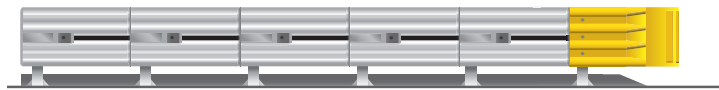


**Crash Cushions**



**QuadGuard<sup>®</sup>**



**TRINITY**  
**HIGHWAY**

*Ahead of the Curve<sup>®</sup>*

# QuadGuard®

The QuadGuard® is a redirective, non-gating crash cushion that consists of crushable, energy absorbing cartridges surrounded by a framework of steel Quad-Beam™ panels. The system is tested to NCHRP Report 350 Test Level 1, Test Level 2, and Test Level 3. It can be used to shield fixed objects of 2' to 10'-6" wide (610 mm to 3,200 mm) while using less than 22' in length. Higher speed QuadGuard® crash cushion units are available.



## Features

- Replaceable, energy absorbing cartridges.
- Self-supporting plastic nose.
- High strength Quad-Beam™ panels.
- Does not use anchoring chains or tension cables.
- Custom connections available.
- Systems available for various lengths, widths, and speeds.
- Compact, modular design (one to twelve bays) tested to speeds from 25 mph (40 km/h) to 75 mph (120 km/h).

## Assembly and Maintenance

- Damaged cartridges are replaceable.
- Anchorage options include asphalt, concrete, and soil-drive pile.
- Potentially reusable after an impact within NCHRP Report 350 crash test standards.\*

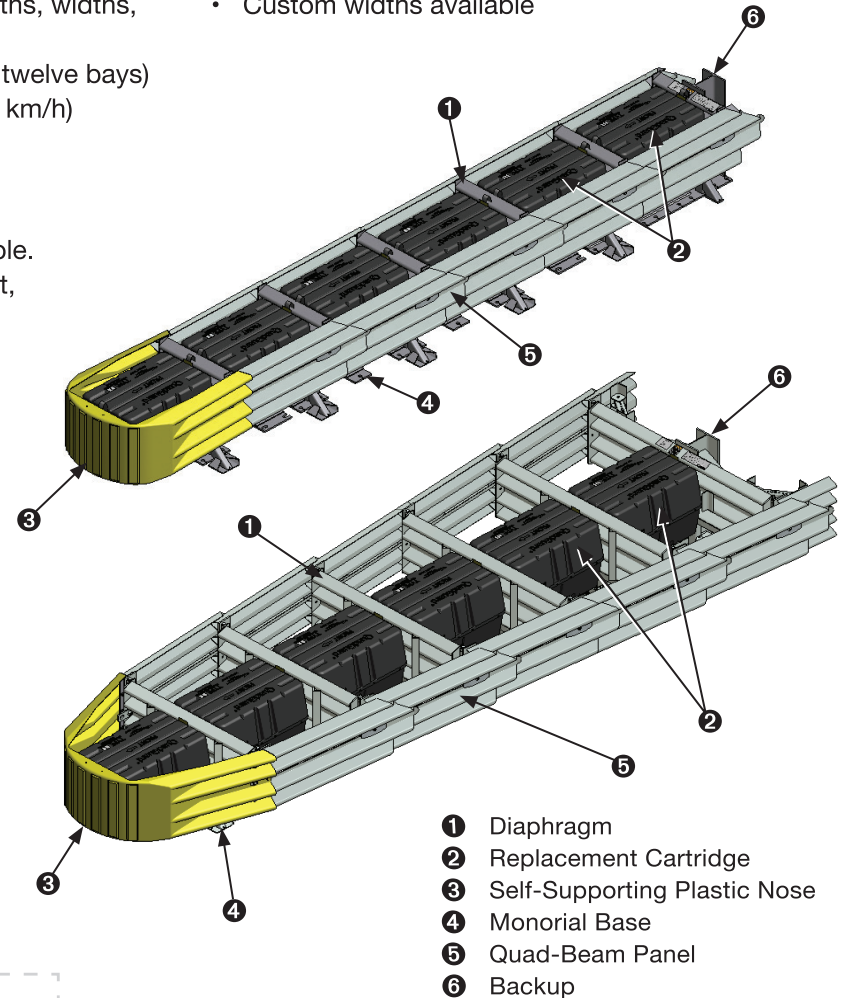
## Back-Up Structure and Attachments

- Simplified backups – Tension strut or concrete
- Bridge pier(s) and parapet(s)
- Square block(s)
- Temporary and permanent concrete barrier(s)
- W-beam
- Thrie-beam

## Specifications

### Typical Six-Bay Unit

- 2,255 lbs. (1,020 kg)
- 21' Long (6.4 m)
- 2' (610 mm) min., 126" (3.2 m) Max. Width at Backup Structure
- Custom widths available



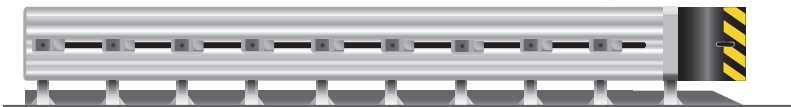
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# QuadGuard<sup>®</sup> CEN



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**INTERNATIONAL**

# QuadGuard® CEN

The QuadGuard® CEN is a redirective, bidirectional crash cushion that consists of crushable, energy absorbing cartridges surrounded by a framework of steel Quad-Beam™ panels. It is tested to EN 1317-3 for speeds up to 110 km/h. The QuadGuard® CEN has been further tested to 100 km/h, 80 km/h, and 50 km/h and can be used to shield fixed objects 610 mm to 2,286 mm wide.

The QuadGuard® CEN, as a member of the QuadGuard® family of crash cushions, consists of many of the same components as the QuadGuard.

## Assembly and Maintenance

- Damaged cartridges are replaceable.
- Monorail base does not use anchoring chains or tension cables.

## Features

- Replaceable, energy absorbing Type-E cartridges.
- Durable nose designed to minimize damage from nuisance impacts.
- High strength Quad-Beam™ panels.
- Tested to 110 km/h (P4), 100 km/h (P3), 80 km/h (P2), and 50 km/h (P1).
- The QuadGuard® CEN is CE marked and has been certified by an authorized EU Notified Body.

## Back-Up Structure and Attachments

Simplified tension-strut backup stand-alone or multiple connection panels available for:

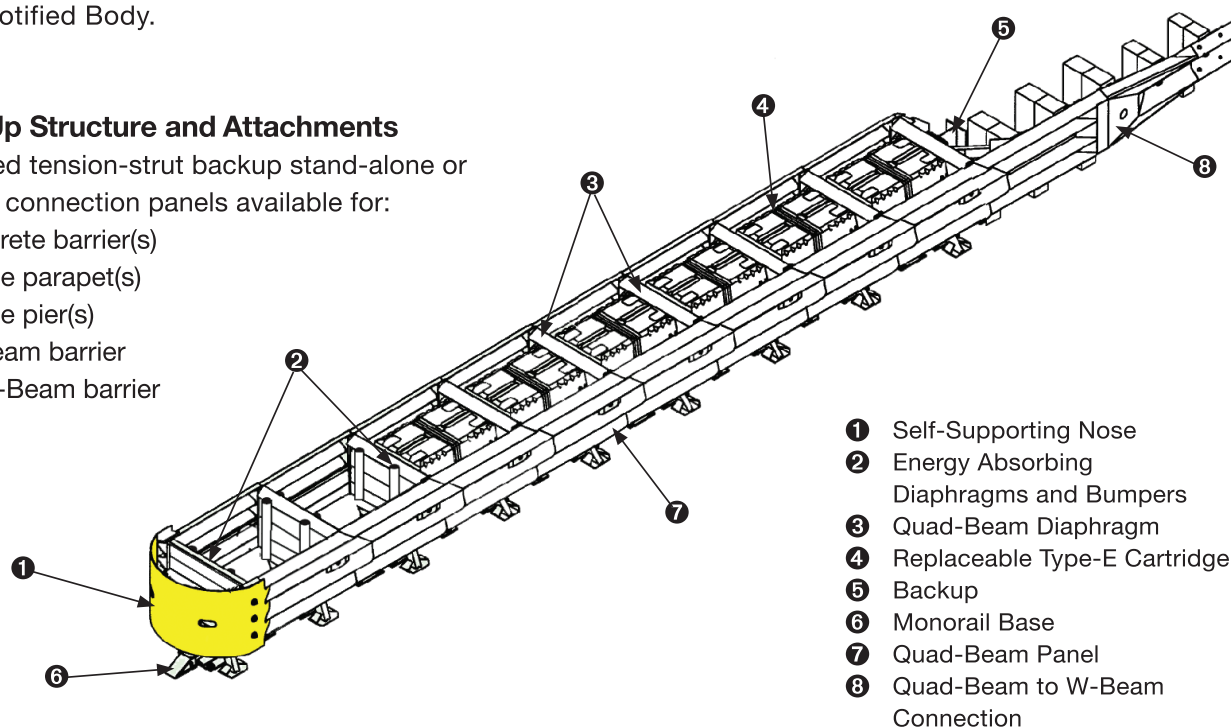
- Concrete barrier(s)
- Bridge parapet(s)
- Bridge pier(s)
- W-Beam barrier
- Thrie-Beam barrier

## Specifications

### Typical 110 km/h Unit

(Also available in 100 km/h, 80 km/h, and 50 km/h units)

- Length: 7.97 m
- Width: 610 mm Min. Width and 2,286 mm Max. Width at Backup Structure.



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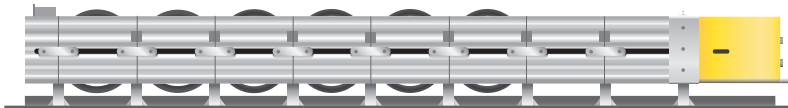
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**Crash Cushions**



**QuadGuard® Elite**



**TRINITY**  
**HIGHWAY**

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# QuadGuard® Elite

The QuadGuard® Elite is a redirective, non-gating crash cushion. The system is tested to NCHRP Report 350 Test Level 2 and Test Level 3. The cylinders are made of High Density Polyethylene (HDPE) and are potentially reusable after an impact within NCHRP Report 350 crash test standards.\* The QuadGuard® Elite, as a member of the QuadGuard® family of crash cushions, consists of many of the same components as the QuadGuard.

## Assembly and Maintenance

- Monorail base does not use anchoring chains or tension cables.
- Anchorage options include asphalt, concrete, and soil-drive pile.
- Cylinders are potentially reusable after an impact within NCHRP Report 350 crash test standards.\*

## Features

- Flex-belt nose.
- High strength Quad-Beam™ panels.
- High Density Polyethylene (HDPE) cylinders.
- Compact, modular design tested to speeds from 25 mph (40 km/h) to 70 mph (113 km/h).
- Custom connections available.
- Systems available for various lengths, widths, and speeds.

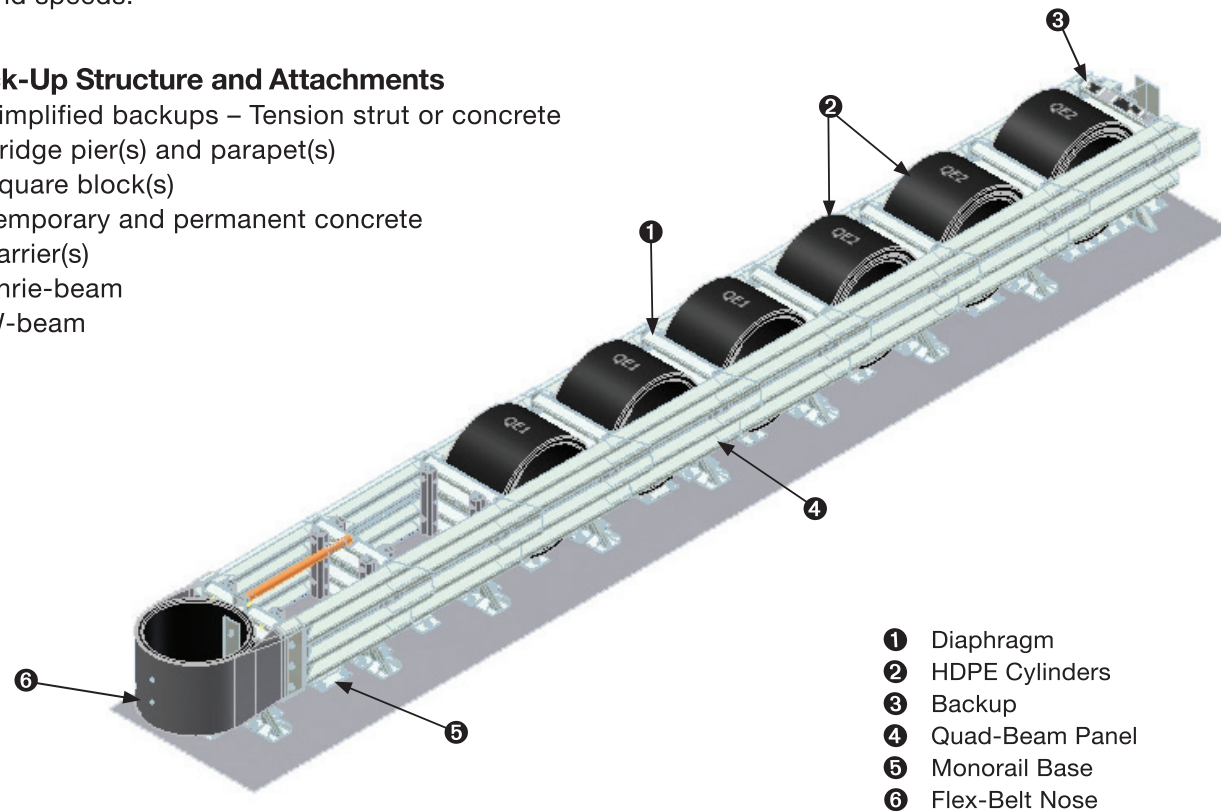
## Back-Up Structure and Attachments

- Simplified backups – Tension strut or concrete
- Bridge pier(s) and parapet(s)
- Square block(s)
- Temporary and permanent concrete barrier(s)
- Thrie-beam
- W-beam

## Specifications

### Typical Eight-Bay Unit

- (Available in widths of 24", 30", 36", 69" & 90")
- 4,900 lbs. (2,223 kg)
  - 26.75' Long (8 m)
  - 24" (610 mm) Min., 90" (2.29 m) Max. Width at Backup Structure
  - Custom widths available



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**QuadGuard<sup>®</sup> High Speed  
(HS)**

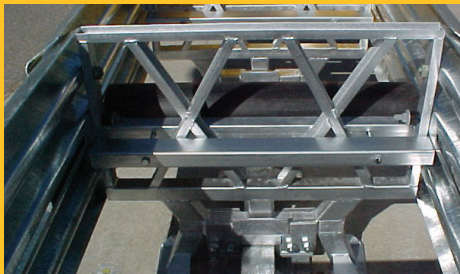


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# QuadGuard® High Speed (HS)

The QuadGuard® High Speed (HS) system is a redirective, non-gating crash cushion that consists of three space frames, six standard diaphragms, and crushable energy absorbing cartridges, all surrounded by a framework of steel Quad-Beam™ panels. The system is tested to NCHRP Report 350 Test Level 3. The QuadGuard® HS can be used to shield fixed objects 24", 30", and 36" wide.

The QuadGuard® HS, as a member of the QuadGuard® family of crash cushions, consists of many of the same components as the QuadGuard.



Space-Frame Diaphragm

## Features

- Flex-belt nose.
- Replaceable energy absorbing cartridges.
- Lightweight space-frame diaphragms in the first three bays.
- High strength Quad-Beam™ panels.
- Does not use anchoring chains or tension cables.
- Custom connections available.
- Compact, modular design tested to 70 mph (113 km/h).

## Assembly and Maintenance

- Interchangeable components help reduce repair costs.
- Anchorage options include both asphalt and concrete.
- Major components are potentially reusable after an impact within NCHRP Report 350 crash test standards.\*

## Back-Up Structure and Attachments

- Simplified backups – Tension strut or concrete
- Bridge pier(s) and parapet(s)
- Concrete gores
- Temporary and permanent concrete barrier(s)
- Thrie-beam end sections
- W-beam end sections

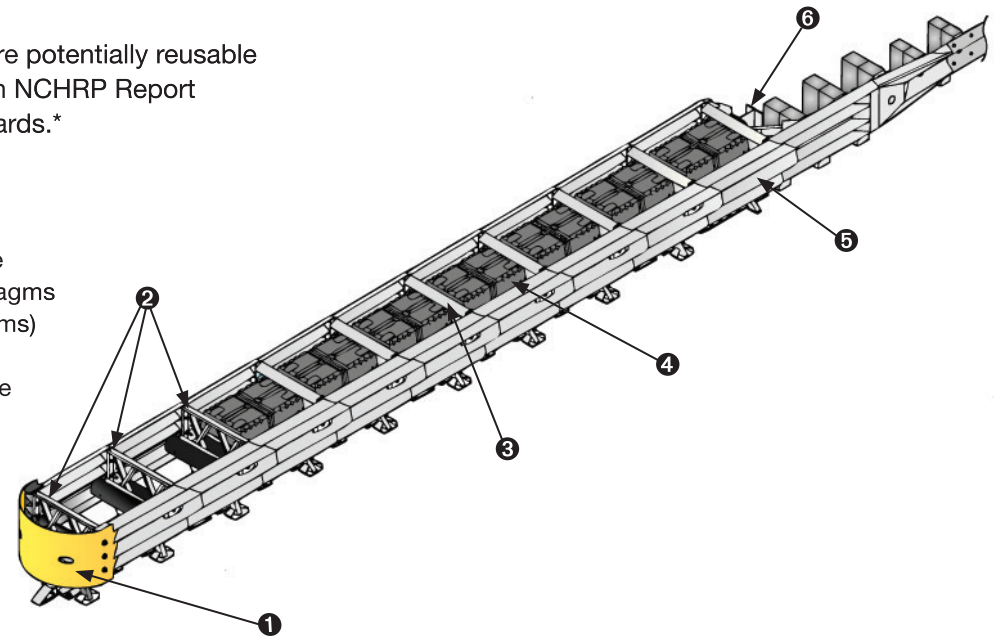
## Specifications

### Nine-Bay Unit

(Available in widths of 24", 30" & 36")

- 3,700 lbs. (1,678 kg)
- Length: 30' (9,144 mm)
- Shields fixed objects up to 36" in Width

- 1 Self-Supporting Nose
- 2 Space-Frame Diaphragms (First Three Diaphragms)
- 3 Standard Diaphragm
- 4 Replaceable Cartridge
- 5 Quad-Beam Panel
- 6 Backup



An original  product.

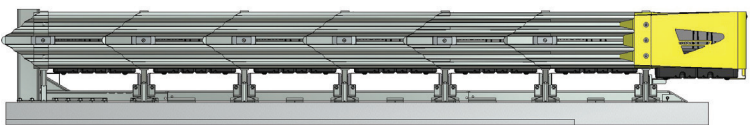
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# QuadGuard® II



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# QuadGuard® II

The QuadGuard® II is a redirective, non-gating crash cushion that consists of an engineered steel nose and crushable, energy absorbing cartridges surrounded by a framework of steel Quad-Beam™ panels. The system is tested to NCHRP Report 350 Test Level 2 and Test Level 3. The Test Level 2 model is 25% shorter than the original QuadGuard® measuring less than 10' (3 m). The Test Level 3 model is nearly 3' (.9 m) shorter in length than its predecessor. The QuadGuard® II can be used to shield fixed objects 24" to 126" wide (610 mm to 3.2 m) while using less than 19' in length (22' for the 126").

The QuadGuard® II, as a member of the QuadGuard® family of crash cushions, consists of many of the same components as the QuadGuard.



## Features

- Self-supporting steel nose, custom cut-out available.
- Monorail guide shims to stabilize the diaphragms.
- Footprint is 25% less for TL-2 and 3' less for TL-3 than the original QuadGuard®.
- High strength Quad-Beam™ panels.
- Does not use anchoring chains or tension cables.
- Compact, modular design tested to speeds from 25 mph (40 km/h) to 62 mph (100 km/h).

## Assembly and Maintenance

- Damaged cartridges are replaceable.
- Monorail base does not use anchoring chains or tension cables.
- Anchorage options include asphalt, concrete, and soil-drive pile.
- Potentially reusable after an impact within NCHRP Report 350 crash test standards.\*

## Back-Up Structure and Attachments

- Simplified backups – Tension strut or concrete
- Bridge pier(s) and parapet(s)
- Square block(s)
- Temporary and permanent concrete barrier(s)
- Thrie-beam
- W-beam

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## Specifications

### Test Level 2 Two-Bay Unit

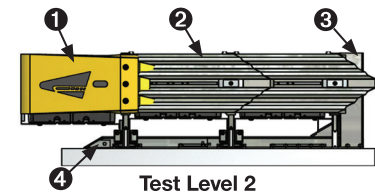
(Available in widths of 24", 30", 36" & 48")

- 9' 11" Long (3.03 m)
- 24" (610 mm) Min. Width and 48" (1.22 m) Max. Width at Backup Structure
- 24" Wide Unit: 1,210 lbs. (549 kg)

### Test Level 2 Three-Bay Unit

(Available in widths of 69" & 90")

- 69" & 90" Wide Units are 13' Long (3.96 m)
- Max. Width for Three-Bay is 90" (2.29 m)



### Test Level 3 Five-Bay Unit

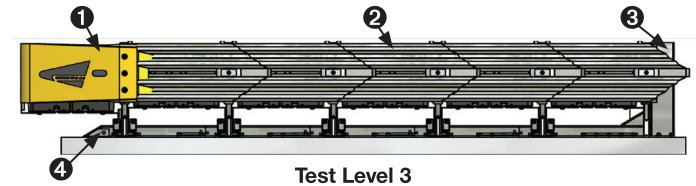
(Available in widths of 24", 30", 36", 48", 69" & 90")

- 19' Long (5.8 m)
- 24" (610 mm) Min. Width at Backup Structure
- 24" Wide Unit: 2,455 lbs. (1,114 kg)

### Test Level 3 Six-Bay Unit

(Available in width of 126")

- 22' Long (6.73 m)
- 126" (3.2 m) Max. Width at Backup Structure



- 1 Engineered Steel Nose
- 2 Quad-Beam Panel
- 3 Steel Backup
- 4 Monorail Base

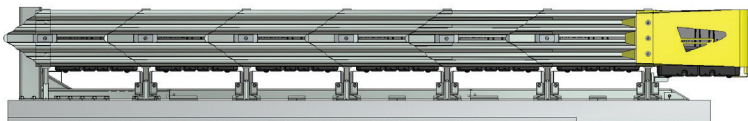
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# QuadGuard<sup>®</sup> M10



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# QuadGuard® M10

The QuadGuard® M10 is a redirective, non-gating crash cushion that consists of an engineered steel nose and crushable, energy absorbing cartridges surrounded by a framework of steel Quad-Beam™ panels. The system is tested to the Manual for Assessing Safety Hardware (MASH) Test Level 3. It can be used to shield fixed objects of 24" (610 mm) wide.

The QuadGuard® M10, as a member of the QuadGuard® family of crash cushions, consists of many of the same components as the original Test Level 3 QuadGuard® platform and framework in addition to an engineered steel nose and monorail shims.

## Features

- Self-supporting steel nose.
- Tension strut backup.
- Monorail guide stabilizers.
- Anchorage in concrete.
- High strength Quad-Beam™ panels.
- Does not use anchoring chains or tension cables.

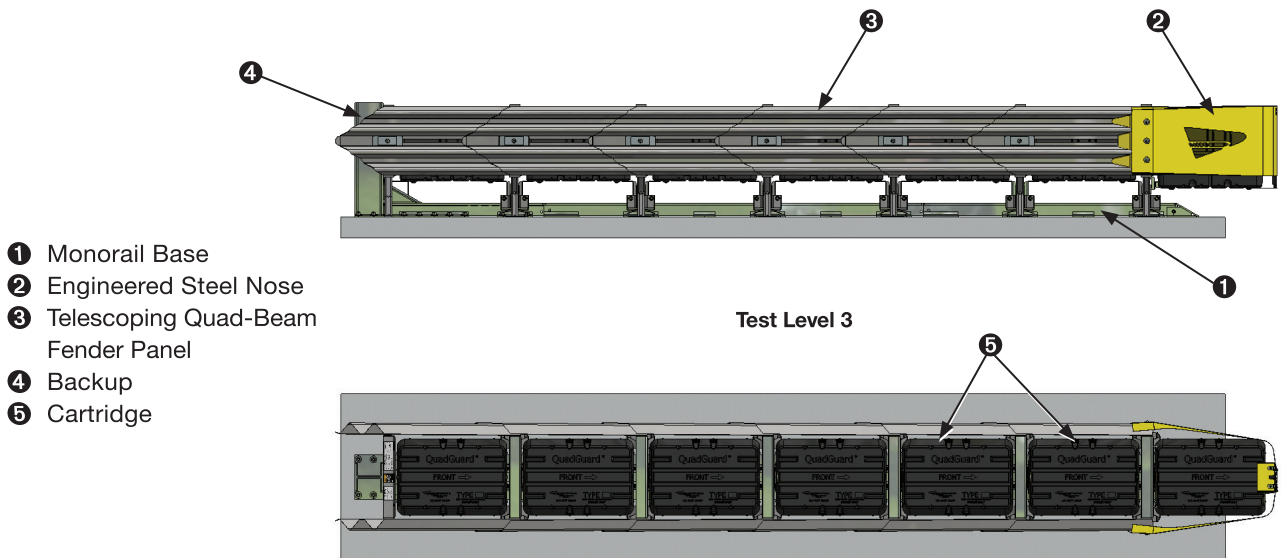
## Assembly and Maintenance

- Damaged cartridges are replaceable.
- Potentially reusable after an impact within MASH crash test standards.\*

## Specifications

### Test Level 3 System

- System Length – 22' 0" (6.71 m)
- Effective Length – 20' 8" (6.30 m)
- System Width – 24" (610 mm)



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