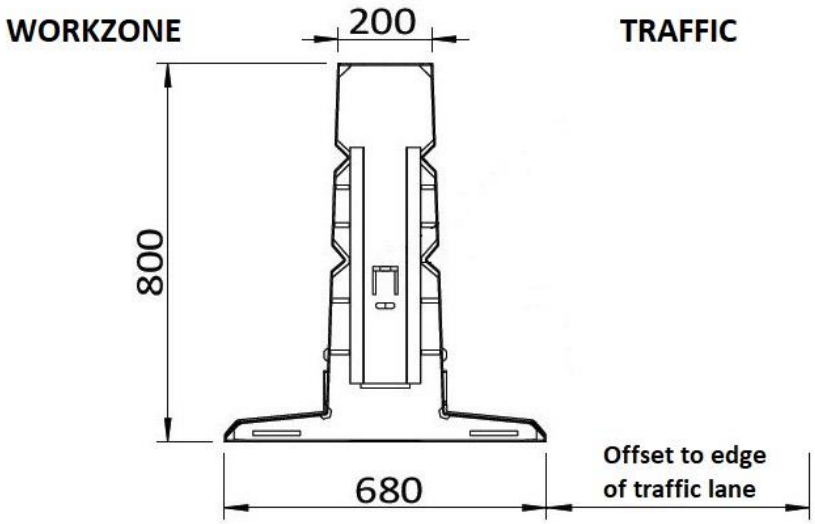
DEFENDER 100HC

REVISION REGISTER

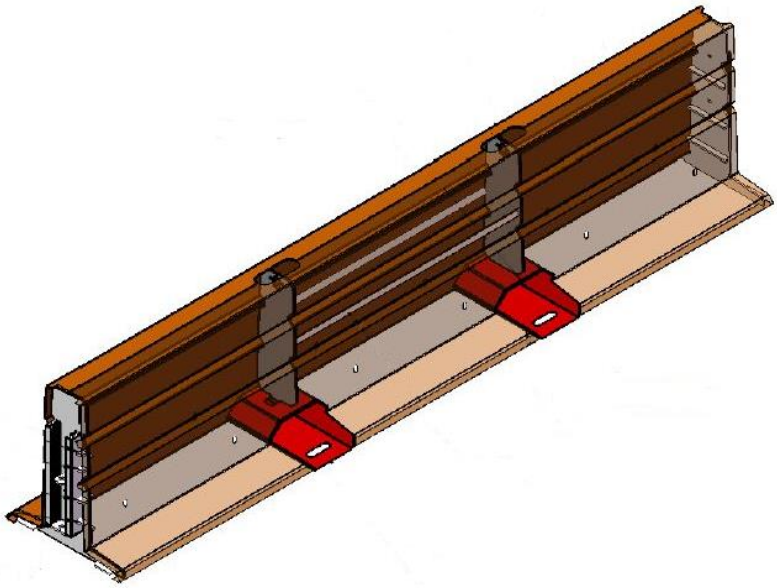
Revision	Description	Date
1	Issued for use.	08/01/2020.
1A	Terminals permitted updated. Manual updated.	9/08/2021
1B	Terminals permitted updated. Manual reference updated. Supplier details updated.	12/10/2022

Defender 100HC is a portable pinned steel barrier that is to be used for temporary applications only. Each Defender 100HC barrier unit is effectively 3.9 m long with a unit mass of 303 kg. The Defender 100HC **does not** include 3# concrete filled ballast boxes.

Images:



Typical cross section of Defender 100HC



Oblique view of Defender 100HC unit

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Photograph of Defender 100HC unit

Ownership: Safe Barriers Pte Ltd

Supplier: Safe Barriers Pty Ltd
Suite 54, 29 Smith Street
Parramatta, NSW 2150
Phone: 1800 169 799
Website - www.safebarriers.com

Test Level: Approved to MASH TL3 and MASH TL4.

Test Level	Test Description	Deflection	Working Width (measured at base of units)
MASH – TL3	2,270 kg vehicle @ 100 km/h, 25º impact angle	2.30 m	2.98 m
MASH – TL4	10,000 kg vehicle @ 90 km/h, 15º impact angle	2.47 m	3.31 m

Configuration:

- Standard 3.9 m long units excluding ballast are to be used.
- As the barrier is designed to resist loadings by deflecting the units should be free to move, other than where pinned.
- The system was crash tested on a flat asphalt surface.

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Design:

- Design to be in accordance with the Defender 100HC® Product Design and Installation Manual Version 3.0, dated 13 April 2022.
- When installed on 150 mm asphalt with 150 mm compacted sub-base the system is anchored every 48.15 m (maximum) using 30 mm diameter x 500 mm long Q235B grade steel ground anchor pins. The pins are placed in the pre-cut slot in the barrier drain at the base of the Defender 100HC barrier.
- When installed on Bituminous seal on minimum AASHTO Standard Soil or unsealed pavement consisting of minimum AASHTO Standard Soil the system is anchored every 45.45 m (maximum) using 30 mm diameter x 500 mm long Q235B grade steel ground anchor pins. The pins are placed in the pre-cut slot in the barrier drain at the base of the Defender 100HC barrier
- It is recommended that the barrier (680 mm width) should be offset from the edge of traffic lane by:
  - traffic speed 40 km/h or less - 0.2 m;
  - traffic speed 41 to 60 km/h - 0.3 m;
  - traffic speed 61 to 80 km/h - 0.5m;
  - traffic speed greater than 80 km/h - 1.0 m
- Barrier length must be sufficient to adequately protect the hazard.
- The ends of the barrier must be protected with a suitable end treatment.
- Minimum pavement construction is:
  - 150 mm asphalt with 150 mm compacted sub-base,
  - Bituminous seal on minimum AASHTO Standard Soil or
  - Unsealed pavement consisting of minimum AASHTO Standard Soil.

Minimum Length:
97.5 m (not including terminals).

Terminals permitted:

- Absorb-M (suitable for maximum design speed = 80 km/h, maximum posted speed = 70 km/h)

- Hercules Crash Cushion, pinned (anchored), suitable for TL3 conditions.
  Not permitted as a departure terminal. At the connection to the crash cushion, the Defender 100HC end unit is required to be transitioned to the Crash Cushion (incorporating 8# ground anchor pins) as detailed in the Defender 100HC® Product Design and Installation Manual Version 3.0, dated 13 April 2022.

- Quadguard M10 CZ Crash Cushion, pinned (anchored), suitable for TL3 conditions.
  At the connection to the crash cushion, the Defender 100HC end unit is required to be transitioned to the Crash Cushion (incorporating 8# ground anchor pins) as detailed in the Defender 100HC® Product Design and Installation Manual Version 3.0, dated 13 April 2022.

- TAU-M Crash Cushion, pinned (anchored), suitable for TL3 conditions.
  At the connection to the crash cushion, the Defender 100HC end unit is required to be transitioned to the Crash Cushion (incorporating 8# ground anchor pins) as detailed in the Defender 100HC® Product Design and Installation Manual Version 3.0, dated 13 April 2022.

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Crash cushions 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.

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

- TAU-II Crash Cushion, pinned (anchored), suitable for TL3 conditions.
  At the connection to the crash cushion, the Defender 100HC end unit is required to be transitioned to the TAU-II Crash Cushion (incorporating 8# ground anchor pins) as detailed in the Defender 100HC® Product Design and Installation Manual Version 3.0, dated 13 April 2022.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.

Point of Redirection:
For TL3 conditions, the point of redirection shall be at the nose of the pinned Crash Cushion, at both ends; or if the trailing end doesn't form a hazard and does not include a pinned Crash Cushion, then 1.275 m upstream of the trailing end, as long as the final barrier unit is pinned.

For TL4 conditions, the point of redirection shall be 7.8m from the nose of the pinned Crash Cushion, at both ends.

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.
- Cannot be placed adjacent to kerbs or other objects within the deflection limits of the barrier, which may prevent lateral displacement.
- Standard 3.9 m long units cannot be used on radii less than 230 m.
- 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 the Defender 100HC® Product Design and Installation Manual Version 3.0, dated 13 April 2022.

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.

References:

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Item	Description
1	System tested on MASH TL 3 on 14 September 2017 and MASH TL 4 on 15 February, 29 March and 20 June 2017, by Holmes Solution. A copy of this testing can be found on Main Roads file 17/9004.

Relevant FHWA Approval Letters:
Refer to website:
https://safety.fhwa.dot.gov/roadway_dept/countermeasures/reduce_crash_severity/barriers/pdf/b297.pdf

Code	Description
B-297	Defender Barrier 100 HC - MASH TL 4.