ArmorZone MASH Longitudinal Barrier – Temporary

Product summary

<table>
<thead>
<tr>
<th>Status</th>
<th>Accepted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>Temporary – Water Filled Longitudinal Barriers</td>
</tr>
<tr>
<td>Test Level</td>
<td>Test Level 2 (MASH): 70km/h (refer to design requirements)</td>
</tr>
<tr>
<td>Supplier</td>
<td>Ingal Civil Products</td>
</tr>
<tr>
<td>Description</td>
<td>Temporary barrier made up of 2 metre long plastic units joined using the ArmorZone twin pin and filled with 520 litres of water.</td>
</tr>
<tr>
<td></td>
<td>• Orange standard units</td>
</tr>
<tr>
<td></td>
<td>• Yellow end treatment units</td>
</tr>
</tbody>
</table>

Introduction and purpose

This detail sheet supplements VicRoads’ Road Design Note 06-04 - Accepted Safety Barrier Products. Please refer to RDN 06-04 for the current VicRoads acceptance status, information on the product assessment process and general acceptance conditions.

The technical details within this document have been extracted from information submitted to VicRoads by the Supplier and the recommended ‘Conditions for Use’ from the Austroads Safety Barrier Assessment Panel (ASBAP).

VicRoads requirements take precedence over the product manual and Austroads conditions. Where a departure from these requirements is required, users should understand the risks and document their engineering decisions.

For more detailed product information, refer to the individual product manual or contact the System Supplier.

Technical information

The ArmorZone MASH Longitudinal Barrier should be designed, installed and maintained in accordance with the following VicRoads conditions for use.

These conditions for use have been based on an Austroads assessment of technical performance against AS/NZS 3845 and contain VicRoads specific requirements when necessary.

Typical installation arrangement shown above.

Summary Conditions for Use

<table>
<thead>
<tr>
<th>Accepted configuration</th>
<th>ArmorZone MASH Longitudinal Barrier – Temporary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variants</td>
<td>Nil</td>
</tr>
<tr>
<td>Deflection</td>
<td>4.1m</td>
</tr>
<tr>
<td>Product manual reviewed</td>
<td>Released March 2019</td>
</tr>
<tr>
<td>ASBAP issue</td>
<td>5 September 2019</td>
</tr>
</tbody>
</table>

Refer VicRoads conditions for use (below).
VicRoads Conditions for Use

Tested design requirements

<table>
<thead>
<tr>
<th>Containment level</th>
<th>Speed (km/h)</th>
<th>Vehicle mass (kg)</th>
<th>Point of Redirection (m)*</th>
<th>Minimum length of barrier (m)</th>
<th>Anchor/Pin Spacing (m)*</th>
<th>Dynamic deflection (m)</th>
<th>Working width (m)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MASH TL-1</td>
<td>50</td>
<td>2270</td>
<td>Leading 24 Trailing 26</td>
<td>50</td>
<td>N/A</td>
<td>2.16</td>
<td>2.61</td>
<td>Units must not be interchanged with ArmorZone NCHRP 350 units.</td>
</tr>
<tr>
<td>MASH TL-2</td>
<td>70</td>
<td>2270</td>
<td>Leading 24 Trailing 26</td>
<td>50</td>
<td>N/A</td>
<td>4.1</td>
<td>4.6</td>
<td>Units must not be interchanged with ArmorZone NCHRP 350 units.</td>
</tr>
</tbody>
</table>

Working width = Deflection + System width

Approved Terminals and Connections

Crash Cushions or Terminals must be fitted to both ends of a barrier

Public Domain Products

- W-Beam Guardrail: Not permitted
- Thrie-Beam Guardrail: Not permitted
- Type F Concrete Safety Barrier: Not permitted

Proprietary Products

- ArmorZone MASH End Treatment Unit:
  - This is a gating terminal.
  - Terminal units are not filled with water.

Design Guidance

- System width (m): 0.45
- Installation:
  - This product must be installed and maintained in accordance with the Product Manual and Road Agency specifications. Road Agency specifications and standards shall have precedence.
- Minimum distance to excavation:
  - 2.61 metres measured from the traffic face of the MASH TL-1 barrier.
  - 4.60 metres measured from the traffic face of the MASH TL-2 barrier.
- Slope limit:
  - Side slope limit: 10 Horizontal to 1 Vertical (10%).
  - Side slopes must be considered to minimise manual handling risks and site conditions.
- Systems conditions:
  - 1. Flaring across the clear zone without a terminal listed below is NOT permitted.
  - 2. Installation on top of a kerb is not recommended, however if installed on top of a kerb, all system components must be free to operate.
- Gore area use: Permitted – consider speed and deflection limitations
- Pedestrian area use: Permitted – consider potential for snagging and deflection.
- Cycleway use: Permitted – consider potential for snagging and deflection.
- Frequent impact likely: Permitted
- Remote location: Permitted
- Median use: Permitted – consider speed and deflection limitations
Foundation pavement conditions

<table>
<thead>
<tr>
<th>Pavement</th>
<th>Use</th>
<th>Accepted Speed (max)</th>
<th>Post/pin spacing (m)</th>
<th>Pavement construction</th>
<th>Post/pin type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>Permitted</td>
<td></td>
<td></td>
<td>Foundation pavement conditions must be smooth and free of snag points, kerbs or obstructions that may interfere with the operation of the product. Graded level surface for unsealed compacted formation and natural surface.</td>
<td>Refer to the Product Manual</td>
</tr>
<tr>
<td>Deep lift asphaltic concrete</td>
<td>Permitted</td>
<td></td>
<td></td>
<td>Refer to the Product Manual</td>
<td>Refer to the Product Manual</td>
</tr>
<tr>
<td>Asphaltic concrete over granular pavement</td>
<td>Permitted</td>
<td></td>
<td>70km/h</td>
<td>Refer to the Product Manual</td>
<td>Refer to the Product Manual</td>
</tr>
<tr>
<td>Flush seal over granular pavement</td>
<td>Permitted</td>
<td></td>
<td></td>
<td>Refer to the Product Manual</td>
<td>Refer to the Product Manual</td>
</tr>
<tr>
<td>Unsealed compacted formation</td>
<td>Permitted</td>
<td></td>
<td></td>
<td>Refer to the Product Manual</td>
<td>Refer to the Product Manual</td>
</tr>
<tr>
<td>Natural surface</td>
<td>Permitted</td>
<td></td>
<td></td>
<td>Refer to the Product Manual</td>
<td>Refer to the Product Manual</td>
</tr>
</tbody>
</table>

Other considerations and comments

Damaged Components

Any ArmorZone™ MASH TL2 units that clearly show damage, like large holes or significant deformation, must be replaced.

Small leaks and holes in the centre section of the units can be repaired as per the ‘Repair Guide’ and the ‘Plastic Weld Guide’ of the Product Manual.

References

- VicRoads Road Design Note 06-04 Accepted Safety Barrier Products.

Detail Sheet – Update Summary

<table>
<thead>
<tr>
<th>Issue</th>
<th>Approved</th>
<th>Amendment</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2019</td>
<td>M-SSD</td>
<td>First edition</td>
</tr>
<tr>
<td>Dec 2019</td>
<td>M-SSE</td>
<td>Second edition – MASH TL-1 added</td>
</tr>
</tbody>
</table>
Design Terminology

- Direction of travel (2)
- Direction of travel (1)
- Trailing Terminal
- Offset to travel lane
- Safety Barrier
- Length of need
- Hazard
- Leading Terminal
- Trailing point of need
- Leading point of need
- First possible point of contact with hazard from direction 2
- First possible point of contact with hazard from direction 1

Deflection Terminology

- Hazard free area
- Working width (vehicle roll allowance)
- Permanent deformation
- Containment = Tested vehicle weight
- System width
- Dynamic deflection
- Working width

Terminal Terminology

- Crash terminal
- Trailers
- Development length
- Point of need
- Minimum length of barrier
- Point of need
- Maximum length of barrier

Flare Terminology

- Flare
- Flare length
- Flare width
- Point of need with flare
- Flare rate = d:1
- Safety Barrier
- Edge line
- Direction of travel