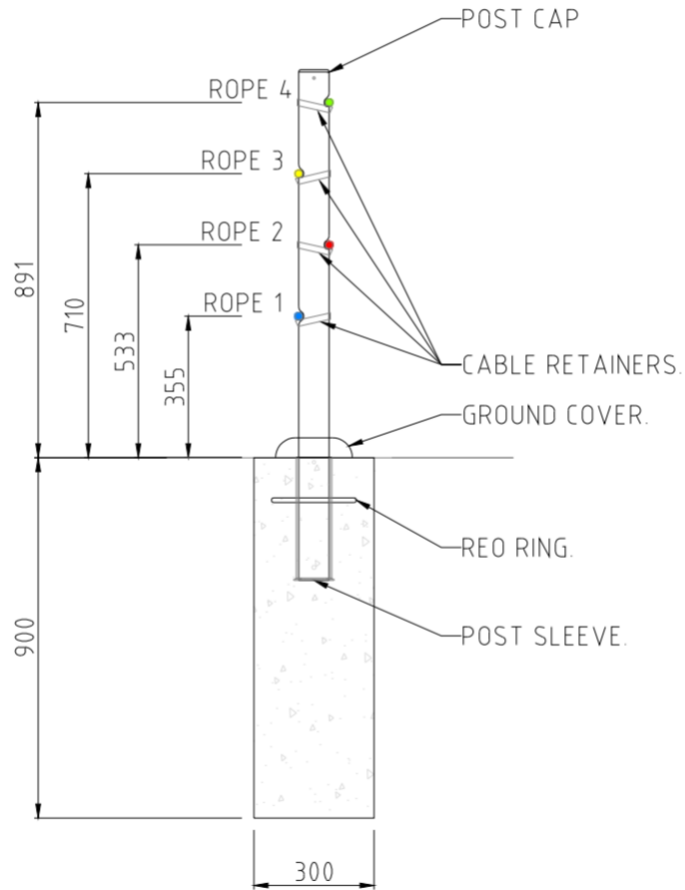


Photograph of MASH TL3 BRIFEN wire rope safety barrier installation (concrete strip footing shown).

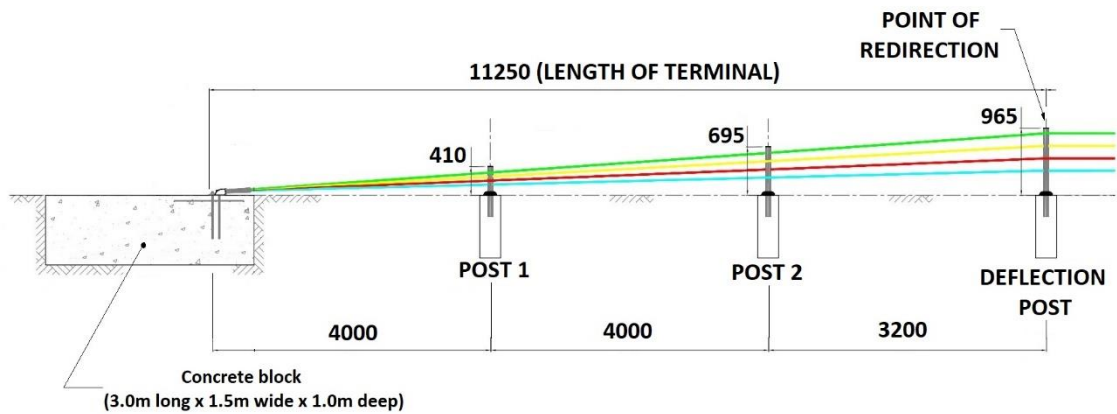


Photograph of MASH BRIFEN terminal end (installed in continuous concrete footing)

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Typical cross section of MASH TL3 BRIFEN through post.



Detail of MASH BRIFEN end terminal

Owner:

Hill & Smith Limited
 Springvale Business & Industrial Park
 Bilston, West Midlands, UK
 Website - <https://hill-smith.co.uk/>

MASH TL3 BRIFEN WIRE ROPE SAFETY BARRIER

Supplier:

Safe Direction Pty Ltd
Unit 2, 5 Simpson Close, Smeaton Grange, NSW 2567
Ph: (02) 4648 0394
Website - <https://www.safedirection.com.au/>

Test Level: MASH TL 3 (barrier and terminal).

Accepted Barrier Configuration:

- Post spacing of 2.1 m, four wire ropes located at heights of 890 mm, 710 mm, 530 mm and 355 mm.
- Ropes at a nominal 15 kN tension.
- Installed with cast in-situ concrete footings.

Note that to avoid the cast in-situ concrete footings clashing with underground services the spacing of barrier posts may be reduced. Post spacing may not be increased above 2.1 m.

Design Considerations:

Design should be undertaken in accordance with the BRIFEN MASH Wire Rope Safety Barrier - Product & Installation Manual (Ref: PM 028/02), provided by the Supplier.

Deflection:

2.4 m under MASH TL 3 conditions (2270 kg vehicle at 100 km/h impacting at 25 degrees, post spacing 2.1 m).

Note that this deflection was measured in a crash test performed under controlled conditions. The deflection recorded is the horizontal offset between the traffic face of the barrier measured prior to and during 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:

2.4 m under MASH TL 3 conditions (2270 kg vehicle at 100 km/h impacting at 25 degrees, post spacing 2.1 m).

Deflection Correction Factors:

A correction factor of 1.1 shall be applied to the deflection and working width for MASH TL3 BRIFEN Wire Rope Safety Barrier, when the length of barrier is 300m or greater.

Footings

In the BRIFEN MASH Wire Rope Safety Barrier - Product & Installation Manual the concrete footings for each post are specified as 300 mm dia, 900 mm deep when the barrier is installed in "firm soils or stronger". The crash testing of the BRIFEN MASH TL3 Wire Rope Safety Barrier was conducted with the barrier installed in concrete pavement.

For installations in WA, weaker soil conditions are likely to be present. Given recent instances of wire rope barrier failures in WA due to inadequate concrete footings, Main Roads requires that geotechnical investigations be undertaken and site specific foundations designed for all MASH TL3 BRIFEN Wire Rope Safety Barrier installations.

Minimum Length:

187 m (excluding terminal ends).

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Length of Need:

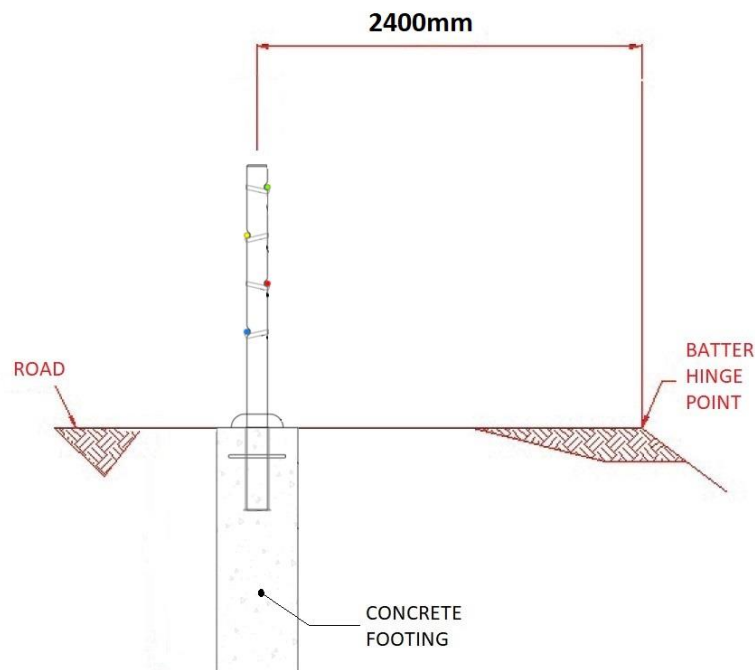
The beginning of the length of need of the barrier commences at the deflection post which is at the 3rd post from the anchor (refer detail of MASH BRIFEN end terminal).

Kerbing:

The BRIFEN MASH Wire Rope Safety Barrier - Product & Installation Manual states that placing kerbs in front of the barrier or terminal is not recommended. As an alternative subsurface grated drainage should be considered.

Offset from Batter Hinge Point:

The BRIFEN MASH Wire Rope Safety Barrier - Product & Installation Manual states the recommended minimum offset from the barrier to the batter hinge point is 2.4m (when posts are installed at 2.1m centres).



End Treatments:

The barrier comes with its own gating end treatment, MASH BRIFEN end terminal which complies with MASH TL 3.

As a gating terminal, a runout area shall be provided, 18.5 m downstream and 6 m laterally from the point of redirection.

Delineators:

For all installations, delineation of the MASH TL3 BRIFEN Wire Rope Safety Barrier is to be provided by delineator post caps at suitable intervals based on post spacing to approximate 25 m intervals between markings.

Limitations:

- The cross slope shall be not greater than 10% 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.
- The MASH TL3 BRIFEN Wire Rope Safety Barrier - Product & Installation Manual states that placing kerbs in front of the barrier or terminal is not recommended
- Shall not be used on curves less than 200 m radius.

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- Shall not be used on sag curves with a K value less than 30.
- Note that for this system there are no “intermediate anchors” and that anchorage is provided by installation of separate barrier lengths with overlaps. Main Roads WA limits the length of barrier between terminals to 1000 m.

Parts to be Replaced after Impact:

Damaged posts, damaged cables, post caps and any other system componentry.

Parts Typically Re-Useable after Impact:

Wire Rope. Unless strands are damaged then they must be replaced.

References:

BRIFEN MASH Wire Rope Safety Barrier - Product & Installation Manual (Ref: PM 028/02)

Refer to website: <https://www.safedirection.com.au/>

Refer to Main Roads file 20/7058.