

## Landscaping

### Charcon Safeticurb®



Offering substantial cost savings in comparison to alternative traditional pipe and gully systems, Safeticurb® is a long established, well proven linear drainage system with a discrete cross-fall which directs surface water to drainage entrances for hard landscaped areas and roadways.

- Slot or grid options
- Substantially reduces the need for expensive underground pipework
- Suitable for all hard landscaped surfaces and heavier duty options such as industrial sites
- Discrete cross fall to direct surface water to drainage entrances for hard landscaped areas and roadways.

#### Performance

**Strength:** The strength requirements are met to the manufacturing standard. Loading standard conforms to EN 1433 up to Class F (Class F = 900kN), dependant upon type selected.

#### Complementary products

Designed for use with Charcon block paving and British Standard kerb.

#### Applications

Safeticurb is suited to car parks, pedestrianised areas, public highways, heavy duty industrial sites, airport taxiways and specialist industrial areas.

#### Manufacturing standard

Safeticurb is manufactured in two halves using a wet pressed method and bonded together. It is tested in accordance with European Standard BS EN 1433.

All Aggregate Industries products are manufactured in accordance with ISO 9001 with factory compliance to ISO 14001.



#### Colour swatch



1. Grey

#### Safeticurb

Dimensions (mm)	Standard (DBA)	Heavy duty (DBM)	Standard (DBG-DI)	Standard (DBK-HB2)
Type	Slot	Slot	Grid - ductile iron	Slot
Class (up to)	C (250kN)	F (900kN)	D (400kN)	D (400kN)
Length	914	914	914	914
Width (overall)	250	250	250	250
Depth (overall)	250	250	250	350
Nominal Bore	125	125	125	125
Weight (approx. kg)	102	106	107	129

Dimensions (mm)	Standard (DBA)	Heavy duty (DBM)	Standard (DBG-DI)	Standard (DBK-HB2)
Slot drain aperture width	15	15		15
Grid width			124	
Colour available	Grey	Grey	Grey	Grey

Accessories – Silt top box type A (Class C), Super heavy duty silt box type H (Class F – Class D with Grating). Supply of complete silt boxes only (either with a solid lid or grating) – separate supply of boxes, lids and gratings is prohibited in line with EN1433.

## Trafficking selector (EN 1433 Standard Classification)

Unit/bore (mm)	Class A 15kN	Class B 125kN	Class C 250kN	Class D 400kN	Class E 600kN	Class F 900kN	Unit weight (kg)
<b>Main units</b>							
DBA/125	•	•	•				102
DBM/125	•	•	•	•	•	•	106
DBG/DI/125	•	•	•	•			107
DBK HB2/125	•	•	•	•			129
<b>Accessories</b>							
Type A silt box top	•	•	•				115
Type H silt box top	•	•	•	•	•	•	148
Inspection unit DBG/DI/125	•	•	•	•			107
Inspection unit kerb HB2/125	•	•	•	•			129
Manhole cover kerb HB2/125	•	•	•	•			175
Transition kerb HB2/125	•	•	•	•			109

• indicates suitability

### Key to unit abbreviations:

HB half batter, DI ductile iron

### EN 1433 standard classifications

Class A (15kN): Pedestrian areas, walkways and cycle tracks.

Class B (125kN): Pedestrianised areas and car parks with limited vehicle access.

Class C (250kN): Kerbside drainage to public highways, parking areas, service stations and pedestrian areas.

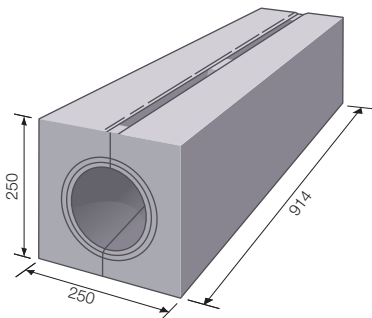
Class D (400kN): Public highways and general parking areas.

(Note: Grid systems should not be used for fast moving traffic.)

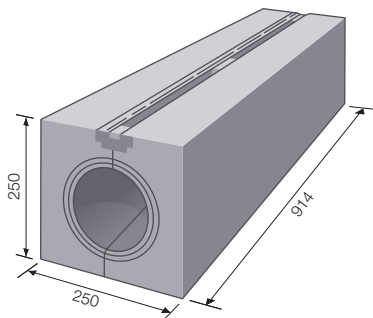
Class E (600kN): Heavy industrial sites, dockyards and lorry parks.

Class F (900kN): Airport taxiways and specialist industrial sites.

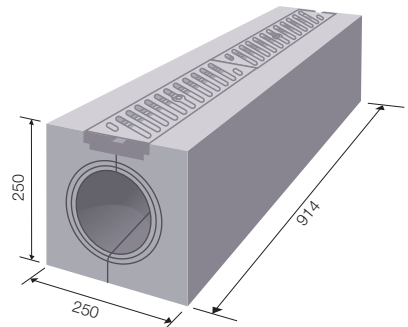
# Charcon Safeticurb®



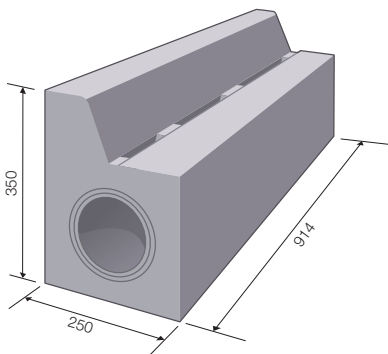
Safeticurb slot unit  
DBA (125mm bore)



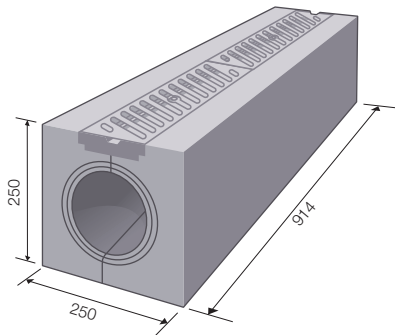
Safeticurb slot unit with ductile iron insert  
DBM (125mm bore)



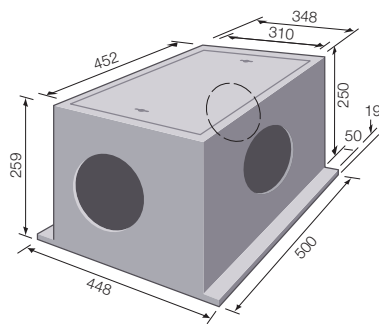
Safeticurb grid unit  
DBG/DI (125mm bore)



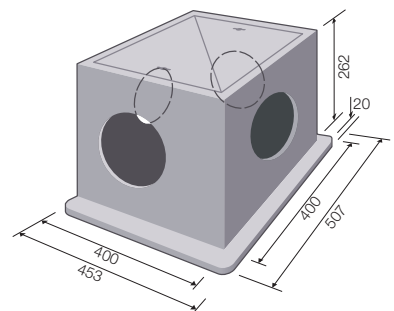
Safeticurb kerb profile unit  
(illustrated) DBK HB2 (125mm bore)



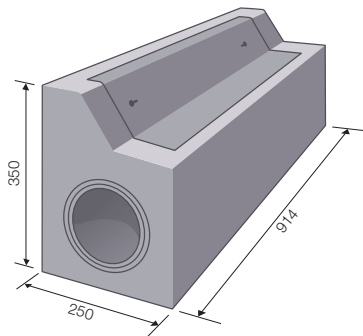
DBG/DI  
Can be used as inspection units within runs of DBA and DBM



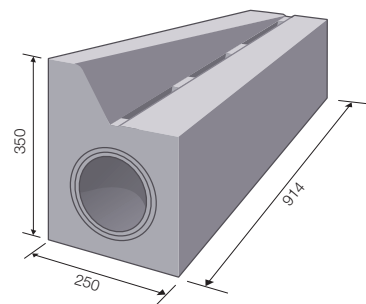
Silt box top type A (ductile iron) 00978  
For use with DBA, DBM and DI. Supplied with solid top (grating available to order 01128)



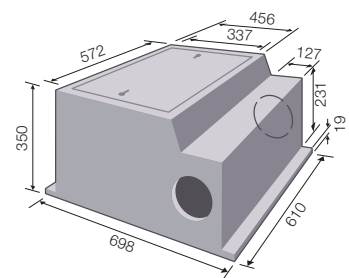
Silt box type H (ductile iron) 01195  
For use with DBM. Supplied with solid top (D400 grate available to order 00980)



Accessories  
For use with DBK HB2 inspection unit HB2



Transition unit HB2 LH (RH)  
For use with DBK HB2 to DBA, DBM and DBG



Manhole cover HB2 (ductile iron) 01095

## Natural fall systems - design considerations

### System drainage areas:

#### Gradient against rainfall intensity by nominal bore

Gradient	Rainfall intensity (discharge l/s)	Area drained 30mm/hr	40mm/hr	50mm/hr	75mm/hr
<b>Nominal bore (mm)</b>	<b>125</b>	<b>125</b>	<b>125</b>	<b>125</b>	<b>125</b>
1:50 (2.00%)	15	1860	1400	1120	740
1:100 (1.00%)	10.9	1310	980	790	520
1:200 (0.50%)	7.7	920	690	550	370
1:300 (0.33%)	6.2	750	560	450	300
1:400 (0.25%)	5.4	650	480	390	260
1:500 (0.20%)	4.8	580	430	350	230
1:1000 (0.10%)	3.3	400	300	240	100

### General principles

The aim is to ensure prompt and cost-effective removal of surface water during and immediately after rainfall.

Optimum balance of cost efficiency and performance is achieved by parallel drainage runs at 30-35 m intervals across drainage area.

Note: Wider spacing between runs is possible, but (dependent on rainfall intensity) may result in slower removal of surface water and increased costs – for extra outlets and additional underground pipework.

Maximum recommended width of the drained area to any one run is 35 metres.

Choose slot or grid unit options according to type and frequency of anticipated trafficking. These options do not affect the design of drainage performance.

### Self-cleansing velocity

A flow rate of 0.76 metres per second is normally sufficient to avoid silt settlement in the channel inverts. Longitudinal gradients required to achieve this velocity are:  
0.75% (1:133).

Will operate successfully at slacker gradients, though occasional flushing out may be needed.

## Installation design – units

### General principles

All units are unreinforced: protect from stresses caused by thermal expansion of cementitious paving materials. Leave 1mm gap between each unit to prevent damage from thermal expansion of the units themselves.

Expansion joints **MUST** be installed on each side of drainage runs in concrete pavements or those incorporating a cement bound/lean mix concrete roadbase.

DO NOT place these joints directly adjacent to any trafficked unit as this would allow units to rock under trafficking and may allow water ingress into the base or sub-grade. Recommended position of joints (minimum distances) is 600mm from Clearway/ Safeticurb units (see Figs 1-3).

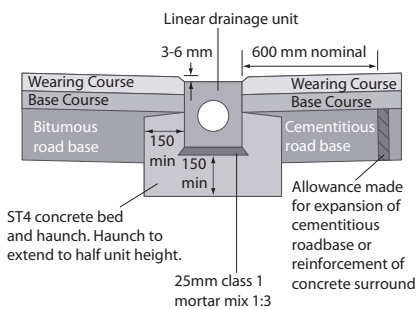


Fig 1. Basic unit – flexible/semi-flexible installation

### Base foundations

Recommended typical foundation for Safeticurb is a minimum 150mm depth of ST4 concrete with a 25mm bed of Class 1 mortar (1:3 cement: sand) to allow easy adjustment of units to line and level.

Note: Strength, overall depth and width of the base may need to be increased when laid on low - strength sub-grades.

### Haunching

Recommended typical haunches (to within 100mm of top unit) for Safeticurb is ST4 concrete.

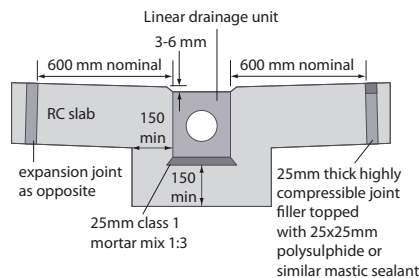


Fig 2. Basic unit – rigid installation

### Installation design - radii, crossings, junctions and bends

#### Radii

**Safeticurb:** Where necessary, standard (straight) units may be laid to form radii or bends.

Alignment ring within bore acts as a former for infill mortars to seal joint.

#### Crossings

**Safeticurb (DBK unit only):** To continue linear drainage at road junctions, kerb crossing points (pedestrian/vehicular), use transition units to reduce kerb height to road level. These connect with standard grid or slot units as necessary.

#### Junctions/sharp bends

**Safeticurb:** Use silt box top at outlets or with suitable uPVC pipe fittings (cut to fit) to form junctions or sharp bends (see Figs 5a, 5b).

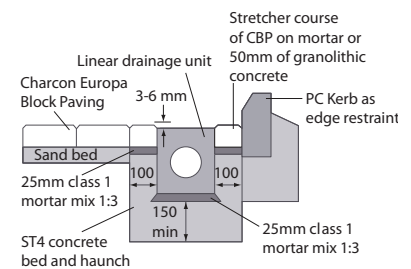


Fig 3. Basic unit – block paved installation

# Charcon Safeticurb®

## Installation design - outlets

### General principles

Details of outlet units and inspection access differ according to which linear drainage system is used.

In any system, silt or detritus should normally be prevented from entering the main drainage sewer. An outfall chamber is required to enable silt collection before onward connection to a sewer.

### Types of outfall chamber

- Trapped precast concrete, clay or plastic gully pots. Gully pot capacity may be insufficient for some larger linear drainage installations
- Purpose-built brick or concrete inspection chamber
- Precast concrete manhole rings
- Dedicated sump unit.

### Select outfall pipe diameter/gradient

Care should be taken to ensure sufficient capacity.

### Safeticurb (see Fig 6)

Select outfall chamber, pipe dimension and pipe gradient to suit system capacity.

Position a silt box top on two courses of engineering brickwork over the selected outfall chamber/silt trap to give access (via the silt box lid) for silt removal.

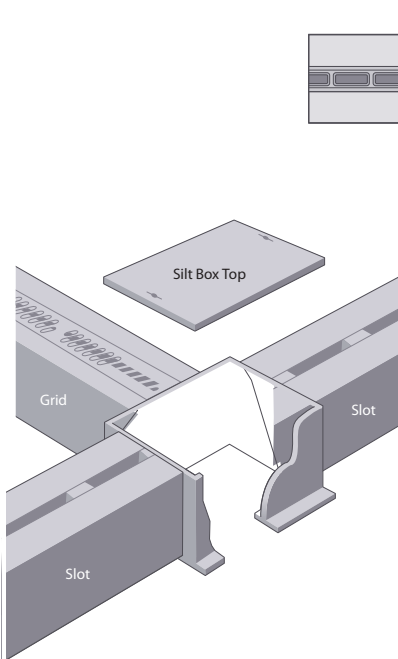


Fig 4. Safeticurb outlet/junction

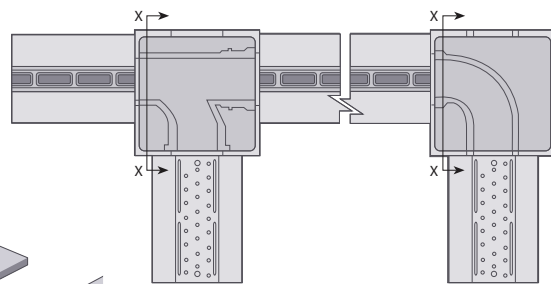


Fig 5a. Safeticurb junction bends

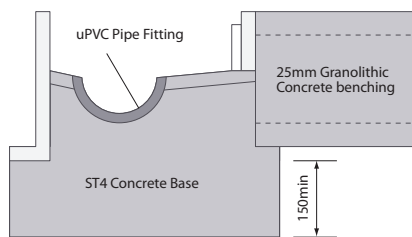


Fig 5b. x-x section (from Fig 5a.)

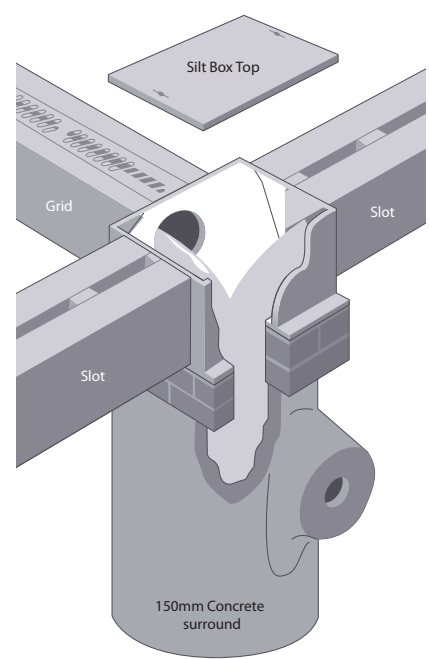


Fig 6. Safeticurb outlet construction

## Sitework - setting out

**General principles:** Plan for laying to start from an outfall at the lowest point of the system. This ensures self-draining if wet weather occurs during installation.

Use level pins and string lines to ensure correct level and alignment.

**Safeticurb:** The surface of these systems' drainage units should be 3-6mm below the level of the surrounding pavement surface.

After completing base foundations, lay units onto a Class 1 mortar (1:3 cement: sand) bed, adjusting to line and level using a pavior's maul.

Leave 1mm gap between units to allow for thermal expansion.

If a watertight joint is required, a gun-applied sealant may be applied to the end of each unit.

**Safeticurb DBA slot units:** Protect slots from stones during construction. Slot units without iron inserts can be damaged when stones are impacted by vehicle traffic.

**Safeticurb DBG grid units:** Grid fixing bolts should be tightened a minimum of 5 turns after clamping plate has made contact with the soffit of the bore.

## Handling equipment

For appropriate handling and lifting equipment, contact Probst Handling Equipment on 01939 235325.

## Maintenance

**General:** With correct design and installation, maintenance needs for all linear drainage systems should be minimal. However, it is essential to continued efficient drainage performance that all channels, inlets and outlets are kept free from blockage or accumulations of silt and debris. To that end, regular inspection is recommended.

Frequency of inspection and maintenance is dependent on local conditions, the surrounding environment, and on the actual gradient within the installed system.

Any temporary blockages can be successfully eliminated provided that:

- sufficient inspection/access points are designed into the system
- no hardened material is allowed to choke the bore.

**Commissioning and handover:** On full completion of installation.

- Flush all excess mortar and building debris from the bore
- Empty silt traps
- Clean out/clear all inlet holes (including slots or grid apertures).

**For Safeticurb units DBA:** Slot apertures without cast iron inserts can be damaged when stones are impacted into the slot by vehicles. Clear all loose stones. (Slots should also be protected during construction when stones are present).

**For Safeticurb units DBA/DBK:** Ensure slot apertures are cleared of all loose stones. (This is especially important when adjacent soft landscaping works are undertaken).

If necessary, cut back road surfacing adjacent to inlet holes in order to ensure unimpeded access for surface water (a special cutting tool is available on request).

**Routine maintenance procedures:** Inspect system regularly for obstructions, or heavy detritus build-up. Empty gully pots/inspection chambers to remove all silt. Where necessary, cleaning or unblocking can be achieved by:

- high pressure water jetting
- hand rodding.

## Good practice

The following are general principles of good site practice which will contribute to successful installations:

**Handling:** Handle all products with care on site. Avoid damage to edges and faces.

**On-site storage:** Prior to installation, stack materials bed on bed on a hard level surface: protect from rain.



**Sitework:** Protect channels and gratings from concrete droppings and mortar splashes during installation. This may be achieved by temporary covering of openings with hardboard or plywood sheeting.

Protect slot apertures (especially if no iron insert is included) from stone damage during construction, particularly where site vehicle trafficking is likely after system installation.

Do not begin construction of adjacent footways and/or surfacing of carriageways until base and haunch concrete have achieved adequate strength.

## Sustainability and local sourcing

**Energy use:** Aggregate Industries is at the forefront of sustainability and has committed to reduce carbon emissions by 20% by 2016 based on a 2012 base line.

**Recyclable:** 100% of the product can be recycled thus reducing the amount of material that is sent to landfill.

**Manufacturing location:** Produced in the UK, with locally sourced materials under strict environmental and social legislation, for local supply.

**Responsible sourcing:** Aggregate Industries is the first company in the world to achieve a BES 6001:2008 Responsible Sourcing Certificate from BRE Global. Products are assessed on:

- quality management
- environmental management
- health and safety management
- greenhouse gas emissions
- minimising raw material usage
- labour practice
- biodiversity
- community engagement.

## Key aggregate and recycled content

Safeticurb is manufactured using a hard wearing granite aggregate.

## Generic green guide rating\*

Not applicable.

## Policies

Aggregate Industries policies on the Environment & Community, Health & Safety and Sustainable Solutions for different product applications can be viewed on our website [www.aggregate.com](http://www.aggregate.com)

## Installation standard

Install in accordance with Aggregate Industries recommendations. For specific guidance refer to [www.aggregate.com](http://www.aggregate.com) or call the technical helpline on 01335 372222.

## Maintenance and cleaning

Aggregate Industries can supply on request advice on specific stain removal and general maintenance, suitable cleaning products, referrals to specialist cleaning companies etc.

## COSHH data

Full COSHH data on the Charcon range of products is available on request. Please call the technical helpline on 01335 372222.

## Technical support

Detailed guidance and assistance with the preparation of specification of the Charcon range of hard landscaping products, including model clauses, is available through the sales office. A free technical design service is also available.

**For further information, please refer to our technical services on 01335 372222.**

\*Ratings based upon generic green guide values (2009) supplied by BRE Global Ltd, [www.thegreenguide.co.uk](http://www.thegreenguide.co.uk)

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