

Drainage systems.

**Ecologically
sustainable channel**



SUSTAINABLE SURFACE WATER DRAINAGE SOLUTIONS

**REDUCING CARBON +
REPURPOSING WASTE +
REDUCING RISK +
ENVIRONMENTAL IMPACTS**

**A better way of working for a safer
more sustainable environment**



Duradrain

Durachannel

Duraproducts

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INNOVATING SINCE 2003

The way we design and construct is changing.

To meet the new carbon/climate targets set by governments, designers are looking to create structures and serving infrastructure that contribute to a better built environment.

From initial conception, planning, designed function, operation, right through to it's end of life/legacy, designers are looking for real and evident reduction in impacts at every stage of a project's construction.



Infrastructure for modern cities for example is already changing, where new roads and pavements are designed to give priority to and encourage increased use for pedestrians, cyclists, wheelchair users and public transport.

Our sustainable surface drainage solutions have evolved to meet the new challenges designers now face, providing real environmental benefits to the design within the product's make-up, method of install, system performance and end of life potential.

Reducing and offsetting environmental impacts are now a fundamental factor within project design.

In choosing products with a high recycled content, you immediately eradicate significant risks that waste can present to the natural environment.

You also create a sustained demand for recycled material that drives innovation so we not only recycle more in terms of volume but in variety, recycling material that would once have been considered un-recyclable.

Additionally, our products and systems are specifically designed to lower risk and impacts at every stage of their life cycle, through initial sourcing of the materials to the next stage of reuse, recycling or carbon recovery.

Our processes are energy efficient, producing products with a low carbon footprint. The lighter weight of each product reduces carbon use in transport to and around site, and within the method of install.

ENVIRONMENTAL BENEFITS



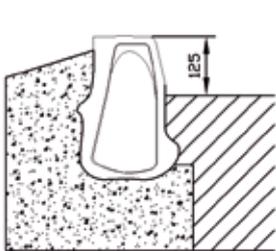
OPTIMUM DRAINAGE SOLUTIONS

Duradrain Products allow for surface water collection within varied surfaces or as a combined road edge/kerb-boundary.

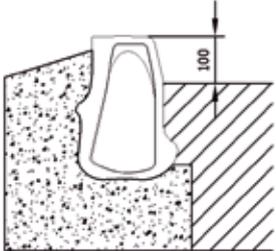
All standard units are monolithic and robust providing solutions for infrastructure with variable function and risk.



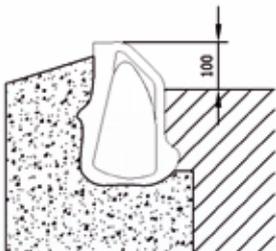
**A better way of working for
a safer more sustainable
environment**



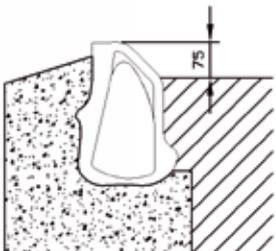
Half Batter Kerb - 125mm Upstand



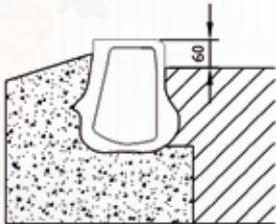
Half Batter Kerb - 100mm Upstand



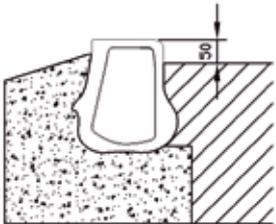
Splay (Full Batter) Kerb 100mm Upstand



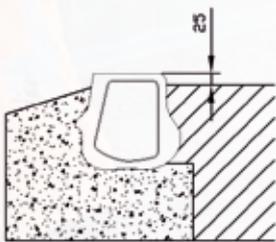
Splay (Full Batter) Kerb 75mm Upstand



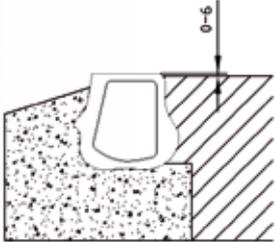
Bullnosed Low Profile Kerb 60mm Upstand



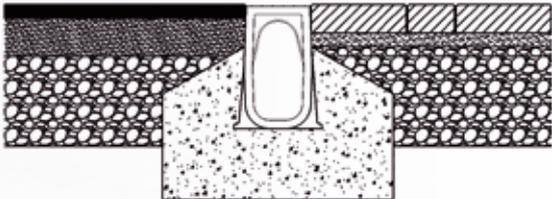
Bullnosed Low Profile Kerb 50mm Upstand



Bullnosed Crossing Kerb 25mm Upstand



Bullnosed Crossing Kerb 0-6mm Upstand



Flush Linear Channel within Varied Surfaces

EFFICIENCY

All exposed impermeable surfaces and structures require effective drainage to prevent flooding or settlement and to protect surfaces.

Dura Products linear surface drainage systems provide a sustainable, safe, efficient and cost-effective solution for the collection and evacuation of surface water run-off.

Using hydraulically efficient material, the shape and large cross-sectional areas provide a surface water drainage system that can deliver large volumes at outlet within a shallow construction.

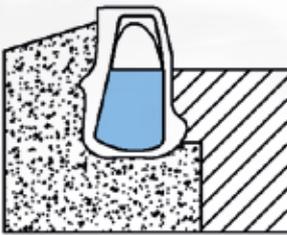
Linear drainage systems collect run-off quickly and efficiently which helps extend the life of a project, and improve user safety.

This is essential for Highways and Infrastructure generally.

Unlike the traditional kerb and gully methods where flows compound on the surface, the collected run-off is contained and driven to outlet hidden within the channel body. Linear drainage is a much more efficient method of drainage where levels across site can be simplified to deliver run off directly to a linear low point.

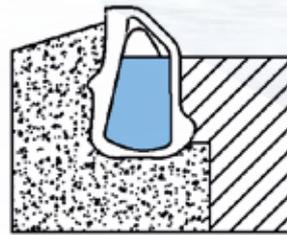
PERFORMANCE





Duradrain 70000HB

Ahb = Usable Channel Volume
 (Open-Flow) = 21,197mm²
 Phb = Wetted Perimeter = 467mm
 n = Roughness Value = 0.009
 S = Slope/Equivalent Head
 R = A/P



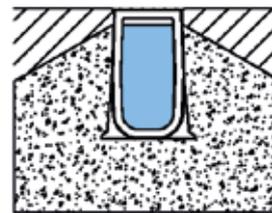
Duradrain 60000SP

Asplay = Usable Channel Volume
 (Open-Flow) = 22,182mm²
 Psplay = Wetted Perimeter = 486mm
 n = Roughness Value = 0.009
 S = Slope/Equivalent Head
 R = A/P



Duradrain 70035LP

Alp = Usable Channel Volume
 (Open-Flow) = 21,197mm²
 Phb = Wetted Perimeter = 467mm
 n = Roughness Value = 0.009
 S = Slope/Equivalent Head
 R = A/P



Durachannel 50000LD

A = Usable Channel Volume
 (Open-Flow) = 18,246mm²
 P = Wetted Perimeter = 436mm
 n = Roughness Value = 0.009
 S = Slope/Equivalent Head
 R = A/P

$$V = 1/n \times R^{2/3} \times S^{1/2}$$

V (Velocity) x A = Q - Flow @ Outlet (Unrestricted)

For a fully proven system, flows should be calculated for each section of CKD to outlet/outlets.

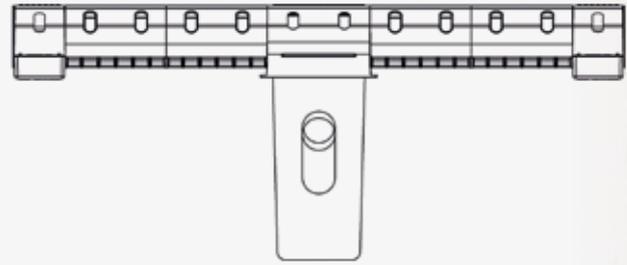
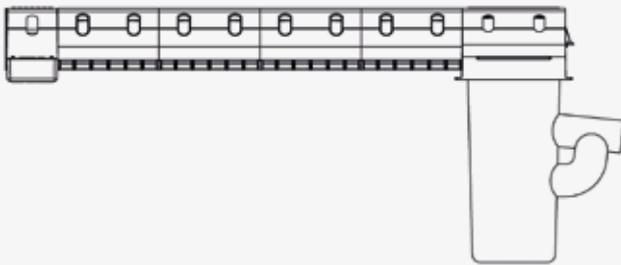
For an optimum solution, linear drainage systems should generally be designed with the fewest number of outlets and therefore offering the shallowest discharge into the serving carrier system.

The simplest solutions start with a sealed end cap and access point. Linear surface drainage solutions provide a more accessible system for maintenance. We recommend access points are positioned at the head of each linear section and at intervals to suit specific site conditions.

Inspection and jetting can be made within the channel from the access points and also through the inlet slots within the standard units. Linear sections working at or just below capacity will generally be optimum in terms of silt transit.

Ensuring sections are designed to their maximum length before outlet will generally prove optimum in terms of installed cost and reduced maintenance.

The choice and position of outlet can have an effect on the outputs within each section. We generally recommend full gully outfalls which provide wider access for maintenance and allow flows to drop-out free without obstruction into standard road gullies or access chambers.



**A better way of working for
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environment**



QUALITY, COMPLIANCE, PERFORMANCE ASSURED

Combined Kerb and Linear Surface Drainage Systems are a universally recognised and efficient method of draining surfaces.

Duradrain and **Durachannel** are manufactured in accordance with EU Harmonised & UK Designated Standards (EN1433-Load Category Group 4-**D400**). The Standard verifies compliance and defines the requirements and demands for a product and system.

The requirements for compliance have been developed and set by CEN/CENILEC within EU Legislation. They are designed to remove barriers to trade, promote entrepreneurship and improve access to markets.

Duradrain and **Durachannel** systems comply fully with the harmonised standard (EN1433-**D400**) and carry the CE mark. Dura systems also meet the requirements of

UK interim advice note IAN117/08 Rev 2 and can be approved, used and adopted within highways across the UK, Ireland & Mainland Europe.

Group 3 (min, class C250) – Kerb sides and non trafficked areas of hard shoulders and similar.

Group 4 (min, class D400) – Carriageways of roads (including pedestrian streets), hard shoulders and parking areas, for all types of road vehicles.

Please note – Qualification under EN1433 verifies compliance, defining the requirements for a product based on its intended use/function. Additionally, a hydraulic function check for each section to outlet is necessary. EN1433 also stipulates installation “must” be carried out as per Manufacturers installation advice..

DURADRAIN 60000

The 60000 SP Range has a full batter (45 Degree) Splay Profile used primarily on fast moving carriageways, verges and rural infrastructure where there is no rear footway.

The profile is designed to allow accidental overrun but encourage vehicles back towards the carriageway.





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ENVIRONMENTAL IMPACTS**

Duradrain 60000

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK5S	Duradrain 305 Full Batter / Splay Standard Unit	500	100	305	215	75/100	7	D400



Duradrain 305 Splay Standard Unit

The recycled & recyclable lightweight standard units are manufactured from a hydraulically efficient material and have a large useable volume.

This means large areas can be drained quickly and safely, protecting surfaces by taking run-off at multiple points across the whole length of the kerb-line.

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK5P	Duradrain 305 Full Batter / Splay Gully Outfall	500	100	353	457	75/100	78	D400

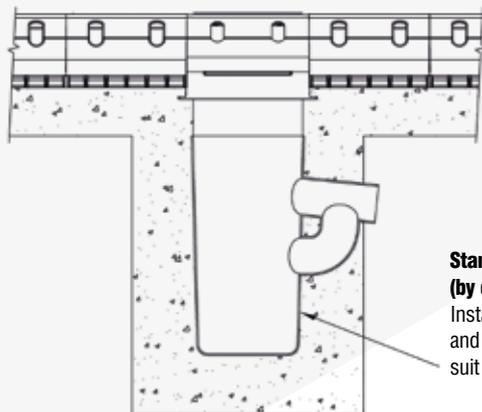


Duradrain 305 Full Batter / Splay Gully Outfall

The **Duradrain** Full Batter ductile iron top and base units provide a high quality, heavy duty outlet point.

The units allow for single or dual inflows and have a large access area for maintenance.

Gully Installation Detail



Standard Gully Pot (by others)
Installed at depth and orientation to suit invert requirements

Duradrain 60000

Item Code	Description	Depth mm	Width mm	Weight kg
4EK5T	Duradrain 305 Universal End Cap / Outlet	305	215	0,2



Duradrain 305 Universal End Cap / Outlet

Duradrain Universal end caps are cut to profile on site and fitted to access / outlets and standard units.

Simply apply sealant up to the window / entry height and fix. Caps can be cut to allow for below ground pipe connections.

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK5C	Duradrain 305 Splay Rodding Access / Outlet Unit	250	100	360	218	75/100	19	D400



Duradrain 305 Splay Rodding Access / Outlet Unit

Duradrain solid ductile iron access points can be installed at the head of each run and at regular intervals subject to site conditions. Units are supplied with a blank plug which can be removed, sealed and refitted.

Alternatively they can be used as a robust shallow or intermediate outlet point (EN1401-162 Dia Rear Pipe Outlet).

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK5SRE1	Duradrain SP External Radius Unit 7/5	480	100	305	215	75/100	7	D400
4EK5SRE2	Duradrain SP External Radius Unit 12/8m	480	100	305	215	75/100	7	D400
4EK5SRE3	Duradrain SP External Radius Unit 27/13m	480	100	305	215	75/100	7	D400
4EK5SRI1	Duradrain SP Internal Radius Unit 7/5	480	100	305	215	75/100	7	D400
4EK5SRI2	Duradrain SP Internal Radius Unit 12/8m	480	100	305	215	75/100	7	D400
4EK5SRI3	Duradrain SP Internal Radius Unit 27/13m	480	100	305	215	75/100	7	D400



Duradrain SP External/Internal Radius Unit

Standard Units can be supplied faceted to suit both external and internal radii.

DURADRAIN 70000

The 70000 HB Range has a half battered profile used primarily on roads with a rear footway or at surface boundaries to hard standings and car parking areas.

The profile is designed to deter vehicle overrun and deflect traffic back onto the carriageway.





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Duradrain 70000

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK1S	Duradrain 305 Half Batter Standard Unit	500	100	305	215	100/125	8,4	D400

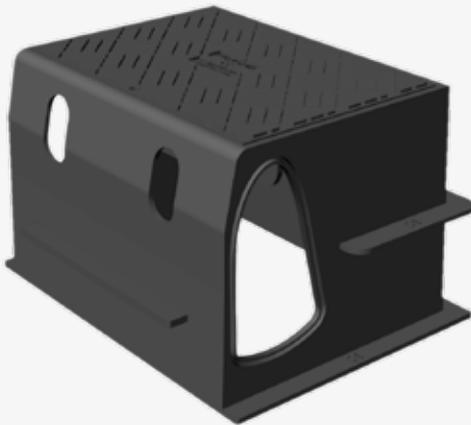


Duradrain 305 Half Batter Standard Unit

The recycled & recyclable lightweight standard units are manufactured from a hydraulically efficient material and have a large useable volume.

This means large areas can be drained quickly and safely, protecting surfaces by taking run-off at multiple points across the whole length of the kerb-line.

Item Code	Description	Length mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK1P	Duradrain 305 Half Batter Gully Outfall	500	353	457	100/125	78	D400

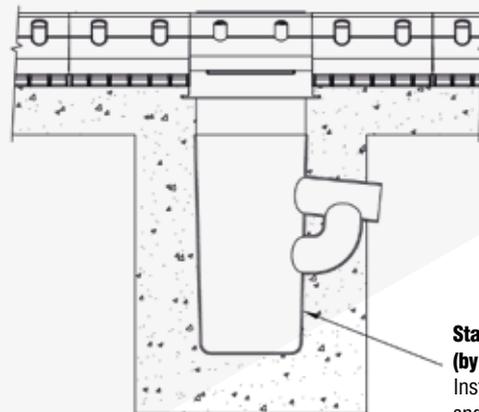


Duradrain 305 Half Batter Gully Outfall

The **Duradrain** Half Batter ductile iron top and base units provide a high quality, heavy duty outlet point.

The units allow for single or dual inflows and have a large access area for maintenance..

Gully Installation Detail



Standard Gully Pot (by others)
Installed at depth and orientation to suit invert requirements

Duradrain 70000

Item Code	Description	Depth mm	Width mm	Weight kg
4EK1T	Duradrain 305 Universal End Cap / Outlet	305	215	0,2



Duradrain 305 HB End Cap / Outlet

Duradrain Universal end caps can be fitted to access/ outlets and standard units.

Simply apply sealant up to the window/entry height and fix. Caps can be cut to allow for below ground pipe connections.

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK1C	Duradrain 305 HB Rodding Access / Outlet Unit	250	100	360	218	100/125	19	D400



Duradrain 305 HB Rodding Access / Outlet Unit

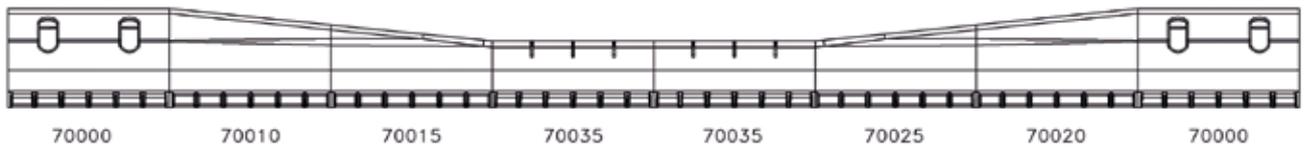
Duradrain solid ductile iron access points can be installed at the head of each run and at regular intervals subject to site conditions.

Units are supplied with a blank plug which can be removed, sealed and refitted. Alternatively they can be used as a robust shallow or intermediate outlet point (EN1401-162 Dia Rear Pipe Outlet).



Drop Kerbs & Centre Stones

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK1SX	Duradrain Left Hand Drop Kerb L305	500	100	305/255	215		7	D400
4EK1SY	Duradrain Left Hand Drop Kerb L255	500	100	255/205	215		5	D400
4EK1DX	Duradrain Right Hand Drop Kerb R305	500	100	305/255	215		7	D400
4EK1DY	Duradrain Right Hand Drop Kerb R255	500	100	255/205	215		5	D400
4EK1RF	Duradrain Drainable Centre Stone 205	500	100	205	215	0/25	4,8	D400



We offer standard drop configurations from 125mm/ 100mm full kerb height.

Road surfacing can be rolled to accommodate a 0-6mm or 25mm upstand through the crossing.

Duradrain one piece centre stones are supplied with vertical 8mm pedestrian friendly inlets to maintain drainage through each drop section.



Radius Units & Corners

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK1SRE1	Duradrain HB External Radius Unit 7/5m	480	100	305	215	75/125	7	D400
4EK1SRE2	Duradrain HB External Radius Unit 12/8m	480	100	305	215	75/125	7	D400
4EK1SRE3	Duradrain HB External Radius Unit 27/13m	480	100	305	215	75/125	7	D400
4EK1SRI1	Duradrain HB Internal Radius Unit 7/5m	480	100	305	215	75/125	7	D400
4EK1SRI2	Duradrain HB Internal Radius Unit 12/8m	480	100	305	215	75/125	7	D400
4EK1SRI3	Duradrain HB Internal Radius Unit 27/13m	480	100	305	215	75/125	7	D400

Duradrain HB Internal/External Radius Unit

Standard Units can be supplied faceted to suit both external and internal radii.



Duradrain Internal/External 90 Deg Corner

Standard full height and dropped units can be supplied cut and fixed to provide precise external or internal angles.

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK1AE	Duradrain External HB 90 Deg Corner	300x300	100	305	215	75/100	7	D400
4EK1AI	Duradrain Internal HB 90 Deg Corner	300x300	100	305	215	75/100	7	D400



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Duradrain SHALLOW PROFILE

Modern infrastructure design for our towns and cities is changing to meet the new net carbon zero targets set by governments to reduce environmental impacts. Designers are creating roads and pavements to encourage increased use for pedestrians, cyclists, wheelchair users and public transport.

CKD (Combined Kerb & Drainage) is already an accepted and adoptable method of highway drainage. Our shallow profile drainable units give designers further options to allow for shallower kerb upstands, ideal for cycleways with designated lane separation.



Duradrain Shallow Profile

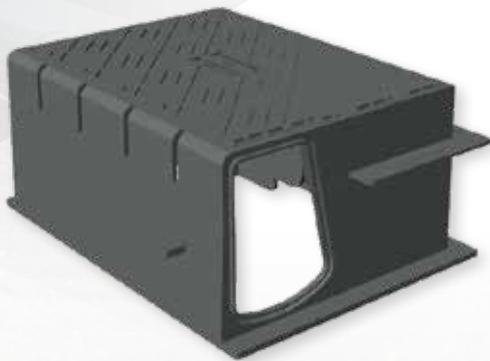
Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK1RF	Duradrain Drainable Centre Stone 205	500	100	205	215	0/25	4,8	D400
4EK1RFA	Duradrain Low Profile Bullnose 240	500	100	240	215	35/60	5,5	D400



Shallow Profile Standard Units

The recycled & recyclable lightweight drainable units are manufactured from a hydraulically efficient material and have a large useable volume. This means large areas can be drained quickly and safely, protecting surfaces by taking runoff at multiple points across the whole length of the kerb-line.

Item Code	Description	Length mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EK1PS	Duradrain B/N Gully Outfall	500	457	253	0/60	58	D400
4EK1PSC	Duradrain B/N GO Access only c/w Sealed Base Plate	500	457	253	0/60	60	D400

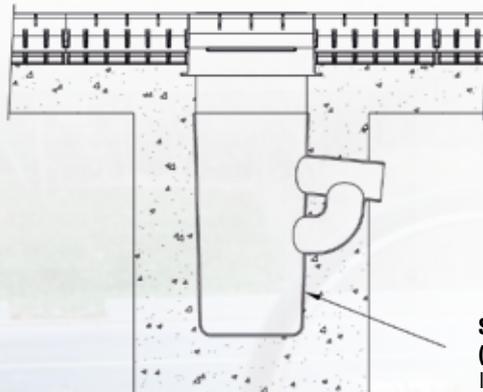


Duradrain Bn Gully Outfall

The Duradrain Bullnose ductile iron top and base units provide a high quality, heavy duty outlet point.

The units allow for single or dual inflows and have a large access area for maintenance.

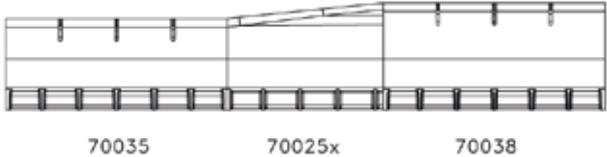
This unit can be supplied with a sealed baseplate when used as access only.



Standard Gully Pot (by others)
Installed at depth and orientation to suit invert requirements

Shallow Profile Transition Unit

We can also supply pre-fabricated handed drop/ transitions to accommodate variable changes in height common with low profile designs where crossing points are shallow.



Durachannel

The 50000 **Durachannel** Range is a traditional monolithic linear surface water drainage system.

The recycled & recyclable lightweight standard units are manufactured from a hydraulically efficient material and have a large useable volume.

This means large areas can be drained quickly and safely, protecting surfaces by taking run-off at multiple points across the whole length of the channel-line.



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Durachannel

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Kerb Upstand mm	Weight kg	Load Classification
4EC1S	Durachannel 160mm Standard Unit	500	100	160	187	Doppia 8mm	7	D400
4EC4S	Durachannel 280mm Standard Unit	500	100	280	187	Doppia 8mm	8	D400

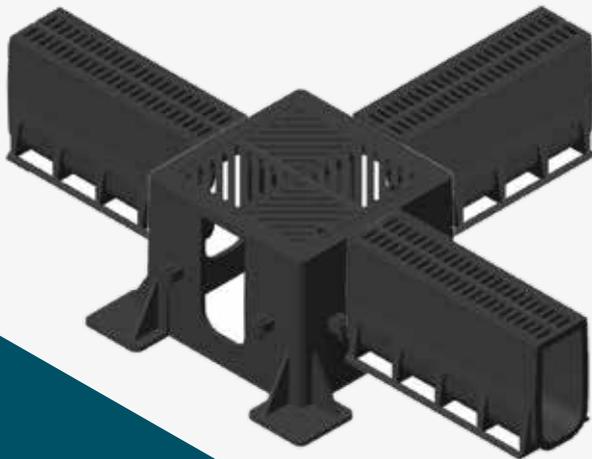


Durachannel Standard Unit

The recycled & recyclable lightweight standard units are manufactured from a hydraulically efficient material and have large useable volume.

This means large areas can be drained quickly and safely, protecting surfaces by taking run-off at multiple points across the whole length of the channel-line.

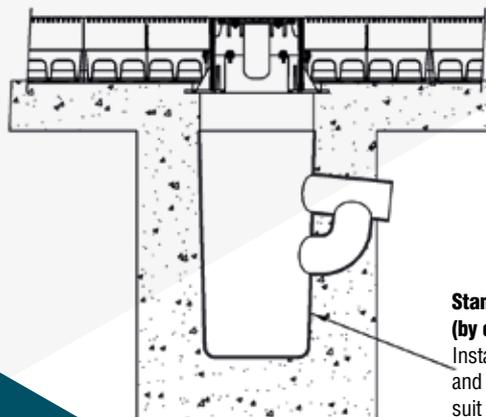
Item Code	Description	Length mm	Depth mm	Width mm	Weight kg	Load Classification
4EC1P	Durachannel Universal Outfall	360	461	360	38	D400
4EC1PG	Durachannel UO Junction/angle c/w Sealed Base Plate	360	461	360	39	D400



Durachannel Universal 4-Way Inflow Outfall/Junction/Corner Unit

The Durachannel ductile iron grate and base units provide a high quality, heavy duty outlet point.

The unit allows for four way channel inflows and has a large access area for maintenance. This unit can be supplied with a sealed baseplate to provide a robust, fully supported corner/junction unit.



Standard Gully Pot (by others)

Installed at depth and orientation to suit invert requirements

Durachannel

Item Code	Description	Length mm	Water passage mm	Depth mm	Width mm	Weight kg	Load Classification
4EC4C	Durachannel 260mm Rodding Access	250	100	360	202	18	D400



Durachannel 260mm Rodding Access

Durachannel solid ductile iron access points can be installed at the head of each run and at regular intervals subject to site conditions.

Units are supplied with a blank plug which can be removed, sealed and refitted. Alternatively they can be used as a robust shallow or intermediate outlet point (EN1401-162 Dia Rear Pipe Outlet).

Item Code	Description	Depth mm	Width mm	Weight kg
4EC1T	Durachannel End cap	360	187	0.2

Durachannel End Cap

Duradrain Universal end caps can be fitted to access/outlets and standard units.

Simply apply sealant up to the window / entry height and fix. Caps can be cut to allow for below ground pipe connections.



Duradrain/Durachannel Sealant

Item Code	Description	Weight kg	Volume	Coverage	Colour
4EZ1CS	Duradrain One Part Low Modulus Polyurethane Sealant	0,8	600ml	10 Joints / Tube	Grey
4EZ1PS	Duradrain Sealant Applicator	2	N/A	N/A	N/A
4EZ1CC	Durachannel One Part Low Modulus Polyurethane Sealant	0,8	600ml	10 Joints / Tube	Black



Duradrain/Durachannel sealant should be applied around the channel body up to the road surface / inlet level.

All Units have a flush face to face contact so each unit can be hammered to line and level creating an effective seal across the whole joint width. The bed and brace within the retention elements create a single structure and unlike traditional jointed or laid-in channels, there are no weak points across the joint providing a longer lasting seal in service.

For highways adoption all joints must be sealed.
(EN1433-HA-Doc_IAN117/08 Rev 2.)

HB & SP Duradrain - Hydraulic Flow Chart

Duradrain Ensures You Meet Your CDM Obligations

PROJECT TITLE: PROJECT INNOVATION
DATE: 28/01/21

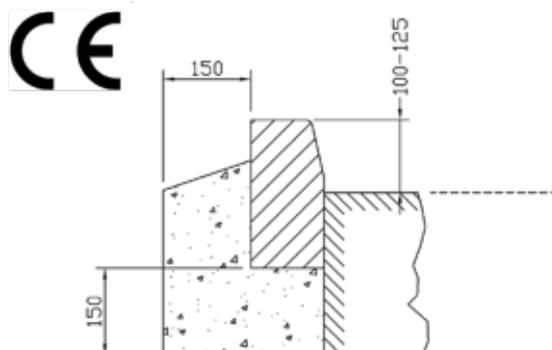
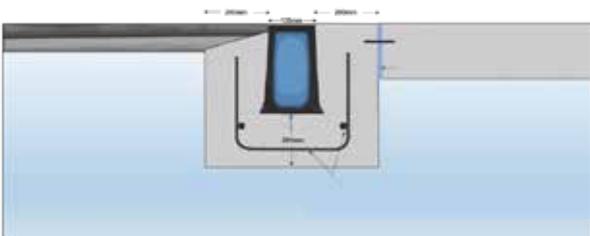
30,676kg of Carbon saved for every 1000m with a Durakerb installation.
 (PAS 2050.IS by Sustain Limited).

Run Number	Run Length (m)	Designed Rate of Intensity (mm/hr)	Required Run Capacity (L/sec)	Catchment Area (m ²)	Select Kerb Profile	Run Capacity @ Outlet - Flows Driven by Gradient - One Directional (L/sec)	Run Capacity @ Outlet - Flows Driven by Gravity - Restraint to outlet (L/sec)	Run Capacity @ Outlet - Flows Driven by Gravity - Outlet to outlet - Two Directional (L/sec)	OK	Notes
1/1.000	33.1	58.7	8.02	492	HB	20.84			✓	Required run capacities are based on a rainfall intensity of 50mm/hr+ 20% to allow for climate change, falling on 100% of the catchment areas taken from drawings supplied.
1/2.000	22.4	58.7	9.10	558	HB	30.37			✓	
1/3.000	46.1	58.7	13.22	811	HB	28.26			✓	

Free Design Advice

Dura Products offer the opportunity to design & construct innovatively, with responsibility to the environment and everyone involved in the construction process. We can supply simple run schedules, provide product details in various formats for insertion and full hydraulic calculations with design/installation advice for the complete Dura range.

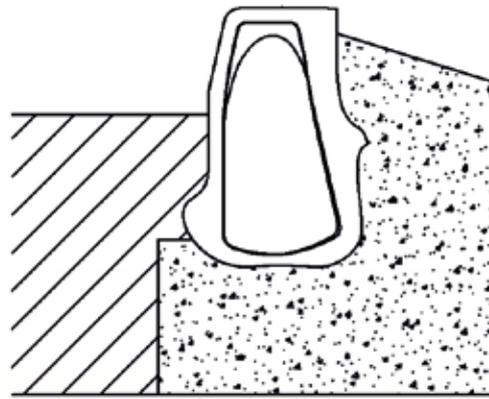
Although **Dura Products** offer unique benefits, they are specifically design to comply with regular industry and/or harmonised British and European standards.



Design & Installation Information

Every project, large or small, should be fully assessed so a correct installation method can be agreed and therefore full integration achieved. All projects have differing and specific demands so it is important for designers to make a full risk assessment.

The position of the kerbs/drainage units, the surrounding structure/landscape, functions, road alignment, levels, specific local design criteria and the type/volume of traffic will determine a best method of installation.



System & Product Maintenance

- 1 **Duradrain** and **Durachannel** are designed to be integrated into varied hard-landscapes and perform the function of drainage within the channel body. After initial installation, each section of CKD/Channel should be jetted to ensure the bores are free of silt and debris. It is possible to jet from the surface through the slots/inlets working from an open access point to outlet. Outlets should also be free of silt and any obstruction. Once cleaned the access lids should be re-fitted and the locking bolts fixed securely.
- 2 The frequency and necessity for maintenance is project specific and can be influenced by factors prior to collection and at outlet discharge. If necessary, a maintenance procedure can be agreed as part of the overall drainage strategy with a full risk assessment carried out.
- 3 A visual inspection can be carried out periodically to assess the condition. It is usual to see scuff marks which will not affect the function or longevity of the product. Access lids should be checked to ensure they are locked and secure.
- 4 Where there has been a serious accident and units require replacing, new units can be cut to size and patched-in. It is important to take the repair across the extent of any damage and ensure the existing bed and brace or haunches are sound. Units can then be re-installed using Durakerb bedding mortar or a strong polymer modified mortar with adhesive properties if considered necessary.
- 5 It is important to assess the drainage function also. A visual inspection of the surrounding surfaces will generally provide evidence of pooling which could be a result of a blockage within the channel body. Any leaves, mud, and rubbish should be swept away from the inlet/slots so run-off entry is clear.
- 6 Each section of CKD/Channel should be jetted to outlet to ensure the bores are free of silt and debris. It is possible to jet from the surface and loosen any stubborn weed growth through the slots/inlets working from an open access point to outlet. Outlets should also be cleared free of silt and any obstruction and ensure the drainage connections are correctly fixed. Once cleaned the access lids should be re-fitted and the locking bolts fixed securely.
- 7 Access Lids and Gully Units are bolted and locked using M8/M16 socket head allen keys.



