

## SAFEZONE LDS (LOW DEFLECTION SYSTEM)

### REVISION REGISTER

Revision	Description	Date
1	Issued for use.	2/07/2020.
1 A	Owner and supplier details updated. Permanent use and alternative anchor added. Installation manual references updated.	5/10/2022
1 B	At supplier's request, offsets to be measured from outer edge of anchor shoe. Installation manual updated. Foundation pavement requirement table added. Point of redirection and terminals permitted updated.	17/12/2024
1 C	Update anchor and foundation pavement requirements. Additional commentary on product use.	12/06/2026

SafeZone is a portable steel barrier, which is anchored to the pavement at the ends (and at intermediate anchors at 69.6 m spacing) and is considered a semi rigid system. It is approved for use by Main Roads WA, with conditions under a separate design sheet.

SafeZone LDS (Low Deflection System) is a variant of SafeZone, with anchors at 11.6 m spacing and reduced deflections. The SafeZone LDS is also considered a semi rigid system that is approved for use in temporary applications only.

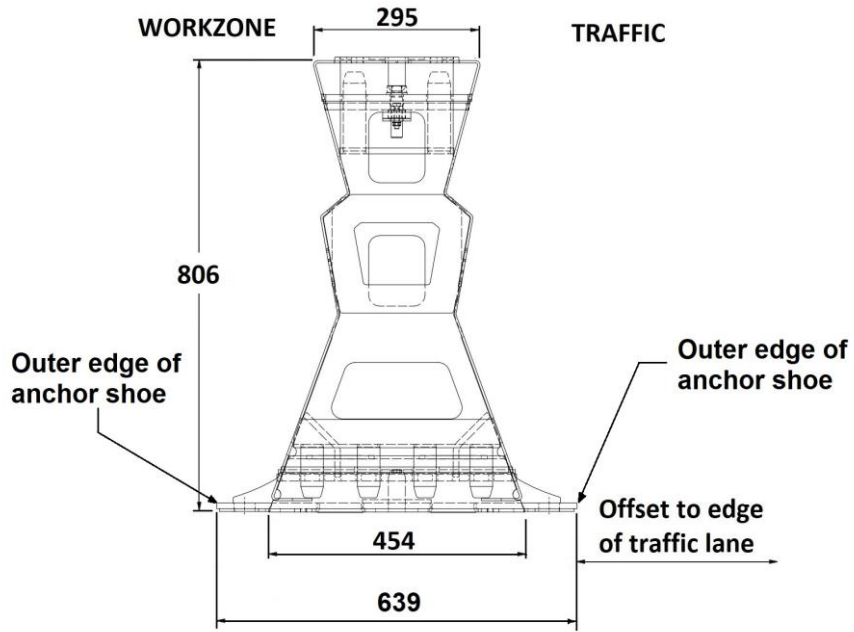
This product is designed for constrained sites ONLY that cannot accommodate the working widths of more flexible systems. While providing lower working width, this product increases the potential for vehicle occupant risk during high-speed impacts.

Throughout the installation it is recommended to revert to greater pin spacing (Standard) where there is the accepted working width behind the installation.

SafeZone LDS may be considered for permanent installation. However, approval is required from MRWA Road & Traffic Engineering Branch prior to specifying this application.

# SAFEZONE LDS (LOW DEFLECTION SYSTEM)

Images:



Cross section (anchor shoe shown)



Photograph of 5.8m long element (2# anchor shoes shown)



Photograph of Installation (2# anchor shoes shown)

## SAFEZONE LDS (LOW DEFLECTION SYSTEM)

### Ownership:

Ownership
Jaybro Group
Supplier
Jaybro Group 29 Penelope Crescent, Arundell Park, NSW 2148

**Test Level:** Approved to MASH TL 3 and TL 4.

Test Level	Test Description	Deflection	Working Width (measured at base of units)
MASH – TL 3	2,270 kg vehicle @ 100 km/h, 25° impact angle	0.42 m	1.06 m
MASH – TL 4	10,000 kg vehicle @ 90 km/h, 15° impact angle	0.45 m	2.17 m

Note that the deflections and working widths were measured in crash tests performed under controlled conditions.

The deflection values are the horizontal offset between the face of the barrier (in these cases the outer edge of the anchor shoe on the traffic side) measured prior to and following vehicle impact.

The working width values are the horizontal offset between the face of the barrier (in these cases the outer edge of the anchor shoe on the traffic side) measured prior to vehicle impact and the maximum lateral position of any major part of the system or vehicle after impact (in the MASH TL 3 case the outer edge of the anchor shoe on the workzone side and in the MASH TL 4 case the top of the test vehicle).

Designers should be aware that the values from crash tests that are published may not be the maximum values achieved in the field for all impacts by errant vehicles.

### Configuration:

- The SafeZone LDS system consists of 5.8 m long elements. Two elements are bolted together at the factory providing 11.6 m long units. SafeZone LDS may only be installed in straight sections.
- As the barrier is designed to resist loadings by deflecting the units should be free to move but the system must be anchored at each end and if required at intermediate locations.
- The location of pinned intermediate anchors shall be at intervals not greater than 11.6 m.
- Each **end** anchor shall consist of 4# pins, inserted through 2# anchor shoes and anchored to the pavement.
- Each **intermediate** anchor shall consist of 2# pins, inserted through 1# anchor shoe and anchored to the pavement.
- The configuration of anchor shoes and chemically anchored threaded rods anchors shall be as specified in the “SafeZone™ Installation Manual” (Version 1.25).

## SAFEZONE LDS (LOW DEFLECTION SYSTEM)

### Design:

- Design to be in accordance with “SafeZone™ Installation Manual” (Version 1.25).
- It is recommended that the barrier 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 – 0.5 m
  - traffic speed greater than 80 km/h – 1.0m
- Barrier length must be sufficient to adequately protect the hazard.

### Minimum Length:

40.6 m (i.e. minimum length tested)

### Point of Redirection:

The point of redirection for MASH TL 3 conditions shall be the interface between the barrier and the end treatment.

The point of redirection for MASH TL 4 conditions shall be 15.8 m from the end of the SafeZone LDS Barrier (for the leading end) and 24.8 m from the end of the SafeZone LDS Barrier (for the trailing end).

### Terminals permitted:

- TAU-M crash cushion. 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.
- TAU-XR crash cushion. 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.
- Absorb-M (suitable for maximum design speed = 80 km/h, i.e. maximum posted speed = 70 km/h)

### Limitations:

- The ends of the barrier should be shielded with a suitable end treatment or by an overlapping barrier.
- Cannot be placed adjacent to kerbs or other objects within the deflection limits of the barrier, which may prevent lateral displacement.
- Not to be used on longitudinal slopes or crossfalls greater than 8%.
- SafeZone LDS may only be installed in straight sections.
- 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 “SafeZone™ Installation Manual” (Version 1.25).

The holes in the pavement for the anchors made to accommodate the anchor pins must be repaired to the satisfaction of the road authority.

## SAFEZONE LDS (LOW DEFLECTION SYSTEM)

### Foundation Pavement Requirements:

Pavement Type	Pin Type	Pavement Construction (minimum)
Concrete	M30 X 300 mm threaded rod with epoxy (MASH TL 4)	Min. 250 mm reinforced or non-reinforced
	M30 X 175 mm threaded rod with epoxy (MASH TL 3 only)	Min. 150 mm non-reinforced, min 30 MPa
Deep lift asphalt	M30 X 300 mm threaded rod with epoxy (MASH TL 4)	Min. 250 mm
Asphalt over basecourse	M30 X 300 mm threaded rod with epoxy (MASH TL 4)	Min 150 mm AC over 100 mm granular pavement
	M30 X 450 mm threaded rod with epoxy (MASH TL 3 only)	Min 100 mm AC over 200 mm granular pavement
Seal over granular	Not permitted	
Unsealed compacted material	Not permitted	

For pavements not meeting these requirements design advice shall be sought from the Supplier.

#### 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:

"SafeZone™ Installation Manual" (Version 1.25).

Item	Description
1	Barrier system information can be found on Main Roads file 19/1525.