



THE TOTAL SOLUTION IN BARRIER SYSTEMS



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**HILL & SMITH
INFRASTRUCTURE LIMITED**
Springvale Business & Industrial Park,
Bilston, West Midlands WV14 0QL

+44 (0)1902 499400
barrier@hill-smith.co.uk
sales@hill-smith.co.uk

WWW.HILL-SMITH.CO.UK



**INNOVATIVE
SOLUTIONS**



DRIVING SAFETY FORWARD

Hill & Smith Infrastructure Ltd has a long history in the manufacture of highway vehicle restraint systems. Hill & Smith had attained the relevant approvals and is a recognised supplier, specified on many global highway projects.

These approvals (CE/UKCA) ensure that the installed product will perform as it was designed and tested, giving engineers and end users confidence when specifying our products.

With these approved products we can offer the complete solution to overcome the problems encountered along the roadside. When used with our tested transitions we ensure that when different products are required we can safely connect them together, whilst redirecting and containing an impacting vehicle safely. We also offer a range of terminals allowing complete end-to-end solutions, ensuring liability is held within one company.

Information for all of our products are available on our technical website - [xtratech](http://xtratech.com).

This website provides an easy-to-use graphical user interface which simplifies the management and publishing of Drawings and Technical Documents. These can be viewed, printed and downloaded from this site.

To access the xtratech technical website visit:
xtratech.bristorm.co.uk

xtratech

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HILL & SMITH BARRIERS SINCE 1824

Quality design & manufactured
by a respected and established
British Company.

QUICK REFERENCE GUIDE

Vehicle Restraint Systems

EN1317

Profile	Containment Class	Working Width	No. of Ropes	Line Post Centres	Vehicle Intrusion	Drawing Number
Brifen Wire Rope	N2	W5	3	6.0m	-	PD-CEWRSB155
Brifen Wire Rope	N2	W6	3	8.0m	-	PD-CEWRSB156
Brifen Wire Rope	H1	W5	4	3.2m	V18	PD-CEWRSB250
Brifen Wire Rope	H2	W8	4	3.2m	V18	PD-CEWRSB350

Profile	Containment Class	Working Width	Line post Centres	ISL	Vehicle Intrusion	Drawing Number
SPR4- Single Sided	N2	W1	2.0m	B	-	PD-CEGRSB111
SPR4- Single Sided	N2	W2	2.5m	B	-	PD-CEGRSB112
SPR4- Single Sided	N2	W3	4.0m	A	-	PD-CEGRSB113
SPR4- Single Sided	N2	W4	5.0m	A	-	PD-CEGRSB114
SPR4- Double Sided	N2	W4	4.0m	A	-	PD-CEGRSB160
Flexbeam- Single Sided	N2	W5	5.0m	A	-	PD-CEGRSB105
Flexbeam- Double Sided	N2	W2	1.6m	A	-	PD-CEGRSB150
Flexbeam- Double Sided	N2	W3	4.0m	A	-	PD-CEGRSB151
Flexbeam- Double Sided	N2	W4	4.8m	A	-	PD-CEGRSB152
Flexbeam PLUS- Single Sided	N2	W1	1.2m	B	-	PD-CEGRSB100
Flexbeam PLUS- Single Sided	N2	W2	2.0m	B	-	PD-CEGRSB102
Flexbeam PLUS- Single Sided	N2	W3	2.8m	B	-	PD-CEGRSB103
Hi-Flex- Single Sided	H1	W3	1.6m	B	V16	PD-CEGRSB201
Hi-Flex- Single Sided	H1	W4	2.0m	B	-	PD-CEGRSB202
SVV2- Single Sided	H2	W1	2.0m	B	V12	PD-CEGRSB310
Hi-Flex- Single Sided	H2	W5	2.0m	B	-	PD-CEGRSB300
Hi-Flex- Double Sided	H2	W4	1.6m	A	-	PD-CEGRSB350
Black Country – Dudley	N2	W2	3.5m	B	-	PD-CEGRSB121
Black Country – Dudley	N2	W4	6.0m	B	-	PD-CEGRSB120
Black Country – Dudley – Double Sided	N2	W4	6.0m	B	-	PD-CEGRSB165
Black Country – Tipton	L1 (N2/H1)	W4 (W3/W4)	4.0m	B	V17	PD-CEGRSB205
Black Country - Bilston	H2	W2	1.0m	B	V13	PD-CEGRSB301

Vehicle Restraint Systems

NCHRP 350

Profile	Containment Level	Working Width	No. of Ropes	Line Post Centres	Vehicle Intrusion	Drawing Number
Brifen Wire Rope	TL3	n/a	3	3.2m	n/a	WR3010-12
Brifen Wire Rope	TL3	n/a	4	3.2m	n/a	WR3005
Brifen Wire Rope	TL3	n/a	4	6.4m	n/a	WR3027
Brifen Wire Rope	TL4	n/a	4	3.2m	n/a	WR3025

MASH

Profile	Containment Level	Working Width	No. of Ropes	Line Post Centres	Vehicle Intrusion	Drawing Number
Brifen MASH	TL3	n/a	4	2.1 - 6.4m	n/a	PD-MHWRNB250

End Terminals

EN1317

Profile	Containment Class	No. of Ropes	Length	Impact Severity Level	Drawing Number
Brifen Single Stage Terminal	P4	3	27m	A	PD-ENWRNEAT052
Brifen Two Stage Terminal	P4	4	11.175m	A	PD-ENWRNEAT053

Profile	Containment Class	Rating	Length	Impact Severity Level	Drawing Number
Single Sided- Flexbeam	P1	D1.1	12.8m	A	PD-ENGRNEAT001
Double Sided- Flexbeam	P1	D1.1	12.8m	A	PD-ENGRNEAT050
ABC- Single Sided	P4	D1.1	12.4m	B	See Xtratech
Trend- Single Sided	P4	D1.1	12.4m	A	615794/95
Trend- Double Sided	P4	D1.1	8.4m	B	618440/41
Trend- Single Sided	P2	D1.1	4.4m	A	615792/93

NCHRP 350

Profile	Containment Class	No. of Ropes	Length	Drawing Number
Brifen Terminal	TL3	3	8.0m	WR3040 (Brifen Lite)
Brifen Terminal	TL3	4	8.0m	WR3045
Brifen Terminal	TL4	4	11.2m	WR3042

MASH

Profile	Containment Level	No. of Ropes	Length	Drawing Number
Brifen MASH	TL3	4	9.730m	PD-MHWRNEAT050-1/2

More products on Xtratech.

SPECIALISTS IN TECHNICALLY ADVANCED VEHICLE RESTRAINT SYSTEMS

Hill & Smith Barriers - manufacture and supply specialist vehicle restraint systems throughout the world.

Hill & Smith are driving safety forward with a total solution, be it our Flexbeam VRS family of systems for use on highways, Brifen, the wire rope VRS used in over 30 countries worldwide or our Off Road industrial barriers protecting your property.

Hill & Smith, member of the Hill and Smith Holdings Infrastructure Products Group, has vast experience in manufacturing vehicle restraint systems. With a policy to supply quality of service, with tested and proved products, the company has developed a strong reputation in the field of road safety.

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Technical Innovation

A technical innovation in material processing and design engineering. The SPR4 system extends the effective distance between barrier support posts on all our normal containment levels from W1 to W4.



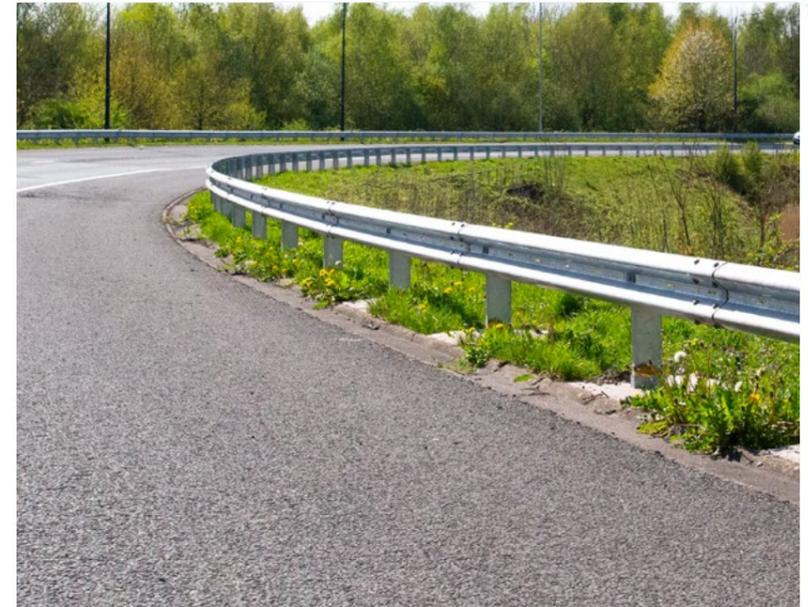
RESISTANCE TO SNOW REMOVAL CLASS 4 SYSTEM

Our SPR4 system extends the effective distance between barrier support posts on all our normal containment levels from W1 to W4.

Specifically designed to offer maximum savings on large scale schemes, our SPR4 system offers an unrivalled installation time due to its common post and beam feature. Containment levels and working widths are traversed with ease by simply altering the post centres and connectivity between existing Flexbeam products and is fully compliant and tested.

With its EN1317 part 5 and CE accreditation, Hill & Smiths SPR4 system will be an added 'tool' in the bag of contractors looking for further commercial savings on larger schemes.

Future stock profiling for clients becomes simple, based on the system's minimal component parts 'one beam – one post' and training is covered under our existing Flexbeam courses.



PRODUCT FEATURES

- ✓ Extends the effective distance between barrier support posts
- ✓ Offers maximum savings on large-scale schemes
- ✓ Quick and easy installation
- ✓ Tested to EN1317
- ✓ CE accreditation achieved
- ✓ Minimal component parts- 'one beam-one post'

Single sided

Working width	Drawing No.	Post Spacing	ISL
N2 W1	PD-CEGRSB111	2000mm	B
N2 W2	PD-CEGRSB112	2500mm	B
N2 W3	PD-CEGRSB113	4000mm	A
N2 W4	PD-CEGRSB114	5000mm	A

Double sided

Working width	Drawing No.	Post Spacing	ISL
N2 W4	PD-CEGRSB160	4000mm	A

The Safest Choice

Double sided or single sided, Flexbeam's full suite of products will leave you with no gaps in safety. Driven, surface mounted, concreted in with or without sockets, no matter what the ground conditions, Flexbeam performs.



DRIVING OPTIMAL PERFORMANCE THROUGH DESIGN SIMPLICITY.

At the heart of our Flexbeam family of products lies an untensioned corrugated beam that continually outperforms its humble design origins.

Developed to assist contractors by having minimal variations in components and a 'child's play' approach to transitioning through containment levels/working widths.

Flexbeam has become the industries first choice due to its speed of installation and ease of stocking when considering legacy maintenance contracts.

Flexbeam VRS

Flexbeam utilises the 'W' beam profile mounted on 'Z/S' profile posts.

The systems can be installed on driven posts, surface mounted posts, in socketed posts or posts cast directly into concrete.



PRODUCT FEATURES

- ✓ Heart of our Flexbeam family tested to EN1317
- ✓ Minimal variations in components and 'child's play' approach to transitioning
- ✓ Quick and easy installation
- ✓ Easy of stocking large quantities
- ✓ Posts can be installed on driven, socketed, surface mounted or concrete-in posts

Single sided

Working width	Drawing No.	Post Spacing	ISL
N2 W5	PD-CEGRSB105	5000mm	A

Double Sided

Working width	Drawing No.	Post Spacing	ISL
N2 W2	PD-CEGRSB150	1600mm	A
N2 W3	PD-CEGRSB151	4000mm	A
N2 W4	PD-CEGRSB152	4800mm	A

FLEXBEAM PLUS

Cost effective systems

Cost effective systems even at low working widths. By strengthening our posts we can increase the support centres and still achieve low working widths.



FLEXBEAM PLUS

TIGHT ON SPACE SHOULDN'T MEAN TIGHT ON BUDGET!

The Flexbeam ethos of simplicity continues throughout our Flexbeam Plus range of systems. Using the same 'W' beam for continuity and a stronger 'Z/S' post.

With a system that can connect directly into Flexbeam without the need for costly transitions, can be driven, surface mounted, socketed or cast directly into concrete, it really is the 'go-to' product when trying to adhere to target costings.

With the inclusion of the Tranzflex transition the Flexbeam Plus system becomes compliant and connectable to a wide range of Varley & Gulliver Parapet products – providing an end-to-end design solution.



PRODUCT FEATURES

- ✓ 'W' beam for continuity and stronger 'Z/S' posts
- ✓ Can connect into other H&S Guardrail systems
- ✓ Posts can be installed on driven, socketed, surface mounted or concrete-in posts
- ✓ Compliant and connectable with Varley and Gulliver parapets

FLEXBEAM PLUS

Single sided

Working width	Drawing No.	Post Spacing	ISL
N2 W1	PD-CEGRSB100	1200mm	B
N2 W2	PD-CEGRSB102	2000mm	B
N2 W3	PD-CEGRSB103	2800mm	B

HIGH-CONTAINMENT

SAVING LIVES AND SECURING ASSETS.

We are all too aware of the increasing number of structures, assets and obstacles the designers of today take into consideration when looking at VRS implementation.

Our range offers both single sided and double sided high containment protection from 10,000kg & 13,000Kg vehicles. Offering these systems in either driven, surface mounted, socketed or cast post variants allows the designer & contractor every available installation solution.

Couple this with EN1317 approved & tested transitions into our Flexbeam & Flexbeam Plus systems, we now offer seamless phasing through containment and working widths from start to finish.



PRODUCT FEATURES

- ✓ Single sided and double sided high containment protection
- ✓ Variable posts for easy and quick installation
- ✓ Seamless phasing through containment and working widths

Single Sided

Name	Performance	Drawing No.	Post Spacing	ISL
Hi-Flex	H1W3	PD-CEGRSB201	1.6m	B
Hi-Flex	H1W4	PD-CEGRSB202	2.0m	B
Tipton	H1W1 (L1W4)	PD-CEGRSB205	4.0m	B
SVV2	H2W1	PD-CEGRSB310	2.0m	B
Bilston	H2W2	PD-CEGRSB301	1.0m	B
Hi-Flex	H2W5	PD-CEGRSB300	2.0m	B

Double Sided

Name	Performance	Drawing No.	Post Spacing	ISL
Bri-Flex	H2W4	PD-CEGRSB350	1.6m	A

TRANSITIONS

CONNECTING SAFELY

The weakest point of any product is the barrier connection. With this in mind our Tranzflex range of approved & tested transitions allows us not only to be confident in our products performance but also to guarantee that vehicles are contained and redirected safely when containment and working widths are changing.

Having been rigorously tested and approved along side Varley & Gulliver's parapet systems, we are one of the few manufacturers who are able to offer designers the confidence of compliant system design from normal to high containment and then into parapet applications.



N2 Single Sided Transitions

Name	Description	Drawing No.
Tranzflex 101-170	N2 S/S Flexbeam to V&G Parapet	PD-ENGRTR100
Tranzflex 100	N2 S/S Flexbeam to H1/H2 S/S Flexbeam	PD-ENGRTR101
Flexbeam Transition	N2 S/S Flexbeam to N2 D/S Flexbeam	FBGA020
Flexbeam to SVV2	N2 S/S Flexbeam to H2 S/S SVV2	PD-ENGRTR102
N2-H2 Bilston	N2 S/S Guardrail to H2 Bilston	PD-ENGRTR104

N2 Single/Double Sided Brifen Transition

Name	Description	Drawing No.
Bri-Flex	N2 Brifen 4 Rope to H1W7 Brifen 4 Rope Transition	PD-ENWRTR150
Bri-Trans	N2 Brifen 4 Rope to N2 S/S OBB	PD-ENWRTR151

Guardrail to Concrete Transitions

Name	Description	Drawing No.
REBLOC to Guardrail	N2 S/S Guardrail to REBLOC	PD-ENGRTR105
H2 to Concrete	H2 Single Sided Bilston VRS to Concrete	PD-ENGRTR107

PRODUCT FEATURES

- ✓ Tested transitions
- ✓ Vehicles are contained and redirected safely
- ✓ Tested along side Varley & Gulliver's parapet systems
- ✓ Quick and easy installation

NON-CONNECTING TRANSITION

CONTAINMENT ACHIEVED WITHOUT DISRUPTING UK INFRASTRUCTURE.

The latest innovation by Hill & Smith is a viable highway solution when nothing else suits!

The Non-Connecting transition is tested to EN1317 and its primary function is to replace the use of full height anchors allowing a barrier to be anchored or ended next to infrastructure that cannot have any load transferred to them. Acting as a stand-alone anchor, the non-connecting transition works in conjunction with the Hill & Smith Flexbeam family of products alongside, masonry parapets, stone bridges, approaching substandard parapets and even ancient monuments.



NON-CONNECTING TRANSITION

PRODUCT FEATURES

- ✓ Acting as a stand alone anchor
- ✓ EN1317 Tested
- ✓ Only solution when nothing else suits
- ✓ Compatible with Flexbeam and Flexbeam PLUS
- ✓ Suitable when none a loadbearing structure is present

Single sided

Working width	Drawing No.	ISL
N2W1	PD-ENGRTR103-1/2	C

END TERMINALS

COMPLIANT MEANS FROM START TO FINISH.

Complementing our Flexbeam VRS system we offer P4 and P1 fully tested end terminal solutions.

In addition to this we offer TCB & OBB end terminals all classed as P1.



P1 Terminals

For use on roads with a speed limit of less than 50mph, or departure ends on roads above 50mph (see TD19/06 for guidance). There are two terminals in the Flexbeam range, one single sided and one double sided, both with a class code of D1.1.

P4 Terminals

For use on roads with a speed limit of 50mph and greater (see TD19/06 for guidance).

- We offer two S/S P4 terminals:
- > Trend with a class code of D1.1
 - > ABC with a class code of D1.1
 - > On Double Sided Trend D/S D1.1

FLEXGUARD

SINGLE SIDED RETRO FITTED BARRIER SYSTEM.

Flexguard is a barrier which hangs beneath all other Flexbeam products, preventing motorcyclists from impacting the posts.

When the barrier is impacted by a vehicle, it is designed to fall to the floor. This does not affect the performance of the barrier and allows it to perform as designed.

PRODUCT FEATURES

- ✓ Can be fitted to existing barrier systems
- ✓ Cost effective solution
- ✓ Low cost installation for both new and existing barriers
- ✓ Quick and easy installation



Class Leading Wire Rope System

As a 2,3 or 4 rope barrier system it allows sand & debris to pass directly through it and not collect into dangerous 'drifts' which then encroach the highway traffic lanes. This improves safety and minimizes maintenance.



THE WIRE ROPE SAFETY SYSTEM WEAVING ITSELF AROUND THE GLOBE.

With Brifen's visually striking 'weave' configuration it is easy to see why an increasing number of countries around the world are taking advantage of its performance, speed of installation, lower maintenance lifecycle costs and in certain environments, its ecologically adaptive design.

Developed to EN1317 (including CE certification) Brifen has found itself installed in over 30 countries worldwide such as UK, USA, Australia, Scandinavia, South America and the Middle East.

To allow connection to other barrier systems we have developed a transition (Britranz) which is fully tested to EN1317 and ensures it contains and safely redirects impacting vehicles.

To complete our range we have a variation of Brifen Terminals fully tested and rated to P1 and P4.



PRODUCT FEATURES

- ✓ Quick and easy installation
- ✓ After impact, fence line stays in an upright position
- ✓ Brifen remains 'in tension' even with the huge local temperature variance between day & night, due to the interwoven design

Working width	Drawing No.	Post Spacing	No. of ropes
N2 W5	PD-CEWRSB155	6000mm	3
N2 W6	PD-CEWRSB156	8000mm	3
H1 W5	PD-CEWRSB250	3200mm	4
H2 W8	PD-CEWRSB350	3200mm	4



THE WIRE ROPE SAFETY SYSTEM WEAVING ITSELF AROUND THE GLOBE.

NCHRP350 systems

Brifen is available in several designs, all approved by the Federal Highway Administration (FHWA) fully complying with NCHRP350 TL-3 & TL-4 crash testing requirements. There are several types of end treatments FHWA compliant allowing you to choose the system that best meets your specific needs.

Mash Systems

Fully compliant to the AASHTO standard for the testing of permanent cable safety barriers, MASH. The latest revision of MASH focuses on the new matrix for testing on slopes allowing for the accurate installation and application of Brifen VRS.

Brifen End Terminals

To support the tested Brifen wire rope systems above, Brifen terminals also achieve TL3 ratings making them suitable to all global applications.



BRIFEN

NCHRP 350 tested and rated

Test Level	Drawing No.	Post Spacing	No. of ropes
TL3	WR3010-12	3200mm	3
TL3	WR3005	3200mm	4
TL3	WR3027	6400mm	4
TL4	WR3025	3200mm	4

MASH tested and rated

Profile	Containment Level	Working Width	No. of ropes	Line Post Centres	Vehicle Intrusion	Drawing No.
Brifen MASH	TL3	n/a	4	2.1 - 6.4m	n/a	PD-MH WRSB250

REGISTER

Hill & Smith Infrastructure **Xtratech**

Guardrail

Brifen Wire Rope

Terminals

Parapets

Concrete VRS

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Simple access to our system drawings and installation guidance:

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VIEW

