

SPECIALIST KERBS & PERMEABLE PAVING





The Brett Group is a leading independent manufacturer of building materials. Our business is built on sustainable and lasting relationships with customers, suppliers and local communities. Our focus on service has enabled us to become a market leader in the design, manufacture and supply of high quality solutions for hard landscaping, transport, infrastructure and construction projects of all sizes. Everything we do is designed to enhance the built environment and the lives of those who use it. All of our products are enhanced by a comprehensive technical support service from concept through to installation and ultimate use.

Contents

About Brett	4
Specialist kerbs	
Trief kerb systems	8
Kassel	20
Slimline Kassel	24
Case Studies	26
Permeable paving	
Permeable paving systems	28
Alpha Flow	32
Beta Flow	33
Omega Flow	34
Grass Flow	35
Case studies	36
Machine lay paving	
Machine lay paving systems	40
Omega ML and Alpha ML	41
Zeta Lock ML	42
Omega Flow ML and Grass Flow ML	43
Safe handling	
Safe handling	44

KEY



Consider for mobility
access projects



Consider for surface
water source control



Machine lay option
available



People and Partnerships

PEOPLE

The development of our people is high on our list of priorities. By employing the highest calibre personnel and continually adding value to their performance, we strive to exceed our customers' expectations and requirements – this is integral to the partnerships we forge.

PARTNERSHIPS

Being an independent company and taking a long-term view means that, with Brett, you are dealing with teams of people, not corporations.

Our integrity, experience, flexibility, commitment and knowledge, demonstrated in practice, establishes trust and loyalty. This, we believe, is the bedrock of our long term relationships and your successful projects.



Quality



An internally developed, fully integrated management system 'QHEST', (Quality, Health, Environment, Safety Together) has been running across the Brett business, starting in 2008. This enables us to benchmark and continually improve our operational efficiency.

The ongoing development of the QHEST integrated management system will ensure that Brett remains at the forefront of system design and compliance.

Internal management reports to the board on a monthly basis on all aspects, link in to business Key Performance Indicators to deliver ongoing improvement for our business.

QHEST is supported by our own internal systems which are in turn integrated with independently audited national standards.

All of this is underpinned by independent accreditation to ISO 9001.



Health and Safety



Our Behavioural Safety programme, 'Alive and Well' was introduced in 2006. Comprehensive training and regular employee engagement identifies both good practice and areas of improvement for everyone. Alive and Well feedback is combined with Near Miss Reporting to ensure all actions are captured and can be acted upon.

Since the introduction of Alive and Well, our rate of reportable accidents has fallen by around 50% - a great achievement and one kept under constant review for future improvement.

This has been recognised by numerous industry awards for our performance in the area of our business.

Our firm belief in our people, their well-being, training and success is underwritten by OHSAS 18001 accreditation.



Sustainability



We are an ISO 14001 registered company.

In 2008, Brett was a lead signatory to the UK Concrete Industries Sustainable Construction Strategy. This initiative will provide industry-wide commitment to the following:

- Producing an annual Sustainability Performance Report for the UK concrete industry
- Agreeing set performance targets for the industry
- Working to reduce CO₂ emissions from the sector
- Playing a leading role in meeting the challenges of sustainable construction
- Providing key industry data for life cycle analysis modelling
- Demonstrating the benefits of concrete products within the built environment

Since 2010, we have also been certified under BES 6001 to a 'very good' accreditation. This offers the potential to enhance project performance ratings when designing to BREEAM or similar environmental standards.



Trief kerbs - introduction	8
Trief GST2A and GST2	10
Trief GST1A Cadet	12
Trief tapers	13
Trief radials	14
Trief chevron	16
Trief bespoke	18
Trief testing	19
Kassel kerb	20
Slimline Kassel kerb	24
Case studies	26

Specialist Kerbs

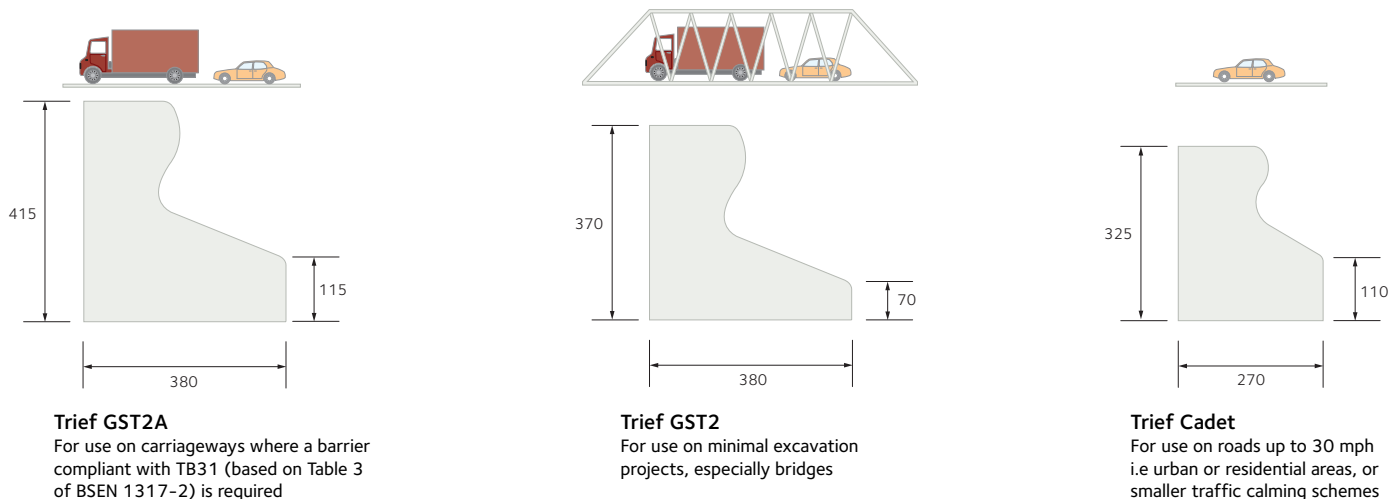
Brett Landscaping have long been recognised as leaders in the area of specialist kerb systems.

Our Trief containment and Kassel bus boarding solutions are established as market leaders due to the innovation of their design, the support package Brett offer and their proven effectiveness in use.

Trief® kerb

The BS EN 1317-2 compliant containment kerb system providing vehicle and pedestrian safety through physical and visual deterrence

THE TRIEF KERB SYSTEM



Since 1962, the Brett Trief containment kerb system has been delivering high levels of vehicle and pedestrian protection and is widely recognised as having made a substantial contribution to British road safety. The unique Trief profile works by trapping the tyre of impacting vehicles and ensuring that they do not leave the carriageway. Trief kerbs provide solutions for bridges and roads carrying all types of vehicles, offering enhanced safety for vehicles and pedestrians alike.

The Trief and Trief Cadet kerb system is comprised of a range of components, including quadrants, short lengths, as well as radius and transition kerbs. This allows for a wide range of design possibilities that can address specific site constraints and safety considerations.

The use of transition kerbs allows Trief kerbs to be seamlessly integrated into existing half batter kerbs.

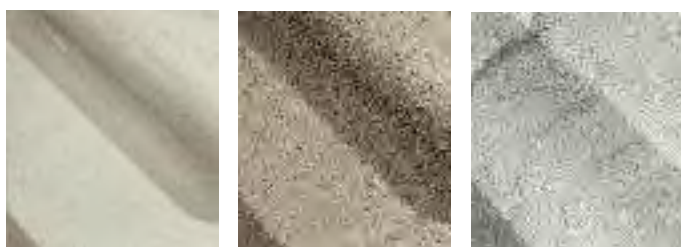
Trief kerb units are available as standard with transitions to British Standard HB2 or spray kerbs.

COMPOSITION AND MANUFACTURE

Trief Kerb units are wet cast from high strength concrete, manufactured with premium quality granite aggregates.

FINISHES

Trief kerb units are available in three standard finishes:



Standard concrete for a smooth, matt surface

Exposed aggregate with a subtle, slightly aged finish

Granite for a smooth natural stone appearance

FEATURES AND BENEFITS

- Trief kerbs have been tested to BS EN 1317-2
- Design prevents vehicles from deliberately or accidentally leaving the carriageway
- Protects people, infrastructure and landscaping by containing vehicles within the carriageway
- Deters drivers from mounting the kerb by creating a visual warning
- Controls traffic flows when used as part of traffic management or calming measures
- Provides effective protection for pedestrians in mixed use areas such as motorway services and pedestrian islands
- Available in a wide range of colours, finishes and textures from either cast concrete or cut granite to suit project requirements
- Extensive range of quadrant and radial units available to create comprehensive traffic management solutions
- Smaller toe profile of GST2 is ideal for bridges due to reduced excavation requirement and reduced weight
- Available with dowel holes for sites with limited haunching options – particularly bridges – or where extra restraint is required
- Highly visible Trief chevron units provide information on road navigation from a distance and in low light conditions
- Most roundabout shapes, sizes and radius can be accommodated

HOW DOES TRIEF WORK?

The Brett Trief kerb has been designed and proven to work in three stages to prevent vehicles leaving the carriageway:

1. The Trief kerb is designed to present a clear visual signal to road users that prevents vehicles trying to leave the carriageway, its height also discourages pedestrians from crossing the highway.

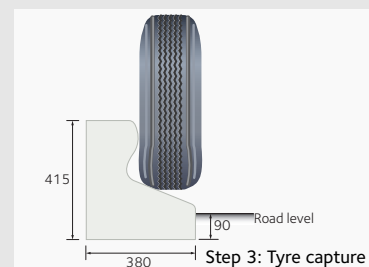
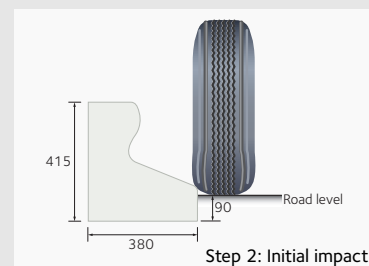
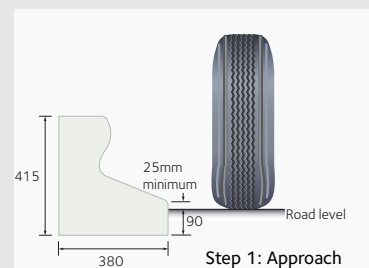
The result is that the separate streams of road users are effectively segregated which is a key contributor to enhancing road safety.

2. The Trief kerb should be installed with a 25mm upstand from the highway surface leading onto an inclined shoulder. This is essential to give road users an initial physical warning that their vehicle is leaving the carriageway and that they need to take action to bring their vehicle back onto the carriageway. The inclined shoulder will help the driver bring the vehicle back on to the carriageway.

3. Finally, the Trief kerb is designed to capture the sidewall bulge of a vehicle tyre within its concave section thereby containing the vehicle within the highway boundary.

Taken together, these three steps have been proven to contribute to British road safety for over 50 years by providing a reliable, passive safety feature for use on our highways.

Now, they have been proven following BS EN 1317-2 testing at the independent Transport Research Laboratory (TRL).



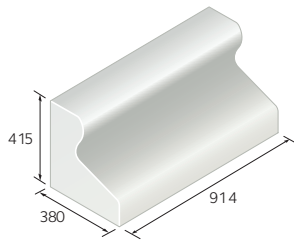
Trief GST2A

Key components and quadrants

Trief GST2A for carriageways and roads

The standard Trief kerb unit provides a strong visual deterrent due to its size and unique shape. This encourages reduced speed levels and increased hazard awareness.

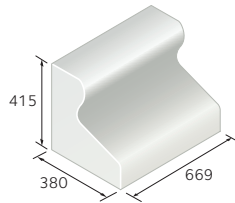
In the event of a vehicle leaving the carriageway, the height and profile of the Trief kerb unit prevents them from exiting the carriageway. This serves to protect both infrastructure as well as pedestrians from vehicles.



GST2A Standard Kerb 914mm

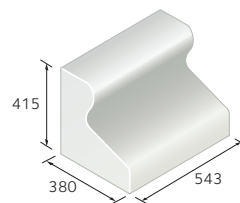
		Wt (kg)
Concrete:	GST2A914	220
Granite:	GST2A914G	261
Exposed:	GST2A914E	220

For units **with** dowel holes, add **D** after '914' element of code ie: GST2A914D



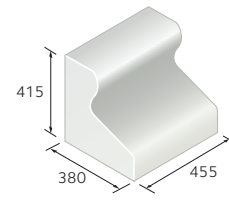
GST2A Short Lengths 669mm

		Wt (kg)
Concrete:	GST2A669	161
Granite:	GST2A669G	191
Exposed:	GST2A669E	161



GST2A Short Lengths 543mm

		Wt (kg)
Concrete:	GST2A543	131
Granite:	GST2A543G	155
Exposed:	GST2A543E	131



GST2A Half Kerb 455mm

		Wt (kg)
Concrete:	GST2A455	110
Granite:	GST2A455G	130
Exposed:	GST2A455E	110

For units **with** dowel holes, add **D** after '455' element of code ie: GST2A455D

The range of Trief quadrant and radius kerbs makes it possible to create sophisticated traffic management solutions to calm traffic flows as well as to provide protection to pedestrians and infrastructure in both single and mixed use areas.

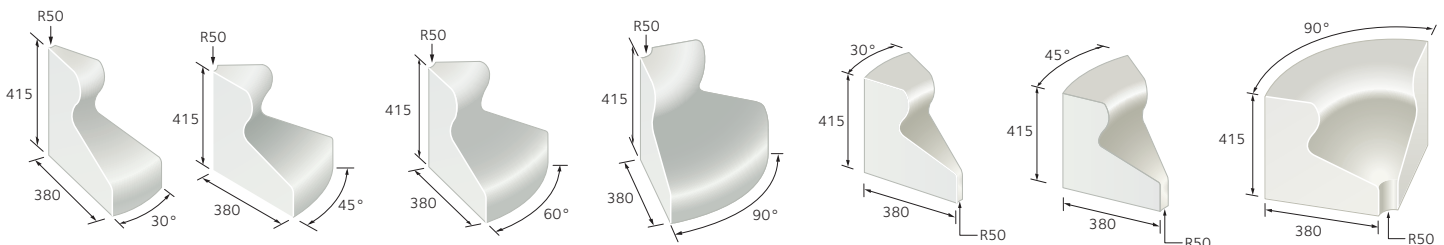
A vast range of pedestrian, traffic and petrol pump islands, road junctions and highway separation points can be designed using the various quadrant, radius, short length and standard units in the Trief kerb range.

TRIEF QUADRANTS

External and internal quadrants are available in 30°, 45° and 90° variations. A 60° external quadrant is also available.

All have a radius of 430mm. The diagrams on page 18 illustrate the range of designs that can be created using the Trief quadrants.

Trief GST2A quadrants



**30° External,
430mm radius**

**45° External
430mm radius**

**60° External
430mm radius**

**90° External
430mm radius**

**30° Internal
430mm radius**

**45° Internal
430mm radius**

**90° Internal
430mm radius**

GST2A External quadrants

	30°	Wt (kg)	45°	Wt (kg)	60°	Wt (kg)	90°	Wt (kg)
Concrete:	GST2AQ30E	31	GST2AQ45E	41	GST2AQ60E	51	GST2AQ90E	75
Granite:	GST2AQ30EG	38	GST2AQ45EG	48	GST2AQ60EG	60	GST2AQ90EG	89
Exposed:	GST2AQ30EE	31	GST2AQ45EE	41	GST2AQ60EE	51	GST2AQ90EE	75

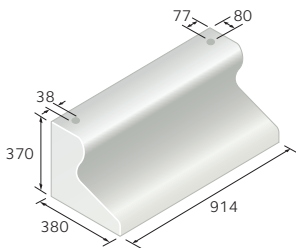
GST2A Internal quadrants

	30°	Wt (kg)	45°	Wt (kg)	90°	Wt (kg)
Concrete:	GST2AQ30I	31	GST2AQ45I	57	GST2AQ90I	114
Granite:	GST2AQ30IG	38	GST2AQ45IG	68	GST2AQ90IG	135
Exposed:	GST2AQ30IE	31	GST2AQ45IE	57	GST2AQ90IE	114

All dimensions are in mm

Trief GST2 for bridges

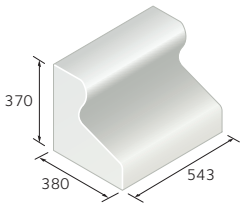
The shallower Trief GST2 profile has been designed to have a slimmer toe section. This serves to minimise excavation requirements and allow installation within limited depth applications, for example, around vulnerable structural parapets and the edge beams of bridges.



GST2 Standard Kerb 914mm

		Wt (kg)
Concrete:	GST2914	184
Granite:	GST2914G	218
Exposed:	GST2914E	184
For units with dowel holes, add D after '914' element of code ie: GST2914 D		

Trief GST2 Kerb units deliver protection from vehicle impact and accidental loading, acting as a highly effective yet economical barrier that shields pedestrians and the structure itself.



GST2 Half Kerb 455mm

		Wt (kg)
Concrete:	GST2455	92
Granite:	GST2455G	109
Exposed:	GST2455E	92
For units with dowel holes, add D after '455' element of code ie: GST2455 D		

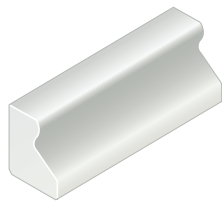


Trief Cadet GST1A

Key components and quadrants

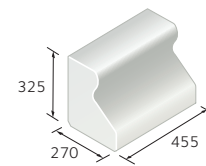
Trief Cadet kerb units for urban areas

The smaller Trief Cadet has been designed for use within lower speed urban areas where the size of the larger Trief units may not suit the surrounding urban environment and pedestrian movement.



GST1A Standard kerb unit 914mm

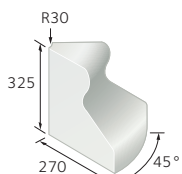
	Wt (kg)
Standard: GST1A914	152
Granite: GST1A914G	180
Exposed: GST1A914E	152



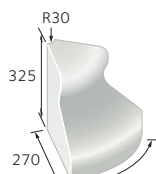
GST1A Half kerb unit 455mm

	Wt (kg)
Standard: GST1A455	70
Granite: GST1A455G	90
Exposed: GST1A455E	70

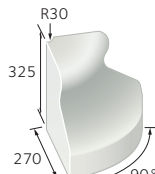
Trief Cadet quadrants



**45° External
300mm radius**



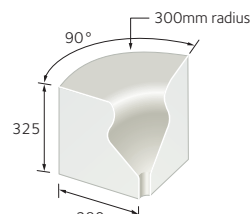
**60° External
300mm radius**



**90° External
300mm radius**

GST1A External quadrants

	45°	Wt (kg)	60°	Wt (kg)	90°	Wt (kg)
Concrete: GST1AQ45E	18		GST1AQ60E	24	GST1AQ90E	36
Granite: GST1AQ45EG	21		GST1AQ60EG	28	GST1AQ90EG	43
Exposed: GST1AQ45EE	18		GST1AQ60EE	24	GST1AQ90EE	36



90° Internal

GST1A Internal quadrants

	Wt (kg)
Standard: GST1AQ90I	46
Granite: GST1AQ90IG	55
Exposed: GST1AQ90IE	46



Clifton Suspension Bridge, Bristol



Trief Cadet GST1A Kerb at Coventry

Trief Tapers

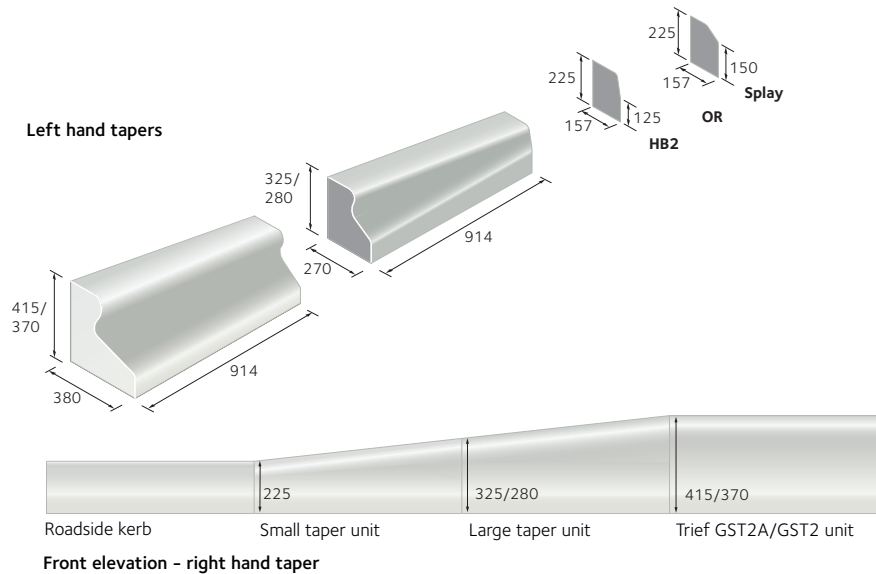
TRIEF TAPERS

Trief to standard kerb tapers

The tapering Trief Kerb profile to normal roadside kerb is completed in two units.

The Trief Kerb is designed to match both British Standard HB2 and Splay roadside kerbs.

The front face of the Trief kerb does not alter the roadside line of standard kerbs, but is built into the footway instead.



GST2A and GST2 Taper left hand

	GST2A	Wt (kg)	GST2	Wt (kg)
Large taper unit left hand				
Concrete:	GST2AL2	177	GST2L2	146
Granite:	GST2AL2G	210	GST2L2G	173
Exposed:	GST2AL2E	177	GST2L2E	146
Height mm:	down to 325 x 270mm		down to 280 x 270mm	

Small taper unit left hand to HB2

	GST2A	Wt (kg)	GST2	Wt (kg)
Concrete:	GST2AL1	108	GST2L1	89
Granite:	GST2AL1G	128	GST2L1G	106
Exposed:	GST2AL1E	108	GST2L1E	89
Height mm:	down to 225 x 157mm		down to 160 x 157mm	

Small taper unit left hand to splay kerb

	GST2A	Wt (kg)	GST2	Wt (kg)
Concrete:	GST2AL1S	104	GST2L1S	85
Granite:	GST2AL1SG	124	GST2L1SG	102
Exposed:	GST2AL1SE	104	GST2L1SE	85
Height mm:	down to 225 x 157mm		down to 160 x 157mm	

GST2A and GST2 Taper right hand

	GST2A	Wt (kg)	GST2	Wt (kg)
Large taper unit right hand				
Concrete:	GST2AR2	177	GST2R2	146
Granite:	GST2AR2G	210	GST2R2G	173
Exposed:	GST2AR2E	177	GST2R2E	146
Height mm:	down to 325 x 270mm		down to 280 x 270mm	

Small taper unit right hand to HB2

	GST2A	Wt (kg)	GST2	Wt (kg)
Concrete:	GST2AR1	108	GST2R1	89
Granite:	GST2AR1G	128	GST2R1G	106
Exposed:	GST2AR1E	108	GST2R1E	89
Height mm:	down to 225 x 157mm		down to 160 x 157mm	

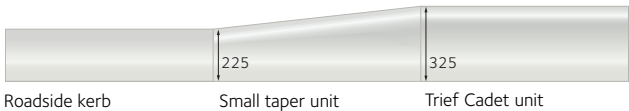
Small taper unit right hand to splay kerb

	GST2A	Wt (kg)	GST2	Wt (kg)
Concrete:	GS2AR1S	104	GS2R1S	85
Granite:	GS2AR1SG	124	GS2R1SG	102
Exposed:	GS2AR1SE	104	GS2R1SE	85
Height mm:	down to 225 x 157mm		down to 160 x 157mm	

Trief Cadet tapers

Trief Cadet tapers are achieved using the smaller (GST2A left hand or right hand) tapered element, as detailed above.

They are available with British Standard HB2 or Splay profile.

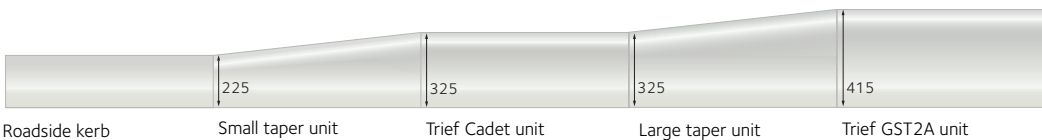


Front elevation - right hand taper



Trief double taper

Trief tapers are designed to be able to integrate both Trief (GST2A) and Trief Cadet (GST1A) systems where appropriate.



Front elevation - right hand taper

Trief radial kerbs

The range of Trief radial units offers the ultimate in design flexibility by allowing an almost infinite degree of configuration and curvature permutations.

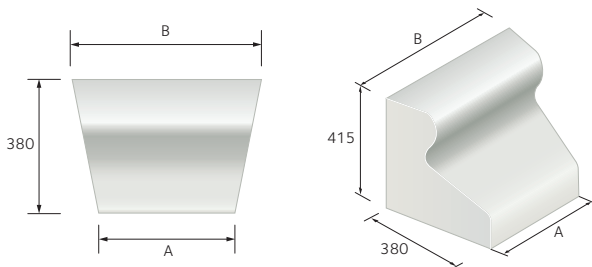
The tables below and chart opposite show the range of radius options available using standard Trief radius components.

Bespoke options are also available on request.



Trief GST2A granite radial components used to create a bespoke kerb curvature

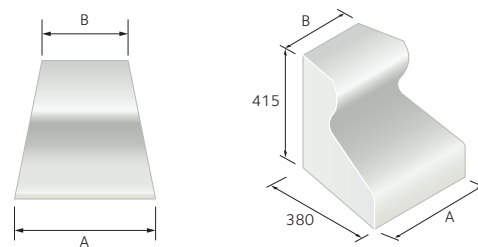
Typical internal radius



Internal radii

	Width (mm)	Length (mm) A	B	Height (mm)	Wt (kg)
Trief Kerb GST2A 1.0m internal radius					
Concrete: GST2A1IR	380	387	538	415	116
Granite: GST2A1IRG					137
Exposed: GST2A1IRE					116
Trief Kerb GST2A 1.2m internal radius					
Concrete: GST2A1.2IR	380	465	616	415	135
Granite: GST2A1.2IRG					160
Exposed: GST2A1.2IRE					135
Trief Kerb GST2A 1.5m internal radius					
Concrete: GST2A1.5IR	380	386	486	415	108
Granite: GST2A1.5IRG					128
Exposed: GST2A1.5IRE					108
Trief Kerb GST2A 3.0m internal radius					
Concrete: GST2A3IR	380	582	657	415	151
Granite: GST2A3IRG					179
Exposed: GST2A3IRE					151
Trief Kerb GST2A 4.5m internal radius					
Concrete: GST2A4.5IR	380	700	760	415	177
Granite: GST2A4.5IRG					210
Exposed: GST2A4.5IRE					177
Trief Kerb GST2A 6m internal radius					
Concrete: GST2A6IR	380	779	829	415	195
Granite: GST2A6IRG					231
Exposed: GST2A6IRE					195

Typical external radius



External radii

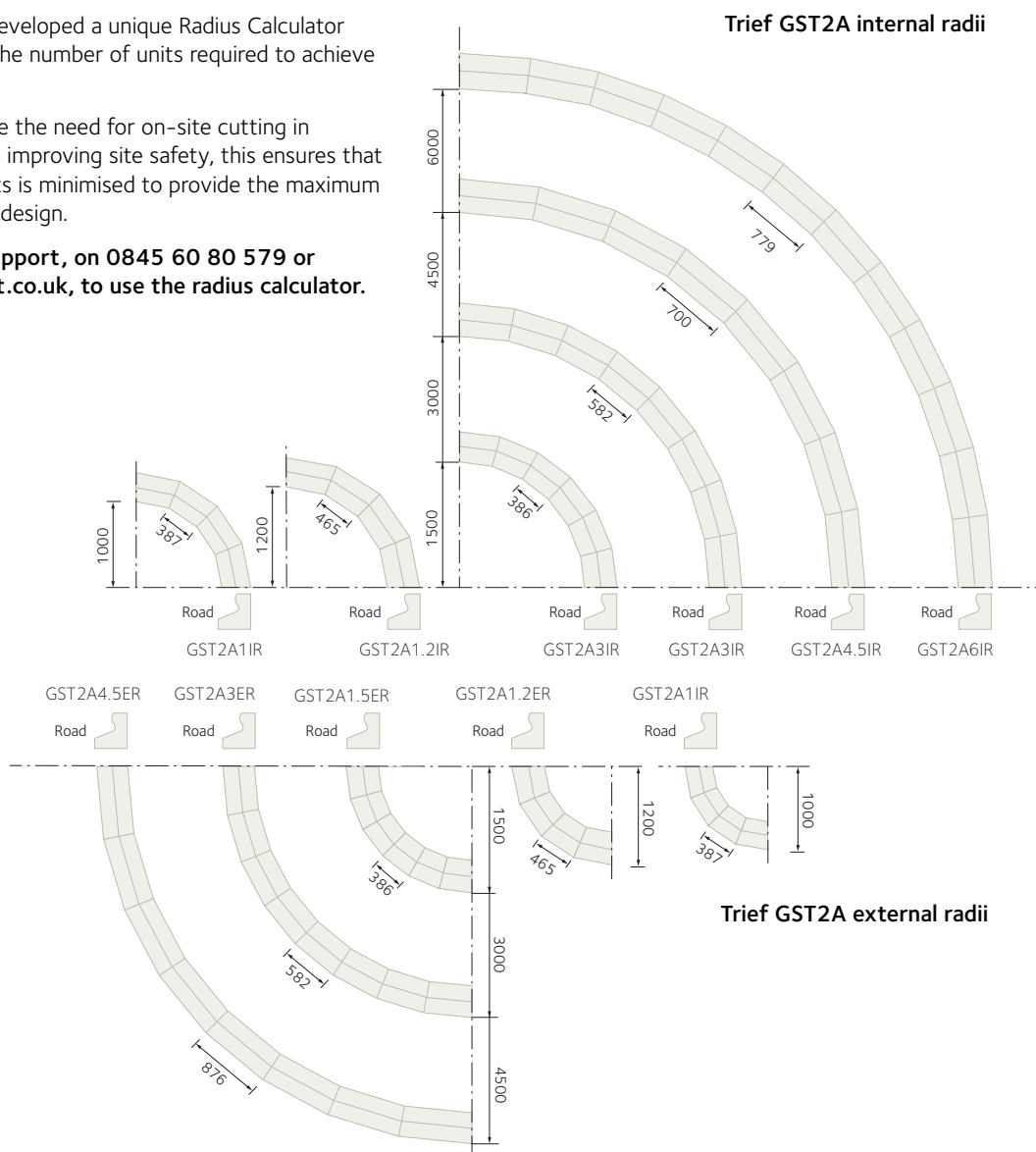
	Width (mm)	Length (mm) A	B	Height (mm)	Wt (kg)
Trief Kerb GST2A 1.0m external radius					
Concrete: GST2A1ER	380	387	236	415	71
Granite: GST2A1ERG					84
Exposed: GST2A1ERE					71
Trief Kerb GST2A 1.2m external radius					
Concrete: GST2A1.2ER	380	465	313	415	89
Granite: GST2A1.2ERG					105
Exposed: GST2A1.2ERE					89
Trief Kerb GST2A 1.5m external radius					
Concrete: GST2A1.5ER	380	386	289	415	79
Granite: GST2A1.5ERG					94
Exposed: GST2A1.5ERE					79
Trief Kerb GST2A 3.0m external radius					
Concrete: GST2A3ER	380	582	507	415	130
Granite: GST2A3ERG					154
Exposed: GST2A3ERE					130
Trief Kerb GST2A 4.5m external radius					
Concrete: GST2A4.5ER	380	876	801	415	202
Granite: GST2A4.5ERG					240
Exposed: GST2A4.5ERE					202

Radius calculations

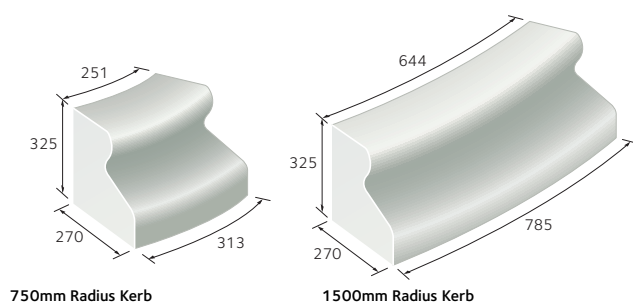
The Brett Design Service has developed a unique Radius Calculator that can specify the type and the number of units required to achieve a specific radius.

Using the calculator can remove the need for on-site cutting in virtually all cases. In addition to improving site safety, this ensures that the gap between individual units is minimised to provide the maximum durability and strength to your design.

Contact Brett Commercial Support, on 0845 60 80 579 or e-mail projectdesigner@brett.co.uk, to use the radius calculator.

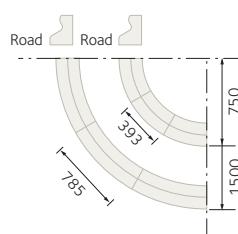


Trief Cadet external radiused components



External radius kerbs

	750mm	Wt (kg)	1500mm	Wt (kg)
Standard:	GST1A75ER	56	GST1A1.5ER	117
Granite:	GST1A75ERG	66	GST1A1.5ERG	139
Exposed:	GST1A75ERE	56	GST1A1.5ERE	117



Trief Cadet external radii

Trief Chevron® and Trief Cadet Chevron®

Visual directional kerbs for traffic management

Brett Trief Chevron and Trief Cadet Chevron kerbs are unique interlocking kerb units that are highly visible from a distance or in low light conditions. The unique chevron design is extremely effective for directional indication at road bends and roundabouts. The units feature the same design, specification and production qualities as the Trief and Trief Cadet units.

TYPICAL USES

Trief and Trief Cadet Chevron kerbs are ideal for roundabouts, where the visibility of the markings and the physical presence of the unit both guide and re-direct drivers within the carriageway.

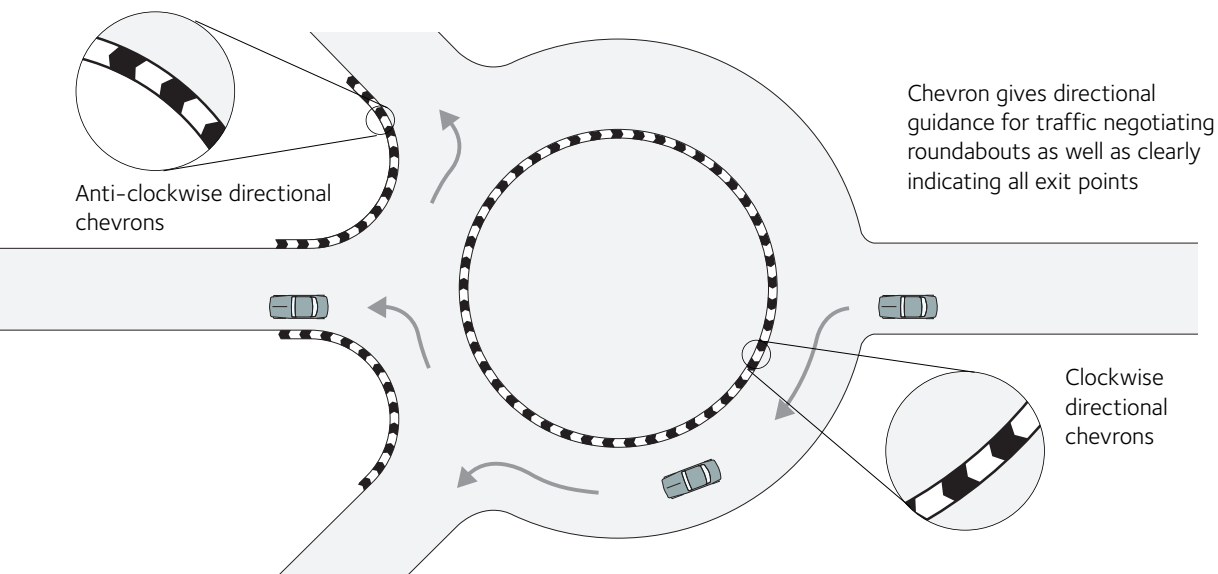
FINISHES

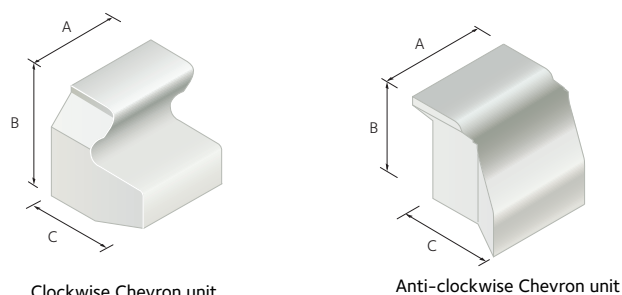
Trief and Trief Cadet Chevron kerbs are available in a choice of two surface finishes:

- Coloured, which has a non-reflective painted finish. Black and white are standard – other colours available on request
- Reflective, which use Ballotini glass beads in the colour coat to create a reflective finish – again black and white are standard, although other colours are available upon request.

FEATURES AND BENEFITS

- Highly visible chevron units provide information on road navigation from a distance and in low light conditions
- Design prevents vehicles from deliberately or accidentally leaving the carriageway
- Protects people, infrastructure and landscaping by containing vehicles within the carriageway
- Controls traffic flows when used as part of traffic management or calming design
- Most shapes or sizes of roundabout or curves can be achieved
- Comes in clockwise and anti-clockwise units to assist with traffic management and calming measures, as shown below
- Simple design requires minimal maintenance and repair compared to other directional indicators



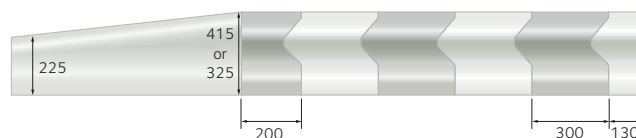


Clockwise Chevron unit

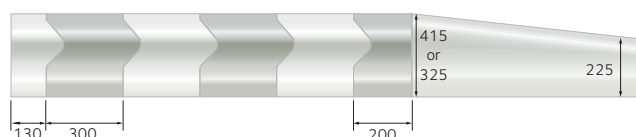
Anti-clockwise Chevron unit

Trief and Trief Cadet Chevrons

Dimensions	A	B	C
Trief GST2A Chevron	300	415	380
Trief Cadet GST1A Chevron	300	325	270



Front elevation with clockwise directional indication



Front elevation with anti-clockwise directional indication

Trief and Trief Cadet Chevron specification tables

Trief Chevron and Trief Cadet Chevron Kerb units are available in both clockwise and anti-clockwise units to assist with traffic management and calming measures in a wide range of situations.

Trief Chevron

			Wt (kg)
Chevron Clockwise	Black reflective	GST2ACCBFRF	72
	Black resin	GST2ACCBMR	
	White reflective	GST2ACCWRF	
	White resin	GST2ACCWMR	
Chevron Clockwise Stop End Left hand	Black reflective	GST2ACCLBRF	44
	Black resin	GST2ACCLBRM	
	White reflective	GST2ACCLWRF	
	White resin	GST2ACCLWMR	
Chevron Clockwise Stop End Right hand	Black reflective	GST2ACCRBRF	44
	Black resin	GST2ACCRBRM	
	White reflective	GST2ACCRWRF	
	White resin	GST2ACCRWMR	
Chevron Anti-Clockwise	Black reflective	GST2ACABRF	72
	Black resin	GST2ACABRM	
	White reflective	GST2ACAWRF	
	White resin	GST2ACAWMR	
Chevron Anti-Clockwise Stop End Left hand	Black reflective	GST2ACALBRF	44
	Black resin	GST2ACALBRM	
	White reflective	GST2ACALWRF	
	White resin	GST2ACALWMR	
Chevron Anti-Clockwise Stop End Right hand	Black reflective	GST2ACACBRF	44
	Black resin	GST2ACACBRM	
	White reflective	GST2ACACWRF	
	White resin	GST2ACACWMR	

Trief Cadet Chevron

			Wt (kg)
Chevron Clockwise	Black reflective	GST1ACCBFRF	49
	Black resin	GST1ACCBMR	
	White reflective	GST1ACCWRF	
	White resin	GST1ACCWMR	
Chevron Clockwise Stop End Left hand	Black reflective	GST1ACCLBRF	30
	Black resin	GST1ACCLBRM	
	White reflective	GST1ACCLWRF	
	White resin	GST1ACCLWMR	
Chevron Clockwise Stop End Right hand	Black reflective	GST1ACCRBRF	30
	Black resin	GST1ACCRBRM	
	White reflective	GST1ACCRWRF	
	White resin	GST1ACCRWMR	
Chevron Anti-Clockwise	Black reflective	GST1ACABRF	49
	Black resin	GST1ACABRM	
	White reflective	GST1ACAWRF	
	White resin	GST1ACAWMR	
Chevron Anti-Clockwise Stop End Left hand	Black reflective	GST1ACALBRF	30
	Black resin	GST1ACALBRM	
	White reflective	GST1ACALWRF	
	White resin	GST1ACALWMR	
Chevron Anti-Clockwise Stop End Right hand	Black reflective	GST1ACACBRF	30
	Black resin	GST1ACACBRM	
	White reflective	GST1ACACWRF	
	White resin	GST1ACACWMR	

Trief: design scope

Bespoke options

The proven ability to manufacture and supply bespoke products made Brett an obvious choice as a supplier of paving and kerbing (Olympic venues) to the London 2012 Games where both Trief and Kassel products were supplied to the main Olympic Park.

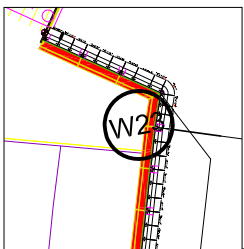
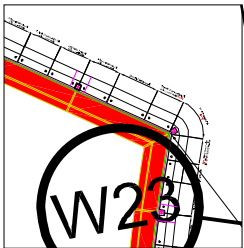
Trief design service: call 0845 60 80 579

Brett offer a full Trief design service to assist in maximising safety, practical layout and aesthetic issues. We are able to offer design advice or full installation design, calculate quantities and provide detailed installation diagrams. We also design and produce bespoke units for specific projects.

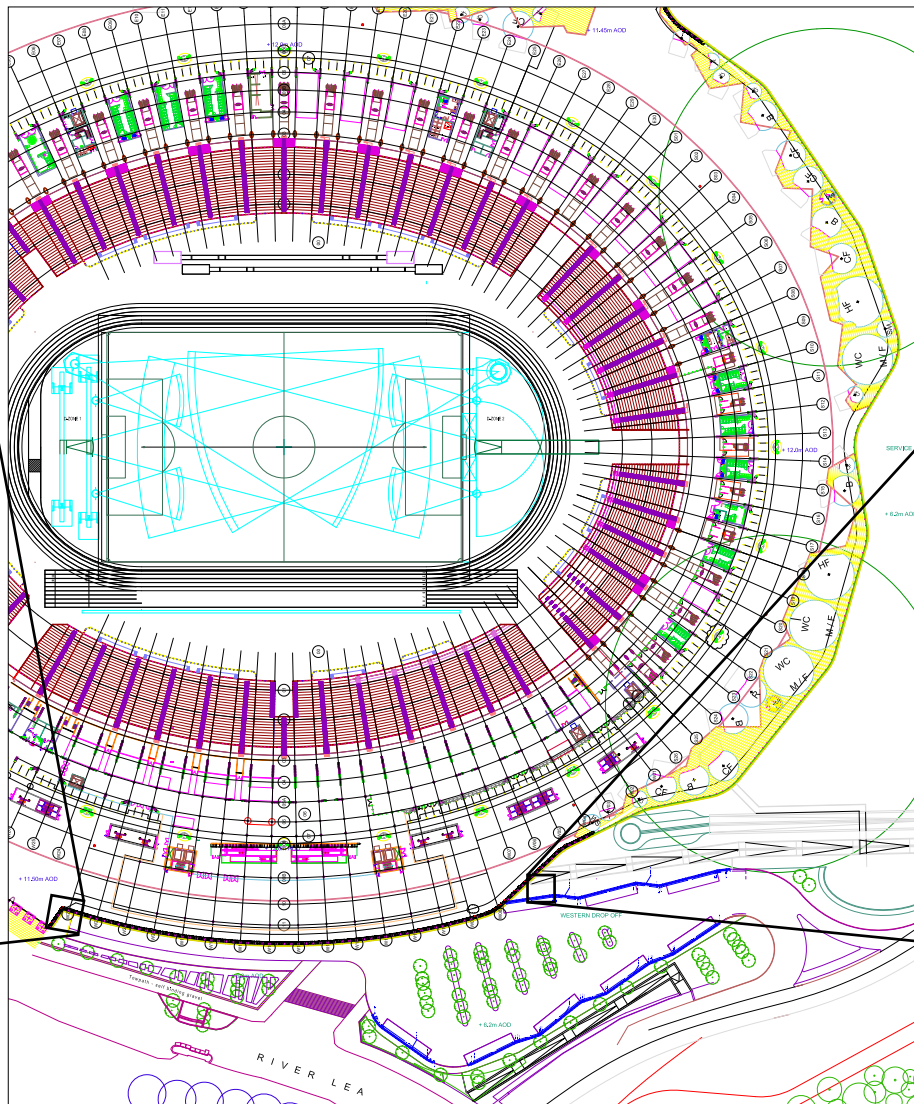
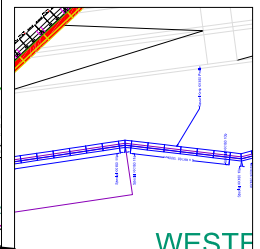
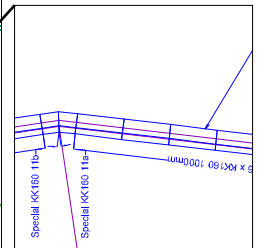
Effective design also enables the minimisation of on-site cutting, which can significantly improve site safety as well as reducing construction waste.



Trief kerbs



Kassel kerbs



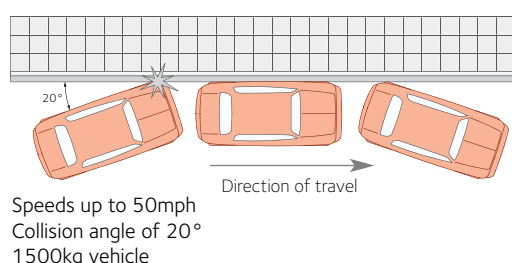
Trief: independently tested

Independently tested to BS EN 1317-2



Trief has now been in service and protecting our infrastructure for over 50 years. Modern testing now proves that it is still one of the most cost-effective redirectional kerb system available on the market.

The Trief GST2A kerb has been tested by the Transport Research Laboratory (TRL) against BS EN 1317-2 Road Restraint Systems, and proven to pass. The test consists of a 1500 kg passenger vehicle hitting the kerb at a speed of 80 kmh and at an angle of 20°. In order to pass the test, the vehicle must be safely redirected to protect pedestrians and other road users.



The TRL Report (Reference No. TRL068) concluded that the Trief GST2A kerb fully complied with the acceptance criteria for the TB31 test with an 'A' rating for impact severity level.

The 'A' rating (out of A, B and C) is defined within the standard as affording the greatest level of safety for the occupant of the errant vehicle than the other two classifications.

Similarly, when it comes to protecting pedestrians and structures, the test report found that, during the entire test sequence, none of the wheels of the vehicle passed over or under the safety barrier.

These results are further proof that the Trief kerb system remains at the forefront of passive safety systems for all road users.

Find out more by visiting www.brettpaving.co.uk where a video of the test as well as a copy of the full test report can be downloaded.

Summary of Trief dynamic impact testing

When designing for Highway Agency or similar projects it is a requirement of the design procedure that the designer must have (and state) the following information summary:

Testing organisation	Transport Road Laboratory (TRL)
Date of test	17 July 2012
Test method	BS EN 1317, parts 1 & 2
Vehicle impact test description	TB31
Dynamic deflection	0.0m
Permanent deflection	0.0m
Working width	1.38m (class W5, the width of the system)
Impact severity level	'A' rating
Containment level	Normal containment N1



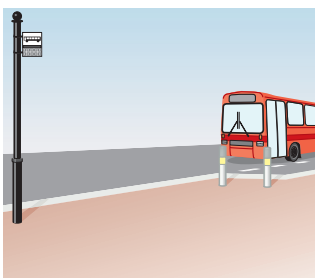
Kassel[®] kerb

Specialist bus boarding kerb for safe and easy passenger access

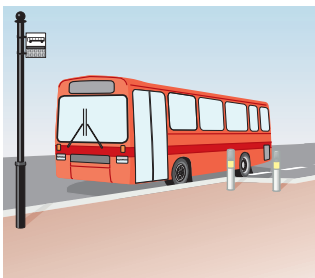
A proven advance in public transport access and convenience, Kassel kerb offers a unique solution for bus docking by providing a reduced gap between pavement and the bus platform. The results are safer, faster and easier passenger access. This is particularly true for wheelchair and pushchair access, providing a more efficient and accessible community transport service.

The unique profile of the Brett Kassel kerb, with its 75° face and bottom end radius, is designed to minimise tyre wear when buses are pulling into the bus stop, thereby reducing tyre replacement costs for bus operating companies.

How to achieve the optimal bus stopping position

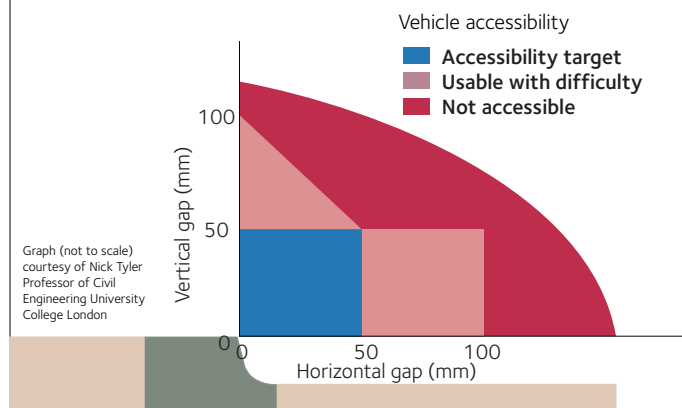


1. The bus driver first starts to position the bus 50m out from the bus stop.



2. The driver steers the bus onto the Kassel kerb at a gentle angle so that the tyre of the bus 'kisses the kerb'. The Kassel kerb then guides the bus into the optimal position for passenger boarding and alighting.

3. The unique Kassel kerb profile and smooth concrete finish steers the bus along the face of the bus stop into the optimal stopping position without damaging the tyres. The optimal stopping position reduces the gap to less than 50mm providing easy and safe access for all passengers.



Features and benefits

- Easy, safe and quick access for all passengers
- Disability Discrimination Act (DDA) compliant providing enhanced safety for disabled, elderly or visually impaired passengers and those with pushchairs, without delays
- Tactile diamond-shaped top surface for increased passenger slip resistance
- Clearly demarcates the area of a bus stop
- Available in two heights to provide a vertical/horizontal gap of less than 50mm for improved passenger access and safety
- Guides vehicle into optimum stopping position parallel with the kerb
- Unique, smooth concave kerb profile reduces tyre wear
- Ideal for shared bus and low-floor tram stops
- Available in a wide range of colours and textures from either cast concrete or cut granite to suit your design requirements
- A range of quadrant, transition and radial units are available to create comprehensive bus stop or station solutions
- Single piece product design provides greater durability than 'built-up' systems
- Compatible with Brett's tactile, flag and concrete block paving ranges



Kassel Kerb guides the bus into an optimal stopping position reducing the boarding gap to less than 50mm



Kassel Kerb provides safe and easy access for all passengers

Tactile paving
Kassel Kerbs are complemented by a range of tactile flag pavings to give comprehensive pedestrian and disabled safety approach



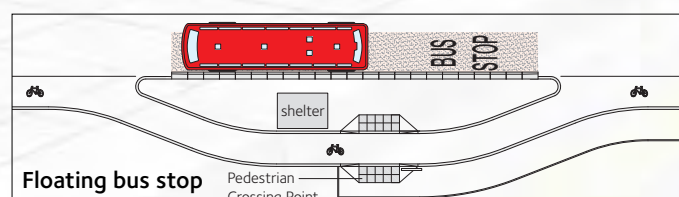
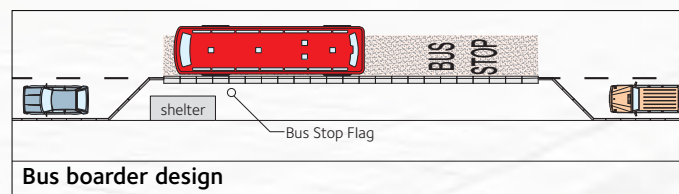
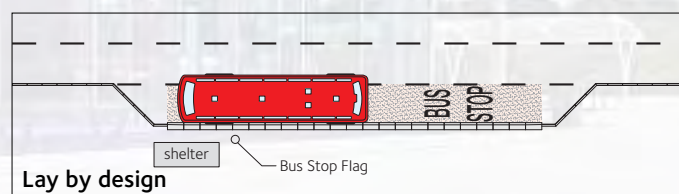
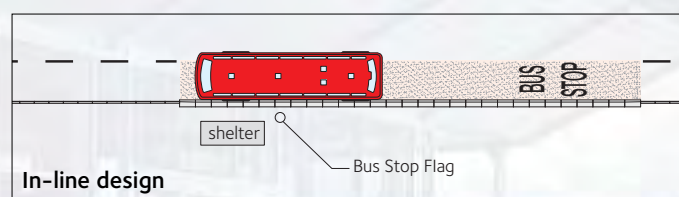
Visit www.brettpaving.co.uk to see the driver training video for Kassel Kerbs



Bus stop design

Kassel kerb offers a unique performance at bus stops, stations and depots. However, to obtain maximum benefit, it is important to consider the broader design. Aspects for consideration include:

- Location
- Layout (i.e. inline, lay-by, bus boarder or flocking bus stops)
- Length
- Shelters, information stands and street furniture
- Boarding points, pavement traffic, queueing areas
- Paving
- Road markings
- Alignment
- Period of use – lighting
- Pedestrian access



Kassel® kerb key components

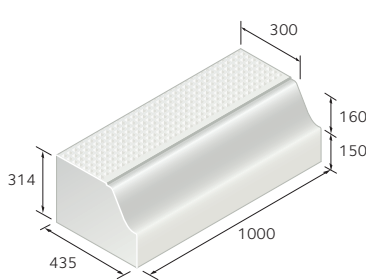
Kassel kerb range

The Brett Kassel kerb system is comprised of a range of components, including quadrants, flat blocks, ramps, as well as radial and transition kerbs. These allow the design of a wide range of options to address site constraints and safety considerations. Kassel kerb units are also available in a wide range of natural granite colours. The granite units feature the same design properties as the standard concrete units.

The product specification tables provide all of the information necessary for specifying and ordering Brett Kassel kerbs.

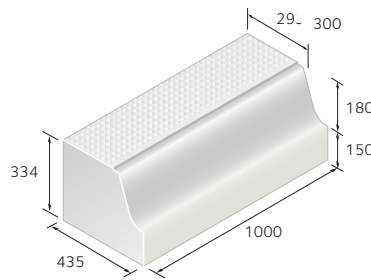
160mm and 180mm standard kerbs

Both standard sizes permit a maximum 50mm gap between kerb and bus. The 180mm unit provides increased height and is ideal for non-hydraulic buses. Whereas the 160mm unit is ideal for hydraulic buses where the boarding platform can be lowered to ease access.



Standard Kerb

160mm unit		Wt (kg)
Concrete:	KK601000	274
Granite:	KK601000G	325

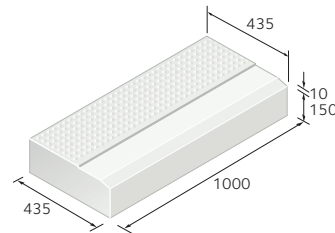


Standard Kerb

180mm unit		Wt (kg)
Concrete:	KK801000	292
Granite:	KK801000G	346

Flat blocks

Flat blocks can be used with both 160 and 180mm Kassel ramps to provide crossing point for pedestrians when used with a ramp set.

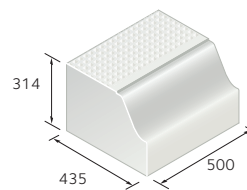


Flat Blocks

		Wt (kg)
Concrete:	KKFB	163
Granite:	KKFBG	193

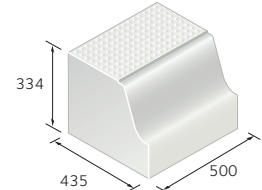
Half kerbs

Both the 160mm and the 180mm units are available in 500mm lengths to help reduce the need for on-site cutting.



Half Kerb

160mm unit		Wt (kg)
Concrete:	KK60500	137
Granite:	KK60500G	163

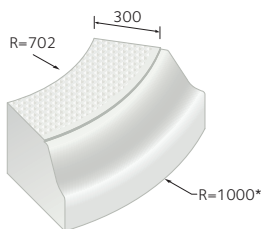


Half Kerb

180mm unit		Wt (kg)
Concrete:	KK80500	146
Granite:	KK80500G	173

Radii and quadrants

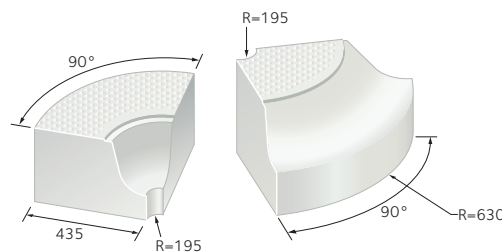
A range of components allowing the designer to produce a number curved kerb configurations.



45° quadrant external

160mm unit		Wt (kg)
Concrete:	KK60Q45E	248
Granite:	KK60Q45EG	294

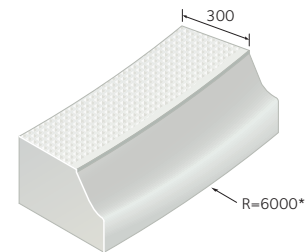
180mm unit		Wt (kg)
Concrete:	KK80Q45E	268
Granite:	KK80Q45EG	318



90° quadrant - internal or external

160mm unit	Internal	External	Wt (kg)
Concrete:	KK60Q90I	KK60Q90E	188
Granite:	KK60Q90IG	KK60Q90EG	223

180mm unit			
Concrete:	KK80Q90I	KK80Q90E	205
Granite:	KK80Q90IG	KK80Q90EG	243



Radius kerb 3 or 6m (external or internal)

3m Radius Kerbs			Wt (kg)
160mm unit	Internal	External	
Concrete:	KK603IR	KK603ER	279
Granite:	KK603IRG	KK603ERG	331

180mm unit			
Concrete:	KK803IR	KK803ER	298
Granite:	KK803IRG	KK803ERG	353

6m Radius Kerbs			Wt (kg)
160mm unit	Internal	External	
Concrete:	KK606IR	KK606ER	279
Granite:	KK606IRG	KK606ERG	331

180mm unit			
Concrete:	KK806IR	KK806ER	298
Granite:	KK806IRG	KK806ERG	353

Notes: All granite kerb weights are approximate and are based on Silver Grey Granite. Precise weight information can be provided at time of quotation. All dimensions in mm.

Kassel® Kerb transitions and ramps

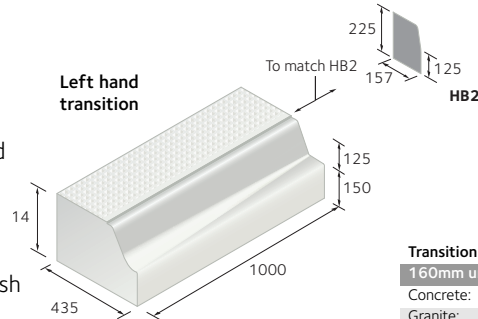
Transition units and Ramp sets

These units create a seamless transition between standard 160mm or 180mm units and British Standard HB2 kerbs, whilst Ramp sets create a transition to the flat block.

Transition to British Standard HB2 kerbs

Transition kerbs taper from a Kassel kerb unit to a British Standard HB2 kerb with an upstand of 125mm. If the existing kerbs have been laid at a different height, the kerbs abutting the Kassel kerb transitions should be re-adjusted to the appropriate level and laid with the face in-line with the kerb.

In all cases, the 'toe' of the Kassel kerb unit should be flush with the surface of the road so that the weight of the bus on the Kassel kerb unit prevents the unit from moving.



Transition kerbs

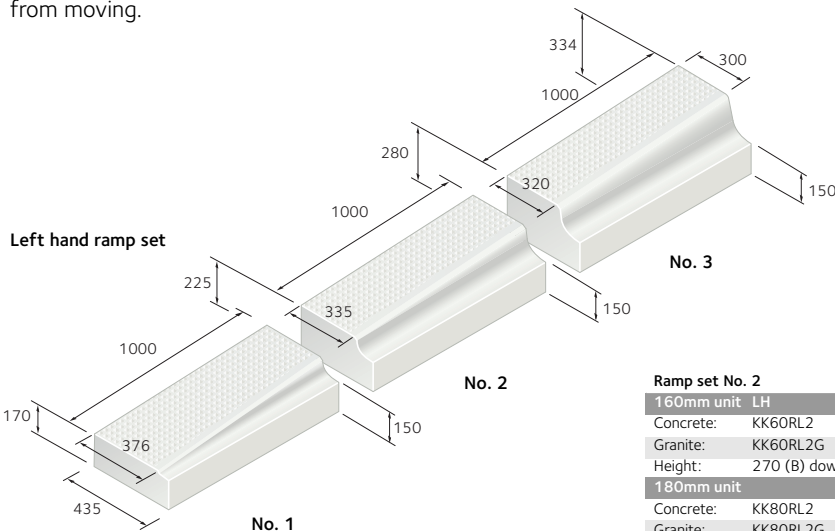
160mm unit	LH	RH	Wt (kg)
Concrete:	KK60TLH	KK60TRH	265
Granite:	KK60TLHG	KK60TRHG	310
Height:	314 (A) down to 275mm		

180mm unit			
Concrete:	KK80TLH	KK80TRH	271
Granite:	KK80TLHG	KK80TRHG	321
Height:	334 (A) down to 275mm		



Roadside kerb Transition unit Standard units

Front elevation - right hand transition



Ramp set No. 3

160mm unit	LH	RH	Wt (kg)
Concrete:	KK60RL3	KK60RR3	164
Granite:	KK60RL3G	KK60RR3G	194
Height:	215 (C) down to 170mm (D)		

180mm unit			
Concrete:	KK80RL3	KK80RR3	182
Granite:	KK80RL3G	KK80RR3G	216
Height:	225 (C) down to 170mm (D)		

Ramp set No. 2

160mm unit	LH	RH	Wt (kg)
Concrete:	KK60RL2	KK60RR2	218
Granite:	KK60RL2G	KK60RR2G	259
Height:	270 (B) down to 215mm (C)		

180mm unit			
Concrete:	KK80RL2	KK80RR2	236
Granite:	KK80RL2G	KK80RR2G	280
Height:	280 (B) down to 225mm (C)		

Ramp set No. 1

160mm unit	LH	RH	Wt (kg)
Concrete:	KK60RL1	KK60RR1	257
Granite:	KK60RL1G	KK60RR1G	305
Height:	314 (A) down to 270mm (B)		

180mm unit			
Concrete:	KK80RL1	KK80RR1	275
Granite:	KK80RL1G	KK80RR1G	326
Height:	A = 334 down to B = 280mm		



Front elevation - right hand ramp set

Slimline Kassel® kerb

Slimline kerb system ideal for retrofit applications

SLIMLINE KASSEL KERB SYSTEM

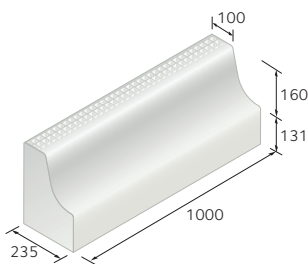
Brett Slimline Kassel kerbs are ideally suited for retro-fit applications where designers wish to minimise the disruption to the existing kerb line and require minimal excavation prior to installation.

The use of the Diamond Paving flag from Brett Landscaping can provide the same tactile surface as would be achieved using conventional Kassel kerbs, see page 22.

The unique Slimline kerb and its transition units match those of the standard Kassel profile, enabling the system to be simply integrated into existing kerb configurations, so minimising time, cost of installation and disruption to local traffic.

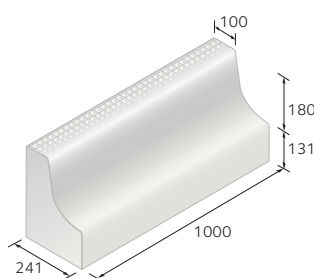
160mm and 180mm Slimline Kassel standard units

Both standard sizes permit maximum 50mm gap between kerb and bus. The 180mm unit gives increased height, making it ideal for non-hydraulic buses.



Slimline Kassel standard kerb units

160mm unit	Wt (kg)
Concrete: KKSL601000	103
Granite: KKSL601000G	122

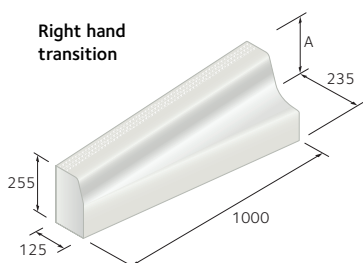


Slimline Kassel standard kerb units

180mm unit	Wt (kg)
Concrete: KKSL801000	128
Granite: KKSL801000G	152

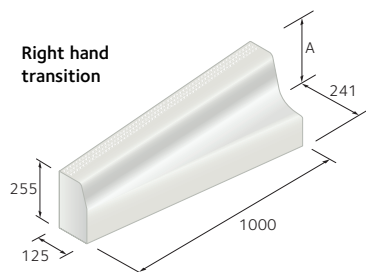
160mm and 180mm Slimline Kassel transition units

These units are used to create a seamless transition from Slimline Kassel Kerb units to British Standard HB2 kerb.



Slimline Kassel transition kerb units

160mm unit	LH	RH	Wt (kg)
Concrete:	KKSL60TLH	KKSL60TRH	99
Granite:	KKSL60TLHG	KKSL60TRHG	117
Height:	A = 291 down to B = 255mm		



Slimline Kassel transition kerb units

180mm unit	LH	RH	Wt (kg)
Concrete:	KKSL80TLH	KKSL80TRH	103
Granite:	KKSL80TLHG	KKSL80TRHG	122
Height:	A = 311 down to B = 255mm		

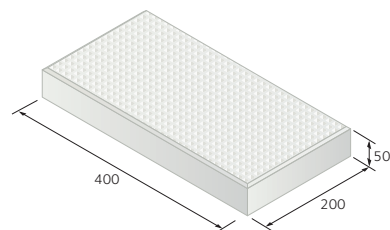


Diamond paving

Ideal for integrating into bus stops when the Brett Slimline Kassel system has been specified.

The Brett Diamond Paving solution provides the benefit of the textured Kassel surface without disturbing the existing kerb line.

When using Brett Diamond Paving, it is possible to pre-drill units to install LED ground lighting to provide enhanced bus stop safety for passengers in poor light conditions.



Roadside kerb Slimline transition unit Standard Slimline unit

Front elevation - right hand taper



Trief® and Kassel® design and scheduling

Brett can offer bespoke layout designs for kerb and highway projects. This can include incorporating special mouldings and uniquely sized units that minimise the need for on-site cutting.

Project and schedule drawings as well as the units themselves can be sequentially numbered to make installation as rapid and straightforward as possible.

Our production and scheduling services allow call off and delivery of product in tranches as installation progresses, again ensuring that work proceeds smoothly and quickly.

We can offer extensive installation advice and on-site problem-solving, as well as design assistance in achieving radii and other kerb forms.

CAD drawings of Kassel and Trief Kerb units are available on request from our Technical Design Services team on 0845 60 80 579 or e-mail projectdesigner@brett.co.uk

“Brett Landscaping has been immensely helpful in helping us to devise our bridge protection strategy, both in terms of engineering know-how and customer support. The use of Trief helped us to overcome key challenges on the bridges in question, in order to deliver a cost-effective and fit-for-purpose solution”

Metrolink



Project: Manchester Metrolink
Client: Manchester Council
Product: Trief GST2 Kerbs
Size: N/A

Bridging the safety gap with Trief Kerb

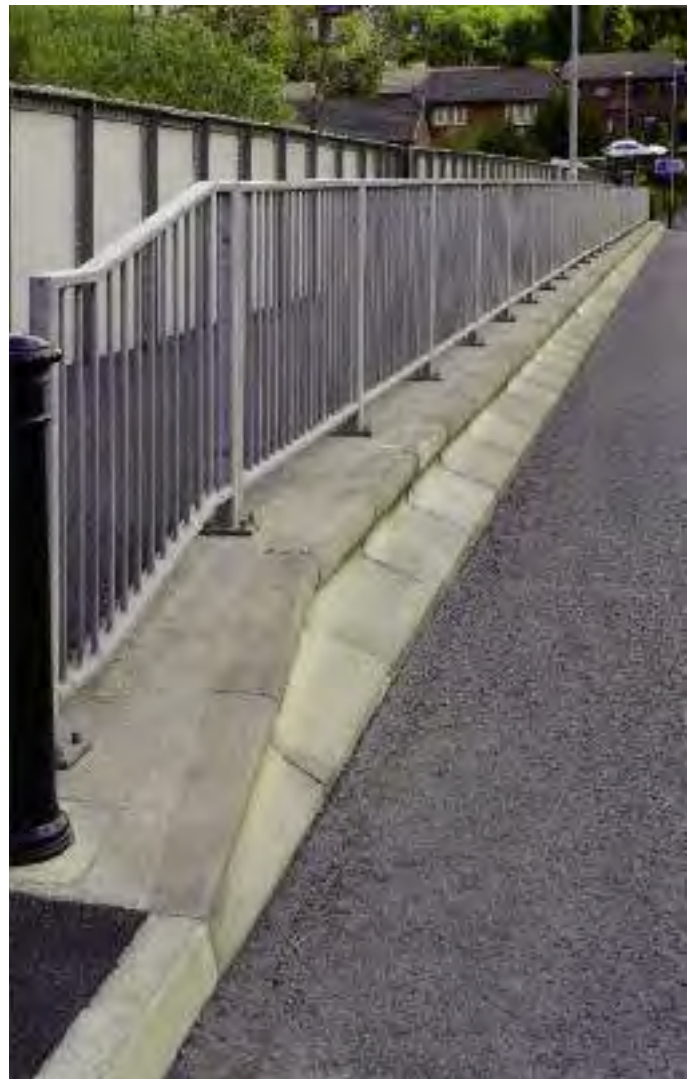
Trief vehicle containment kerbs from Brett Landscaping have been specified to provide protection on bridges as part of Manchester's major Metrolink project.

Safety was a critical element of the bridge design, with enhanced containment required to protect against the risk of vehicles crashing onto bridge parapets and potentially onto the tram lines below. While standard crash barriers have been used where appropriate, there were a number of bridges in the Oldham area with relatively narrow road access, where such barriers would be unduly intrusive.

Selecting a suitable containment kerbing system still required extensive research to find a well-engineered safety kerb that was proven to deliver the required standard of safety – and the unique credentials of Trief made it particularly attractive to the Metrolink team. Trief not only becoming the first of its type to pass the rigorous BS EN 1317-2 test with the highest available A rating for impact severity whilst the containment level was determined as N1.

This proved decisive for Metrolink. “Alone amongst the safety kerb options we researched, Brett Landscaping had successfully sought compliance with BS EN 1317-2. This, combined with its common usage by local highway authorities across Britain, ensured that Trief had by far the best credentials for this project,” confirms Mungo Stacey.

“The decision to use Trief kerbs ensures the optimum balance between vehicular access and protection of the Metrolink infrastructure,” explains Adam Rawling of Laing O'Rourke.





“This is a product that does its job extremely well, and that’s the reason we’ve continued to install it. There isn’t a kerb comparable in its quality.”
Brighton and Hove Council

Project: Lewes Road, Brighton
Client: Brighton and Hove Council
Product: Kassel Kerb
Size: 3.6 miles

Brighton kerbs are right on

The confidence of Brighton and Hove Council, winner of the CIVITAS City of the year 2014 award for clean transport, in the quality of the market leading Kassel bus boarding kerb from Brett Landscaping is underlined by The Lewes Road project – 3.6 miles of Kassel servicing this vital and busy, 24 hour route along Brighton’s academic corridor.

Kassel kerbs have been considered must-have materials by the council, since research conducted at University College London in 1998 concluded that it was the most ‘fit for purpose,’ especially when used with modern low-floor buses. One of the first local authorities to act on the research, Brighton and Hove Council, has now installed Kassel kerbing to enhance passenger access to and from public transport along many of their key routes.

The combination of low-floor buses with Kassel improves access for those with mobility issues such as the disabled, or passengers with young children, while also speeding up journey times. All of which add to an improved public transport experience, and the subsequent goal of encouraging more people to use public transport than drive private cars.

Accordingly, the council has doubled the number of its bus passengers since 1993 and is sustaining a 4-5% growth of users every year with 46.4 million passenger journeys being made in 2014.

“Kassel kerbs play an integral part in that, because, put simply, the materials meet the needs of buses. Installed correctly, the use of these kerbs reduces the requirement for cage markings – the yellow road marks which indicate where a bus should stop – and enables drivers to gauge the perfect stopping location to successfully, and safely drop and collect passengers, without ‘swinging in’.



CIVITAS City of the year 2014





Benefits and design	31
PermCalc	31
Alpha Flow	32
Beta Flow	33
Omega Flow	34
Grass Flow	35
Case studies	36

Permeable paving

Brett Landscaping is a major UK manufacturer of concrete block paving and has been supplying permeable paving to work within Sustainable Drainage Systems (SuDS) for many years.

The result of this is our ability to offer an extensive range of permeable block paving, as well as expertise in the cost effective design and construction of permeable pavements.

When Brett permeable paving blocks are used as surfacing in a permeable pavement they offer excellent source control, with water quickly passing between blocks into the jointing aggregate and sub-base below.

This means that surface water can be intercepted at source and infiltrate through the pavement into ground or drain slowly from the site, or drain next stage of the management train. This avoids significant surface water run off which can trigger flooding events. It also allows for the removal of a significant percentage of pollutants, thus helping to improve the quality of water infiltrating into the ground or draining from site and enhancing amenity.

We are able to offer a range of aesthetic options, as well as integration with other Brett Landscaping products and services, to enable the creation of highly cost effective drainage systems that reduce risk through good design, use of correct materials and good construction practice.



The requirement for permeable paving is driven by the Local Authority Planning Department and their ongoing obligation to deliver effective SuDs, to reduce flood potential and improve water quality.

The increasingly severe flooding events we have seen in recent years drive home the importance of integrating a good sustainable drainage system (SuDS) into new developments – in both the commercial and housebuilding sectors.

Climate change and more frequent extreme events, coupled with the ongoing requirement for high density developments means that our existing drainage infrastructure sometimes can't cope with the increased demands placed upon them. SuDS is recognised as a solution with permeable pavements offering a particularly space-efficient option for developers – a key benefit in projects where space is at a premium.

Brett understands the importance of early engagement in the SuDS design process to help optimise the effectiveness of concrete block permeable paving (CBPP) installed within your project so that the passage through planning is kept straightforward, construction is simplified and costs kept to a minimum. We also understand that the aesthetics of your site are of equal importance and have tailored our solutions to ensure that they will create a visually attractive and durable landscape for your development.

The RIBA Green Overlay for planning recommends that SuDS systems are designed-in from the start of the project. Our knowledge and design expertise are geared to support this process with the know-how, resources and products to assist the developer in designing the best and most cost-effective SuDS solutions:

- PermCalc – see opposite
- CPD Training Events – including RIBA CPD
- One-to-one coaching/training

We can also appreciate, and help to allay, the concerns expressed by Local Authority Highway Engineers regarding the adoption and long term maintenance of permeable pavements.

In particular, tapping in to our expertise and knowledge can help the designer or developer produce better designs and improved design detailing. This helps to ensure improved material selection and the incorporation of good construction practice. This can in turn, reduce any long term risk in adopting permeable pavements meaning that they can offer an ideal solution across a wide range of applications.

It is for this reason that Brett are an ideal partner to help you optimise water control and pollution reduction without sacrificing building space.



PermCalc

Free permeable pavement design software
for SuDS applications in accordance with
BS 7533



PermCalc is a powerful, free to use, online software tool designed to help paving professionals quickly and easily create cost effective permeable pavement solutions for SuDS applications in accordance with BS 7533.

PermCalc saves time, whether designing from first principles, or checking existing designs and makes 'what if' scenarios with multiple variables easy to produce and compare.

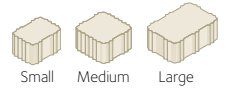
PermCalc is the only design software of its kind which can provide estimated construction costs based on either actual or default costs for each component or construction task.

This estimation facility uniquely extends to costing all the adjacent areas – including impermeably paved areas, kerbs and drain connectors – enabling the designer to quickly determine the total pavement construction cost and hence arrive at the most cost effective solution for their project.

Visit www.brettpaving.co.uk to find out more.

Alpha Flow

Traditional tumbled sett paving



Brett Alpha Flow permeable paving with tumbled edges provides a durable, aesthetically pleasing solution for a wide variety of environments.

Bringing together the aesthetics of Alpha Antique paving with the permeability benefits of 'Flow' products for projects requiring a SuDS solution.

KEY INFORMATION

- Manufactured and tested to BS EN 1338: 2003
- Install in accordance with BS 7533
- Surface permeability 3386 mm/h when tested to BS DD 229: 1996
- 3 standard colours available; others made to order
- 3 plan sizes available
- 2 thicknesses to suit various trafficking requirements
- Complementary kerb range available
- Complementary permeable aggregates available



AUTUMN GOLD (AG)



BRINDLE (BR)



CHARCOAL (CL)

Add AG/BR/CL to specify colour.
For example, the code for an 80mm thick large block in Autumn Gold (AG) would be NLAFL80AG.

Alpha Flow product specification table

Product	Code	Thickness (mm)	Plan size (mm)	No. per m ²	Area (m ²) per pack	No. per pack	Pack weight (kg)
Small	NLAFS60	60	105 x 140	68	10.32	702	1230
Medium	NLAFM60	60	140 x 140	51	10.35	528	1260
Large	NLAFL60	60	210 x 140	34	10.35	352	1260
Small	NLAFS80	80	105 x 140	68	7.50	510	1200
Medium	NLAFM80	80	140 x 140	51	7.53	384	1220
Large	NLAFL80	80	210 x 140	34	7.53	256	1220

All Alpha Flow products are ex stock. Other colours made to order.

Beta Flow

Low chamfer contemporary permeable block paving



Brett Beta Flow permeable paving has been designed to have the same clean-lined aesthetic as conventional Beta paving, but with the added versatility to integrate into a SuDS scheme.

Beta Flow is ideal for use in creating a wide range of designs to enhance any project whilst the pencil edge detailing credits a smoother running surface. This makes it ideal for use in mobility applications or retail outlets where small wheel trolleys are used.

KEY INFORMATION

- Manufactured and tested to BS EN 1338: 2003
- Install in accordance with BS 7533
- Surface permeability 3386 mm/h when tested to BS DD 229: 1996
- Complementary kerb range available
- Complementary permeable aggregates available



BRINDLE (BR)

Beta Flow product specification table

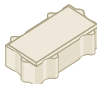
Product	Code	Thickness (mm)	Plan size (mm)	No. per m ²	Area (m ²) per pack	No. per pack	Pack weight (kg)
Large	BFL80BR	80	210 x 140	34	7.53	256	1220

Made to order.



Omega Flow

Traditional rectangular permeable block paving



Standard

Brett Omega Flow comes with a classic rectangular block profile with purpose-designed nibs to optimise permeability and interlock.

Tough and hard-wearing, Omega Flow is also available in herring-bone format for machine lay paving.

KEY INFORMATION

- Manufactured and tested to BS EN 1338: 2003
- Install in accordance with BS 7533
- Surface permeability 4265 mm/h when tested to BS DD 29: 1996
- 5 standard colours available; others made to order
- 2 thicknesses to suit various trafficking requirements
- Complementary kerb range available
- Machine lay options available
- Complementary permeable aggregates available



Add AG/BR/BO/CL/GY to specify colour. For example, the code for a standard 80mm thick block in Burnt Oak (BO) would be OF80BO.



AUTUMN GOLD (AG)



BRINDLE (BR)



NATURAL (GY)



BURNT OAK (BO)



CHARCOAL (CL)

Omega Flow product specification table

Product	Code	Thickness (mm)	Plan size (mm)	No. per m ²	Area (m ²) per pack	No. per pack	Pack weight (kg)
Standard	OF60	60	215 x 115	50	8.08	404	970
Standard	OF80	80	215 x 115	50	6.16	308	1030

All Omega Flow products are ex stock. Other colours made to order.

Grass Flow

High void permeable paving for occasional traffic areas



Brett Grass Flow can be used in a lightly trafficked permeable pavement, with the joints and filled with permeable aggregate to help combat soil erosion.

Alternatively, Grass Flow can also be used as a grass paver with the joints and voids filled with soil and seeded (design using the TRL method, Structural Design & Pilot scale Trial of Modular Cellular Paving for Greened Safe Havens & Emergency Access Routes – Chaddock and Jones 2007).

KEY INFORMATION

- Manufactured and tested to BS EN 1338: 2003
- Install in accordance with BS 7533
- Surface permeability 2,575mm/hr when tested to BS DD 29: 1996
- Single standard plan size available
- Available in 80mm
- Machine lay option available
- Complementary permeable aggregates available



NATURAL (GY) WITH AGGREGATE



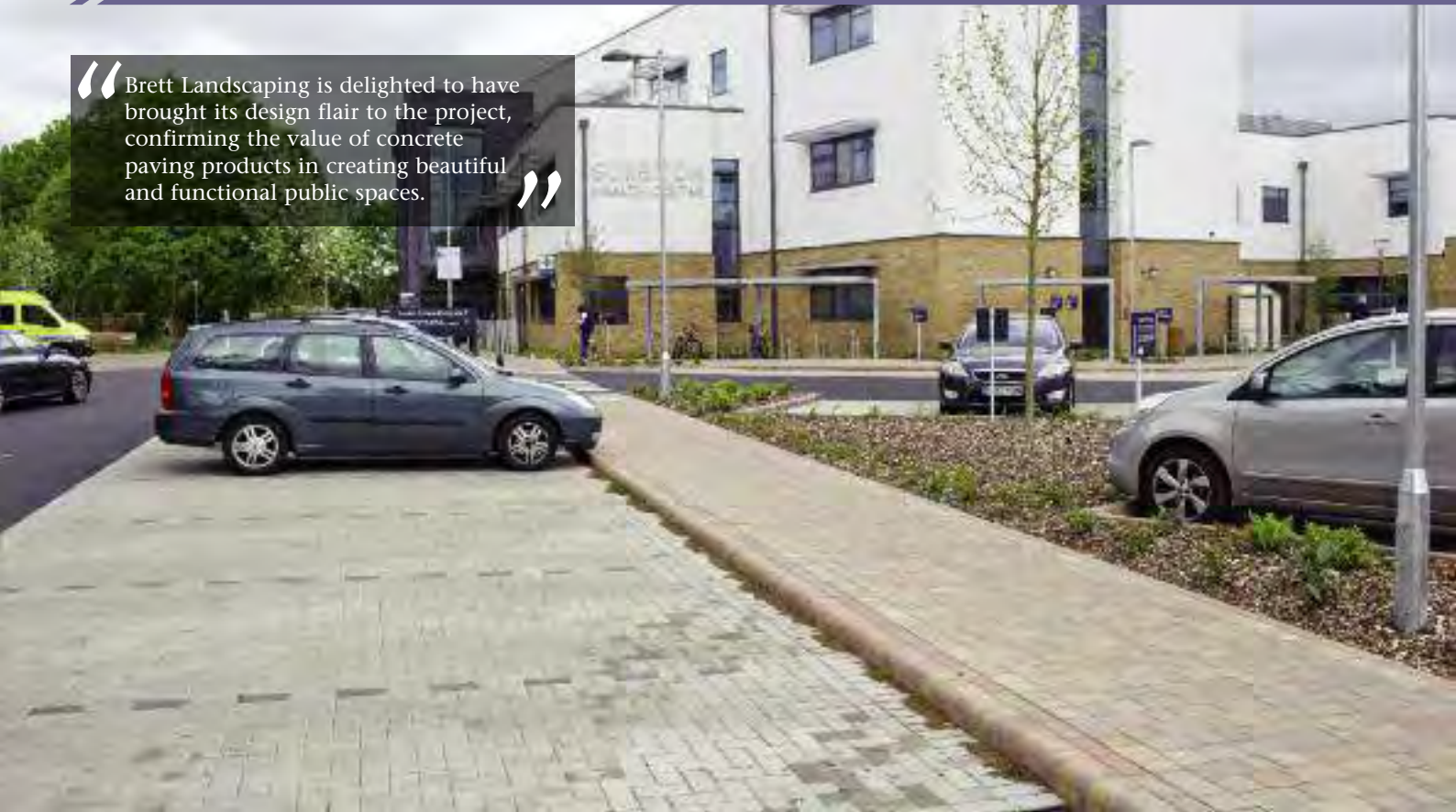
NATURAL (GY) WITH GRASS

Grass Flow product specification table

Product	Code	Thickness (mm)	Plan size (mm)	No. per m ²	Area (m ²) per pack	No. per pack	Pack weight (kg)
Standard	XF80GY	80	210 x 141	40	6.75	270	1300

All Grass Flow products are ex stock. Other colours available made to order.

“Brett Landscaping is delighted to have brought its design flair to the project, confirming the value of concrete paving products in creating beautiful and functional public spaces.”



Project: Surbiton Health Centre
Client: Farncombe Construction
Product: Alpha Flow / Omega Flow / Yorktone Kerb
Size: N/A

Surbiton Health Centre

This new development takes into account the site's drainage needs and made best use of the site space by incorporating SuDS.

After initial investigations and various 'what if' alternatives, created using our unique PermCalc permeable paving design and costing software package, Brett Landscaping recommended a combination of Alpha Flow and Omega Flow permeable paving complemented by decorative kerbs. Brett also manufactured a bespoke flat block kerb to deliver the optimum solution for the project's requirements.

The modern design of Brett Alpha Flow permeable paving, which has tumbled edges to provide a durable, aesthetically pleasing solution, together with Omega Flow's classic rectangular block profile, enabled Farncombe Construction to meet the SuDS requirements of the installation without compromising on aesthetic appearance.

During the design process, Brett also suggested redesigning the kerb line and paved areas to make better use of the space, as well as proposing amendments to the original design spec to achieve the best combination of products.

The finished design is intended to help with inspiring patients and pupils. All too often this is regarded as simply about what goes on indoors: in reality, the design of outdoor spaces is widely recognised as helping in the healing process as well as stimulating creativity at school.



See our Omega Flow System Test video, filmed at Sixfields:
www.brettpaving.co.uk/commercial/permeable-paving/omega-flow



Project: Sixfields Leisure and Retail Centre
Client: Northampton Borough Council
Product: Omega Flow
Size: 52,000m ²

The site at Sixfields lies on the outskirts of Northampton and had been derelict since the 1970's when it was used as a landfill site following previous use for gravel extraction. The site also included a sensitive nature reserve containing a unique habitat for wildlife.

The Sixfields development is part of the Northampton Brownfield Initiative – a mixed urban regeneration project containing new housing, a rugby club, football pitch and large car parks, as well as a nature reserve. Sitting on the bank of the River Nene, it was evident from the start that any design had to minimise any future risk of flooding if it was to be viable.

Brett Landscaping advised the client on the advantages of using a sustainable drainage system to minimise the risk of any future flooding on the site. The two main car parks, of 19,000m² and 16,000m² respectively, were both constructed using Omega Flow permeable paving. Additionally, 17,000 m² of roadways linking the car parks were also constructed using Omega Flow.

The finished design allows surface water run-off to pass down into the sub-base providing attenuation before it is released at a constant rate through five outfalls into a brook.

One of the key advantages of permeable paving is that any hydrocarbons and other pollutants are captured in the sub-base where they are then broken down naturally within the permeable pavement construction layers. This removes the need for catch pits and oil interceptors on the site thereby helping to reduce the overall project cost to the client – as well as maximise the available space for development.





Introduction	40
Omega ML	41
Alpha ML	41
Zeta Lock ML	42
Omega Flow ML	43
Grass Flow ML	43

Machine lay paving

An increasing number of both standard and permeable block paving products from Brett can be packaged for machine lay. Brett Landscaping has worked to ensure that cluster sizes are optimised according to block dimensions to maximise laying efficiency.



Machine lay paving

Rapid installation for concrete block paving

Using machine lay technology to install concrete block paving offers a number of advantages during the installation process. In particular, laying speeds are significantly increased whilst the pre-set cluster patterns provide excellent levels of consistency, this being particularly important on larger sites.

Modern methods of installation of concrete block paving can deliver enhanced levels of speed, efficiency and quality over traditional laying methods.



Machine lay clusters specification table

Block	Thickness (mm)	Code	Plan size (mm)	Blocks per m ²	Area (m ²) per pack	Blocks per pack	Cluster size (mm)	Cluster area m ²	Pack weight (kg)
Omega ML									
64 cluster	60	OM60--ML64	200 x 100	50	10.24	512	1273 x 1202	1.28	1395
64 cluster	80	OM80--ML64	200 x 100	50	7.68	384	1273 x 1202	1.28	1391
Alpha ML									
Mixed cluster	60	NLAA60--MLS	mixed	n/a	9.26	378	1225 x 840	1.03	1203
Mixed cluster	80	NLAA80--MLS	mixed	n/a	7.20	294	1225 x 840	1.03	1254
Zeta Lock ML									
48 cluster	80	ZL80--ML	205 x 102.5	48	8.00	384	1300 x 940	1.00	1370
Omega Flow ML									
64 cluster	60	OF60--ML	215 x 115	50	10.24	512	1273 x 1202	1.28	1395
64 cluster	80	OF80--ML	215 x 115	50	7.68	384	1273 x 1202	1.28	1391
Grass Flow ML									
30 cluster	60	XF80--ML	210 x 141	40	6.75	270	1157 x 742	0.89	1300

Notes: All Machine Lay products are made to order

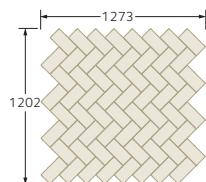
Add two letter colour suffix to specify colour. For example, the code for an Omega Flow ML 80mm thick, large block in Charcoal (CL) would be OF80CLML for where machine lay product is required.



Please visit
www.brettpaving.co.uk/commercial/machine-lay/
 for Technical data sheets containing further
 installation guidance

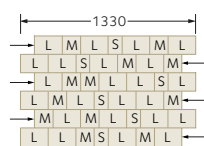
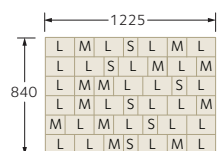
Omega ML

Brett Omega ML comes formatted for machine lay in a 45° cluster of 64 blocks which enables the creation of both 45° and 90° herringbone patterns during installation. With a layer size of 1.28m² Omega ML is available made to order in either 60 or 80mm thickness and a range of colours.



Alpha ML

Brett Alpha ML blocks come in a pre-formatted, 42 block stretcher design to create a random coursed pattern. The cleverly designed interlocking layer avoids a cluster effect, improving installer output.



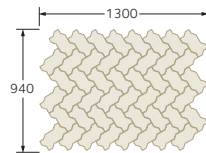
S - small
M - medium
L - large



Machine lay paving

Rapid installation for concrete block paving

Zeta Lock ML



Brett Zeta Lock ML is a sixteen sided block paver incorporating a unique spacer configuration specifically designed to provide the greatest interlock between blocks to give maximum pavement rigidity.

This makes it ideal for use in heavily trafficked areas such as ports, container yards and airports where its ability to be machine laid is ideal for meeting the installation demands of larger commercial sites.

KEY INFORMATION

- Manufactured and tested to BS EN 1338: 2003
- Install in accordance with BS 7533
- 2 standard colours available; others made to order
- Single standard plan size available
- Closure blocks available for abutting a straight edge

Available in a 45° cluster format, Zeta Lock ML can be installed to create both 45° and 90° herringbone patterns suitable for even the most demanding applications.



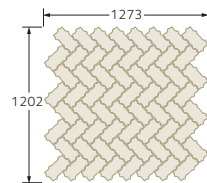
CHARCOAL (CL)



NATURAL (GY)



Omega Flow ML



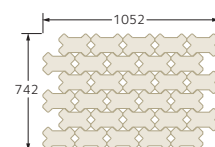
Brett Omega Flow ML is the permeable option of the classic rectangular block paver.

Formatted for machine lay in a 45° cluster of 64 blocks which enables the creation of both 45° and 90° herringbone patterns during installation.

Available with a layer size of 1.28m² in two thicknesses and a range of colours made to order.



Grass Flow ML



Brett Grass Flow ML machine lay block paving comes formatted in stretcher bond to provide enhanced strength and a high speed of installation compared with other grass protection systems.

Alternatively, Grass Flow can also be used as a grass paver with the joints and voids filled soil and seeded.



Safe Handling

Kerbs and flags are heavy objects and will generally require specialist lifting equipment allied to safe handling to ensure a safe working environment.

Brett believes that many potential site handling issues can be overcome by gaining our early involvement at the design stage. This allows us the option to design out on site cutting and unnecessary lifting by tailoring our product delivery to best suit your individual project and site conditions.

SAFE WORKING PRACTICE - LEGISLATION AND GUIDANCE

In 2003, the Health and Safety Executive (HSE) targeted kerb laying as a means of enforcing existing legislation namely the Manual Handling Operations Regulations 1992. This is part of their ongoing strategy to address the high incidence of muscular-skeletal disorders within the construction industry.

One direct result of this initiative was that Interpave, the precast concrete kerb and paving association, produced detailed handling guidance for kerb and flag products. This is designed to further enhance the safe handling, lifting and movement of flag and kerb units and complements the HSE publication incorporating their hierarchy of reducing risk.

As a member of Interpave and a leading supplier of hard landscaping products, Brett is continually investigating and implementing the best handling methodology and technology. In this document we outline some of the key handling options relating to our products - using not only mechanical lifting grabs but also a range of vacuum lifting and positioning options.

Our Design Support Service can offer extensive installation Advice, on-site problem-solving as well as design assistance. Contact Brett by calling 0845 60 80 579 or by emailing projectdesigner@brett.co.uk



KERBS

BRETT DESIGN AND KERB CUTTING SERVICE

Brett offers a design layout service for all of our products, including our Trief and Kassel Kerbs, which can in many cases eliminate the need for the contractor to cut kerbs on site thereby reducing risk and improving construction efficiency.

A key part of this service involves the Brett Technical Department analysing intended site layouts and providing advice on how to optimise standard components. Where necessary, we will produce customised components that are specially manufactured or cut existing products to suit. Cutting is undertaken in our manufacturing plants under safe and controlled conditions.

A schedule summarising quantities and product types is supplied for each project with each one given a unique ID. These are then identified on the construction drawings to assist the contractor in the installation process.

As part of this service our Trief and Kassel kerbs can also be cored for drainage purposes or to accommodate location dowels as required on bridge decks where kerbs are adhered in place due to the reduced excavation depths.

If the cutting of kerbs on site is necessary, it should be undertaken in accordance with the guidance published by Interpave. This guidance was developed as part of an HSE supply chain initiative and is based upon a hierarchy of control:

- Avoid cutting**
- Minimise cutting**
- Control dust generation during cutting**

HANDLING TRIEF AND KASSEL KERBS

The handling of all kerbs should always be in accordance with the Health and Safety Executive's construction information sheet No 57 'Handling kerbs: Reducing the risks of musculoskeletal disorders and the Interpave guidance 'Handling Kerbs and Flags'.

Mechanical grabs

Mechanical grabs are activated either hydraulically or by relying on the mass of the kerb to activate the gripping bars by scissor action. This equipment is used in conjunction with existing site construction plant that is certified to lift heavy loads such as a backhoe or excavator.



Trief Cadet Kerb unit 117kg

Mechanical grab SWL 1500kg

Safe handling

Vacuum lifting

Vacuum lifters are usually self-contained units that are used in conjunction with existing site construction plant that is certified to lift heavy loads such as a backhoe or excavator. The vacuum pump is usually powered by a rechargeable battery.

Whereas re-positioning can be necessary when using a mechanical lifting clamp – to allow access for side clamps – a key advantage of vacuum lifters is that they allow product to be lifted directly from the pallet without the need for prior repositioning. One fewer handling process means faster handling with less risk.



Trief Cadet Kerb unit 220kg Vacuum pad SWL 350kg Vacuum lifter SWL 500kg Fork Sleeves with Lifting Hook SWL 2500kg

Selecting lifting equipment

When planning a project it is essential to plan and assess the work in order to ensure that risk is kept to a minimum. This process allows for selection of the appropriate equipment for handling and laying the relevant product at the design stage.

It is important to ensure that safe working load (SWL) of the lifting equipment is not exceeded and in the case of vacuum lifting, the correct vacuum pad is used. All equipment must be used and maintained in accordance with the manufacturers instructions.

In addition to use with a standard concrete finish, vacuum pads are suitable for use with diamond pattern, exposed aggregate and granite finishes.

The table below shows lifting equipment that is typically suitable, in the majority of cases, for the products listed, but it is the responsibility of the contractor to ensure that the optimal lifting and handling conditions and equipment are provided for all site operatives.

Handling options for Trief and Kassel Kerbs

Description	Weight (kg)	Plan dimension (mm)	Mechanical grab	Vacuum lifter
-------------	-------------	---------------------	-----------------	---------------

Trief GST2A

Standard Kerb	220-261	914 x 380	✓	✓
Short Lengths	110-191	Various	✓	
Radius Units	71-240	Various	✓	✓
Quadrants	31-135	Various	✓	
Tapers	89-210	Various	✓	

Trief GST2

Standard Kerb	184-218	914 x 380	✓	✓
Half Units	92-109	455 x 380	✓	
Tapers	85-173	Various	✓	✓

Trief GST1A (Cadet)

Standard Kerb	152-180	914 x 270	✓	✓
Half Units	70-90	455 x 270	✓	
Radius Units	56-139	Various	✓	✓
Quadrants	18-43	Various	✓	
Tapers	108-128	Various	✓	✓

Kassel Kerb KK160

Standard Kerb	274-325	1000 x 435	✓	✓
Half Kerb	137-163	500 x 435	✓	
Radius Units	279-331	Various	✓	✓
Quadrants	248-294	Various	✓	
Transitions	265-310	Various	✓	✓
Ramps	164-305	Various	✓	✓

Kassel Kerb KK180

Standard Kerb	192-346	1000 x 435	✓	✓
Half Kerb	146-173	500 x 435	✓	
Radius Units	279-353	Various	✓	✓
Quadrants	205-318	Various	✓	
Transitions	271-321	Various	✓	✓
Ramps	182-326	Various	✓	✓

Kassel Slimline KK160

Standard Kerb	103-122	1000 x 235	✓	✓
Transitions	99-117	Various	✓	✓

Kassel Slimline KK180

Standard Kerb	128-152	1000 x 241	✓	✓
Transitions	103-122	Various	✓	✓

Additional information

Brett is continually looking to make improvements in the product range and therefore any information such as dimensions and weights are subject to change. Customers should always check with a local stockist that they are using the most current product information.

Find your Brett stockist by visiting brettpaving.co.uk or call 0845 60 80 570.

Colour swatches in this brochure are as accurate as printing allows, however products may vary. This is why we recommend you look at samples and if possible try to see some product laid.

CONSIDERATIONS FOR CONCRETE PRODUCTS

Efflorescence: Efflorescence is a temporary salt residue that can occur on all concrete products in their initial life. The salt masks the colour of the product and is often mistaken for fading. The best course of action is to leave the paved area to weather over time and efflorescence will usually disappear.

Porosity: Concrete continues to cure for many years after manufacture. Whilst this happens, and usually only during its initial life, a level of porosity may exist where some product retains water giving a damp appearance. This will disappear as the concrete continues to harden and the product dries out.

Aggregate contaminants: Very rarely concrete may be affected with Iron Pyrites and/or Lignite. These are both the result of naturally occurring constituents within the product raw materials which may result in localised discolouration of the surface of an individual unit. This phenomenon will not normally affect the performance of the product.

Sealants: Sealers can help protect and enhance your investment. Before you choose to buy one, make sure you are aware of the following. Sealers may trap potential efflorescence and other forms of discolouration that can occur from time to time, making them almost impossible to remove.

We recommend you wait 12-18 months before sealing. This will allow any potential discolouration to be exposed and enable you to remove it. Before sealing, make sure that the paving is thoroughly cleaned and any joints are filled. Prior to applying to the whole installation, test in a small inconspicuous area.

Surface marking: Some products within the range are deliberately distressed via a tumbling process in order to give them their aged aesthetic. Tumbling can leave a dust on the surface of the product that should significantly reduce with the natural ageing process.

The colours in concrete paving come from pigmentation placed into the product during production. Products may have 2 or 3 different pigments added to create the subtle and very attractive colour tones. When installed these variations appear more uniform over a large area.

Aged products: such as Alpha Antique have been distressed with varying production techniques. The distressing process by its very nature creates a random aesthetic. This variation is deliberate and gives the appeal of the product range.

ORDERING

To order Brett product contact your nearest Brett stockist, call 0845 60 80 570 or visit brettpaving.co.uk

All dimensions quoted in Brett literature are nominal and are for guidance only. Actual sizes of individual units will vary

The total quantity required should ideally be ordered and delivered at the same time to reduce the risk of product variation.

DELIVERY & INSPECTION

In the unlikely event of products arriving in a less than satisfactory condition, please refer to Brett immediately with product and batch code details that are printed on the packaging.

Any suggestion of non-conformity must result in the complaint being registered and the product not being installed. Responsibility for costs incurred for uplifting and relaying defective product may be prejudiced if the defect should have been apparent before installation.

PLANNING PERMISSION

Legislation on hard landscaping changes around your property may require a planning application. The responsibility to comply lies with the homeowner.

HEALTH & SAFETY

Hard landscaping products can be hazardous, especially when lifting, cutting, drilling or abrading. Always carry out a risk assessment and apply the appropriate precautions to help avoid the risk of injury to yourself or others.

INSTALLATION

Brett products should be installed to relevant European standards where appropriate.

Where products fall outside the scope of such standards, Brett best practice installation techniques are recommended. For any queries on installation methods please call our Customer Services on 0845 60 80 570.

Each manufacturing production run of a specific product (or batch) will have its own unique characteristics. Minimising the number of batches will help reduce product variation. Products should be laid from a number of packs at the same time. In the case of paving three packs should be mixed for single colours, five in the case of multi-coloured product. Ideally, product should also be mixed by being taken from vertical stacks rather than in layers of the same pack.

AFTERCARE

All pavements should be subjected to a regular maintenance regime. For more details on the appropriate course of action, please see the 'Essential Maintenance Guide' on brettpaving.co.uk.

All of the details in this brochure are believed to be correct at the time of going to press but information relating to dimensions and weights are subject to change. The colour swatches shown are representative of our products but can appear different in print. We encourage buyers to check product samples when specifying. Brett Landscaping reserve the right to amend or change any of the specifications shown in our literature at our discretion without prior notice.



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