

QUADGUARD HS SYSTEM

REVISION REGISTER

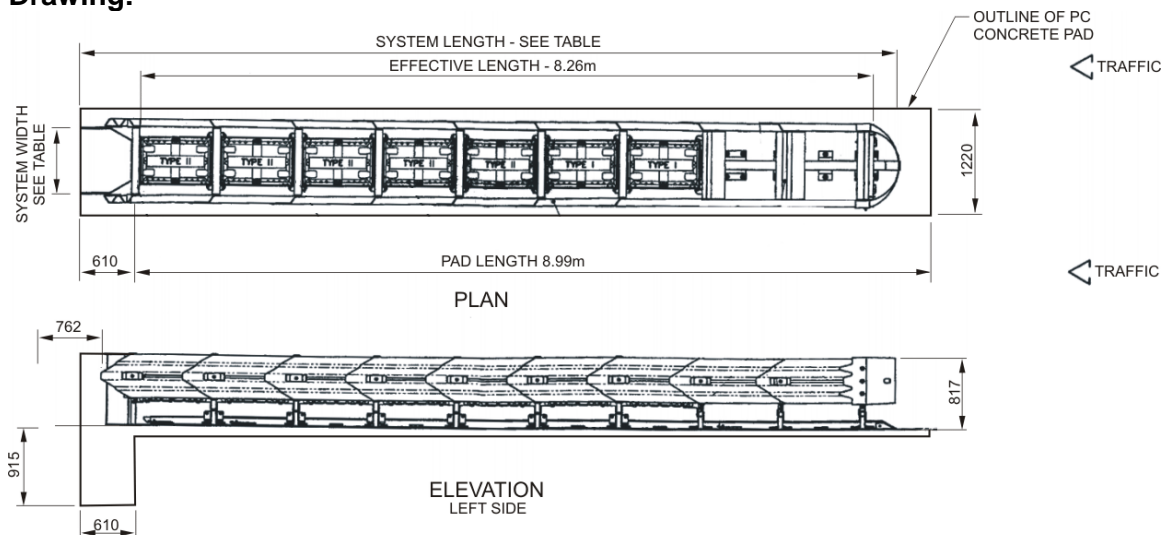
Revision	Description	Date
1	Issued for use.	23/2/2004.
1 A	Minor editorial revisions.	3/03/2006.
1 B	Supplier details amended. Photograph added. Minor editorial revisions	19/12/2013
1 C	Update Supplier details	17/08/15

The QuadGuard HS System is a re-directive, non-gating crash attenuator that has been crash tested to 110 km/hr and uses crushable cartridges to absorb the energy from impact. Damaged cartridges must be replaced after impact.

Identification Photograph:



Drawing:



(showing concrete back-up)

Ownership: Energy Absorption Systems Inc Chicago, Illinois
www.energyabsorption.com

Supplier: Ingal Civil Products
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 Ph: (08) 9452 9111 Fax: (08) 9358 9111
 Website: <http://www.ingalcivil.com.au/>

QUADGUARD HS SYSTEM

Test Level: Tested in accordance with NCHRP 350 to TL3 fully tested but with an impact speed of 110 km/hr (TL3+).

System Length (m)*	Effective Length (m)*	System Width (m)	Model Number
8.92	8.26	610	QH2409Y
8.85	8.26	760	QH3009Y
9.11	8.26	915	QH3609Y

* Length based on tension strut back-up

Configuration:

- Unit to be installed with a Tension Strut Back-up and a 28 MPa concrete pad to anchor the system for ease of construction.
- Concrete back-up should be used when the unit is connecting to a concrete barrier being constructed as part of the works.
- All supplied units are to have the yellow flexi-belt nose.

Design:

- Design to be in accordance with the QuadGuard® HS Product Manual.
- No elevated kerbs, islands, drainage structures or any other item that can affect the height at which a vehicle could impact the unit at shall be placed 15m prior to the unit or along the length of the unit to the rear of the backup. Only flush kerbing shall be permitted around the unit.
- Available in the following nominal widths 610, 760 & 915 mm.
- In situations where traffic is approaching from the rear of the system the Designer has the choice of the following transitions Quad panel to concrete safety barrier, Thrie-beam, W-beam, End Shoe (refer to Figures 6-9 respectively of the QuadGuard® HS Product Manual). Designer must specify transition for system.
- Upon impact, the fender panels telescope towards and beyond the backup by as much as 635mm from their pre-impact position. Therefore the unit must be positioned a minimum of 635mm forward of objects that could interfere with movement of the panels.

Limitations:

Cannot be used on crossfalls steeper than 8%.

Installation and Maintenance Requirements:

The end treatment shall be installed and repaired after impact in accordance with the QuadGuard® HS Installation Manual.

Parts to be Replaced after Impact:

Cartridges and fender panels depending on location and size of impact.

Parts Typically Re-Useable after Impact:

Undamaged cartridges and fender panels.

References:

Manuals

Available on the Boylan Group website:

Quadguard® HS Product Manual, Rev A 02/25/10
Quadguard® HS Installation Manual, Rev B 3/4/10

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Relevant FHWA Approval Letters

(Refer to website http://safety.fhwa.dot.gov/fourthlevel/hardware/term_cush.htm)

Code	Description
CC35E	Approval letter for Quadguard HS for nominal speed of 110 km/hr for full text matrix. Note unit is 9 bay.