



Linear Drainage Product Guide



Marshalls

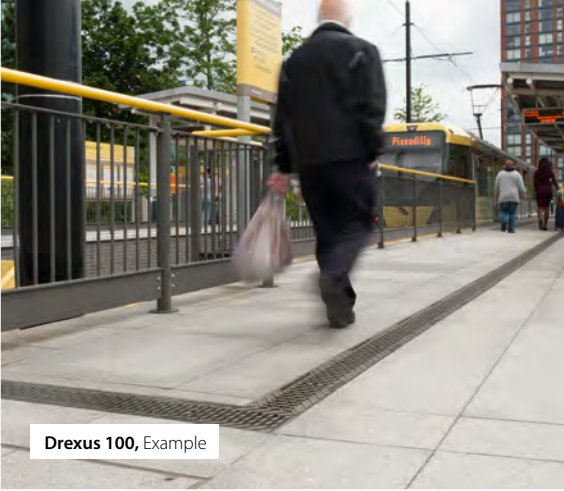
Creating Better Spaces



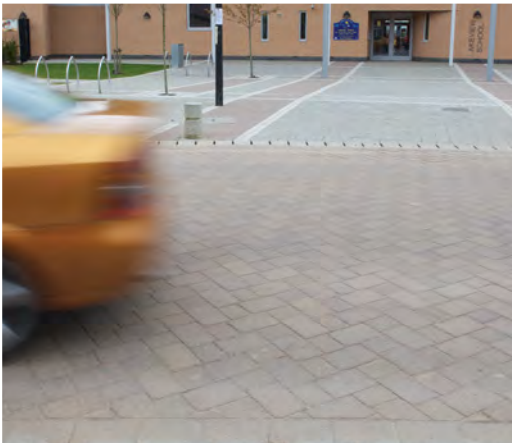
Mono Beany, A259



Beany Block, Newcastle



Drexus 100, Example



Max-E Channel, Bedford



Mono Slot Drain, Doncaster



Drexus XL, Example



Mini Beany, Conservation, Bedford



Birco 150, London

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Why Choose Marshalls?

Marshalls plc is the UK's leading hard landscaping company. We have achieved this status through progressive product innovation and by demonstrating outstanding service levels to our customers. This privileged position will be sustained by continuous investment in our brand, our products, and our people.

This dedication to excellence is exemplified by Marshalls commitment to developing a first class range of linear channel drainage products that fit even the most bespoke hydraulic system requirements.

Marshalls experience and expertise can ensure that the right system is selected, detailed, delivered and installed to give total peace of mind.

Marshalls pledges that all of the drainage products featured in this book comply with relevant industry standards, are manufactured to the highest standards, are fit for purpose and are designed to optimise savings in manufacture and use.

Marshalls' purchasing policy sets out the standards and ethics by which we conduct our business and operate our management systems to manage our suppliers.

The majority of our products are manufactured in the UK; where products are sourced from outside the UK an ethical risk assessment is completed and an appropriate action plan agreed - multi-stakeholder independent social audits are part of our best practice. Marshalls is a member of both the Ethical Trading Initiative and UN Global Compact.

Marshalls accepts legal compliance as an absolute minimum standard to which we work and, where no legislation is in place, we use industry best practice. Legal compliance is monitored through our independently audited management systems. Our Board is ultimately responsible for ensuring the business operates in a socially responsible way, including compliance with relevant legislation.

We're dedicated to creating spaces that make the world a better place for everybody – one pavement, one car park, and one city centre at a time.

Our vision is built upon four pillars: values by which our every decision is guided, no matter how big or small.

Demonstrating leadership.

We believe in driving the industry forward. It's an ambition we've been acting on for 120 years, thanks to our size, capability, range of products and unmatched market knowledge.

Delivering excellence.

We have very high standards. Our products have to be innovative, our people have to be the best, our workmanship has to be perfect. Only then can we deliver the quality we're renowned for, at every stage of the process.

Building trust.

Everyone at Marshalls acts with integrity, treating customers and their projects with care and respect. It means people trust us with their home, their business, their town. And it's how we foster relationships for the long-term.

Being sustainable.

We use the world to source our products, so we have a responsibility to look after it. It's something we have been committed to for over 120 years and has ensured our longevity. Whether it's creating stronger communities, preserving environments, or contributing to the UN Global Compact, our work is always sustainable.



Marshalls is a member of the Ethical Trading Initiative (ETI).



Design Service & Project Support

Engineering Solutions

Marshall is committed to ensuring that the right system is selected, detailed, delivered and installed. The understanding that the right selection of linear drainage system is crucial to the function of any hard landscaped area therefore Marshalls Linear Drainage team will work in partnership with the specifier, engineer and contractor, to become an integrated part of the design process, helping transform and deliver ideas into hydraulic designs matched to the individual project requirements to give total peace of mind.

“Our everyday goal is simple – Support the customer’s performance and aesthetic design aspirations with a commercially driven, value added Design support service, excelling through computer aided drawings, engineered solutions and technical advice.”

Marshalls free, no-obligation Drainage Design Service encompasses the following services:

In-House Design Support Services

By use of our bespoke computer software the design team can plan realistic and rapid solutions to your drainage needs. The Design Team will:

- Work with the project team to ensure the client’s expectation are met
- Operate with either electronic (CAD) or hard copy drawings
- Assist in the selection of the most appropriate system
- Provide hydraulic data to support the adequacy of the selected system
- Provide schedule and / or layouts of the components as appropriate

Flexible input options enable the user to generate required rainfall events in terms of duration and return period whilst also having the capability to adjust for climate change. These features ensure that each Marshalls linear drainage design can be tailored to meet the requirements of a specific project.

The Online Design Tool will:

- Give access at all times from most web active devices
- Save designs to a personal online library within your account
- Give access to pre-designed templates for fast track designing
- Automatically update with additional or new product and technical data
- Calculate flow rates and capacity levels required

CPD Presentations and Training

Marshalls Linear Drainage Team provides free of charge comprehensive and industry leading range of CPD (Continuous Professional Development) seminars to architects, engineers and contractors.

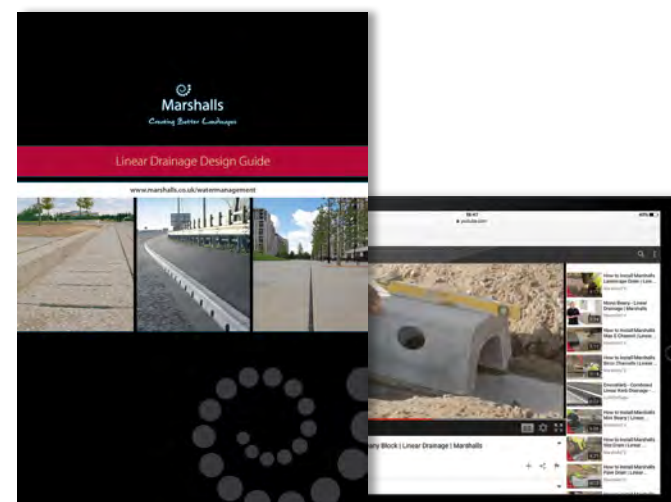
Marshalls CPD seminars cover a whole range of water management topics and solutions from permeable paving to linear and combined kerb and drainage systems.



Technical Design Guide

The fully comprehensive Marshalls Linear Drainage Design Guide draws from Marshalls experience in linear drainage, and aims to help the reader to understand more about this subject in a comprehensive and easy to understand way.

The guide, walks the reader through all the Product Range, the case for linear drainage, cost comparisons, the product selection process and design principles. The guide also provides technical information, offering advice on design, installation, materials and maintenance.



Further Technical documentation is also available;

- Conduit files
- Computer Aided Design product drawings
- Technical product data and specification sheets
- Declaration of performances in accordance with BS EN 1433:2002
- Maintenance and cleaning regimes
- Online installation guides & videos.

BIM & Product innovation

Marshalls is an early adopter of Building Information Modelling (BIM) and has invested heavily in developing our people and skills to create the appropriate BIM objects and data that large commercial projects will soon demand. The company is in the process of building a BIM object library that will be unrivalled in the Landscape sector and currently collaborates with relevant industry bodies to develop the training strategies, product data and software that will drive BIM adoption across the industry.

Bespoke Solutions

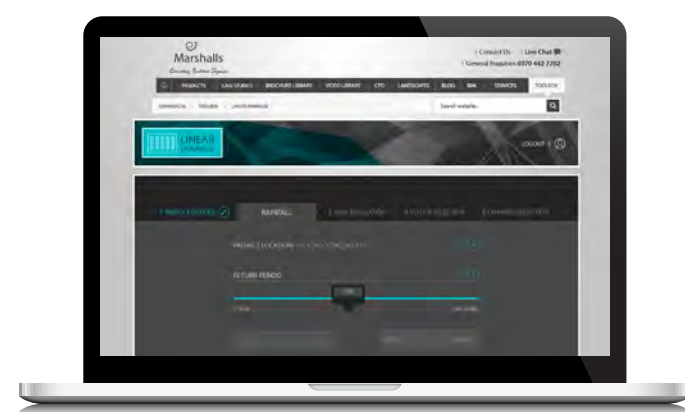
Detailed design features often make the difference between good and great. Marshalls is always delighted to take challenging briefs for bespoke landscape linear drainage features.

Liverpool Lime Street Station required a discreet drainage solution to follow the curvature of the architecture. Marshalls was able to develop a true radius slot drain to meet the clients requirements.

The client of the Welding Institute in Cambridge required a linear drainage solution for a multi story car park. Marshalls was able to recommend and supply Marshalls Birco Profil, a shallow steel channel designed for low construction heights whilst providing optimum drainage performance, reliable traffic safety and attractive design.



Available January 2016



NEW Online Hydraulic Design Software

Marshalls bespoke software (the online design tool) can enable you to plan realistic, precise and cost effective solutions to your drainage needs, all at your fingertips through a simple step-by-step process.

The software uses the modified rational method as described in the Wallingford procedure to calculate appropriate runoff rates for your project. A simple procedure is followed to ensure selection of the correct Marshalls linear drainage system from a structural, aesthetic and hydraulic perspective.



360 Service Package

Our 360 Service Package provides comprehensive support including pre-construction appraisal, product sampling and CAD facilities. Marshalls Water Management and hydraulic engineering consultants are on hand at all stages of planning and

construction to help ensure sound hydraulic design and sustainable performance of the drainage installation. To smooth project management our construction service teams employ state of the art traffic planning software for real time tracking and priority delivery schedules. All of this is underpinned with RIBA accredited training seminars for project teams. Visit marshalls.co.uk/360 to find out how your project can benefit.



Design Space



DESIGN SPACE









A bespoke London work space to inspire landscape design professionals. Bookable spaces for meetings, brainstorm sessions, or simply quiet space to think and create. Fully kitted to explore materials, colours and textures, BIM Models, technical data and social media platforms all on screen.

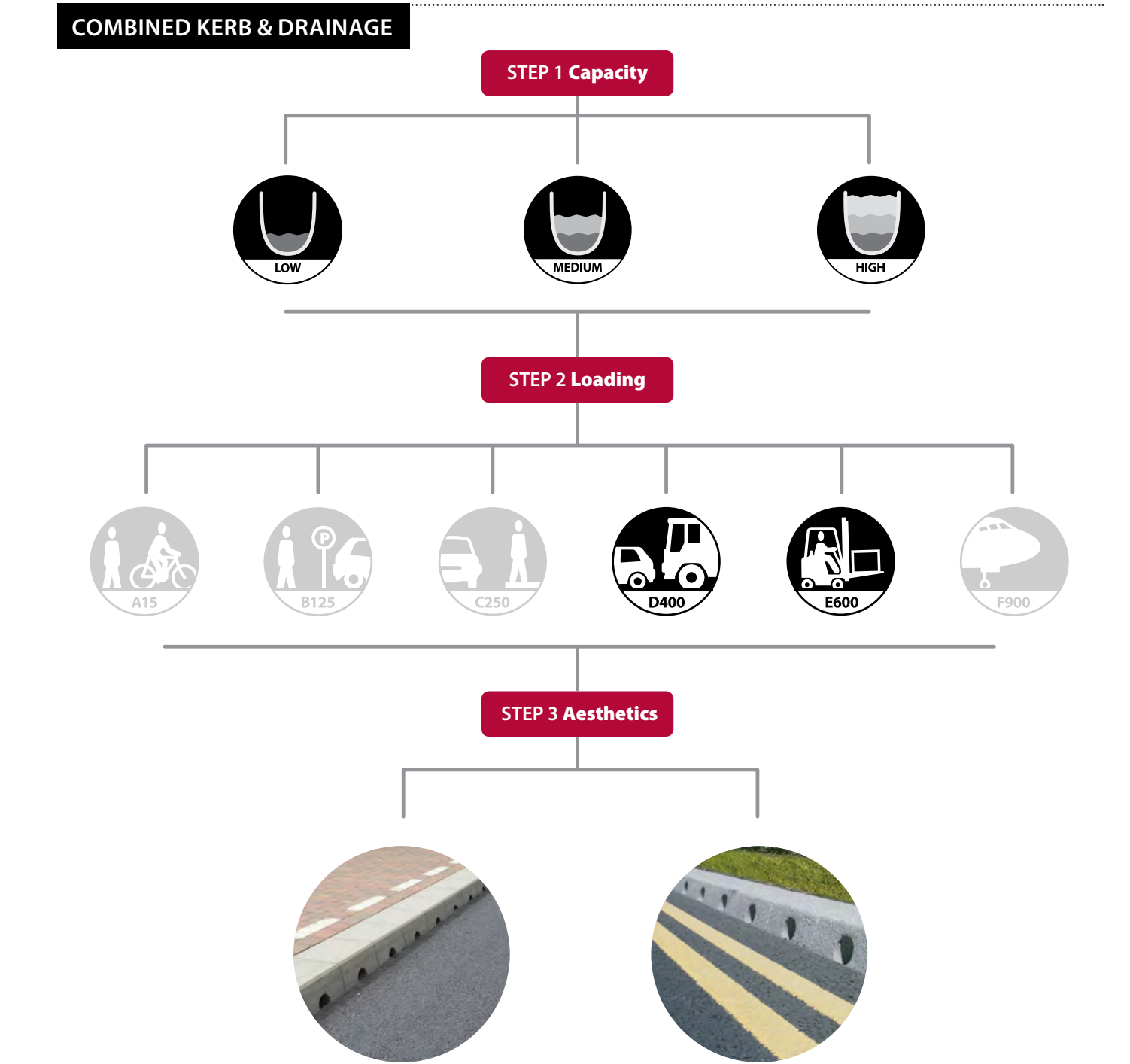
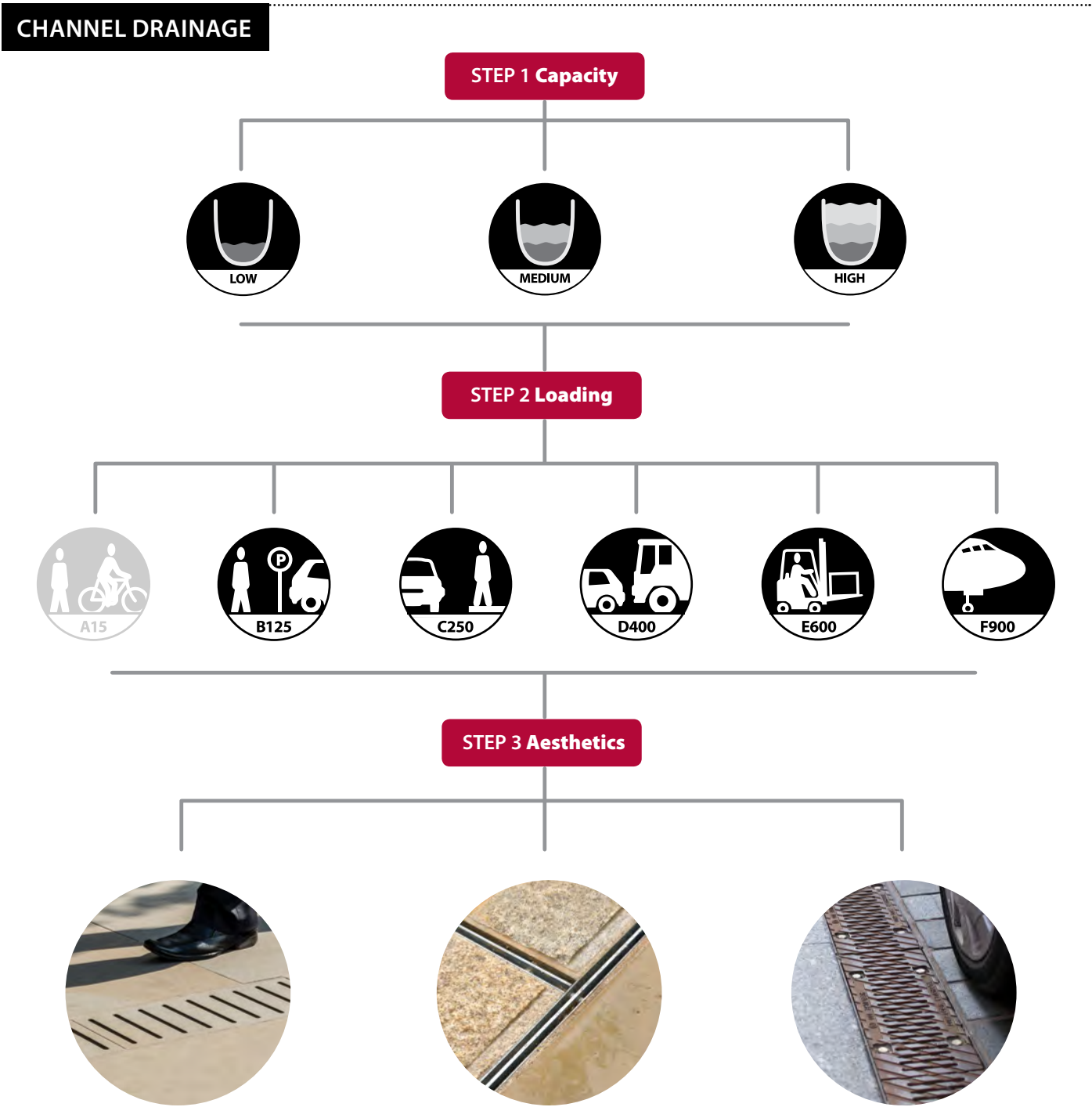
Extra events are a regular programme of seminars, notable speakers, and CPD. Open Space for big ideas, Personal Space for quiet contemplation, Inner Space for imagination.

Decision Steps For Linear Drainage

Once the type of linear drainage system is determined there are three decisions to make in order to select the right product for your requirement:

- STEP1**
Hydraulic capacity - the volume of water expected to be removed, low, medium or high
- STEP 2**
Load Classification - what loading the drainage will be subjected to, conditional on the purpose of the scheme, ranging from pedestrian and cyclist to traffic with high wheel loads
- STEP 3**
Aesthetics – Marshalls provides a wider choice of finish than most whatever the purpose

							
Low Capacity	Medium Capacity	High Capacity	125Kn Test Load	250Kn Test Load	400Kn Test Load	600Kn Test Load	900Kn Test Load
Drains an area up to 750m2 or typical run lengths up to 30 lin m.	Drains an area up to 1750m2 or typical run lengths up to 100 lin m.	Drains an area in excess of 1750m2 or typical run lengths over 100 lin m.	Footways, pedestrian areas, car parks, car parking decks and similar areas used by light, slow-moving traffic.	Kerb-sides, general parking areas and hard shoulders that extend to a maximum of 0.5m into the trafficked area.	Carriageways of roads (including pedestrian streets and parking areas) catering for all legal road-going vehicles.	Private traffic areas used by vehicles imposing particularly heavy wheel loads.	Special areas of abnormally heavy wheel loads e.g. aircraft pavements.



Steps 1 & 2 - Choose Your Channel





Steps 1 & 2 helps you to select the right channel to suit your capacity and loading requirement.

Choice depends on:

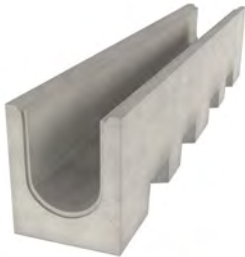
- Step 1 - Hydraulic capacity, from low to high
- Step 2 - Loading application from B125 to F900

Constructed from high performance concrete or medium density polyethylene, there's a channel solution for every scheme.

Drexus 100



- Available in 1000mm and 500mm lengths
- Invert width 100mm
- Available in 5 constant invert depths of 90 (0/0), 115 (5/0), 140 (10/0), 165 (15/0) and 190mm (20/0)
- 4 transition units, each 1000mm long
- T-Junctions, end caps, cap outlets and outfalls
- Tops – Drexus Pave Drain, Drexus Slot Drain, cast iron grate tops







Birco Shallow Channel



- Available in 1000mm lengths
- Invert widths of 100, 150 and 300mm
- Available in 6 constant invert depths of 20, 40, 50, 80, 130, 180mm
- End caps and cap outlets
- Tops – cast iron and galvanised cast iron/steel grates







Birco Lite Channel



- Available in 1000mm and 500mm lengths
- Invert width of 100mm
- Available in 5 constant invert depths of 90 (0/0), 115 (5/0), 140 (10/0), 165 (15/0) and 190mm (20/0)
- 20 inbuilt fall channels with a gradient of 0.5%, each 1000mm long
- T-Junctions, end caps, cap outlets and outfalls
- Tops – cast iron and galvanised cast iron/steel grates








Birco 100 Channel



- Available in 1000mm and 500mm lengths
- Invert width of 100mm
- Available in 5 constant invert depths of 100 (0/0), 150 (5/0), 200 (10/0), 250 (15/0) and 300mm (20/0)
- 20 inbuilt fall channels with a gradient of 1%, each 1000mm long
- T-Junctions, end caps, cap outlets and outfalls
- Tops – cast iron and galvanised cast iron/steel grates






Birco 150 Channel



- Available in 1000mm and 500mm lengths
- Invert width of 150mm
- Available in 5 constant invert depths of 150 (0/0), 200 (5/0), 250 (10/0), 300 (15/0) and 350mm (20/0)
- 20 inbuilt fall channels with a gradient of 1%, each 1000mm long
- T-Junctions, end caps, cap outlets and outfalls
- Tops – cast iron and galvanised cast iron/steel grates






Traffic Drain & Mini Beany Channel



- Available in 1000mm and 500mm lengths
- Available in 4 constant invert depths of 110 (0/0), 160 (5/0), 210 (10/0), 260mm (15/0)
- Base transition unit available
- Radius units available
- End caps, cap outlets and cover plates and outfalls
- Tops – cast iron and Mini Beany tops







Birco 200 Channel



- Available in 1000mm and 500mm lengths
- Invert width of 200mm
- Available in 4 constant invert depths of 205 (0/0), 230 (5/0), 255 (10/0), 280 (15/0) and 350mm (20/0)
- 20 inbuilt fall channels with a gradient of 1%, each 1000mm long
- T-Junctions, end caps, cap outlets and outfalls
- Tops – cast iron grates








Max-E & Beany Channel



- Available in 500mm lengths
- Available in 4 constant invert depths of 100 (0/0), 170 (5/0), 240 (10/0), 520mm (15/0)
- Base transition unit available
- Radius units available
- End caps, cap outlets, cover plates and outfalls
- Tops – concrete, in-laid, cast iron and beany tops



Drexus XL



- Available in 2000mm lengths
- Invert width 188 (325), 319 (425), 379 (525), 482 (675), 586mm (825)
- Available in 5 constant invert depths of 505 (325), 631 (425), 721 (525), 857 (675), 1014mm (825)
- 8 transition units each approx 478mm long
- End caps, chamber transitions and outfalls
- Tops - In-situ cast concrete












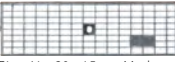


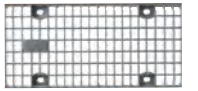








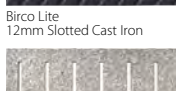





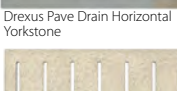






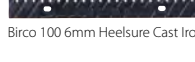



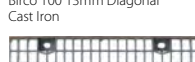







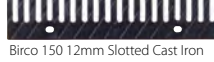















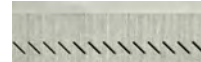
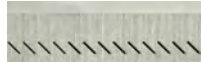










Step 3 - Choose Your Top

Steps 1 & 2 are very much predetermined by project specifics, however the choice of aesthetics, step 3, can be made with far more freedom.

Step 3 - Aesthetics

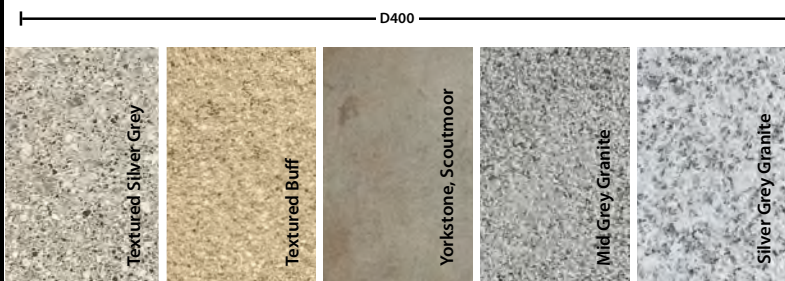
Marshalls Linear Drainage Systems allow designers the broadest of choices to suit their scheme aesthetic. Drainage tops are made in a variety of materials, patterns and colours.

The chart below shows the Drainage Top styles available for different linear base classifications.

	<div>CLASS B125 125kN TEST LOAD Footways, pedestrian areas, car parks, car parking decks and similar areas used by light, slow-moving traffic.</div>	<div>CLASS C250 250kN TEST LOAD Kerb-sides, general parking areas and hard shoulders that extend to a maximum of 0.5m into the trafficked area.</div>	<div>CLASS D400 400kN TEST LOAD Carriageways of roads (including pedestrian streets and parking areas) catering for all legal road-going vehicles.</div>	<div>CLASS E600 600kN TEST LOAD Private traffic areas used by vehicles imposing particularly heavy wheel loads.</div>	<div>CLASS F900 900kN TEST LOAD Special areas of abnormally heavy wheel loads e.g. aircraft pavements.</div>
<div>LOW CAPACITY Drains an area up to 750m²* or typical run lengths up to 30 lin m</div>	<div> Birco Lite 6mm Heelsure Cast Iron</div> <div> Drexus 100 6mm Heelsure Cast Iron</div>	<div> Birco Lite 12mm Slotted Cast Iron</div> <div> Birco Lite 30 x 15mm Mesh Galvanised Steel</div> <div> Birco Lite 6mm Heelsure Cast Iron</div> <div> Birco Lite 12mm Slotted Stainless Steel</div> <div> Birco 100 30 x 30mm Mesh Galvanised Steel</div> <div> Birco 100 12mm Slotted Cast Iron</div> <div> Birco 100 30 x 12mm Galvanised Steel Mesh</div> <div> Drexus 100 6mm Heelsure Cast Iron</div> <div> Drexus 100 12mm Slotted Cast Iron</div> <div> Birco 150 12mm Slotted Cast Iron</div> <div> Drexus Slot Drain Mono</div>	<div> Birco Lite 6mm Heelsure Cast Iron</div> <div> Birco Lite 12mm Slotted Cast Iron</div> <div> Drexus Pave Drain Horizontal Textured Silver Grey</div> <div> Drexus Pave Drain Horizontal Mid Grey Granite</div> <div> Drexus 100 6mm Heelsure Cast Iron</div> <div> Drexus Slot Drain Duo</div> <div> Birco Lite Ellipse Cast Iron</div> <div> Drexus Pave Drain Horizontal Yorkstone</div> <div> Drexus Pave Drain Horizontal Textured Buff</div> <div> Drexus Pave Drain Horizontal Silver Grey Granite</div> <div> Drexus 100 12mm Slotted Cast Iron</div> <div> Drexus Slot Drain Duo Offset</div> <div> Mono Beany Standard Grey</div>	<div> Birco 100 12mm Slotted Cast Iron</div> <div> Birco 100 6mm Heelsure Cast Iron</div> <div> Birco 100 Cast Iron Solid Cover</div> <div> Birco 150 6mm Heelsure Cast Iron</div> <div> Birco 150 Cast Iron Solid Cover</div> <div> Birco 100 13mm Diagonal Cast Iron</div> <div> Birco 100 20 x 30mm Mesh Galvanised Steel</div> <div> Birco 150 12mm Slotted Cast Iron</div> <div> Birco 150 12mm Slotted Galvanised Cast Iron</div> <div> Birco 150 20 x 30mm Mesh Galvanised Steel</div> <div> Mini Beany Standard Grey</div> <div> Mini Beany Conservation Silver Grey</div>	<div> Birco 100 12mm Slotted Cast Iron</div> <div> Birco 150 12mm Slotted Cast Iron</div> <div> Traffic Drain</div>
<div>MEDIUM CAPACITY Drains an area up to 1750m²* or typical run lengths up to 100 lin m</div>	<div> Birco 150 12mm Slotted Cast Iron</div>	<div> Mono Beany Standard Grey</div>	<div> Birco 150 12mm Slotted Cast Iron</div> <div> Birco 150 6mm Heelsure Cast Iron</div> <div> Birco 150 12mm Slotted Galvanised Cast Iron</div> <div> Mini Beany Standard Grey</div> <div> Birco 150 Cast Iron Solid Cover</div> <div> Birco 150 20 x 30mm Mesh Galvanised Steel</div> <div> Birco 200 18mm Slotted Cast Iron</div> <div> Mini Beany Conservation Silver Grey</div>	<div> Birco 150 12mm Slotted Cast Iron</div> <div> Traffic Drain</div>	
<div>HIGH CAPACITY Drains an area in excess of 1750m²* or typical run lengths over 100 lin m</div>	<div> Max-E Channel Standard Grey</div> <div> Drexus XL Insitu Cast Concrete</div>	<div> Drexus XL Insitu Cast Concrete</div>	<div> Birco 200 18mm Slotted Cast Iron</div> <div> Birco 300 20mm Slotted Cast Iron</div> <div> Max-E Channel Reinforced Standard Grey</div> <div> Max-E Channel Conservation Silver Grey</div> <div> Beany Block Standard Grey</div> <div> Beany Block Conservation Silver Grey</div> <div> Drexus XL Insitu Cast Concrete</div>	<div> Birco 300 20mm Slotted Cast Iron</div> <div> Max-E-Channel Cast Iron</div> <div> Drexus XL Insitu Cast Concrete</div>	



Drexus Pave Drain, Example



Drexus Pave Drain

Paving Drainage System



Channel Drainage Product Range



Marshalls NEW Drexus Pave Drain offers a unique aesthetic for linear drainage. Through our concrete expertise and heritage in natural stone we have developed a drainage solution to complement our most popular paving products including premium concrete and natural stone. Drexus Pave Drain is available in a variety of finishes, suitable for any public realm development.

NS Plus
Q10 170

* Not suitable for public road carriageways or motorways

NEW

Drexus Pave Drain

A Tops

Top	Loading	Length (mm)	Width (mm)	Depth (mm)	Unit Weight (kg)	Horizontal Slot
Textured Silver Grey	D400	500	160	80	15	DR544810
Textured Buff	D400	500	160	80	15	DR544820
Granite Silver Grey	D400	500	160	105	17	DR544840
Granite Mid Grey	D400	500	160	105	17	DR544850
Yorkstone Scoutmoor	D400	500	160	105	17	DR544860

B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 0/0	1000	160	100	170	90	37	DR541015
Channel 5/0	1000	160	100	195	115	45	DR541025
Channel 10/0	1000	160	100	220	140	53	DR541035
Channel 15/0	1000	160	100	245	165	61	DR541045
Channel 20/0	1000	160	100	270	190	69	DR541055
Channel 0/0	500	160	100	170	90	18.5	DR541515
Channel 5/0	500	160	100	195	115	22.5	DR541525
Channel 10/0	500	160	100	220	140	26.5	DR541535
Channel 15/0	500	160	100	245	165	30.5	DR541545
Channel 20/0	500	160	100	270	190	34.5	DR541555

Drexus Pave Drain with reference numbers indicated in **bold** black are available ex-stock. Drexus Pave Drain with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.

D T Junction Channels

T Junction Channels	Unit Weight (kg)	Item Code
T-Channel 0/0	19	DR543750
T-Channel 10/0	27	DR543760
T-Channel 20/0	35	DR543770

C Channel Transitions

Channel Transitions	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
0/0 - 5/0	1000	160	100	179	104/129	39	DR542110
5/0 - 10/0	1000	160	100	204	129/154	43	DR542120
10/0 - 15/0	1000	160	100	229	154/179	46	DR542130
15/0 - 20/0	1000	160	100	254	179/204	50	DR542140

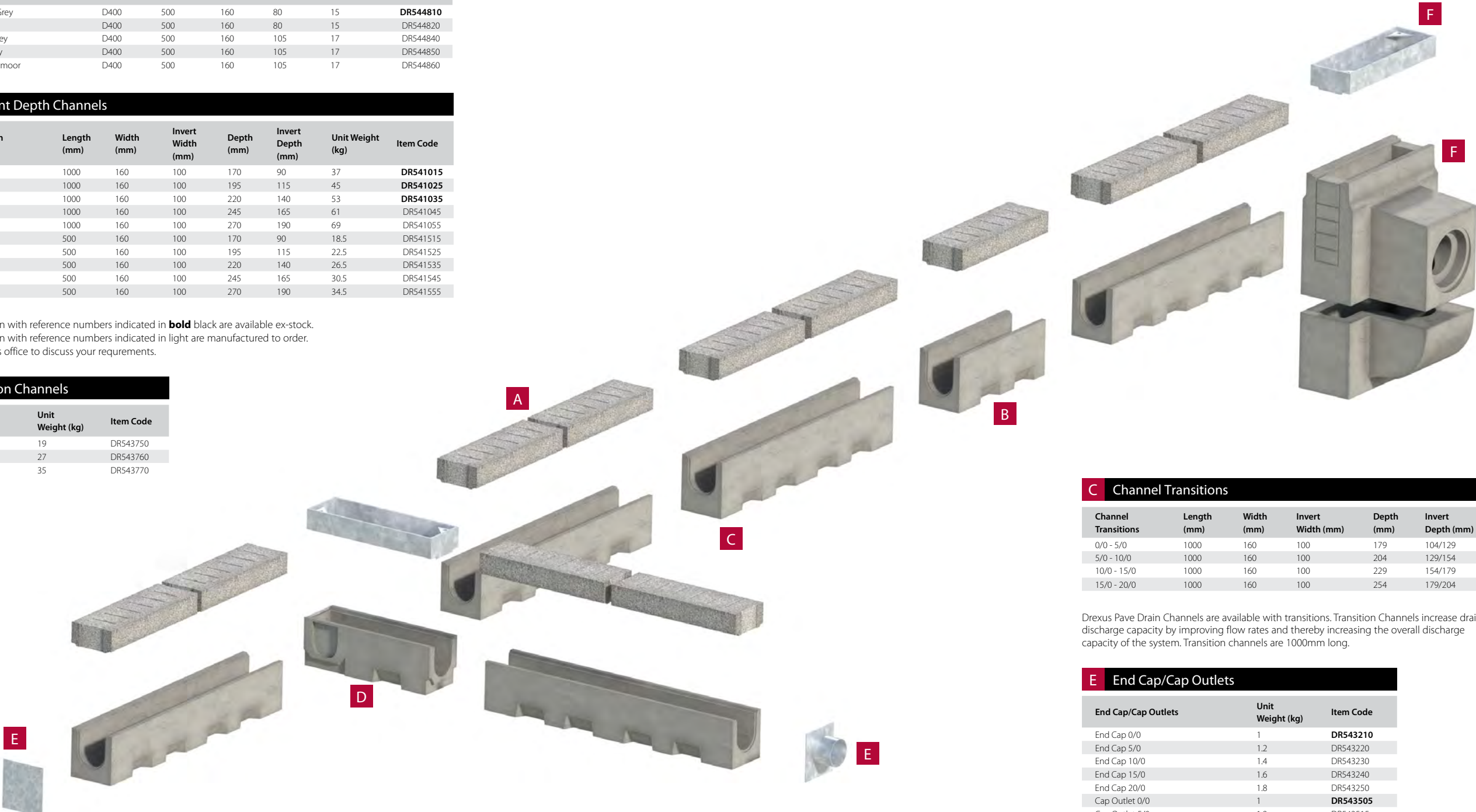
Drexus Pave Drain Channels are available with transitions. Transition Channels increase drainage discharge capacity by improving flow rates and thereby increasing the overall discharge capacity of the system. Transition channels are 1000mm long.

E End Cap/Cap Outlets

End Cap/Cap Outlets	Unit Weight (kg)	Item Code
End Cap 0/0	1	DR543210
End Cap 5/0	1.2	DR543220
End Cap 10/0	1.4	DR543230
End Cap 15/0	1.6	DR543240
End Cap 20/0	1.8	DR543250
Cap Outlet 0/0	1	DR543505
Cap Outlet 5/0	1.2	DR543515
Cap Outlet 10/0	1.4	DR543525
Cap Outlet 15/0	1.6	DR543535
Cap Outlet 20/0	1.8	DR543545

F Outfall & Access Covers

Outfall & Access Covers	Unit Weight (kg)	Item Code
Side Outfall	137	DR543020
End Outfall	101	DR543025
Pave Drain Access Cover (Low)	10	DR544770
Pave Drain Access Cover (Nat Stone)	12	DR5447750



Drexus Pave Drain Installation Guide

1. Excavation

a.

Sufficient material should be excavated to accommodate the drainage channel, concrete bedding and haunching.

b.

Any 'soft spots' or poorly compacted formation should be made good.
2. Setting Out

a.

The top of the Drexus Pave Drain should be 5mm below the finished pavement surface.

b.

It may be advantageous to use setting out pins and string lines to achieve the desired level for the channels.
3. Outfalls

a.

Drexus Pave Drain outfalls should be installed first.

b.

Sufficient material should be excavated to accommodate the trapped Drexus Pave Drain outfall units

c.

150mm of C25/30 mix (BS 8500-1&2) concrete is placed in the bottom of the excavation

d.

The bottom section of the two part outfall is lowered into position

e.

Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Drexus Pave Drain outfall so as to provide a seal between the top and bottom sections

f.

The bedding concrete should be laid and brought up level with underside of the pavement bedding course.

g.

The Access Cover & Frame Units should be set directly onto a 10mm bed of mortar with mortar Class12 to BS EN 998-2:2003 along each side of the outfall unit
4. Channel Installation

a.

Bedding concrete (C25/30 to BS 8500-1&2) of the appropriate thickness and depth shall be laid

b.

Channels shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill, channel ends should about as tightly as possible.

c.

Alternatively, the channels may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.

d.

Where cutting is necessary, channels shall be cut so that no single Unit is less than 350mm in length.

e.

All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter.
5. Channel Joint Sealant

a.

Jointing of channels shall occur prior to the fixing of the top units. A bead of M Flex sealant should be gunned in to the groove formed when adjacent channels abut.

b.

Surplus sealant shall be removed from the inner surface of the Units as work proceeds.
6. Top Block Installation

a.

The string line should be set to the level of the top corner of Units.

b.

Again, starting at the Outfall, the Units should be set directly onto a 10mm bed of mortar to mortar class 12 BS EN 998-2:2003.

c.

The Top Blocks should be tamped into position close to previously laid Units and the alignment checked.

d.

The levels should be checked using the string line and a spirit level.

e.

In addition, the general alignment should be checked from all directions as each Block is laid. Any Unit deviating by more than 3mm in 3m from line and level shall be made good by lifting and relaying.

f.

The joints between adjacent top units are dry and units should be laid hand tight to achieve either a 6mm or 12mm opening as detailed on drawing.

g.

Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 200mm in length. All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter.

h.

The Drexus Pave Drain top units should be protected during the construction phase to prevent debris entering the slots.
7. End Caps

a.

Where the Drexus Pave Drain run does not terminate at an outfall, the base unit shall be sealed using the correct sized Drexus Pave Drain End Cap.

b.

The End Cap shall be securely placed against the vertical end of the base unit and haunched with fresh concrete (C25/30 mix to BS 8500-1&2).

In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.

Background

Thistle Street is located at the heart of Scotland's capital city in Edinburgh's New Town. Built in stages between 1767 and 1850, retaining much of the original neo classical and Georgian period architecture, the New Town is considered to be a masterpiece of city planning. Together with the Old Town, it was designated a UNESCO World Heritage Site in 1995.

Challenge

With pedestrian safety and comfort in mind, Edinburgh City Council engineers were seeking to improve drainage around the walkways in this essentially flat area, minimising the issues of ponding and standing water, creating effective channels and falls yet retaining the character of the city streets.

Solution

Marshalls Pave Drain providing the perfect solution, offering a unique aesthetic for linear drainage. Utilising expertise in both concrete and natural stone, Pave Drain provides an effective combined paving and drainage solution which perfectly complements natural stone paving products, including the Scoutmoor Yorkstone installed on Thistle Street.



Client:
City of Edinburgh Council

Engineer:
City of Edinburgh Council
Engineers

Contractor:
Premier 1 (Land Services)

Marshalls products used:
• Yorkstone Pave Drain



Pave Drain

Case Study - Thistle Street, Edinburgh

Available in a variety of designs and finishes, suitable for any public realm development, the Pave Drain concept combines a natural stone upper section complete with drainage slots with a concrete channel block which sits below the upper section, allowing surface water to drain away below the surface of the walkway.

Pave Drain achieves a loading classification of D400, making it suitable for areas subject to vehicular overrun as well as pedestrian traffic, helping to create better and appropriate landscapes for some of Britain's most iconic sites.

Benefit

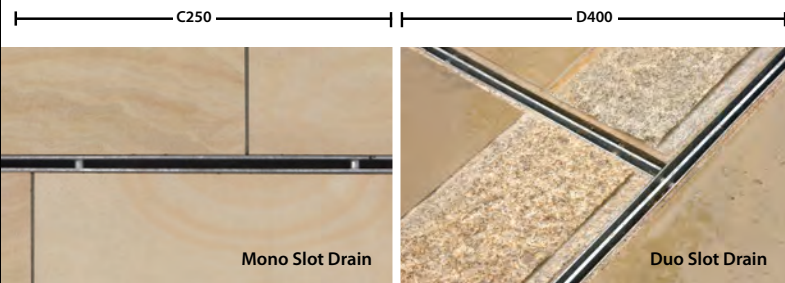
Dovetailing perfectly with existing hard landscaping products along Thistle Street, Marshalls Pave Drain is now playing an important role in maintaining safe and well-drained pedestrian walkways serving the shops and restaurants in this busy and popular area of Edinburgh.



Slot Drain, Example

Drexus Slot Drain

Slot Drainage System



Mono Slot Drain

Duo Slot Drain

Marshall's NEW Drexus Slot Drain is a highly effective yet beautifully discreet solution for surface water removal on premium landscapes. Marshall's New Drexus 100 channel is hidden beneath a slimline galvanised steel slot which features a mono or duo linear aperture.

Perfect for complementing block or flag installations and particularly suited to Natural Stone landscapes, Drexus Slot Drain is suitable for an array of applications and public realm developments.



n55Plus
Q10 170

NEW

Background

Dubbed the construction project of the century, building the Olympic Park created not only a world class venue for the Games, but in the legacy phase a whole new London district. Marshall's is proud to have supplied a wide range of materials to the project and played a role in ensuring the project was completed on time to deliver one of the most successful Games of the modern age.

Challenge

The ODA's Procurement Policy demanded that sustainability credentials as well as good value and high quality were paramount for any company wishing to become a supplier to the Games. As well as guaranteeing high quality solutions, suppliers were required to deliver large quantities of materials within tight time periods, meeting complex security requirements.

Solution

The Marshall's offer for the Olympic Park included full schedules for the quantities of different products required for each phase of the scheme, full design service for the slot drainage system, carbon footprint for all materials used and full sustainability qualification documentation. In addition, Marshall's provided a dedicated on site support team for the construction period and logistical support complying with the site Delivery Management System (DMS) booking in and security system.

The Olympic Park Roads & Bridges contract covered the road infrastructure project for the main Olympic Park. To gain a specification for the linear drainage systems and kerb units, Marshall's worked closely with the designers from a very early stage. Marshall's Beany Block, the original combined kerb and drainage system, was selected for this section of the project. For the North and South Security Plazas and the high profile Aquatics Centre designed by architect Zaha Hadid, Marshall's supplied high quality Birco linear drainage systems.

Slot Drain Duo

Case Study - Olympic Park, London

For the Athletes' Village - one of the most significant new urban developments in the UK - Marshall's supplied Slot Drain Channel system to complement the range of high quality natural stone paving products also supplied by the company for this prestigious site. Slot Drain is a highly effective yet beautifully discreet solution for surface water removal on premium landscapes, with drainage channels hidden beneath the slimline galvanised steel slots, creating a virtually invisible method of removing runoff water for high end schemes.

Benefits

As the UK's leading supplier of hard landscaping materials, Marshall's was able to demonstrate the ability to supply the quantity and quality of products required for a project of this size. The company also operates under the triple bottom line of economic, social and environmental sustainability, placing this ethos at the very heart of the business. Marshall's is proud to be a part of creating better landscapes for future generations to live, work, rest and play in East London.

Client:
ODA

Designer:
Vogt & Applied
Landscape Design

Contractor:
Lend Lease

Engineer:
Arup

Marshall's products used:

- Beany Block
- Birco
- Slot Drain

Drexus Slot Drain

A Top Units

Top Units	Length (mm)	Length (mm)	Width (mm)	Depth (mm)	Unit Weight (kg)	Item Code
Drexus 100 Duo Slot	D400	1000	116	105	8.5	DR544510
Drexus 100 Offset Duo	D400	1000	140	105	11.4	DR544530
Drexus 100 Mono Slot	C250	1000	116	110	6	DR544520
Drexus 100 Duo Slot	D400	500	116	105	4.25	DR544610
Drexus 100 Offset Duo	D400	500	140	105	5.7	DR544630
Drexus 100 Mono Slot	C250	500	116	110	3	DR544620

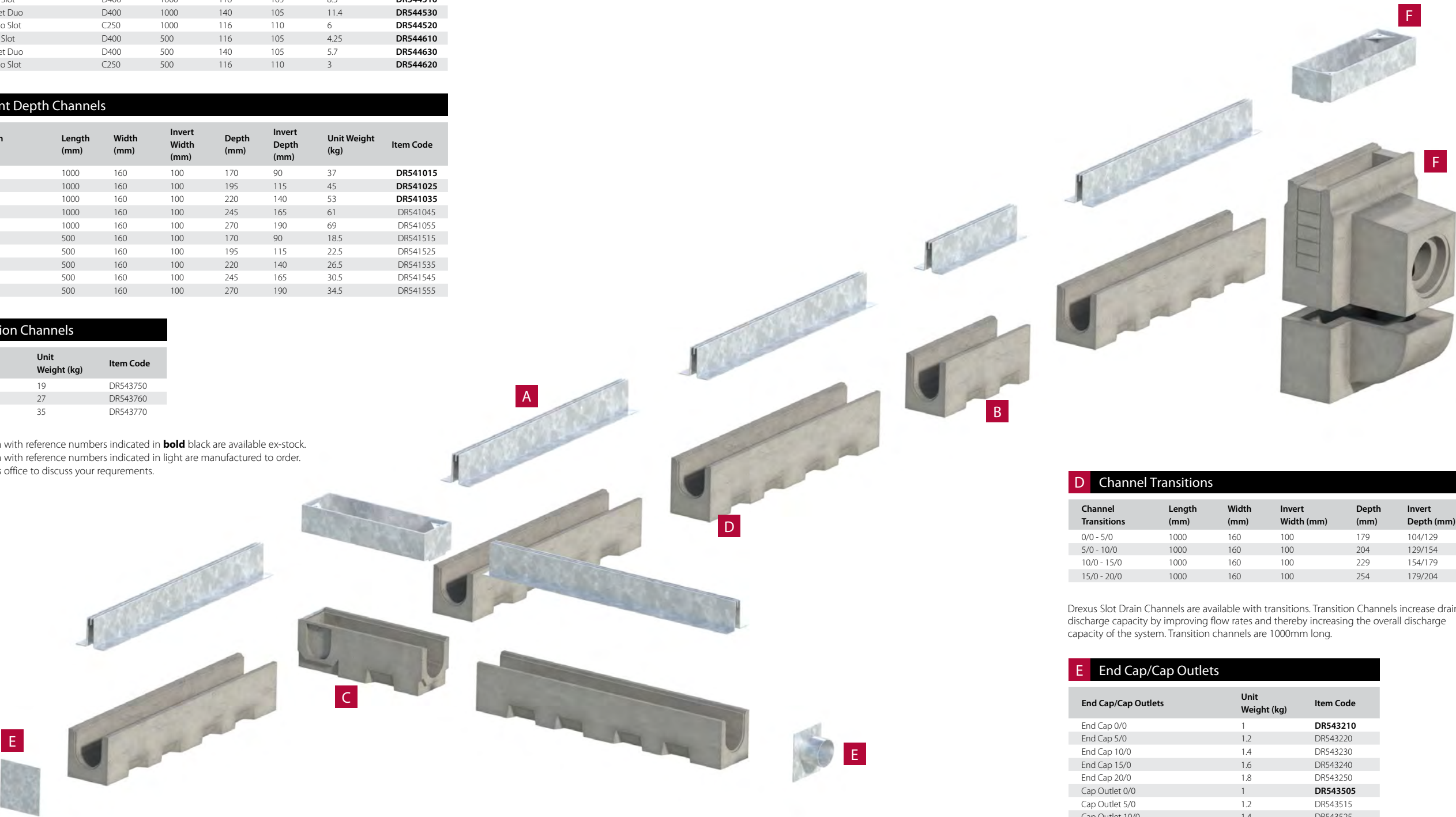
B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 0/0	1000	160	100	170	90	37	DR541015
Channel 5/0	1000	160	100	195	115	45	DR541025
Channel 10/0	1000	160	100	220	140	53	DR541035
Channel 15/0	1000	160	100	245	165	61	DR541045
Channel 20/0	1000	160	100	270	190	69	DR541055
Channel 0/0	500	160	100	170	90	18.5	DR541515
Channel 5/0	500	160	100	195	115	22.5	DR541525
Channel 10/0	500	160	100	220	140	26.5	DR541535
Channel 15/0	500	160	100	245	165	30.5	DR541545
Channel 20/0	500	160	100	270	190	34.5	DR541555

C T Junction Channels

T Junction Channels	Unit Weight (kg)	Item Code
T-Channel 0/0	19	DR543750
T-Channel 10/0	27	DR543760
T-Channel 20/0	35	DR543770

Drexus Slot Drain with reference numbers indicated in **bold** black are available ex-stock. Drexus Slot Drain with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.



D Channel Transitions

Channel Transitions	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
0/0 - 5/0	1000	160	100	179	104/129	39	DR542110
5/0 - 10/0	1000	160	100	204	129/154	43	DR542120
10/0 - 15/0	1000	160	100	229	154/179	46	DR542130
15/0 - 20/0	1000	160	100	254	179/204	50	DR542140

Drexus Slot Drain Channels are available with transitions. Transition Channels increase drainage discharge capacity by improving flow rates and thereby increasing the overall discharge capacity of the system. Transition channels are 1000mm long.

E End Cap/Cap Outlets

End Cap/Cap Outlets	Unit Weight (kg)	Item Code
End Cap 0/0	1	DR543210
End Cap 5/0	1.2	DR543220
End Cap 10/0	1.4	DR543230
End Cap 15/0	1.6	DR543240
End Cap 20/0	1.8	DR543250
Cap Outlet 0/0	1	DR543505
Cap Outlet 5/0	1.2	DR543515
Cap Outlet 10/0	1.4	DR543525
Cap Outlet 15/0	1.6	DR543535
Cap Outlet 20/0	1.8	DR543545

F Outfall & Access Covers

Outfall & Access Covers	Unit Weight (kg)	Item Code
Side Outfall	137	DR543020
End Outfall	101	DR543025
Slot Drain Access Cover (Low)	10	DR544640

Drexus Slot Drain Installation Guide

1. Excavation

- a. Sufficient material should be excavated to accommodate the drainage channel, concrete bedding and haunching.
- b. Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- a. The top of the Drexus Slot Drain should be 5mm below the finished pavement surface.
- b. It may be advantageous to use setting out pins and string lines to achieve the desired level for the channels.

3. Outfalls

- a. Drexus Slot Drain outfalls should be installed first.
- b. Sufficient material should be excavated to accommodate the trapped Drexus Slot Drain outfall units
- c. 150mm of C25/30 mix (BS 8500-1&2) concrete is placed in the bottom of the excavation
- d. The bottom section of the two part outfall is lowered into position
- e. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Drexus Slot Drain outfall so as to provide a seal between the top and bottom sections
- f. The top section of the two part Drexus Slot Drain is lowered into position
- g. The bedding concrete should be laid and brought up level with underside of the pavement bedding course.
- h. The Access Cover & Frame Units should be set directly onto a 10mm bed of mortar with mortar Class12 to BS EN 998-2:2003 along each side of the outfall uni.

4. Channel Installation

- a. Bedding concrete (C25/30 to BS 8500-1&2) of the appropriate thickness and depth shall be laid
- b. Channels shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill, channel ends should about as tightly as possible.
- c. Alternatively, the channels may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.
- d. Where cutting is necessary, channels shall be cut so that no single Unit is less than 350mm in length.
- e. All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter.

5. Channel Joint Sealant

- a. Jointing of channels shall occur prior to the fixing of the top units. A bead of M Flex sealant should be gunned in to the groove formed when adjacent channels abut.
- b. Surplus sealant shall be removed from the inner surface of the Units as work proceeds.

6. Top Unit Installation

- a. The string line should be set to the level of the top corner of Units.
- b. Again, starting at the outfall, the units should be dry laid onto the channel, use a mortar bed for levelling purposes if required to class 12 from BS EN 998-2:2003
- c. The top units should be tamped into position close to previously laid Units and the alignment checked.
- d. The levels should be checked using the string line and a spirit level.
- e. In addition, the general alignment should be checked from all directions as each unit is laid. Any Unit deviating by more than 3mm in 3m from line and level shall be made good by lifting and relaying.
- f. The joints between adjacent top units should be sealed with Marshalls M Tape to prevent ingress of bedding material from the surrounding pavement.
- g. Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 350mm in length. All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter.
- h. Any cut galvanised steel shall be renovated using Defcon Z or similar approved material.

7. End Caps

- a. Where the Drexus Slot Drain run does not terminate at an outfall, the base unit shall be sealed using the correct sized Slot Drain End Cap.
- b. The End Cap shall be securely placed against the vertical end of the base unit and haunched with fresh concrete (C25/30 mix to BS 8500-1&2).

8. Pavement Installation

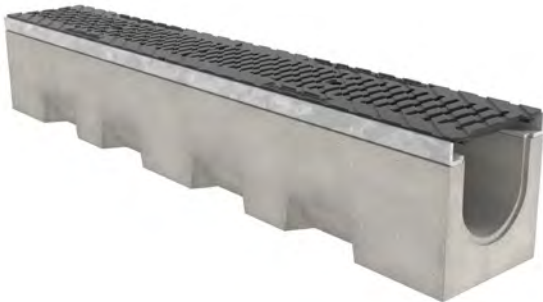
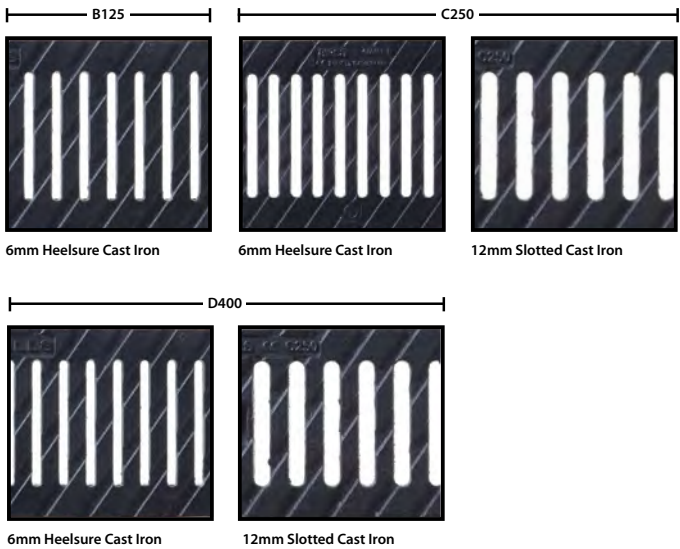
- a. Where Drexus Slot Drain is being laid adjacent to flexibly laid paving the inlet apertures should be sealed against ingress of bedding or jointing material during the construction phase.

In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.



Drexus 100, Example



Drexus 100

Grid Drainage System

Marshalls NEW Drexus 100 is a cost effective lighter weight linear drainage system providing loading of up to D400 when used with the range of Drexus 100 cast Iron grates. With wall thicknesses of just 30mm, and its scalloped side walls this unit is the lightest within the Marshalls channel range.

Available for both pedestrian and standard trafficking applications, making it suitable for a variety of projects including civic, commercial and rail applications.

Drexus 100

A Gratings

Gratings	Loading	Length (mm)	Width (mm)	Unit Weight (kg)	Item Code
6mm Heelsure Cast Iron	B125	500	160	3.8	DR544010
6mm Heelsure Cast Iron	C250	500	160	3.8	DR544020
12mm Slotted Cast Iron	C250	500	160	3.9	DR544030
6mm Heelsure Cast Iron	D400	500	160	4.5	DR544040
12mm Slotted Cast Iron	D400	500	160	4.95	DR544050

B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 0/0	1000	160	100	170	90	38	DR540015
Channel 5/0	1000	160	100	195	115	46	DR540025
Channel 10/0	1000	160	100	220	140	54	DR540035
Channel 15/0	1000	160	100	245	165	62	DR540045
Channel 20/0	1000	160	100	270	190	70	DR540055
Channel 0/0	500	160	100	170	90	19	DR540515
Channel 5/0	500	160	100	195	115	23	DR540525
Channel 10/0	500	160	100	220	140	27	DR540535
Channel 15/0	500	160	100	245	165	31	DR540545
Channel 20/0	500	160	100	270	190	35	DR540555

C T Junction Channels

T Junction Channels	Unit Weight (kg)	Item Code
T-Channel 0/0	19	DR543700
T-Channel 10/0	27	DR543710
T-Channel 20/0	35	DR543720

D Channel Transitions

Channel Transitions	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
0/0 - 5/0	1000	160	100	195	120/145	41	DR542010
5/0 - 10/0	1000	160	100	220	145/170	45	DR542020
10/0 - 15/0	1000	160	100	245	170/195	48	DR542030
15/0 - 20/0	1000	160	100	270	195/220	52	DR542040

Drexus 100 Channels are available with transitions. Transition Channels increase drainage discharge capacity by improving flow rates and thereby increasing the overall discharge capacity of the system. Transition channels are 1000mm long.

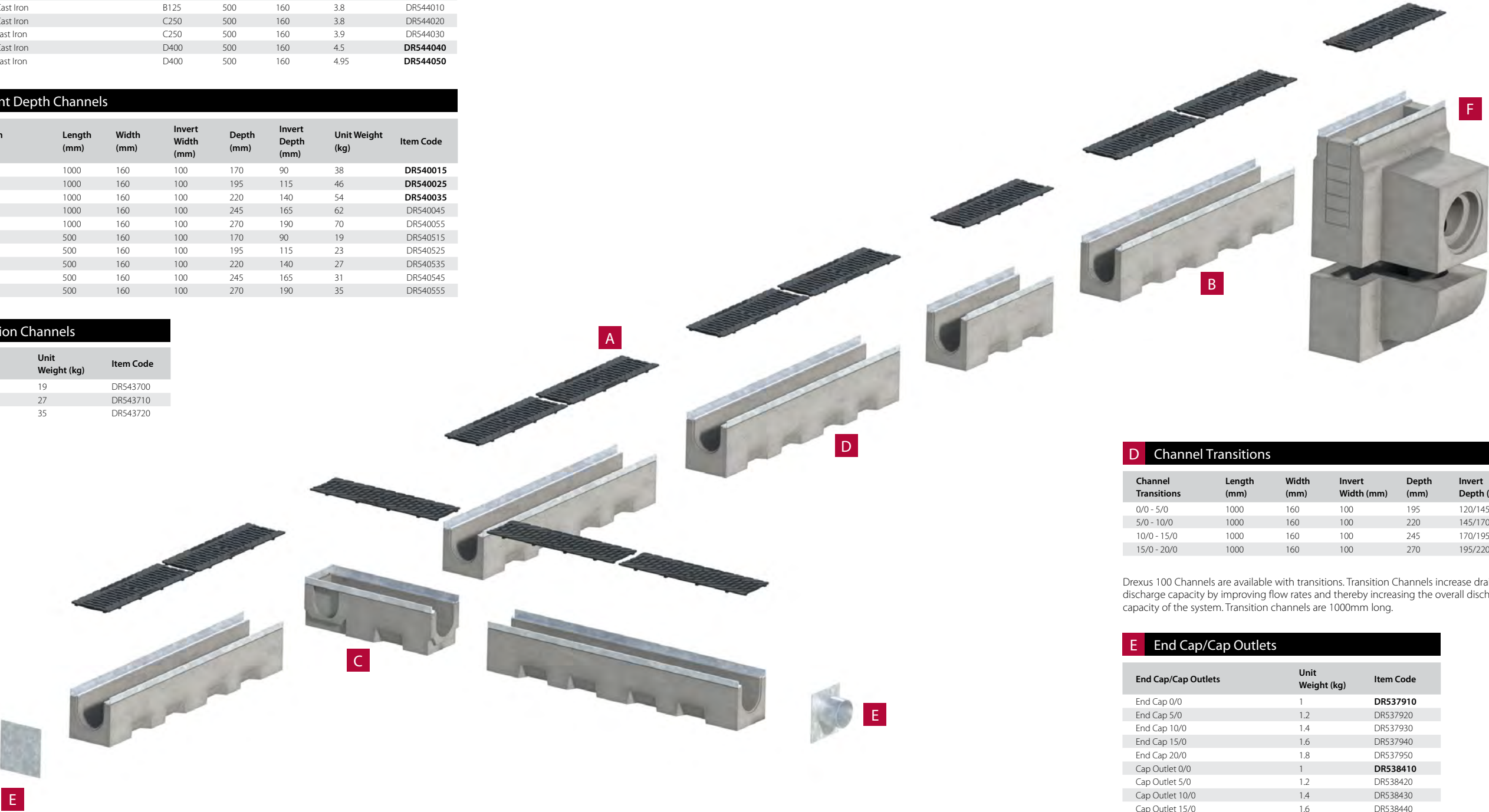
E End Cap/Cap Outlets

End Cap/Cap Outlets	Unit Weight (kg)	Item Code
End Cap 0/0	1	DR537910
End Cap 5/0	1.2	DR537920
End Cap 10/0	1.4	DR537930
End Cap 15/0	1.6	DR537940
End Cap 20/0	1.8	DR537950
Cap Outlet 0/0	1	DR538410
Cap Outlet 5/0	1.2	DR538420
Cap Outlet 10/0	1.4	DR538430
Cap Outlet 15/0	1.6	DR538440
Cap Outlet 20/0	1.8	DR538450

F Outfalls

Outfalls	Unit Weight (kg)	Item Code
Side Outfall	137	DR538510
End Outfall	101	DR538520

Drexus 100 with reference numbers indicated in **bold** black are available ex-stock. Drexus 100 with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.



Drexus 100 Installation Guide

1. Excavation

- a. Sufficient material should be excavated to accommodate channel units, concrete bedding and haunching.
- b. Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- a. Setting out pins should be accurately located to the correct line and level with a string line level with the top rear corners of the channel units.
- b. It may be advantageous to locate setting out pins to the rear of the units to avoid having to lift the units over the string line.

3. Outfalls

- a. Drexus Outfalls should be installed first.
- b. Sufficient material should be excavated to accommodate the trapped Drexus Gully.
- c. 150mm of ST4 mix (BS 8500-1&2) concrete of the appropriate mix is placed in the bottom of the excavation.
- d. The bottom section of the two part Drexus Gully is lowered into position, with the appropriate pipe adaptor placed the aperture for connection to the underground pipework.
- e. A suitable section of the wall of the outfall unit shall be cut out to allow adjacent drainage channels to abut without restricting the flow of water. Cutting shall be achieved by using a concrete saw or disc cutter.
- f. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Birco Gully so as to provide a seal between the top and bottom sections.
- g. The top section of the two part Birco Gully is lowered into position
- h. The bedding concrete should be laid and brought up to the appropriate level dependant on surface finish as shown in the Drexus 100 Standard Detail Sheet.

4. Channel Installation

- a. Bedding concrete (ST1 to BS 8500-1&2) of the appropriate thickness and depth shall be laid as specified in the Drexus Standard Detail Sheets.
- b. The top of the Drexus Channel shall be 5mm below the final pavement surface.
- c. Channel Units shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill
- d. Alternatively, the Channel Units may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.
- e. The concrete haunching shall be of a concrete grade appropriate to the Drainage Channel Loading Class as specified in the Drexus Standard Detail Sheets.
- f. Haunching shall be carried out as one operation to a complete line of Channel Units, to the dimensions indicated in the Drexus Standard Detail
- g. Where channels are laid on or adjacent to existing or proposed concrete slabs, transverse joints shall be formed within the Units and haunching adjacent to the slab joints.
- h. Longitudinal movement joints shall also be formed between the haunching and the slabs as described in the Drexus Drain Standard Detail Sheets.
- i. Where cutting the Drexus Channel Units is required, they shall be cut with a concrete saw or disc cutter, so that no single Unit is less than 350mm long. Birco gratings shall not be cut unless directed by the engineer. Any cut galvanised steel shall be renovated using Defcon Z, or similar approved.

5. Channel Joint Sealant

- a. Jointing of adjacent channels shall be carried prior to fixing the gratings. Marshalls' M-Flex sealant should be gunned into the sealant groove formed when adjacent channels abut.
- b. Surplus sealant shall be removed from the inner surface of the units as work proceeds.

6. Grating Installation

- a. Adjacent Carriageway and/or footway construction shall not be commenced within 3 days of any jointing or haunching/surrounding concrete being placed.
- b. Drexus gratings shall be securely bolted to Drexus Channel Units, before adjacent pavement construction is commenced.
- c. All gratings shall be evenly spaced with bolts tightened down securely to the appropriate torque (Lite: 25Nm, 100, 150 and 200: 75 Nm, 300:100Nm).
- d. On completion of the works, the drainage channel units shall be cleaned out and left free from obstruction. This shall be carried out either by removal of gratings or by high pressure water jetting (100-150 bar at 200 litres/min minimum). Unless otherwise agreed with the specifier, the slot openings shall be covered by timber boards or other method during jetting operations.
- e. Outfall units shall be emptied.
- f. The cleaning process should be repeated where necessary on completion of any remedial works.

7. End Caps/End Cap Outlets

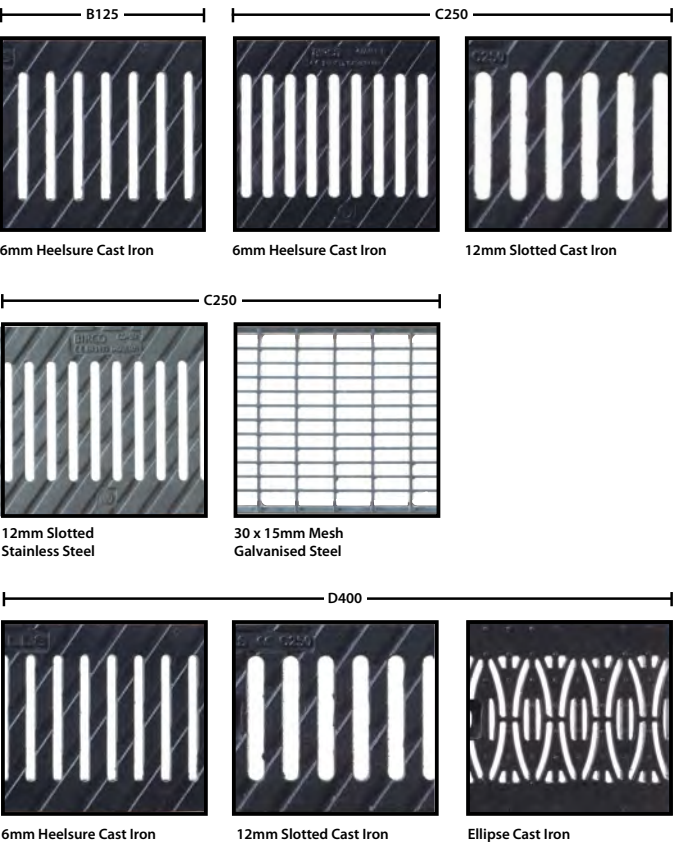
- a. Where the Drexus Channel run does not terminate at an outfall, the base unit shall be sealed using the Drexus Block End Cap or End Cap Outlet.
- b. These are to be held in position by installing 150mm of concrete haunching.
- c. Marshalls M-Flex sealant should be gunned into the sealant groove.

In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

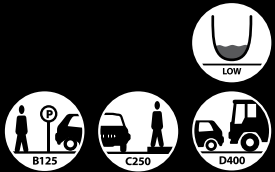
This may require the use of lifting aids to assist installation.



Birco Lite, London Bridge Station



Birco Lite Grid Drainage System



A general purpose low capacity linear drainage system which combines a robust concrete channel with a wide aesthetic range of cast iron, stainless steel or galvanised grates. Available for both pedestrian and standard trafficking applications, making it suitable for a variety of projects including civic, commercial and rail applications.

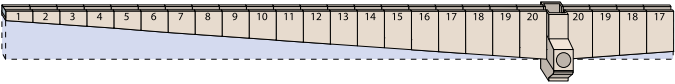
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Birco Lite

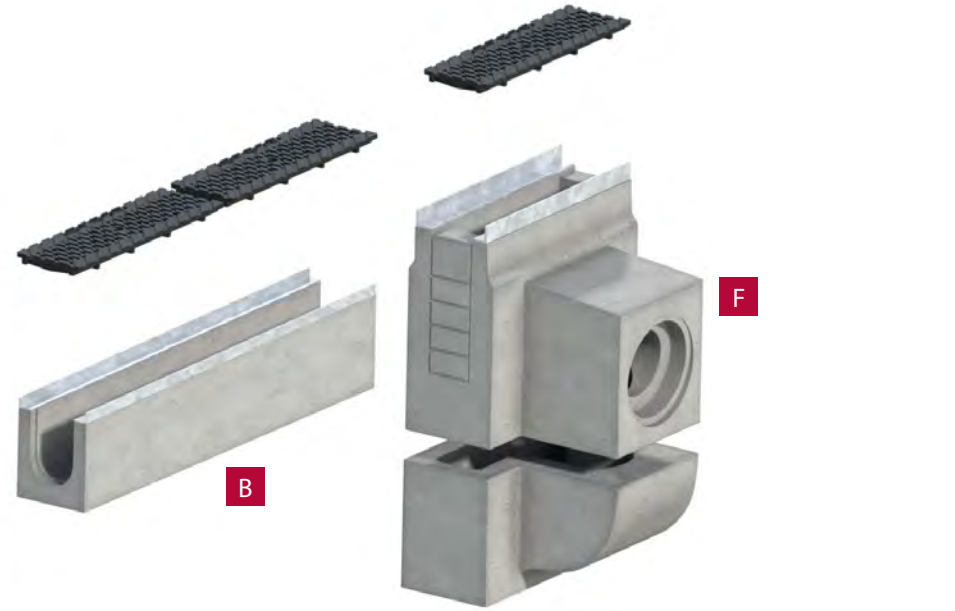
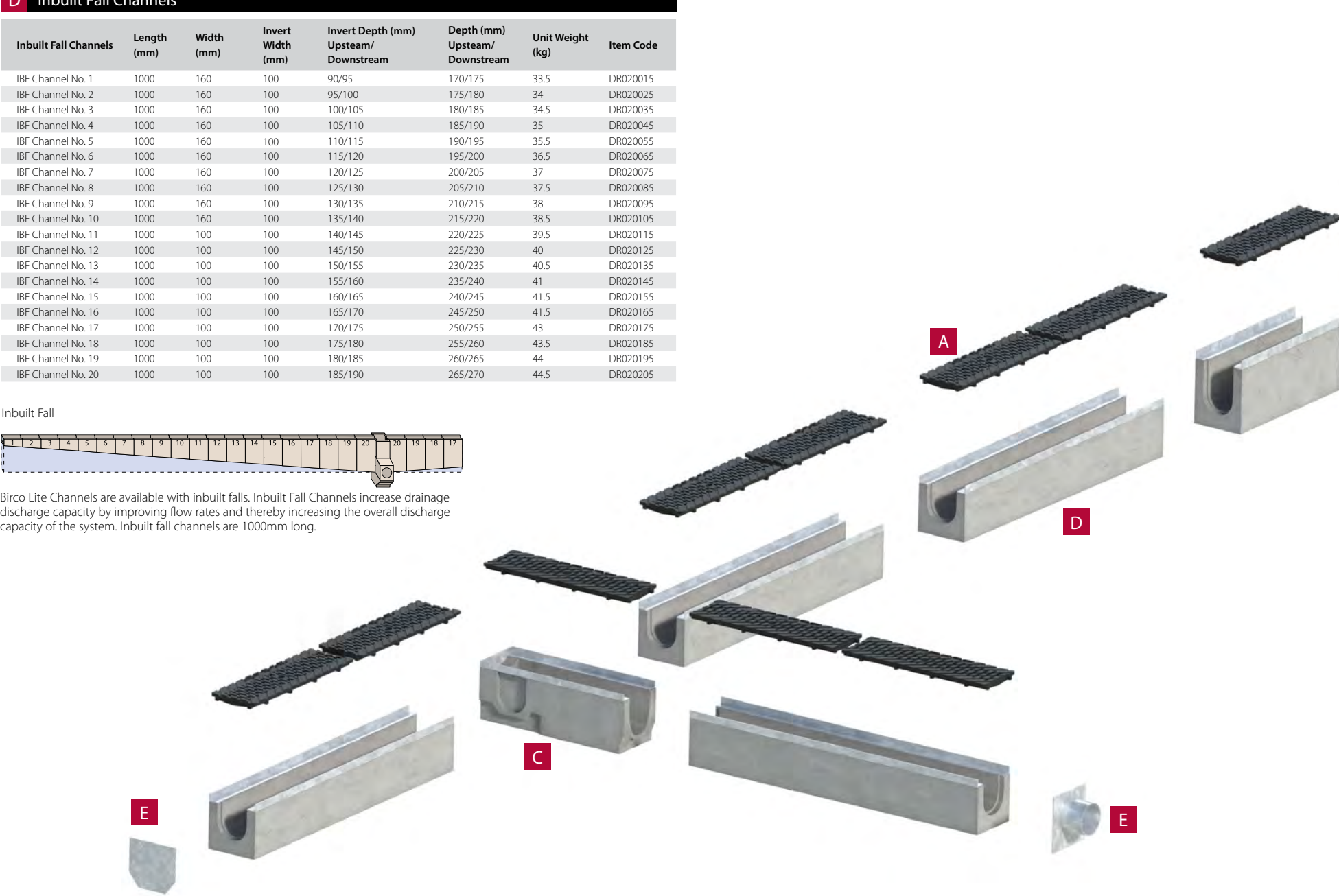
D Inbuilt Fall Channels

Inbuilt Fall Channels	Length (mm)	Width (mm)	Invert Width (mm)	Invert Depth (mm) Upstream/ Downstream	Depth (mm) Upstream/ Downstream	Unit Weight (kg)	Item Code
IBF Channel No. 1	1000	160	100	90/95	170/175	33.5	DR020015
IBF Channel No. 2	1000	160	100	95/100	175/180	34	DR020025
IBF Channel No. 3	1000	160	100	100/105	180/185	34.5	DR020035
IBF Channel No. 4	1000	160	100	105/110	185/190	35	DR020045
IBF Channel No. 5	1000	160	100	110/115	190/195	35.5	DR020055
IBF Channel No. 6	1000	160	100	115/120	195/200	36.5	DR020065
IBF Channel No. 7	1000	160	100	120/125	200/205	37	DR020075
IBF Channel No. 8	1000	160	100	125/130	205/210	37.5	DR020085
IBF Channel No. 9	1000	160	100	130/135	210/215	38	DR020095
IBF Channel No. 10	1000	160	100	135/140	215/220	38.5	DR020105
IBF Channel No. 11	1000	100	100	140/145	220/225	39.5	DR020115
IBF Channel No. 12	1000	100	100	145/150	225/230	40	DR020125
IBF Channel No. 13	1000	100	100	150/155	230/235	40.5	DR020135
IBF Channel No. 14	1000	100	100	155/160	235/240	41	DR020145
IBF Channel No. 15	1000	100	100	160/165	240/245	41.5	DR020155
IBF Channel No. 16	1000	100	100	165/170	245/250	41.5	DR020165
IBF Channel No. 17	1000	100	100	170/175	250/255	43	DR020175
IBF Channel No. 18	1000	100	100	175/180	255/260	43.5	DR020185
IBF Channel No. 19	1000	100	100	180/185	260/265	44	DR020195
IBF Channel No. 20	1000	100	100	185/190	265/270	44.5	DR020205

Inbuilt Fall



Birco Lite Channels are available with inbuilt falls. Inbuilt Fall Channels increase drainage discharge capacity by improving flow rates and thereby increasing the overall discharge capacity of the system. Inbuilt fall channels are 1000mm long.



A Gratings

Gratings	Loading	Length (mm)	Width (mm)	Unit Weight (kg)	Item Code
6mm Heelsure Cast Iron	B125	500	160	3.8	DR035345
6mm Heelsure Cast Iron	C250	500	160	3.8	DR035360
12mm Slotted Cast Iron	C250	500	160	3.9	DR035350
30 x 15mm Mesh Galvanised Steel	C250	1000	160	4.2	DR040465
12mm Slotted Stainless Steel	C250	500	160	2.7	DR041020
6mm Heelsure Cast Iron	D400	500	160	4.5	DR035366
12mm Slotted Cast Iron	D400	500	160	4.95	DR035363
Ellipse Cast Iron	D400	500	160	5.7	DR041020

Birco Lite with reference numbers indicated in **bold** black are available ex-stock. Birco Lite with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.

B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 0/0	1000	160	100	170	90	38	DR005015
Channel 5/0	1000	160	100	195	115	46	DR005025
Channel 10/0	1000	160	100	220	140	54	DR005035
Channel 15/0	1000	160	100	245	165	62	DR005045
Channel 20/0	1000	160	100	270	190	70	DR005055
Channel 0/0	500	160	100	170	90	19	DR010165
Channel 5/0	500	160	100	195	115	23	DR010175
Channel 10/0	500	160	100	220	140	27	DR010185
Channel 15/0	500	160	100	245	165	31	DR010195

E End Cap/Cap Outlets

End Cap/Cap Outlet	Unit Weight (kg)	Item Code
100 End Cap 0/0	1	DR045100
100 End Cap 5/0	1.2	DR045110
100 End Cap 10/0	1.4	DR045120
100 End Cap 15/0	1.6	DR045130
100 End Cap 20/0	1.8	DR045130
100 Cap Outlet 0/0	1	DR045150
100 Cap Outlet 5/0	1.2	DR045160
100 Cap Outlet 10/0	1.4	DR045170
100 Cap Outlet 15/0	1.6	DR045180
100 Cap Outlet 20/0	1.8	DR045190

F Outfalls

Outfalls	Unit Weight (kg)	Item Code
Lite End Outfall 100mm	101	DR050100
Lite Side Outfall 150mm	137	DR050110

C T Junction Channels

T Junction Channels	Unit Weight (kg)	Item Code
T-Channel 0/0	19	DR010210
T-Channel 5/0	23	DR010220
T-Channel 10/0	27	DR010230

Birco Lite Installation Guide

1. Excavation

- a. Sufficient material should be excavated to accommodate channel units, concrete bedding and haunching.
- b. Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- a. Setting out pins should be accurately located to the correct line and level with a string line level with the top rear corners of the channel units.
- b. It may be advantageous to locate setting out pins to the rear of the units to avoid having to lift the units over the string line.

3. Outfalls

- a. Birco Outfalls should be installed first.
- b. Sufficient material should be excavated to accommodate the trapped Birco Gulley.
- c. 150mm of ST4 mix (BS 8500-1&2) concrete of the appropriate mix is placed in the bottom of the excavation.
- d. The bottom section of the two part Birco Gulley is lowered into position, with the appropriate pipe adaptor placed the aperture for connection to the underground pipework.
- e. A suitable section of the wall of the outfall unit shall be cut out to allow adjacent drainage channels to abut without restricting the flow of water. Cutting shall be achieved by using a concrete saw or disc cutter.
- f. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Birco Gulley so as to provide a seal between the top and bottom sections.
- g. The top section of the two part Birco Gulley is lowered into position
- h. The bedding concrete should be laid and brought up to the appropriate level dependant on surface finish as shown in the Birco Standard Detail Sheet.

4. Channel Installation

- a. Bedding concrete (ST1 to BS 8500-1&2) of the appropriate thickness and depth shall be laid as specified in the Birco Standard Detail Sheets.
- b. The top of the Birco Channel shall be 5mm below the final pavement surface.
- c. Channel Units shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill
- d. Alternatively, the Channel Units may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.
- e. The concrete haunching shall be of a concrete grade appropriate to the Drainage Channel Loading Class as specified in the Birco Standard Detail Sheets.
- f. Haunching shall be carried out as one operation to a complete line of Channel Units, to the dimensions indicated in the Birco Standard Detail
- g. Where channels are laid on or adjacent to existing or proposed concrete slabs, transverse joints shall be formed within the Units and haunching adjacent to the slab joints.
- h. Longitudinal movement joints shall also be formed between the haunching and the slabs as described in the Birco Drain Standard Detail Sheets.
- i. Where cutting the Birco Channel Units is required, they shall be cut with a concrete saw or disc cutter, so that no single Unit is less than 350mm long. Birco gratings shall not be cut unless directed by the engineer. Any cut galvanised steel shall be renovated using Defcon Z, or similar approved.

5. Channel Joint Sealant

- a. Jointing of adjacent channels shall be carried prior to fixing the gratings. Marshalls' M-Flex sealant should be gunned into the sealant groove formed when adjacent channels abut.
- b. Surplus sealant shall be removed from the inner surface of the units as work proceeds.

6. Grating Installation

- a. Adjacent Carriageway and/or footway construction shall not be commenced within 3 days of any jointing or haunching/surrounding concrete being placed.
- b. Birco gratings shall be securely bolted to Birco Channel Units, before adjacent pavement construction is commenced.
- c. All gratings shall be evenly spaced with bolts tightened down securely to the appropriate torque (Lite: 25Nm, 100, 150 and 200: 75 Nm, 300:100Nm).
- d. On completion of the works, the drainage channel units shall be cleaned out and left free from obstruction. This shall be carried out either by removal of gratings or by high pressure water jetting (100-150 bar at 200 litres/min minimum). Unless otherwise agreed with the specifier, the slot openings shall be covered by timber boards or other method during jetting operations.
- e. Outfall units shall be emptied.
- f. The cleaning process should be repeated where necessary on completion of any remedial works.

7. End Caps/End Cap Outlets

- a. Where the Birco Channel run does not terminate at an outfall, the base unit shall be sealed using the Birco End Cap or End Cap Outlet.
- b. These are to be held in position by installing 150mm of concrete haunching.
- c. Marshalls M-Flex sealant should be gunned into the sealant groove.

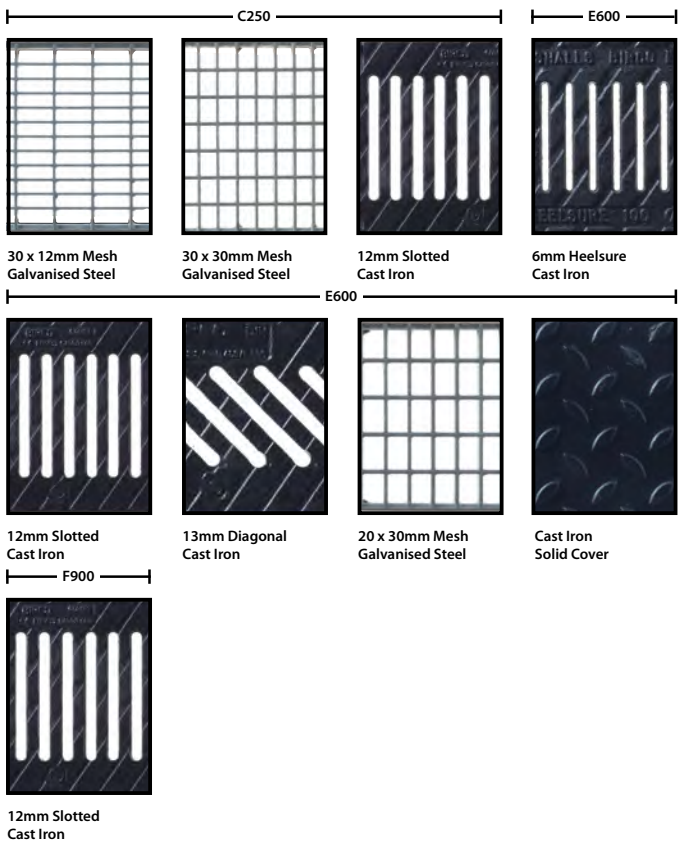
In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.

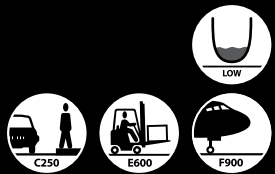
Scan the QR Code to watch the installtion video



Birco 100, Manchester



Birco 100 Grid Drainage System



A multi-purpose low capacity linear drainage system, combining a robust concrete channel with a wide aesthetic choice of cast iron, stainless steel or galvanised grates. A variety of loadings make Birco 100 suitable for light to heavy trafficking so suitable for a variety of projects including civic, commercial, rail and industrial applications.

NSPlus
Q10 180

Birco 100

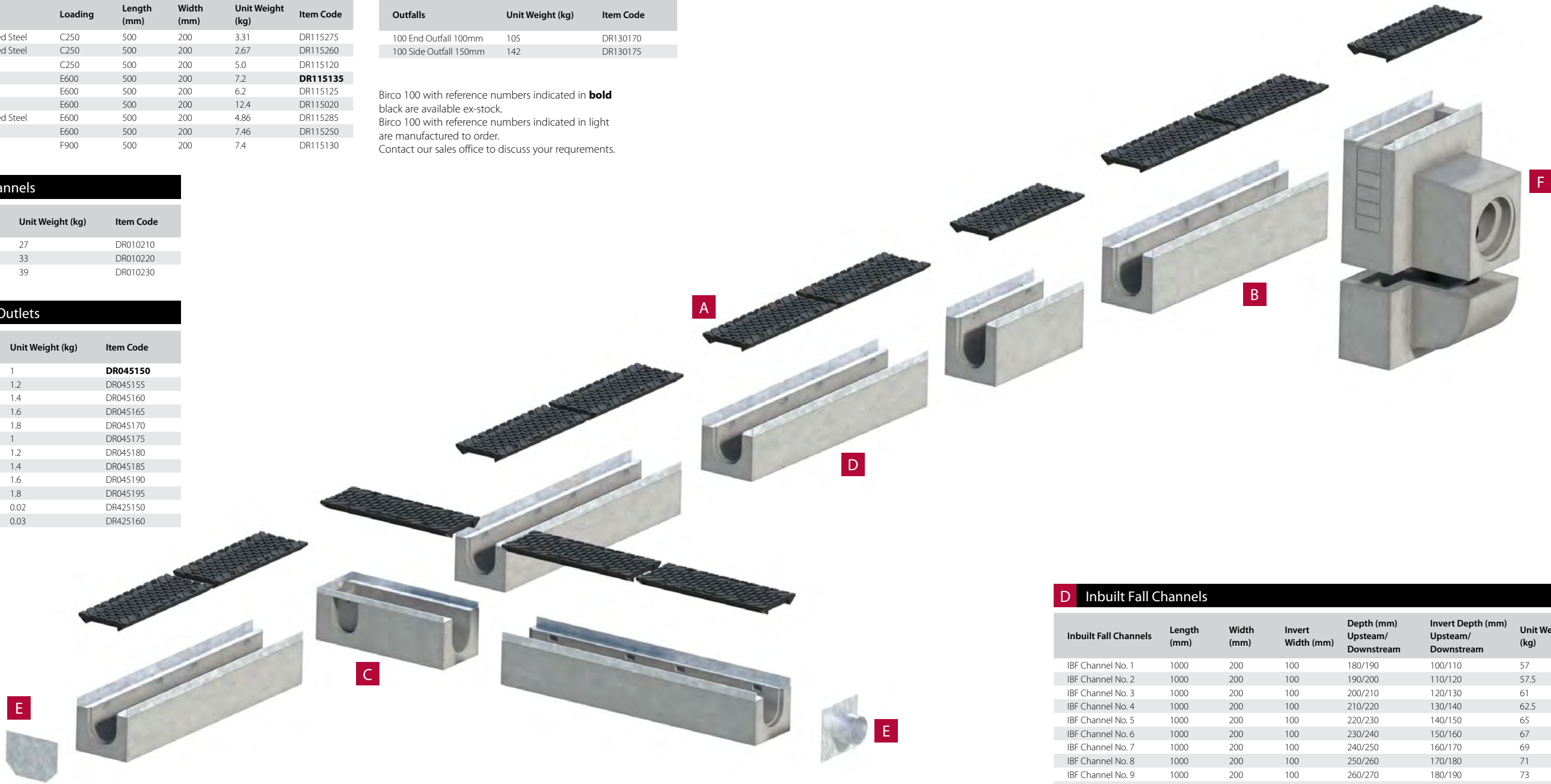
A Gratings					
Gratings	Loading	Length (mm)	Width (mm)	Unit Weight (kg)	Item Code
30 x 12mm Mesh Galvanised Steel	C250	500	200	3.31	DR115275
30 x 30mm Mesh Galvanised Steel	C250	500	200	2.67	DR115260
12mm Slotted Cast Iron	C250	500	200	5.0	DR115120
6mm Heelsure Cast Iron	E600	500	200	7.2	DR115135
12mm Slotted Cast Iron	E600	500	200	6.2	DR115125
13mm Diagonal Cast Iron	E600	500	200	12.4	DR115020
20 x 30mm Mesh Galvanised Steel	E600	500	200	4.86	DR115285
Cast Iron Solid Cover	E600	500	200	7.46	DR115250
12mm Slotted Cast Iron	F900	500	200	7.4	DR115130

C T Junction Channels		
T Junction Channels	Unit Weight (kg)	Item Code
T- Channel 0/0	27	DR010210
T- Channel 5/0	33	DR010220
T- Channel 10/0	39	DR010230

E End Cap/Cap Outlets		
End Cap/Cap Outlets	Unit Weight (kg)	Item Code
100 End Cap 0/0	1	DR045150
100 End Cap 5/0	1.2	DR045155
100 End Cap 10/0	1.4	DR045160
100 End Cap 15/0	1.6	DR045165
100 End Cap 20/0	1.8	DR045170
Cap Outlet 0/0	1	DR045175
Cap Outlet 5/0	1.2	DR045180
Cap Outlet 10/0	1.4	DR045185
Cap Outlet 15/0	1.6	DR045190
Cap Outlet 20/0	1.8	DR045195
Shallow End Cap 80-100	0.02	DR425150
Shallow End Cap 150-200	0.03	DR425160

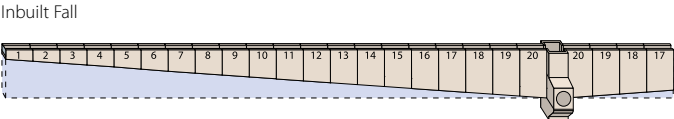
F Outfalls		
Outfalls	Unit Weight (kg)	Item Code
100 End Outfall 100mm	105	DR130170
100 Side Outfall 150mm	142	DR130175

Birco 100 with reference numbers indicated in **bold** black are available ex-stock.
Birco 100 with reference numbers indicated in light are manufactured to order.
Contact our sales office to discuss your requirements.



B Constant Depth Channels							
Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 0/0	1000	200	100	180	100	54	DR080105
Channel 5/0	1000	200	100	230	150	66	DR080115
Channel 10/0	1000	200	100	280	200	78	DR080125
Channel 15/0	1000	200	100	330	250	90	DR080135
Channel 20/0	1000	200	100	380	300	102	DR080145
Channel 0/0	500	200	100	180	100	27	DR090150
Channel 5/0	500	200	100	230	150	33	DR090160
Channel 10/0	500	200	100	280	200	38	DR090170
Channel 15/0	500	200	100	330	250	43	DR090180
Channel 20/0	500	200	100	380	300	51	DR090190
Shallow 80	1000	200	100	80	20		DR420450
Shallow 100	1000	200	100	100	40		DR420460
Shallow 150	1000	200	100	150	80		DR420480
Shallow 200	1000	200	100	200	130		DR420490

D Inbuilt Fall Channels							
Inbuilt Fall Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm) Upstream/ Downstream	Invert Depth (mm) Upstream/ Downstream	Unit Weight (kg)	Item Code
IBF Channel No. 1	1000	200	100	180/190	100/110	57	DR020010
IBF Channel No. 2	1000	200	100	190/200	110/120	57.5	DR020020
IBF Channel No. 3	1000	200	100	200/210	120/130	61	DR020030
IBF Channel No. 4	1000	200	100	210/220	130/140	62.5	DR020040
IBF Channel No. 5	1000	200	100	220/230	140/150	65	DR020050
IBF Channel No. 6	1000	200	100	230/240	150/160	67	DR020060
IBF Channel No. 7	1000	200	100	240/250	160/170	69	DR020070
IBF Channel No. 8	1000	200	100	250/260	170/180	71	DR020080
IBF Channel No. 9	1000	200	100	260/270	180/190	73	DR020090
IBF Channel No. 10	1000	200	100	270/280	190/200	77	DR020100
IBF Channel No. 11	1000	200	100	280/290	210/220	77	DR020110
IBF Channel No. 12	1000	200	100	290/300	220/230	81.5	DR020120
IBF Channel No. 13	1000	200	100	300/310	230/240	81	DR020130
IBF Channel No. 14	1000	200	100	310/320	250/260	86.5	DR020140
IBF Channel No. 15	1000	200	100	320/330	270/280	85	DR020150
IBF Channel No. 16	1000	200	100	330/340	280/340	91	DR020160
IBF Channel No. 17	1000	200	100	340/350	340/350	93.5	DR020170
IBF Channel No. 18	1000	200	100	360/370	360/370	96	DR020180
IBF Channel No. 19	1000	200	100	350/360	350/360	98.5	DR020190
IBF Channel No. 20	1000	200	100	370/380	370/380	101	DR020200



Birco 100 Channels are available with inbuilt falls. Inbuilt Fall Channels increase drainage discharge capacity by improving flow rates and thereby increasing the overall discharge capacity of the system. Inbuilt fall channels are 1000mm long.

Birco 100 Installation Guide

1. Excavation

- a. Sufficient material should be excavated to accommodate channel units, concrete bedding and haunching.
- b. Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- a. Setting out pins should be accurately located to the correct line and level with a string line level with the top rear corners of the channel units.
- b. It may be advantageous to locate setting out pins to the rear of the units to avoid having to lift the units over the string line.

3. Outfalls

- a. Birco Outfalls should be installed first.
- b. Sufficient material should be excavated to accommodate the trapped Birco Gulley.
- c. 150mm of ST4 mix (BS 8500-1&2) concrete of the appropriate mix is placed in the bottom of the excavation.
- d. The bottom section of the two part Birco Gulley is lowered into position, with the appropriate pipe adaptor placed the aperture for connection to the underground pipework.
- e. A suitable section of the wall of the outfall unit shall be cut out to allow adjacent drainage channels to abut without restricting the flow of water. Cutting shall be achieved by using a concrete saw or disc cutter.
- f. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Birco Gulley so as to provide a seal between the top and bottom sections.
- g. The top section of the two part Birco Gulley is lowered into position
- h. The bedding concrete should be laid and brought up to the appropriate level dependant on surface finish as shown in the Birco Standard Detail Sheet.

4. Channel Installation

- a. Bedding concrete (ST1 to BS 8500-1&2) of the appropriate thickness and depth shall be laid as specified in the Birco Standard Detail Sheets.
- b. The top of the Birco Channel shall be 5mm below the final pavement surface.
- c. Channel Units shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill
- d. Alternatively, the Channel Units may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.
- e. The concrete haunching shall be of a concrete grade appropriate to the Drainage Channel Loading Class as specified in the Birco Standard Detail Sheets.
- f. Haunching shall be carried out as one operation to a complete line of Channel Units, to the dimensions indicated in the Birco Standard Detail
- g. Where channels are laid on or adjacent to existing or proposed concrete slabs, transverse joints shall be formed within the Units and haunching adjacent to the slab joints.
- h. Longitudinal movement joints shall also be formed between the haunching and the slabs as described in the Birco Drain Standard Detail Sheets.
- i. Where cutting the Birco Channel Units is required, they shall be cut with a concrete saw or disc cutter, so that no single Unit is less than 350mm long. Birco gratings shall not be cut unless directed by the engineer. Any cut galvanised steel shall be renovated using Defcon Z, or similar approved.

5. Channel Joint Sealant

- a. Jointing of adjacent channels shall be carried prior to fixing the gratings. Marshalls' M-Flex sealant should be gunned into the sealant groove formed when adjacent channels abut.
- b. Surplus sealant shall be removed from the inner surface of the units as work proceeds.

6. Grating Installation

- a. Adjacent Carriageway and/or footway construction shall not be commenced within 3 days of any jointing or haunching/surrounding concrete being placed.
- b. Birco gratings shall be securely bolted to Birco Channel Units, before adjacent pavement construction is commenced.
- c. All gratings shall be evenly spaced with bolts tightened down securely to the appropriate torque (Lite: 25Nm, 100, 150 and 200: 75 Nm, 300:100Nm).
- d. On completion of the works, the drainage channel units shall be cleaned out and left free from obstruction. This shall be carried out either by removal of gratings or by high pressure water jetting (100-150 bar at 200 litres/min minimum). Unless otherwise agreed with the specifier, the slot openings shall be covered by timber boards or other method during jetting operations.
- e. Outfall units shall be emptied.
- f. The cleaning process should be repeated where necessary on completion of any remedial works.

7. End Caps/End Cap Outlets

- a. Where the Birco Channel run does not terminate at an outfall, the base unit shall be sealed using the Birco End Cap or End Cap Outlet.
- b. These are to be held in position by installing 150mm of concrete haunching.
- c. Marshalls M-Flex sealant should be gunned into the sealant groove.

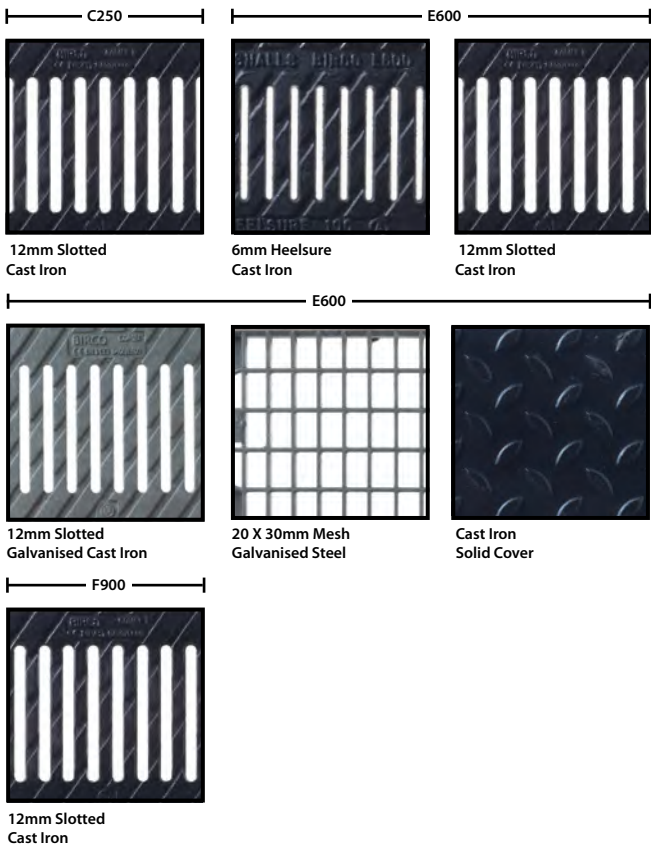
In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.

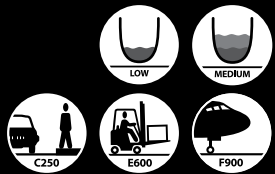
Scan the QR Code to watch the installtion video



Birco 150, London



Birco 150 Grid Drainage System



A medium capacity linear drainage system which combines a robust concrete channel with a wide aesthetic choice of cast iron and galvanised steel grates. Birco 150 is available up to the highest loading classification making it suitable for a variety of commercial, rail and industrial applications.

NSPlus
Q10 180

Birco 150

A Gratings

Gratings	Loading	Length (mm)	Width (mm)	Unit Weight (kg)	Item Code
12mm Slotted Cast Iron	C250	500	250	9.3	DR195200
6mm Heelsure Cast Iron	E600	500	250	10.5	DR195240
12mm Slotted Cast Iron	E600	500	250	11.0	DR195210
12mm Slotted Galvanised Cast Iron	E600	500	250	11	DR197030
20 x 30mm Mesh Galvanised Steel	E600	500	250	7.36	DR197290
Cast Iron Solid Cover	E600	500	250	10.3	DR195230
12mm Slotted Cast Iron	F900	500	250	12.20	DR195220

C T Junction Channels

T-Junction Channels	Unit Weight (kg)	Item Code
T-Channel 0/0	38	DR190020
T-Channel 5/0	44	DR190030

Birco 150 with reference numbers indicated in **bold** black are available ex-stock.
Birco 150 with reference numbers indicated in light are manufactured to order.
Contact our sales office to discuss your requirements.

E End Cap/Cap Outlets

End Cap/Cap Outlets	Unit Weight (kg)	Item Code
150 End Cap 0/0	1	DR197200
150 End Cap 5/0	1.2	DR197210
150 End Cap 10/0	1.4	DR197220
150 End Cap 15/0	1.6	DR197230
150 Cap Outlet 0/0	2	DR200250
150 Cap Outlet 5/0	2	DR200260
150 Cap Outlet 10/0	2	DR200270
150 Cap Outlet 15/0	2	DR200280
Shallow End Cap 120-150	0.03	DR435250

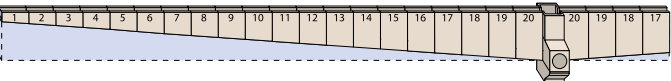
F Outfalls

Outfalls	Unit Weight (kg)	Item Code
150 End Outfall 100mm	140	DR210270
150 Side Outfall 150mm	158	DR210280

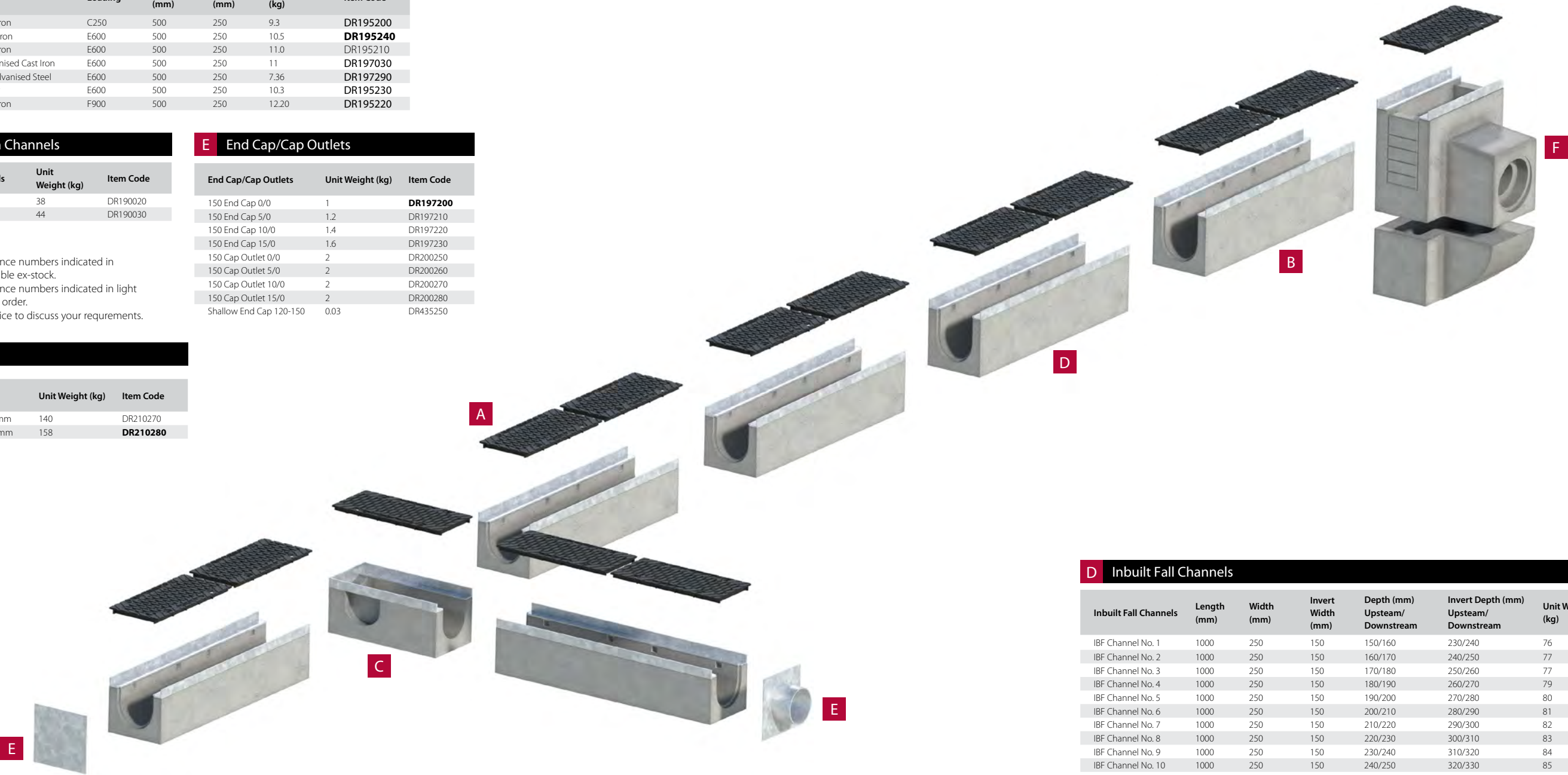
D Inbuilt Fall Channels

Inbuilt Fall Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm) Upstream/ Downstream	Invert Depth (mm) Upstream/ Downstream	Unit Weight (kg)	Item Code
IBF Channel No. 1	1000	250	150	150/160	230/240	76	DR180010
IBF Channel No. 2	1000	250	150	160/170	240/250	77	DR180020
IBF Channel No. 3	1000	250	150	170/180	250/260	77	DR180030
IBF Channel No. 4	1000	250	150	180/190	260/270	79	DR180040
IBF Channel No. 5	1000	250	150	190/200	270/280	80	DR180050
IBF Channel No. 6	1000	250	150	200/210	280/290	81	DR180060
IBF Channel No. 7	1000	250	150	210/220	290/300	82	DR180070
IBF Channel No. 8	1000	250	150	220/230	300/310	83	DR180080
IBF Channel No. 9	1000	250	150	230/240	310/320	84	DR180090
IBF Channel No. 10	1000	250	150	240/250	320/330	85	DR180100
IBF Channel No. 11	1000	250	150	250/260	330/340	86	DR180110
IBF Channel No. 12	1000	250	150	260/270	340/350	87	DR180120
IBF Channel No. 13	1000	250	150	270/280	350/360	88	DR180130
IBF Channel No. 14	1000	250	150	280/290	360/370	89	DR180140
IBF Channel No. 15	1000	250	150	290/300	370/380	90	DR180150
IBF Channel No. 16	1000	250	150	300/310	380/390	91	DR180160
IBF Channel No. 17	1000	250	150	310/320	390/400	92	DR180170
IBF Channel No. 18	1000	250	150	320/330	400/410	93	DR180180
IBF Channel No. 19	1000	250	150	330/340	410/420	94	DR180190
IBF Channel No. 20	1000	250	150	340/350	420/430	95	DR180200

Inbuilt Fall



Birco 150 Channels are available with inbuilt falls. Inbuilt Fall Channels increase drainage discharge capacity by improving flow rates and thereby increasing the overall discharge capacity of the system. Inbuilt fall channels are 1000mm long.



B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 0/0	1000	250	150	230	150	76	DR160200
Channel 5/0	1000	250	150	280	200	88	DR160205
Channel 10/0	1000	250	150	330	250	100	DR160210
Channel 15/0	1000	250	150	380	300	112	DR160215
Channel 20/0	1000	250	150	430	350	124	DR160220
Channel 0/0	500	250	150	230	150	38	DR170206
Channel 5/0	500	250	150	280	200	44	DR170226
Channel 10/0	500	250	150	330	250	50	DR170236
Channel 15/0	500	250	150	380	300	45	DR170246
Shallow 120	1000	250	150	120	50		DR430460
Shallow 150	1000	250	150	150	80		DR430470
Shallow 200	1000	250	150	200	130		DR430480

Birco 150 Installation Guide

1. Excavation

- a. Sufficient material should be excavated to accommodate channel units, concrete bedding and haunching.
- b. Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- a. Setting out pins should be accurately located to the correct line and level with a string line level with the top rear corners of the channel units.
- b. It may be advantageous to locate setting out pins to the rear of the units to avoid having to lift the units over the string line.

3. Outfalls

- a. Birco Outfalls should be installed first.
- b. Sufficient material should be excavated to accommodate the trapped Birco Gully.
- c. 150mm of ST4 mix (BS 8500-1&2) concrete of the appropriate mix is placed in the bottom of the excavation.
- d. The bottom section of the two part Birco Gully is lowered into position, with the appropriate pipe adaptor placed the aperture for connection to the underground pipework.
- e. A suitable section of the wall of the outfall unit shall be cut out to allow adjacent drainage channels to abut without restricting the flow of water. Cutting shall be achieved by using a concrete saw or disc cutter.
- f. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Birco Gully so as to provide a seal between the top and bottom sections.
- g. The top section of the two part Birco Gully is lowered into position
- h. The bedding concrete should be laid and brought up to the appropriate level dependant on surface finish as shown in the Birco Standard Detail Sheet.

4. Channel Installation

- a. Bedding concrete (ST1 to BS 8500-1&2) of the appropriate thickness and depth shall be laid as specified in the Birco Standard Detail Sheets.
- b. The top of the Birco Channel shall be 5mm below the final pavement surface.
- c. Channel Units shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill
- d. Alternatively, the Channel Units may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.
- e. The concrete haunching shall be of a concrete grade appropriate to the Drainage Channel Loading Class as specified in the Birco Standard Detail Sheets.
- f. Haunching shall be carried out as one operation to a complete line of Channel Units, to the dimensions indicated in the Birco Standard Detail
- g. Where channels are laid on or adjacent to existing or proposed concrete slabs, transverse joints shall be formed within the Units and haunching adjacent to the slab joints.
- h. Longitudinal movement joints shall also be formed between the haunching and the slabs as described in the Birco Drain Standard Detail Sheets.
- i. Where cutting the Birco Channel Units is required, they shall be cut with a concrete saw or disc cutter, so that no single Unit is less than 350mm long. Birco gratings shall not be cut unless directed by the engineer. Any cut galvanised steel shall be renovated using Defcon Z, or similar approved.

5. Channel Joint Sealant

- a. Jointing of adjacent channels shall be carried prior to fixing the gratings. Marshalls' M-Flex sealant should be gunned into the sealant groove formed when adjacent channels abut.
- b. Surplus sealant shall be removed from the inner surface of the units as work proceeds.

6. Grating Installation

- a. Adjacent Carriageway and/or footway construction shall not be commenced within 3 days of any jointing or haunching/surrounding concrete being placed.
- b. Birco gratings shall be securely bolted to Birco Channel Units, before adjacent pavement construction is commenced.
- c. All gratings shall be evenly spaced with bolts tightened down securely to the appropriate torque (Lite: 25Nm, 100, 150 and 200: 75 Nm, 300:100Nm).
- d. On completion of the works, the drainage channel units shall be cleaned out and left free from obstruction. This shall be carried out either by removal of gratings or by high pressure water jetting (100-150 bar at 200 litres/min minimum). Unless otherwise agreed with the specifier, the slot openings shall be covered by timber boards or other method during jetting operations.
- e. Outfall units shall be emptied.
- f. The cleaning process should be repeated where necessary on completion of any remedial works.

7. End Caps/End Cap Outlets

- a. Where the Birco Channel run does not terminate at an outfall, the base unit shall be sealed using the Birco End Cap or End Cap Outlet.
- b. These are to be held in position by installing 150mm of concrete haunching.
- c. Marshalls M-Flex sealant should be gunned into the sealant groove.

In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.

Scan the QR Code to watch the installtion video



Traffic Drain

Grid Drainage System

Traffic Drain is a medium capacity system that complements the Mini Beany range to provide continuity of flow between kerb and grate units. The robust concrete channel and strong cast iron gratings are suitable to withstand fast moving vehicles and heavy loading highway applications. Traffic Drain is fully compatible with the full range of Mini Beany junctions, outfalls and other ancillary units.

Traffic Drain

A Top Unit

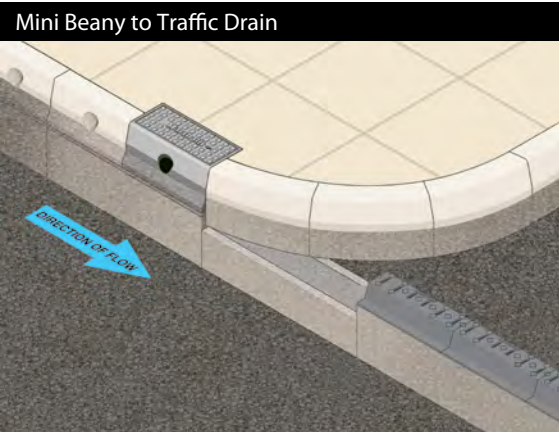
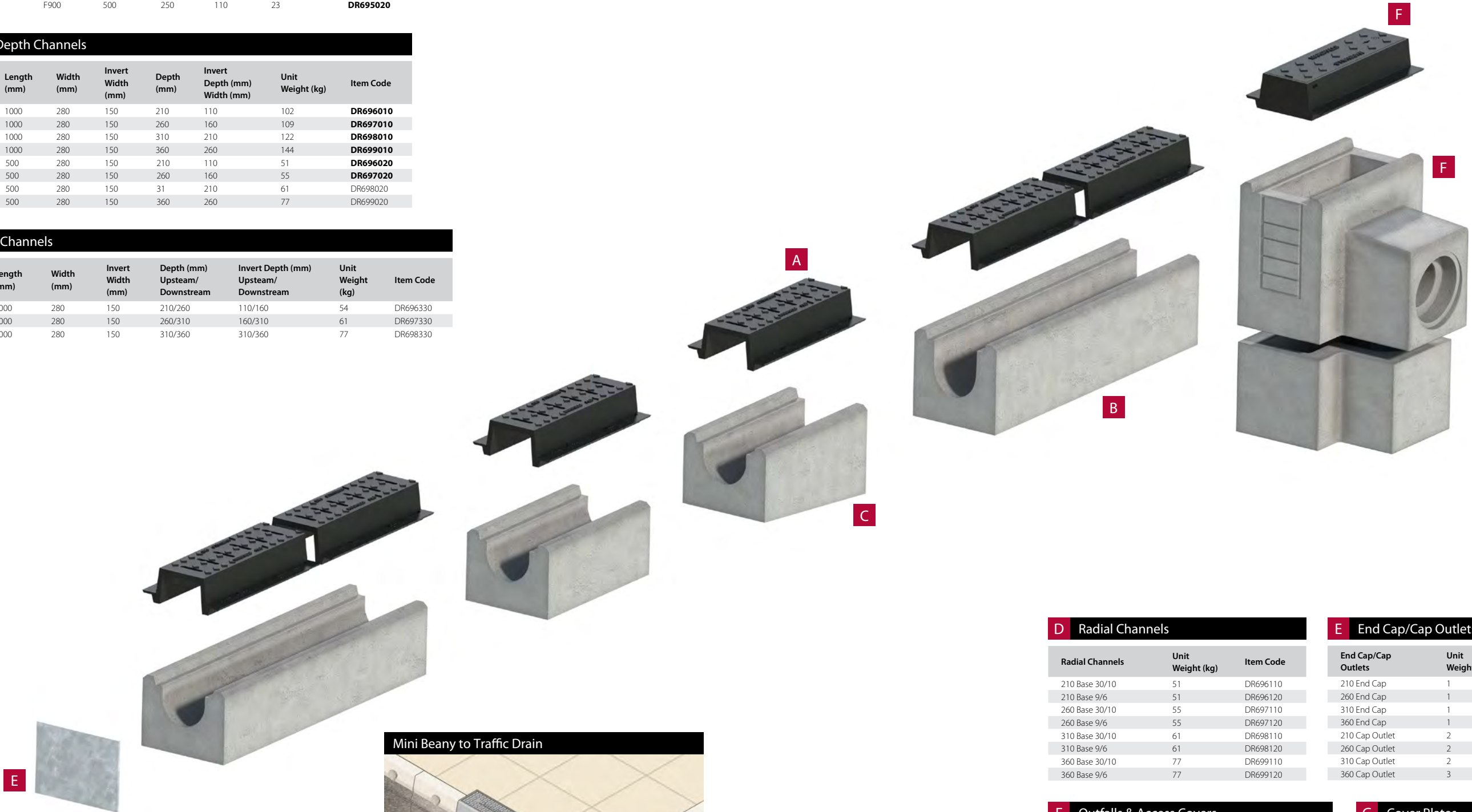
Top Unit	Loading	Length (mm)	Width (mm)	Depth (mm)	Unit Weight (kg)	Item Code
Traffic Drain Cast Iron	F900	500	250	110	23	DR695020

B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
210 Press Chan	1000	280	150	210	110	102	DR696010
260 Press Chan	1000	280	150	260	160	109	DR697010
310 Press Chan	1000	280	150	310	210	122	DR698010
360 Press Chan	1000	280	150	360	260	144	DR699010
210 Press Chan	500	280	150	210	110	51	DR696020
260 Press Chan	500	280	150	260	160	55	DR697020
310 Press Chan	500	280	150	31	210	61	DR698020
360 Press Chan	500	280	150	360	260	77	DR699020

C Transition Channels

Transition Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm) Upstream/ Downstream	Invert Depth (mm) Upstream/ Downstream	Unit Weight (kg)	Item Code
210 - 260	1000	280	150	210/260	110/160	54	DR696330
260 - 310	1000	280	150	260/310	160/310	61	DR697330
310 - 360	1000	280	150	310/360	310/360	77	DR698330



Mini Beany to Traffic Drain

Mini Beany can be used with Traffic Drain where the drainage run continues but the kerb line finishes. A smooth channel invert ensures undistributed flow.

D Radial Channels

Radial Channels	Unit Weight (kg)	Item Code
210 Base 30/10	51	DR696110
210 Base 9/6	51	DR696120
260 Base 30/10	55	DR697110
260 Base 9/6	55	DR697120
310 Base 30/10	61	DR698110
310 Base 9/6	61	DR698120
360 Base 30/10	77	DR699110
360 Base 9/6	77	DR699120

E End Cap/Cap Outlets

End Cap/Cap Outlets	Unit Weight (kg)	Item Code
210 End Cap	1	DR696310
260 End Cap	1	DR697310
310 End Cap	1	DR698310
360 End Cap	1	DR699310
210 Cap Outlet	2	DR696320
260 Cap Outlet	2	DR697320
310 Cap Outlet	2	DR698320
360 Cap Outlet	3	DR699320

F Outfalls & Access Covers

Outfalls & Access Covers	Unit Weight (kg)	Item Code
Traffic Drain Cast Iron Access C&F	34	DR6950100
Inline Side Outfall	150	DR689000
Inline End Outfall	142	DR689010
Slit Box	72	DR689910

G Cover Plates

Cover Plates	Unit Weight (kg)	Item Code
Cover Plate 500 mm	12	DR691030
Cover Plate 1000 mm	6	DR691040
Cover Plate 30/10	6	DR691050
Cover Plate 9/6	6	DR691060

Traffic Drain with reference numbers indicated in **bold** black are available ex-stock. Traffic Drain with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.

Traffic Drain Installation Guide

1. Excavation

- a. Sufficient material should be excavated to accommodate traffic drain Top and Base Units, concrete bedding and concrete haunch.
- b. Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- a. Setting out pins should be accurately located to the correct line and level with a string line level with the top front corners of the Base Units.
- b. It may be advantageous to locate setting out pins to the rear of the Units to avoid having to lift the Units over the string line.
- c. Sufficient setting out pins should be inserted where Traffic Drain base blocks* are laid on horizontal curves.
* Traffic drain base components same as mini beany

3. Outfalls

- a. Traffic Drain outfalls* should be installed first.
* Traffic drain outfall units same as mini beany
- b. Sufficient material should be excavated to accommodate the required Traffic Drain outfall unit
 - i. Inline Side Outfall Unit
 - ii. Inline End Outfall Unit
 - iii. High Capacity Outfall
- c. 125mm of ST4 mix (BS 8500-1&2) concrete of the appropriate mix is placed in the bottom of the excavation
- d. The bottom section of the required traffic drain outfall is lowered into position
- e. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part traffic drain outfall so as to provide a seal between the top and bottom sections
- f. The top section of the two part traffic drain outfall is lowered into position
- g. The bedding concrete should be laid and brought up flush to the top of the traffic drain outfall
- h. The traffic drain Cast iron Access Cover & Frame Unit is located on top of the top section of the outfall unit and should be set directly onto a liberal quantity of stiff, cement mortar to completely fill the whole of the joint.
- i. Traffic Drain Access Covers and Frames are hinged and handed to the direction of the traffic, specified "nearside" and "offside".

4. Base Unit

- a. When used in conjunction with the Mini Beany system, Traffic Drain base channels are the same as Mini Beany base channels.
- b. Base Units shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill
- c. C20/25 concrete to BS 8500-1&2 and BS EN 206-1 for applications up to load classification C250 to BS EN 1433
- d. A C25/30 concrete to BS 8500-1&2 and BS EN 206-1 for applications up to load classification F900 to BS EN 1433
- e. Alternatively, the Base Units may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.

5. Channel Joint Sealant

- a. Sufficient M-Seal bituminous mastic jointing compound should be trowelled on to one end face of the Base Unit so that the joint will be well sealed when the next Unit is tamped into position.
- b. Surplus sealant shall be removed from the inner surface of the Units as work proceeds.

6. Traffic DrainTop Unit Installation

- a. The string line should be set to the level of the top corner of Units.
- b. Again, starting at the Outfall, the Units should be set directly onto a liberal quantity of stiff, cement mortar to completely fill the whole of the joint.
- c. Traffic drain top units should be bed on the following materials
- d. A Mortar class 12 cement mortar to BS EN 998-2 for bedding of the Cast Iron Top Units for applications up to Load Classification D400 to BS EN 1433
- e. Marshalls' M-Bond epoxy mortar for bedding of Cast Iron Top Units for applications E600 and F900 to BS EN 1433
- f. The top units should be tamped into position close to previously laid Units and the alignment checked.
- g. The levels should be checked using the string line and a spirit level.
- h. In addition, the general alignment should be checked from all directions as each unit is laid. Any Unit deviating by more than 3mm in 3m from line and level shall be made good by lifting and relaying.
- i. Top units shall be laid with the top of the unit 5mm below the final pavement level.
- j. The inside and outside of the joints between Base and Top Units should be pointed and cleaned out with a brush or rag as work proceeds.
- k. It is not necessary for Top Block and Base Unit vertical joints to line up
- l. When installed, the minimum depth of construction above the top of the base unit to the drained area surface level shall be not less than 125mm.

7. Cover Plates

- a. Cover Plates, when used, should be bedded on cement mortar to the specified thickness, pointed inside and outside of the joints with the inside of the Base Units being cleaned out as work proceeds.
- b. The Cover Plates should be close jointed and the joints sealed with 50mm wide M-Tape.
- c. Cover Plates shall be suitably protected before and during installation in order that the protective coating is not damaged.
- d. An ST4 mix concrete should be used for the bed and haunch of Base Units where cover plates are used.

8. End Caps

- a. Where the traffic drain run does not terminate at an outfall, the base unit shall be sealed using the Traffic Drain End Cap of required depth.
- b. The End Cap shall be securely placed against the vertical end of the base unit and haunched with fresh concrete (ST1 mix to BS 8500-1&2).

9. Pavement Installation

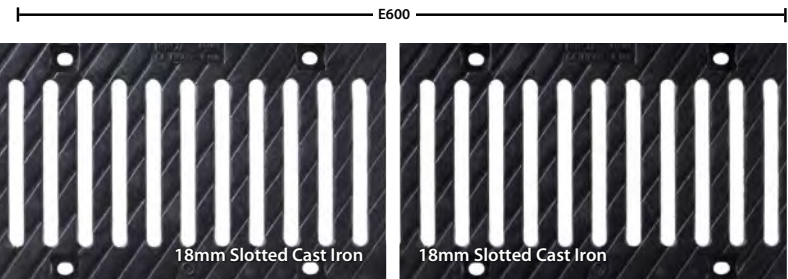
- a. Where Traffic Drain is laid on or adjacent to existing or proposed concrete slabs, transverse joints shall be formed within the units and haunching adjacent to the slab joints and also longitudinal movement joints between the haunching and the slabs.
- b. Where necessary, top unit drainage apertures shall be protected against the ingress of material during concreting operations.

In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.



Birco 200, Gloucestershire



Birco 200

Grid Drainage System



A medium to high capacity linear drainage system which combines a robust concrete channel with a cast iron slotted grate. Suitable for loadings up to E600, making Birco 200 ideal for projects where vehicles impose particularly heavy wheel loads such as industrial applications.

NSPlus
Q10 180
Q10 115

Birco 200

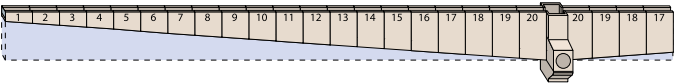
A Gratings

Gratings	Loading	Length (mm)	Width (mm)	Depth (mm)	Unit Weight (kg)	Item Code
18mm Slotted Cast Iron	E600	520	330	35	12.5	DR2754100

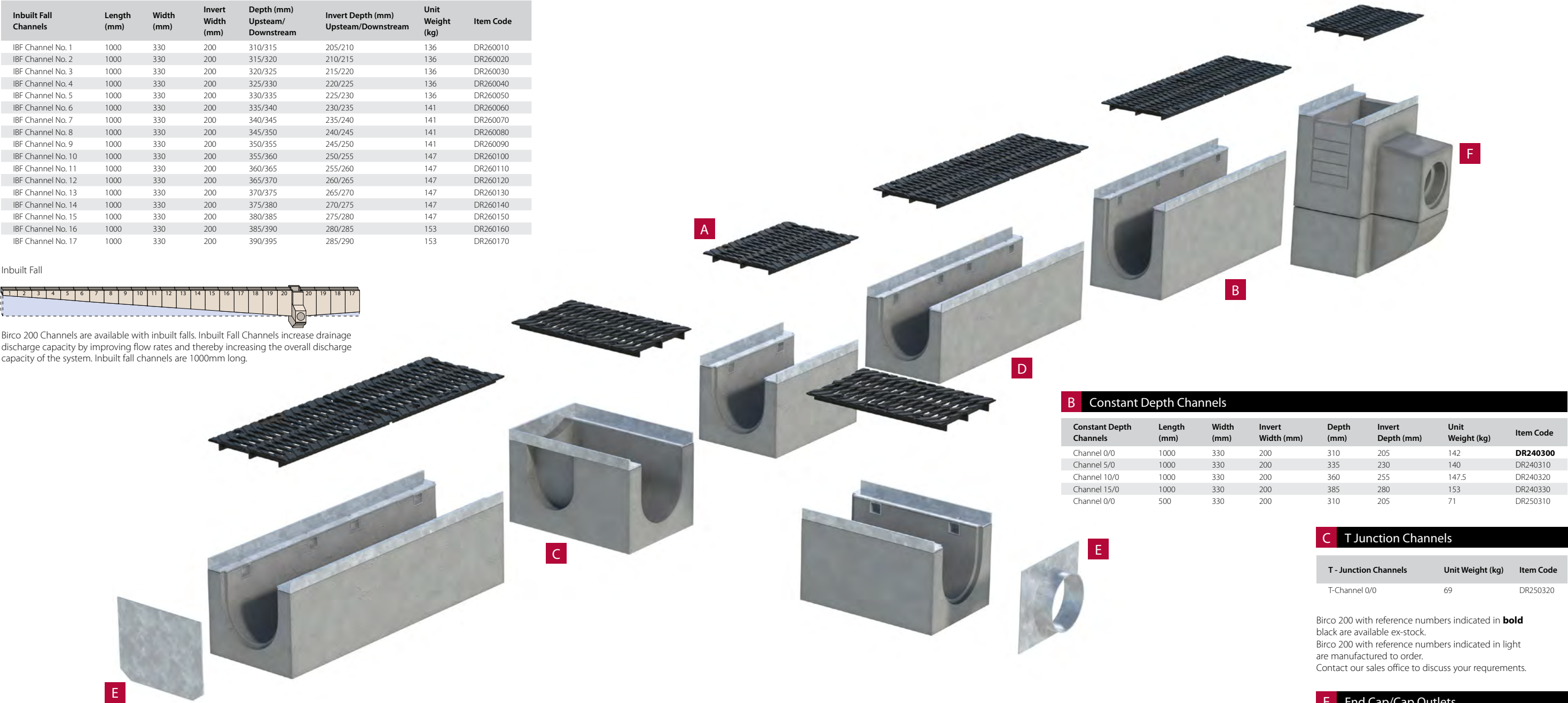
D Inbuilt Fall Channels

Inbuilt Fall Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm) Upstream/ Downstream	Invert Depth (mm) Upstream/Downstream	Unit Weight (kg)	Item Code
IBF Channel No. 1	1000	330	200	310/315	205/210	136	DR260010
IBF Channel No. 2	1000	330	200	315/320	210/215	136	DR260020
IBF Channel No. 3	1000	330	200	320/325	215/220	136	DR260030
IBF Channel No. 4	1000	330	200	325/330	220/225	136	DR260040
IBF Channel No. 5	1000	330	200	330/335	225/230	136	DR260050
IBF Channel No. 6	1000	330	200	335/340	230/235	141	DR260060
IBF Channel No. 7	1000	330	200	340/345	235/240	141	DR260070
IBF Channel No. 8	1000	330	200	345/350	240/245	141	DR260080
IBF Channel No. 9	1000	330	200	350/355	245/250	141	DR260090
IBF Channel No. 10	1000	330	200	355/360	250/255	147	DR260100
IBF Channel No. 11	1000	330	200	360/365	255/260	147	DR260110
IBF Channel No. 12	1000	330	200	365/370	260/265	147	DR260120
IBF Channel No. 13	1000	330	200	370/375	265/270	147	DR260130
IBF Channel No. 14	1000	330	200	375/380	270/275	147	DR260140
IBF Channel No. 15	1000	330	200	380/385	275/280	147	DR260150
IBF Channel No. 16	1000	330	200	385/390	280/285	153	DR260160
IBF Channel No. 17	1000	330	200	390/395	285/290	153	DR260170

Inbuilt Fall



Birco 200 Channels are available with inbuilt falls. Inbuilt Fall Channels increase drainage discharge capacity by improving flow rates and thereby increasing the overall discharge capacity of the system. Inbuilt fall channels are 1000mm long.



B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 0/0	1000	330	200	310	205	142	DR240300
Channel 5/0	1000	330	200	335	230	140	DR240310
Channel 10/0	1000	330	200	360	255	147.5	DR240320
Channel 15/0	1000	330	200	385	280	153	DR240330
Channel 0/0	500	330	200	310	205	71	DR250310

C T Junction Channels

T - Junction Channels	Unit Weight (kg)	Item Code
T-Channel 0/0	69	DR250320

Birco 200 with reference numbers indicated in **bold** black are available ex-stock. Birco 200 with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.

E End Cap/Cap Outlets

End Cap/Cap Outlets	Unit Weight (kg)	Item Code
200 End Cap	2	DR280350
200 Cap Outlet	2.5	DR280370

F Outfalls

Outfalls	Unit Weight (kg)	Item Code
200 Outfall 150mm Side	186	DR290380

Birco 200 Installation Guide

1. Excavation

- a. Sufficient material should be excavated to accommodate channel units, concrete bedding and haunching.
- b. Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- a. Setting out pins should be accurately located to the correct line and level with a string line level with the top rear corners of the channel units.
- b. It may be advantageous to locate setting out pins to the rear of the units to avoid having to lift the units over the string line.

3. Outfalls

- a. Birco Outfalls should be installed first.
- b. Sufficient material should be excavated to accommodate the trapped Birco Gulley.
- c. 150mm of ST4 mix (BS 8500-1&2) concrete of the appropriate mix is placed in the bottom of the excavation.
- d. The bottom section of the two part Birco Gulley is lowered into position, with the appropriate pipe adaptor placed the aperture for connection to the underground pipework.
- e. A suitable section of the wall of the outfall unit shall be cut out to allow adjacent drainage channels to abut without restricting the flow of water. Cutting shall be achieved by using a concrete saw or disc cutter.
- f. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Birco Gulley so as to provide a seal between the top and bottom sections.
- g. The top section of the two part Birco Gulley is lowered into position
- h. The bedding concrete should be laid and brought up to the appropriate level dependant on surface finish as shown in the Birco Standard Detail Sheet.

4. Channel Installation

- a. Bedding concrete (ST1 to BS 8500-1&2) of the appropriate thickness and depth shall be laid as specified in the Birco Standard Detail Sheets.
- b. The top of the Birco Channel shall be 5mm below the final pavement surface.
- c. Channel Units shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill
- d. Alternatively, the Channel Units may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.
- e. The concrete haunching shall be of a concrete grade appropriate to the Drainage Channel Loading Class as specified in the Birco Standard Detail Sheets.
- f. Haunching shall be carried out as one operation to a complete line of Channel Units, to the dimensions indicated in the Birco Standard Detail
- g. Where channels are laid on or adjacent to existing or proposed concrete slabs, transverse joints shall be formed within the Units and haunching adjacent to the slab joints.
- h. Longitudinal movement joints shall also be formed between the haunching and the slabs as described in the Birco Drain Standard Detail Sheets.
- i. Where cutting the Birco Channel Units is required, they shall be cut with a concrete saw or disc cutter, so that no single Unit is less than 350mm long. Birco gratings shall not be cut unless directed by the engineer. Any cut galvanised steel shall be renovated using Defcon Z, or similar approved.

5. Channel Joint Sealant

- a. Jointing of adjacent channels shall be carried prior to fixing the gratings. Marshalls' M-Flex sealant should be gunned into the sealant groove formed when adjacent channels abut.
- b. Surplus sealant shall be removed from the inner surface of the units as work proceeds.

6. Grating Installation

- a. Adjacent Carriageway and/or footway construction shall not be commenced within 3 days of any jointing or haunching/surrounding concrete being placed.
- b. Birco gratings shall be securely bolted to Birco Channel Units, before adjacent pavement construction is commenced.
- c. All gratings shall be evenly spaced with bolts tightened down securely to the appropriate torque (Lite: 25Nm, 100, 150 and 200: 75 Nm, 300:100Nm).
- d. On completion of the works, the drainage channel units shall be cleaned out and left free from obstruction. This shall be carried out either by removal of gratings or by high pressure water jetting (100-150 bar at 200 litres/min minimum). Unless otherwise agreed with the specifier, the slot openings shall be covered by timber boards or other method during jetting operations.
- e. Outfall units shall be emptied.
- f. The cleaning process should be repeated where necessary on completion of any remedial works.

7. End Caps/End Cap Outlets

- a. Where the Birco Channel run does not terminate at an outfall, the base unit shall be sealed using the Birco End Cap or End Cap Outlet.
- b. These are to be held in position by installing 150mm of concrete haunching.
- c. Marshalls M-Flex sealant should be gunned into the sealant groove.

In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.

Scan the QR Code to watch the installtion video



Max-E Channel is a high capacity system that complements the Beany range to ensure continuity between kerb and top units. The range of different concrete top units offered in a variety of colours and finishes complements any aesthetic. A cast iron top option completes the range and provides a solution for the highest loading classification. Max-E Channel is fully compatible with the full range of Beany junctions, outfalls and other ancillary units.

NSPlus
Q10 170

Max-E Channel

A Top Units

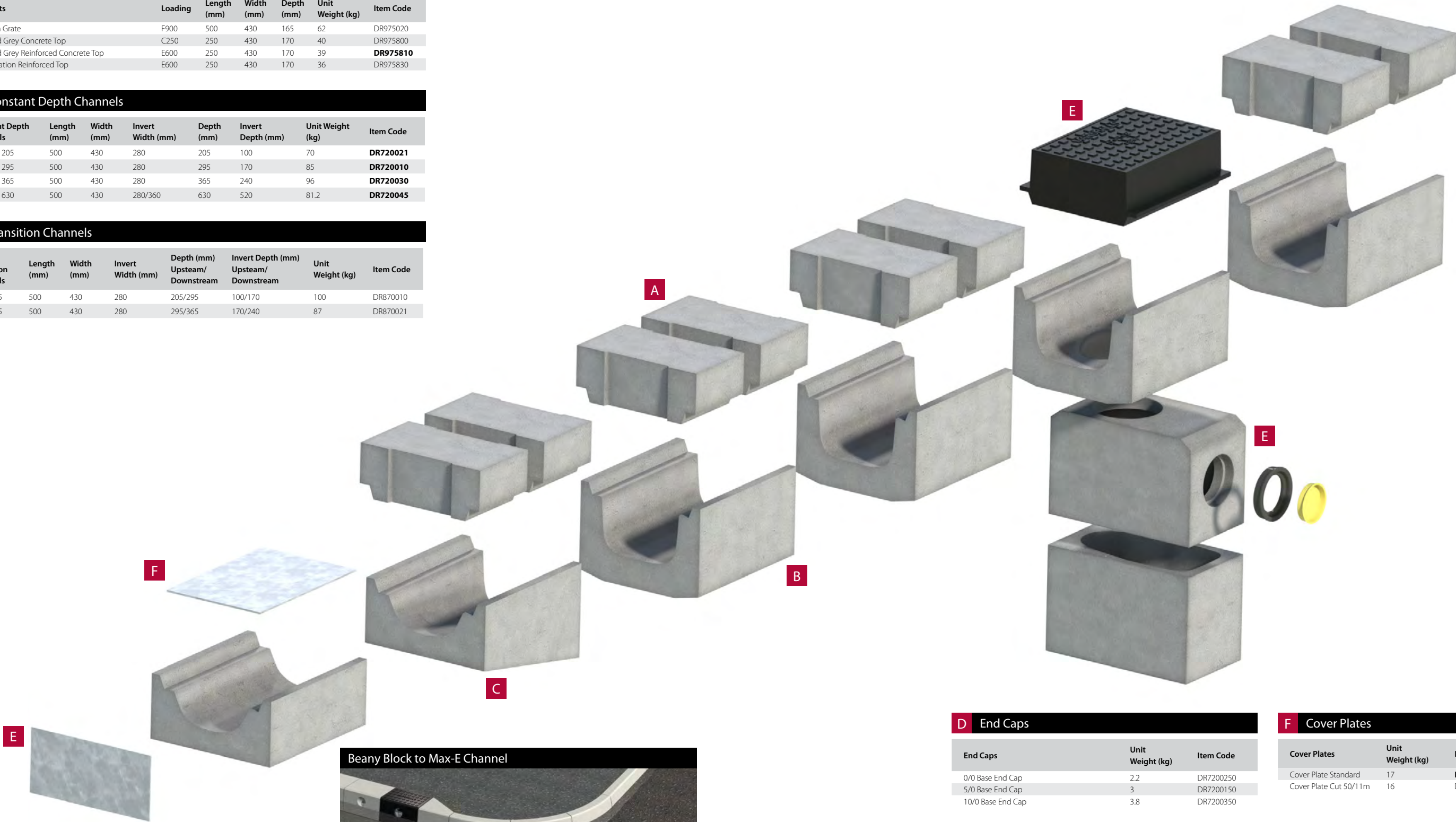
Top Units	Loading	Length (mm)	Width (mm)	Depth (mm)	Unit Weight (kg)	Item Code
Cast Iron Grate	F900	500	430	165	62	DR975020
Standard Grey Concrete Top	C250	250	430	170	40	DR975800
Standard Grey Reinforced Concrete Top	E600	250	430	170	39	DR975810
Conservation Reinforced Top	E600	250	430	170	36	DR975830

B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 205	500	430	280	205	100	70	DR720021
Channel 295	500	430	280	295	170	85	DR720010
Channel 365	500	430	280	365	240	96	DR720030
Channel 630	500	430	280/360	630	520	81.2	DR720045

C Transition Channels

Transition Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm) Upstream/ Downstream	Invert Depth (mm) Upstream/ Downstream	Unit Weight (kg)	Item Code
205 - 295	500	430	280	205/295	100/170	100	DR870010
295 - 365	500	430	280	295/365	170/240	87	DR870021



D End Caps

End Caps	Unit Weight (kg)	Item Code
0/0 Base End Cap	2.2	DR7200250
5/0 Base End Cap	3	DR7200150
10/0 Base End Cap	3.8	DR7200350

E Outfalls & Access Covers

Outfalls & Access Covers	Unit Weight (kg)	Item Code
Max-E Full Depth Access Cover & Frame	85	DR9800150
Max-E Inlaid Access Cover & Frame	32.5	DR9800170
Gully Outfall 225	242	DR4604060
Gully Outfall 150	277	DR4604010

F Cover Plates

Cover Plates	Unit Weight (kg)	Item Code
Cover Plate Standard	17	DR910005
Cover Plate Cut 50/11m	16	DR910010

Max-E-Channel with reference numbers indicated in **bold** black are available ex-stock. Max-E-Channel with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.

Beany Block to Max-E Channel
Beany can be used with Max-E Channel where the drainage run continues but the kerb line finishes. A smooth channel invert ensures undistributed flow

Max-E Channel Installation Guide

1. Excavation

- a. Sufficient material should be excavated to accommodate Top and Base Units, concrete bedding and haunching.
- b. Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- a. Setting out pins should be accurately located to the correct line and level with a string line level with the top front corners of the Base Units.
- b. It may be advantageous to locate setting out pins to the rear of the Units to avoid having to lift the Units over the string line.
- c. Sufficient setting out pins should be inserted where Max-E Channel Bases are laid on horizontal curves

3. Outfalls

- a. Max-E Channel Outfalls should be installed first.
- b. Sufficient material should be excavated to accommodate the Trapped Max-E Channel Gulley
- c. 125mm of concrete of the appropriate mix is placed in the bottom of the excavation
- d. The bottom section of the two part Max-E Channel Gulley is lowered into position
- e. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Max-E Channel Gulley so as to provide a seal between the top and bottom sections
- f. The top section of the two part Max-E Channel Gulley is lowered into position
- g. The bedding concrete should be laid and brought up flush to the top Max-E Channel Gulley
- h. The Max-E Channel Base Outfall Block should be set directly onto a liberal quantity of stiff, cement mortar
- i. The Cast iron Access Cover & Frame Units should be set directly onto a liberal quantity of stiff, cement mortar to completely fill the whole of the joint.

4. Base Unit Installation

- a. Bedding concrete of the appropriate mix and to the appropriate thickness and depth shall be laid
- b. Base Units shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill
- c. Alternatively, the Base Units may be bedded on to a layer of 10 to 40mm cement mortar on a previously prepared concrete foundation.
- d. Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 200mm in length.
- e. All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter.

5. Channel Joint Sealant

- a. Sufficient M-Seal bituminous mastic jointing compound should be trowelled on to one end face of the Base Unit so that the joint will be well sealed when the next Unit is tamped into position.
- b. Surplus sealant shall be removed from the inner surface of the Units as work proceeds.

6. Top Block Installation

- a. The string line should be set to the level of the top corner of Units.
- b. Again, starting at the Outfall, the Units should be set directly onto a liberal quantity of stiff, cement mortar to completely fill the whole of the joint.
- c. Cement mortar shall be Class M12 in accordance with BS EN 998-2 for applications up to and including D400 and should be M Bond epoxy mortar for higher loading applications.
- d. The M Bond epoxy mortar should be mixed in accordance with the instructions on the container.
- e. The Top Units should be tamped into position close to previously laid Units and the alignment checked.
- f. The levels should be checked using the string line and a spirit level.
- g. In addition, the general alignment should be checked from all directions as each Unit is laid. Any Unit deviating by more than 3mm in 3m from line and level shall be made good by lifting and relaying.
- h. The inside and outside of the joints between Base and Top Units should be pointed and cleaned out with a brush or rag as work proceeds.
- i. Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 200mm in length. All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter.
- j. It is not necessary for Top and Base Unit vertical joints to line up
- k. The front and rear concrete haunching is installed to the dimensions shown on the standard detail or drawing.

7. End Caps

- a. Where the Max-E Channel run does not terminate at an outfall, the base unit shall be sealed using the Max-E-Channel End Cap.
- b. The End Cap shall be securely placed against the vertical end of the base unit and haunched with fresh concrete.

8. Pavement Installation

- a. Where Max-E Channel is laid on or adjacent to existing or proposed concrete slabs, transverse joints shall be formed within the units and haunching adjacent to the slab joints and also longitudinal movement joints between the haunching and the slabs.
- b. Where necessary, the Top Unit drainage openings shall be protected against the ingress of material during concreting operations by covering with Waterproof Cloth Tape.

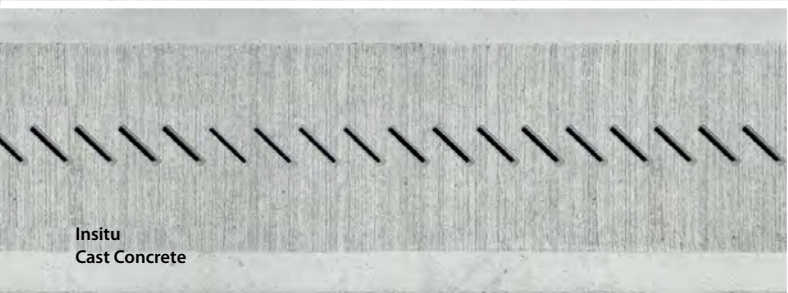
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This may require the use of lifting aids to assist installation.

Scan the QR Code to watch the installtion video



Drexus XL, Example



Insitu Cast Concrete

Drexus XL
Slot Drainage System



Marshalls NEW Drexus XL is a recycled polyethylene (PE) high capacity channel, ideally suited for high capacity heavy duty projects covering any load class from busy service yards and rail & docking ports, airports with severe dynamic transport loading to motorways and commercial outlets.

The high capacity system is designed to offer attenuation and storage facilities but also to achieve sufficient flow velocities at low gradient to ensure that the channels require minimal maintenance. Drexus XL's In-Situ surface finish is designed to integrate seamlessly into concrete or black top surfaces.



Insitu Cast Concrete

NSPlus
Q10 170

NEW

Channel Drainage Product Range

Linear Drainage

www.marshalls.co.uk/commercial/water-management

54

Linear Drainage

www.marshalls.co.uk/commercial/water-management



End Caps	Unit Weight (kg)	Item Code
325 End Cap	1	DR537910
425 End Cap	2.5	DR537920
525 End Cap	3	DR537930
675 End Cap	4.5	DR537940
825 End Cap	5.5	DR537950

End Caps	Unit Weight (kg)	Item Code
325 End Cap	1	DR537910
425 End Cap	2.5	DR537920
525 End Cap	3	DR537930
675 End Cap	4.5	DR537940
825 End Cap	5.5	DR537950

Outfall Accessories	Unit Weight (kg)	Item Code
325 AC Connector - RH	2.6	DR538410
425 AC Connector - RH	3.9	DR538420
525 AC Connector - RH	5	DR538430
675 AC Connector - RH	7	DR538440
825 AC Connector - RH	9	DR538450
325 AC Connector - LH	2.5	DR538510
425 AC Connector - LH	3.9	DR538520
525 AC Connector - LH	4.9	DR538530
675 AC Connector - LH	6.9	DR538540
825 AC Connector - LH	9	DR538550
325-525 Access Chamber & Cover	11.5	DR538905
325-525 AC & Silt Box	26.5	DR538910
675-825 Access Chamber & Cover	15	DR538920
675-825 AC & Silt Box	41.5	DR538925

Outfall Accessories	Unit Weight (kg)	Item Code
325 AC Connector - RH	2.6	DR538410
425 AC Connector - RH	3.9	DR538420
525 AC Connector - RH	5	DR538430
675 AC Connector - RH	7	DR538440
825 AC Connector - RH	9	DR538450
325 AC Connector - LH	2.5	DR538510
425 AC Connector - LH	3.9	DR538520
525 AC Connector - LH	4.9	DR538530
675 AC Connector - LH	6.9	DR538540
825 AC Connector - LH	9	DR538550
325-525 Access Chamber & Cover	11.5	DR538905
325-525 AC & Silt Box	26.5	DR538910
675-825 Access Chamber & Cover	15	DR538920
675-825 AC & Silt Box	41.5	DR538925

Drexus XL Installation Guide

1. Excavation & Setting Out

- a. Mark out the required line of drainage.
- b. Mark out the required level for the system.
- c. Excavate trench with an additional depth and width of 150mm (C250/ D400) or 200mm (F900) each side than the respective dimensions of the selected Channel and Lid. For channel depths see the Marshalls drainage design guide. Suitable trench support and edge protection should be used if identified by the site risk assessment.

2. Access and Outfall Chamber installation

- a. Excavate to formation level
- b. Install trench support and excavation access as required
- c. Prepare formation by trimming or laying blinding concrete
- d. Position chamber or silt box unit in excavation
- e. Set chamber to correct level and orientation using non-compressible setting block
- f. Install formwork and supports for the concrete surround
- g. Provide temporary support to the unit as required to maintain position during placement of base concrete
- h. Place concrete around chamber unit to form base and part of the vertical surround. The surround should extend no more than 75 mm up the side of the chamber unit
- i. Check level and orientation, adjust as required
- j. After initial set has been achieved, install additional chamber units and connection pipework in position as required
- k. Extend formwork and place concrete generally as items 6, 7, 8 & 9 to the top surface of the chamber
- l. When the concrete has achieve strength, strike formwork and remove
- m. Backfill chamber to the underside of the final pavement construction or as required
- n. Bed and haunch cover and frame using a minimum mortar Class 12 to BS EN 998-2 or a similar proprietary bedding compound suitable for application and loading. Level and adjust as required.

3. Drexus XL Unit Installation

- a. Line the trench bottom with a 150mm (C250/D400) or 200mm (F900) deep layer of semi-dry concrete to provide a bed for the Channel. The mix is specified in the drainage design guide.
- b. Manually lift the channel into position if safe to do so. The channel can be lifted by strop if manual handling is unsuitable. Seek further guidance on lifting equipment from the relevant supplier.
- c. It is preferred but not essential to have the male end of the coupling at the start of the run.
- d. Align the horizontal locators at the channel couplings; these can then be fixed in place with a nut and bolt or a zip tie.
- e. Tamp the top of the Channel along its length until it is to line and level.
- f. If necessary pin the feet into position by placing a suitable pin (e.g. setting out pin) into the V notch of the channels feet. The channel can also be braced to the walls of the trench; this will help avoid movement of the system during the concrete pour.
- g. Pour the concrete evenly each side of the channel until the feet are fully submerged.
- h. Remove feet pins prior to the concrete setting if they are required.
- i. Leave the concrete to set this should usually achieve enough stiffness in 12 hours.

4. End Cap and End Cap Outlet

- a. The channels should be terminated with either an end cap or end cap outlet. The end cap is universal for both male and female ends of the channel whereas the end cap outlet is specific.
- b. When terminating the run at an access chamber/outfall an end cap outlet should be used to enter the chamber it can be trimmed to suit. The end cap outlet has also been designed to transition to standard drainage twin wall pipe by way of a standard coupling.

5. Surface Installation

- a. Prior to the next pour of concrete reinforcement bars should be installed if required by the pavement design. Engineering advice should be sought for specific guidance.
- b. Ensure the bungs (colour tbc) are in place to prevent concrete ingress.
- c. Continue to pour concrete to surface level with the top of the rubber bungs.
- d. Finish the concrete surface with power float type devices which will move over the rubber bungs.
- e. When the concrete has set the inlet bungs can be removed, this is best achieved by piercing the units and levering along the inlet.
- f. After concreting the system should not be loaded with passing traffic until the concrete has had time to fully cure.

In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.



Birco 100, Manchester



Max-E Channel, Bedford



Birco 100, Manchester



Pave Drain, Holborn



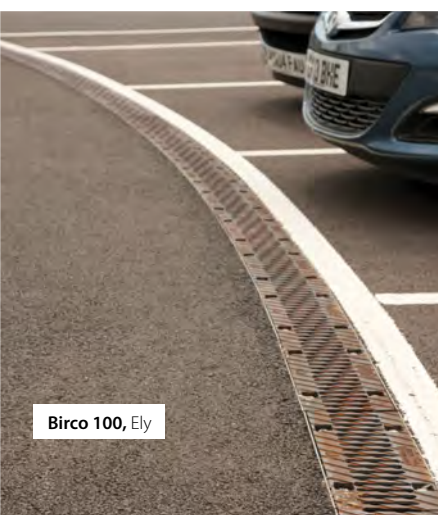
Mono Slot Drain, Celtic Park



Birco Lite, London Bridge Station



Duo Slot Drain, Manchester

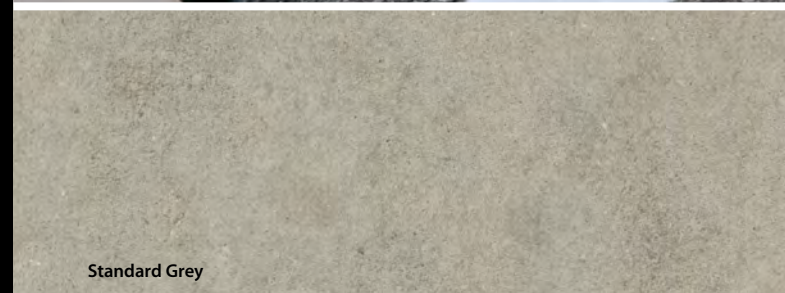


Birco 100, Ely

Combined Kerb & Drainage Product Range



Mono Beany, A21, East Sussex



Standard Grey

Mono Beany®
One Piece Combined Kerb
and Drainage System



An innovative, concrete single piece combined kerb and drainage solution. Mono Beany is a low to medium capacity system which combines strength and aesthetics through Marshalls' high strength M-Tech concrete. A recycled inner plastic core provides hydraulic flow benefits at low capacities. Available in two depths and in both Half Battered and 45° Splayed profiles with a range of accessories to provide a comprehensive drainage system which carries the BSI Kitemark.

NS Plus
Q10 190

Mono Beany

A Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Height (mm)	Unit Weight (kg)	Item Code
Half Battered	1000	150	321	69	DR663030
	500	150	321	34.5	DR663035
	1000	150	502	91	DR663040
45° Splayed	500	150	502	45.5	DR663045
	1000	150	321	64	DR663120
	500	150	321	32	DR663125
	1000	150	502	86	DR663130
	500	150	502	43	DR663135

B Transition Channels

Transition Channels		Length (mm)	Width (mm)	Height (mm)	Invert Depth (mm) Upstream/Downstream	Unit Weight (kg)	Item Code
Half Battered	502 - 321 Transition RH	1000	150	502	221/402	107	DR663320
	503 - 321 Transition LH	1000	150	502	221/403	107	DR663321
	503 - 321 Transition RH	1000	150	502	221/403	107	DR663326
45° Splayed	502 - 321 Transition LH	1000	150	502	221/402	107	DR663305

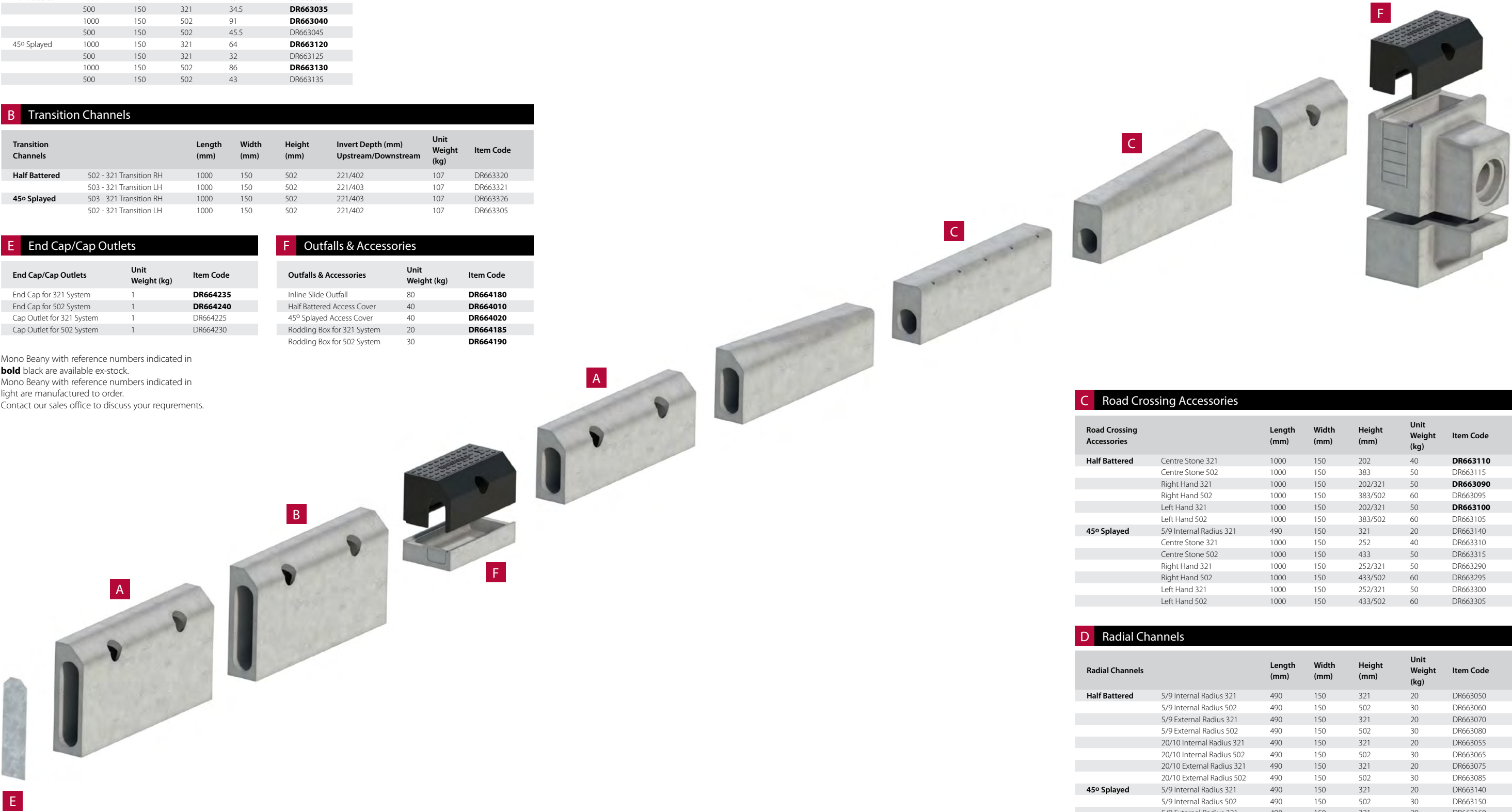
E End Cap/Cap Outlets

End Cap/Cap Outlets	Unit Weight (kg)	Item Code
End Cap for 321 System	1	DR664235
End Cap for 502 System	1	DR664240
Cap Outlet for 321 System	1	DR664225
Cap Outlet for 502 System	1	DR664230

F Outfalls & Accessories

Outfalls & Accessories	Unit Weight (kg)	Item Code
Inline Slide Outfall	80	DR664180
Half Battered Access Cover	40	DR664010
45° Splayed Access Cover	40	DR664020
Rodding Box for 321 System	20	DR664185
Rodding Box for 502 System	30	DR664190

Mono Beany with reference numbers indicated in **bold** black are available ex-stock. Mono Beany with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.



C Road Crossing Accessories

Road Crossing Accessories		Length (mm)	Width (mm)	Height (mm)	Unit Weight (kg)	Item Code
Half Battered	Centre Stone 321	1000	150	202	40	DR663110
	Centre Stone 502	1000	150	383	50	DR663115
	Right Hand 321	1000	150	202/321	50	DR663090
	Right Hand 502	1000	150	383/502	60	DR663095
	Left Hand 321	1000	150	202/321	50	DR663100
	Left Hand 502	1000	150	383/502	60	DR663105
45° Splayed	5/9 Internal Radius 321	490	150	321	20	DR663140
	Centre Stone 321	1000	150	252	40	DR663310
	Centre Stone 502	1000	150	433	50	DR663315
	Right Hand 321	1000	150	252/321	50	DR663290
	Right Hand 502	1000	150	433/502	60	DR663295
	Left Hand 321	1000	150	252/321	50	DR663300
	Left Hand 502	1000	150	433/502	60	DR663305

D Radial Channels

Radial Channels		Length (mm)	Width (mm)	Height (mm)	Unit Weight (kg)	Item Code
Half Battered	5/9 Internal Radius 321	490	150	321	20	DR663050
	5/9 Internal Radius 502	490	150	502	30	DR663060
	5/9 External Radius 321	490	150	321	20	DR663070
	5/9 External Radius 502	490	150	502	30	DR663080
	20/10 Internal Radius 321	490	150	321	20	DR663055
	20/10 Internal Radius 502	490	150	502	30	DR663065
	20/10 External Radius 321	490	150	321	20	DR663075
	20/10 External Radius 502	490	150	502	30	DR663085
45° Splayed	5/9 Internal Radius 321	490	150	321	20	DR663140
	5/9 Internal Radius 502	490	150	502	30	DR663150
	5/9 External Radius 321	490	150	321	20	DR663160
	5/9 External Radius 502	490	150	502	30	DR663170
	20/10 Internal Radius 321	490	150	321	20	DR663145
	20/10 Internal Radius 502	490	150	502	30	DR663155
	20/10 External Radius 321	490	150	321	20	DR663165
	20/10 External Radius 502	490	150	502	30	DR663175

Mono Beany Installation Guide

1. Excavation

- a. Sufficient material should be excavated to accommodate the Units, concrete bedding and haunching.
- b. Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- a. Setting out pins should be accurately located to the correct line and level with a string line level placed to the rear of the kerb.
- b. Sufficient setting out pins should be inserted where Mono Beany Units are laid on horizontal curves.

3. Outfalls

- a. Mono Beany Outfalls should be installed first.
- b. Sufficient material should be excavated to accommodate the Trapped Mono Beany Gully
- c. 125mm of ST4 mix (BS 8500-1&2) concrete of the appropriate mix is placed in the bottom of the excavation
- d. The bottom section of the two part Mono Beany Outfall is lowered into position
- e. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Beany Outfall so as to provide a seal between the top and bottom sections
- f. The bedding concrete should be laid and brought up flush to the top of the Mono Beany Outfall.
- g. The Cast iron Access Cover & Frame Units should be set directly onto a liberal quantity of stiff, cement mortar to completely fill the whole of the joint.

4. Mono Beany Unit Installation

- a. Bedding concrete (ST1 to BS 8500-1&2) of the appropriate thickness and depth shall be laid
- b. Mono Beany Units shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill
- c. Alternatively, the Mono Beany Units may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.
- d. Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 200mm in length and no cuts shall be within 50mm of the inlet aperture. No cutting shall impair the stability of the Unit.
- e. All cutting and trimming of the Units shall be carried out with an appropriate cutting tool.

5. Mono Beany Joint Sealant

- a. Sufficient Marshalls' M-Flex sealant should be gunned into the sealant groove at either end of the unit.

6. Mono Beany End Cap

- a. Where the Mono Beany run does not terminate at an outfall, the base unit shall be sealed using the Mono Beany End Cap.
- b. The End Cap shall be securely placed against the vertical end of the base unit and haunched with fresh concrete (ST1 mix to BS 8500-1&2).

7. Pavement Installation

- a. Where Mono Beany is laid on or adjacent to existing or proposed concrete slabs, transverse joints shall be formed within the units and haunching adjacent to the slab joints and also longitudinal movement joints between the haunching and the slabs.
- b. Where necessary, the Unit drainage openings shall be protected against the ingress of material during concreting operations by covering with Waterproof Cloth Tape.

In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.

Scan the QR Code to watch the installtion video



Marshalls supplied 15,000 linear metres of Mono Beany one-piece combined kerb and drainage to the new M1 smart motorway scheme.

Challenge

The road network is a crucial part of our national transport system and failures to improve these networks increases cost, hinders employment opportunities and makes it harder to do business.

Congestion is already a serious problem on the M1 between junctions 28 and 31 which carries around 95,000 vehicles per day.

The challenge was to install new infrastructure, including drainage attenuation, with minimal disruption and to select a suitable product engineered to help contractors meet deadlines. This would ensure the M1 was open and running to its full capacity within the project timescales. The client also needed to keep within budget and didn't want to pay for a costly over-engineered system.

Solution

Marshalls was chosen to supply linear drainage to the project. Mono Beany is Marshalls' first one-piece combined kerb and drainage system made with ultra-tough M-Tech concrete which has been proven to significantly reduce installation time.

This innovative product is available in two depths which both have a recycled inner plastic core to provide hydraulic flow benefits at low and medium capacities. Each one metre unit can carry up to 40 tonnes (Class D400) when trafficked. The inlet apertures are divergent and angled at 45° to prevent blockages and maximise drainage efficiency. These features ensure surface water is cleared rapidly and internal flow is smooth and efficient.

The hydraulic capacity requirements varied along the run and therefore a mix of Mono Beany 321 and 502 units were required as this was deemed more cost-effective. Marshalls also used its expertise to develop a new transition unit to complete the M1 scheme as part of the Highways Agency's focus on innovation. This was developed in order to create a smooth hydraulic transition from a 502 to a 321 Mono Beany unit, which reduced the hydraulic capacity, while coming within budget.



Client:
Highways England

Contractor:
Costain

Engineer:
Mouchel (Manchester)

Marshalls products used:

- 15,000 linear metres of Mono Beany
- Bespoke transition unit



Mono Beany

Case Study - M1



Benefit
Costain initially anticipated it would lay 240 metres of Mono Beany per day, however using the revolutionary, easy-to-install Mono Beany system the installation time was considerably reduced, with 340 metres installed per day to the scheme.

Malcolm Bell, Construction Manager from Costain said: *“Due to how quickly we were able to install the innovative Mono Beany system there was an increased demand on deliveries to site. Marshalls offered a reliable and guaranteed supply throughout the project, delivering three to four loads per week direct-to-site, often delivering two loads per day. This helped to ensure we met our completion deadlines and kept works disruption to a minimum.*

“Working with Marshalls also offered Costain a dedicated and knowledgeable design team to meet our requirements for this scheme.

“These are all important factors when tasked with installing over nine miles of drainage to a major strategic route connecting people, communities and businesses.”

In the longer term this scheme will help relieve congestion and smooth traffic flow along this stretch of the M1, improving safety and journey times for commuters. These benefits will also support economic development in the region.

Responding to the recent announcement by Highways England that there will be a £1.5bn investment in smart motorway schemes David Jackson, Trading Drainage Director at Marshalls said: “Marshalls is already engaged in a number of smart motorway schemes as part of this investment, offering design expertise on a wide range of suitable products.

“As the UK’s leading supplier of hard landscaping materials, we are committed to developing effective water management and linear drainage solutions to meet the needs of contractors.

“Having already supplied Junctions 28-31 of the M1, we are poised for further involvement to improve the road network and have the capacity and capability to deal with further orders.”



Mini Beany, Conservation, Bedford



Conservation Silver Grey



Standard Grey

Mini Beany[®]

Combined Kerb and Drainage System



LOW



MEDIUM



E600

Mini Beany is a low to medium capacity combined kerb and drainage system which evolved from the successful Beany range. The robust concrete construction makes this the ideal choice for areas of heavy or abnormally heavy wheel loads. Available in a choice of top finishes to complement a wide range of projects, from urban to rural.

Mini Beany

A Top Blocks

Top Blocks	Length (mm)	Width (mm)	Height (mm)	Unit Weight (kg)	Item Code
HB standard Grey	1000	250	240	95	DR672010
HB standard Grey	500	250	240	43	DR672020
45° SP Standard Grey	1000	250	240	98	DR672040
45° SP Standard Grey	500	250	240	43	DR672050
Bull Nose Conservation	1000	250	240	139	DR931210
Bull Nose Conservation	500	250	240	69.5	DR931211

B Base Channels

Base Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
210 Press Chan	1000	280	150	210	110	102	DR696010
260 Press Chan	1000	280	150	260	160	109	DR697010
310 Press Chan	1000	280	150	310	210	122	DR698010
360 Press Chan	1000	280	150	360	160	144	DR699010
210 Press Chan	500	280	150	210	110	51	DR696020
260 Press Chan	500	280	150	260	160	55	DR697020
310 Press Chan	500	280	150	310	210	61	DR698020
360 Press Chan	500	280	150	360	260	77	DR699020

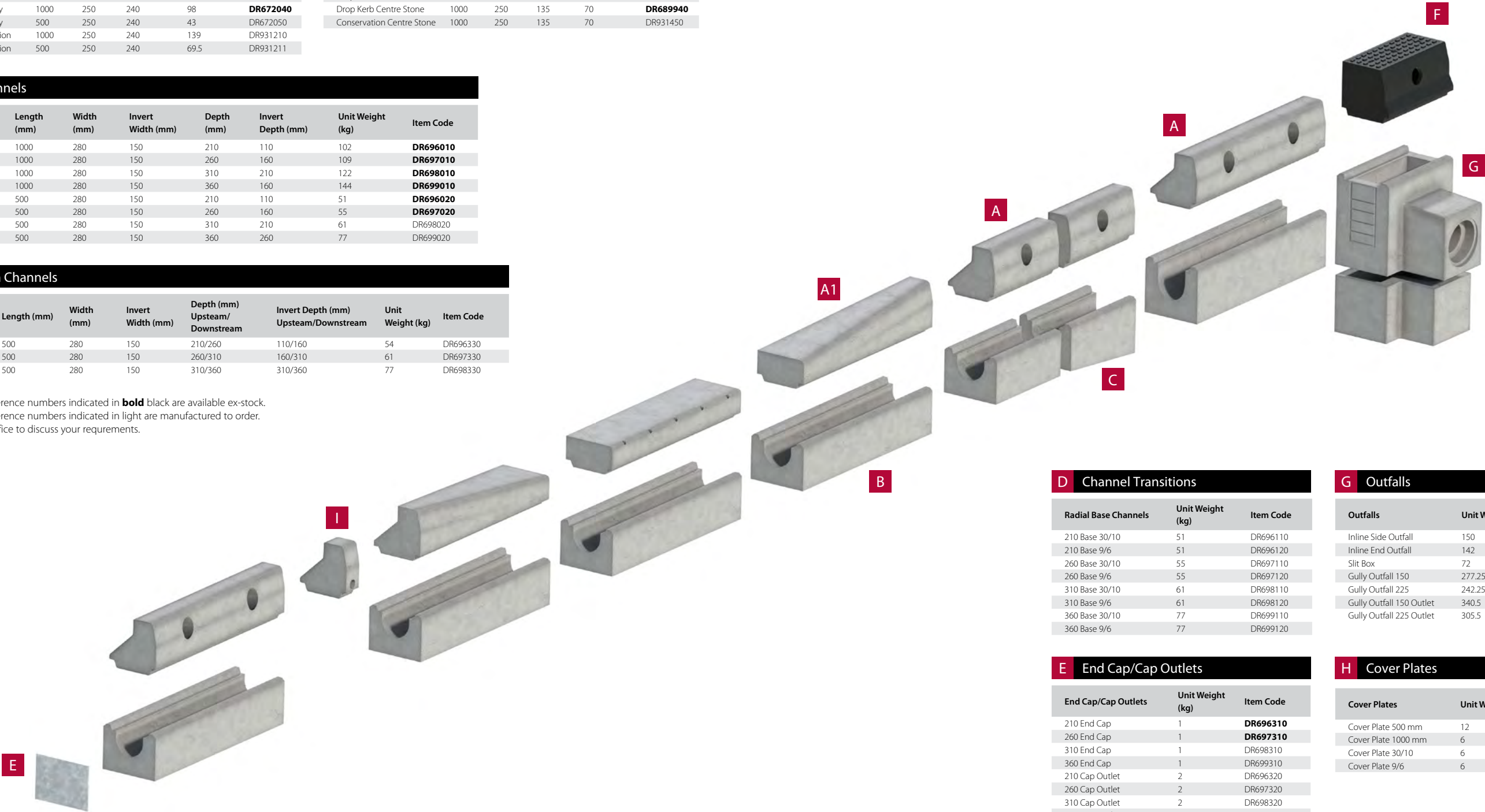
C Transition Channels

Transition Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm) Upstream/ Downstream	Invert Depth (mm) Upstream/Downstream	Unit Weight (kg)	Item Code
210 - 260	500	280	150	210/260	110/160	54	DR696330
260 - 310	500	280	150	260/310	160/310	61	DR697330
310 - 360	500	280	150	310/360	310/360	77	DR698330

Mini Beany with reference numbers indicated in **bold** black are available ex-stock. Mini Beany with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.

A1 Road Crossing Accessories

Road Crossing Accessories	Length (mm)	Width (mm)	Height (mm)	Unit Weight (kg)	Item Code
Drop Kerb LH	1000	250	240/135	82	DR689920
Drop Kerb RH	1000	250	240/135	82	DR689930
Drop Kerb Centre Stone	1000	250	135	70	DR689940
Conservation Centre Stone	1000	250	135	70	DR931450



D Channel Transitions

Radial Base Channels	Unit Weight (kg)	Item Code
210 Base 30/10	51	DR696110
210 Base 9/6	51	DR696120
260 Base 30/10	55	DR697110
260 Base 9/6	55	DR697120
310 Base 30/10	61	DR698110
310 Base 9/6	61	DR698120
360 Base 30/10	77	DR699110
360 Base 9/6	77	DR699120

E End Cap/Cap Outlets

End Cap/Cap Outlets	Unit Weight (kg)	Item Code
210 End Cap	1	DR696310
260 End Cap	1	DR697310
310 End Cap	1	DR698310
360 End Cap	1	DR699310
210 Cap Outlet	2	DR696320
260 Cap Outlet	2	DR697320
310 Cap Outlet	2	DR698320
360 Cap Outlet	2	DR699320

F Access Covers

Access Covers	Unit Weight (kg)	Item Code
HB Access Cover N/S	40	DR691010
45° SP Access Cover N/S	40	DR691015
HB Access Cover O/S	40	DR691020
45° SP Access Cover O/S	40	DR691025
Bull Nose Access Cover N/S	40	DR691027

G Outfalls

Outfalls	Unit Weight (kg)	Item Code
Inline Side Outfall	150	DR689000
Inline End Outfall	142	DR689010
Slit Box	72	DR689910
Gully Outfall 150	277.25	DR460401
Gully Outfall 225	242.25	DR460406
Gully Outfall 150 Outlet	340.5	DR460400
Gully Outfall 225 Outlet	305.5	DR460405

H Cover Plates

Cover Plates	Unit Weight (kg)	Item Code
Cover Plate 500 mm	12	DR691030
Cover Plate 1000 mm	6	DR691040
Cover Plate 30/10	6	DR691050
Cover Plate 9/6	6	DR691060

I Cable Duct Blocks

Cable Duct Blocks	Unit Weight (kg)	Item Code
HB Cable Duct Block	3	DR689900
45° SP Cable Duct Block	3	DR689905

Mini Beany Installation Guide

1. Excavation

- a. Sufficient material should be excavated to accommodate Top and Base Units, concrete bedding and rear concrete haunch.
- b. Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- a. Setting out pins should be accurately located to the correct line and level with a string line level with the top front corners of the Base Units.
- b. It may be advantageous to locate setting out pins to the rear of the Units to avoid having to lift the Units over the string line.
- c. Sufficient setting out pins should be inserted where Mini Beany Blocks are laid on horizontal curves

3. Outfalls

- a. Mini Beany Outfalls should be installed first.
- b. Sufficient material should be excavated to accommodate the required Mini Beany outfall unit
 - i. Inline Side Outfall Unit
 - ii. Inline End Outfall Unit
 - iii. High Capacity Outfall
- c. 125mm of ST4 mix (BS 8500-1&2) concrete of the appropriate mix is placed in the bottom of the excavation
- d. The bottom section of the required Mini Beany Gulley is lowered into position
- e. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Mini Beany Gulley so as to provide a seal between the top and bottom sections
- f. The top section of the two part Mini Beany Gulley is lowered into position
- g. The bedding concrete should be laid and brought up flush to the top of the Mini Beany Gulley
- h. The Mini Beany Cast iron Access Cover & Frame Units located on top of the outfall unit should be set directly onto a liberal quantity of stiff, cement mortar to completely fill the whole of the joint.
- i. Mini Beany Access Covers and Frames are hinged and handed to the direction of the traffic, specified "nearside" and "offside".

4. Base Unit Installation

- a. Bedding concrete (ST1 to BS 8500-1&2) of the appropriate thickness and depth shall be laid
- b. Base Units shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill
- c. Alternatively, the Base Units may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.
- d. Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 200mm in length and no cuts shall be within 50mm of the inlet aperture. No cutting shall impair the stability of the Unit.
- e. All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter.

5. Channel Joint Sealant

- a. Sufficient M-Seal bituminous mastic jointing compound should be trowelled on to one end face of the Base Unit so that the joint will be well sealed when the next Unit is tamped into position.
- b. Surplus sealant shall be removed from the inner surface of the Units as work proceeds.

6. Top Block Installation

- a. The string line should be set to the level of the top corner of Units.
- b. Again, starting at the Outfall, the Units should be set directly onto a liberal quantity of stiff, cement mortar to completely fill the whole of the joint.
- c. Cement mortar shall be Class M12 in accordance with BS EN 998-2.
- d. The Top Blocks should be tamped into position close to previously laid Units and the alignment checked.
- e. The levels should be checked using the string line and a spirit level.
- f. In addition, the general alignment should be checked from all directions as each Block is laid. Any Unit deviating by more than 3mm in 3m from line and level shall be made good by lifting and relaying.
- g. The inside and outside of the joints between Base and Top Units should be pointed and cleaned out with a brush or rag as work proceeds.
- h. Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 200mm in length. All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter.
- i. It is not necessary for Top Block and Base Unit vertical joints to line up
- j. The rear concrete haunching is installed to within 50mm of the top of the Top Block

In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.

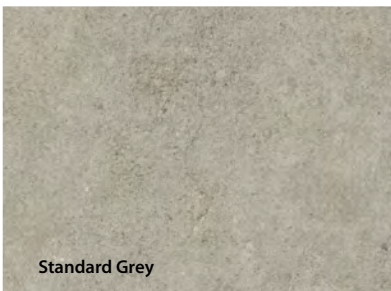
Scan the QR Code to watch the installtion video



Beany Block, Newcastle



Conservation Silver Grey



Standard Grey

Beany® Block

Combined Kerb and Drainage System



The original and the largest combined kerb and drainage system on the market. Trusted and proven over more than 30 years with over 1 million linear meters installed and working. A two piece concrete system available in either standard or textured finishes combines the largest hydraulic capacity with the strongest loading classification. Supported by a range of accessories to deliver a flexible, versatile and aesthetically appealing solution for a variety of projects.

NSPlus
Q10 190
Q25 800

Beany Block

A Top Blocks

Top Blocks	Length (mm)	Width (mm)	Height (mm)	Unit Weight (kg)	Item Code
HB Straight Back	500	430	295	71	DR700020
HB Straight Back Conservation	500	430	295	75	DR9300023
HB Straight Back Low Hole	500	430	295	71	DR700030
HB Symmetrical Low Hole	500	430	295	71	DR700035
HB Symmetrical	500	430	295	73	DR700010
45 Splayed Straight Back	500	430	295	76	DR700060

C Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
205 Press chan	500	430	280	205	100	70	DR720021
295 Press chan	500	430	280	295	170	85	DR720010
365 Press chan	500	430	280	365	240	96	DR720030
630 Press chan	500	430	280/360	630	520	110	DR720045

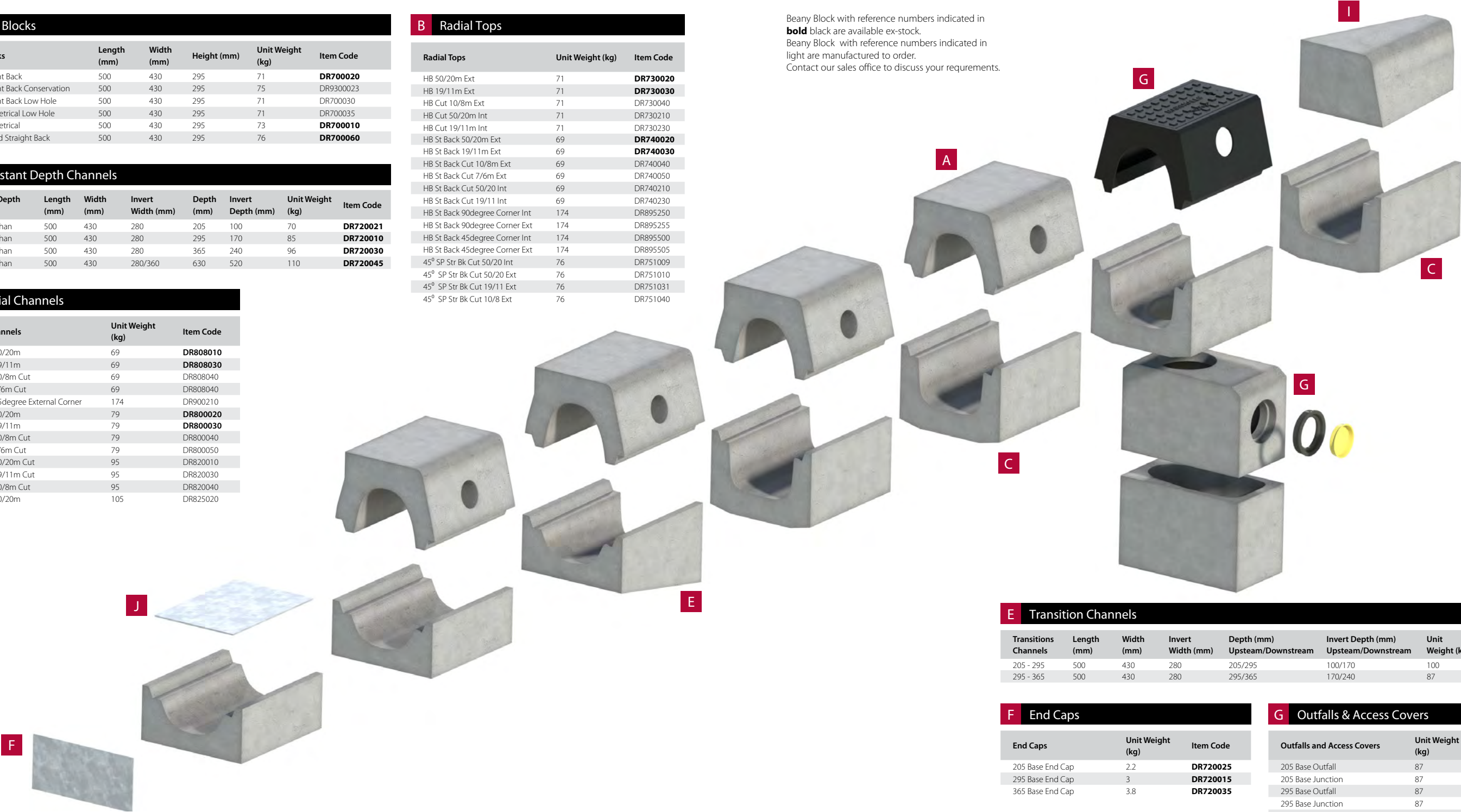
D Radial Channels

Radial Channels	Unit Weight (kg)	Item Code
205 Base 50/20m	69	DR808010
205 Base 19/11m	69	DR808030
205 Base 10/8m Cut	69	DR808040
205 Base 7/6m Cut	69	DR808040
205 Base 45degree External Corner	174	DR900210
295 Base 50/20m	79	DR800020
295 Base 19/11m	79	DR800030
295 Base 10/8m Cut	79	DR800040
295 Base 7/6m Cut	79	DR800050
365 Base 50/20m Cut	95	DR820010
365 Base 19/11m Cut	95	DR820030
365 Base 10/8m Cut	95	DR820040
630 Base 50/20m	105	DR825020

B Radial Tops

Radial Tops	Unit Weight (kg)	Item Code
HB 50/20m Ext	71	DR730020
HB 19/11m Ext	71	DR730030
HB Cut 10/8m Ext	71	DR730040
HB Cut 50/20m Int	71	DR730210
HB Cut 19/11m Int	71	DR730230
HB St Back 50/20m Ext	69	DR740020
HB St Back 19/11m Ext	69	DR740030
HB St Back Cut 10/8m Ext	69	DR740040
HB St Back Cut 7/6m Ext	69	DR740050
HB St Back Cut 50/20 Int	69	DR740210
HB St Back Cut 19/11 Int	69	DR740230
HB St Back 90degree Corner Int	174	DR895250
HB St Back 90degree Corner Ext	174	DR895255
HB St Back 45degree Corner Int	174	DR895500
HB St Back 45degree Corner Ext	174	DR895505
45° SP Str Bk Cut 50/20 Int	76	DR751009
45° SP Str Bk Cut 50/20 Ext	76	DR751010
45° SP Str Bk Cut 19/11 Ext	76	DR751031
45° SP Str Bk Cut 10/8 Ext	76	DR751040

Beany Block with reference numbers indicated in **bold** black are available ex-stock. Beany Block with reference numbers indicated in light are manufactured to order. Contact our sales office to discuss your requirements.



E Transition Channels

Transitions Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm) Upstream/Downstream	Invert Depth (mm) Upstream/Downstream	Unit Weight (kg)	Item Code
205 - 295	500	430	280	205/295	100/170	100	DR870010
295 - 365	500	430	280	295/365	170/240	87	DR870021

F End Caps

End Caps	Unit Weight (kg)	Item Code
205 Base End Cap	2.2	DR720025
295 Base End Cap	3	DR720015
365 Base End Cap	3.8	DR720035

H Cable Duck Blocks

Cable Duck Blocks	Unit Weight (kg)	Item Code
Cable Duct Block HB	12	DR920040
Cable Duct Block Splay	12	DR920050

I Standard Kerb Transitions

Standard Kerb Transitions	Unit Weight (kg)	Item Code
Stop End Top Block L/H	87	DR790010
Stop End Top Block R/H	87	DR790011

G Outfalls & Access Covers

Outfalls and Access Covers	Unit Weight (kg)	Item Code
205 Base Outfall	87	DR850041
205 Base Junction	87	DR850051
295 Base Outfall	87	DR850010
295 Base Junction	87	DR850020
295 Base Outfall/Junction	87	DR850030
365 Base Outfall	87	DR850070
Gully Outfall 150	227	DR460401
Gully Outfall 225	242	DR460406
Access Unit HB Universal	51	DR915017
Access 45 Sp Near Side	95	DR915020
Access 45 Splay Off Side	95	DR915025

J Cover Plates

Cover Plates	Unit Weight (kg)	Item Code
Cover Plate Standard	17	DR910005
Cover Plate Cut 50/11m	16	DR910010

Beany Block Installation Guide

1. Excavation

- Sufficient material should be excavated to accommodate top and base units, concrete bedding and haunching.
- Any 'soft spots' or poorly compacted formation should be made good.

2. Setting Out

- Setting out pins should be accurately located to the correct line and level with a string line level with the top front corners of the Base Units.
- It may be advantageous to locate setting out pins to the rear of the units to avoid having to lift the units over the string line.
- Sufficient setting out pins should be inserted where Beany Blocks are laid on horizontal curves

3. Outfalls

- Beany Outfalls should be installed first.
- Sufficient material should be excavated to accommodate the Trapped Beany Gully.
- 125mm of ST4 (BS 8500-1&2) concrete of the appropriate mix is placed in the bottom of the excavation.
- The bottom section of the two part Beany Gully is lowered into position.
- Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Beany Gully so as to provide a seal between the top and bottom sections.
- The top section of the two part Beany Gully is lowered into position.
- The bedding concrete should be laid and brought up flush to the top Beany Gully.
- The Beany Base Outfall Block should be set directly onto a liberal quantity of stiff, M12 cement mortar (in accordance with BS EN 998-2).
- The cast iron access cover & frame units should be set directly onto a liberal quantity of stiff, cement mortar to completely fill the whole of the joint.

4. Base Unit Installation

- Bedding concrete (ST1 to BS 8500-1&2) of the appropriate thickness and depth shall be laid.
- Base units shall be laid onto the freshly mixed bedding concrete, starting at the outfall, i.e. working uphill.
- Alternatively, the base units may be bedded on to a layer of 10 to 40mm cement mortar (M12 mortar to BS EN 998-2) on a previously prepared concrete foundation.
- Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 200mm in length and no cuts shall be within 50mm of the inlet aperture. No cutting shall impair the stability of the unit.
- All cutting and trimming of the units shall be carried out with a concrete saw or disc cutter.

5. Channel Joint Sealant

- Sufficient M-Seal bituminous mastic jointing compound should be trowelled on to one end face of the base unit so that the joint will be well sealed when the next unit is tamped into position.
- Surplus sealant shall be removed from the inner surface of the units as work proceeds.

6. Top Block Installation

- The string line should be set to the level of the top corner of units.
- Again, starting at the Outfall, the units should be set directly onto a liberal quantity of stiff, cement mortar to completely fill the whole of the joint.
- Cement mortar shall be Class M12 in accordance with BS EN 998-2.
- The top blocks should be tamped into position close to previously laid Units and the alignment checked.
- The levels should be checked using the string line and a spirit level.

- In addition, the general alignment should be checked from all directions as each block is laid. Any unit deviating by more than 3mm in 3m from line and level shall be made good by lifting and relaying.
- The inside and outside of the joints between base and top units should be pointed and cleaned out with a brush or rag as work proceeds.
- Where cutting is necessary, one or two units shall be cut so that no single unit is less than 200mm in length. All cutting and trimming of the units shall be carried out with a concrete saw or disc cutter.
- It is not necessary for top block and base unit vertical joints to line up.
- The rear concrete haunching is installed to within 50mm of the top of the top block.

7. Cover Plates

- Cover plates, when used, should be bedded on cement mortar to the specified thickness, pointed inside and outside of the joints with the inside of the base units being cleaned out as work proceeds.
- The Cover plates should be close jointed and the joints sealed with 50mm wide M-Tape.
- Cover plates shall be suitably protected before and during installation in order that the protective coating is not damaged.
- An ST4 mix concrete should be used for the bed and haunch of base units where cover plates are used.

8. Beany Block Stop End Top Unit

- The Beany Block Stop End top units should be used at any transitions from Beany Block to half battered kerbs.
- At the ends of Beany Block runs, these should be bedded onto freshly mixed concrete (ST1 mix to BS 8500-1&2) and kerb installation continued.
- Where they are to be used at dropped crossings, they should be bedded onto freshly mixed mortar and the dropper kerb and centre stone installation continued.

9. Beany Block End Caps

- Where the Beany Block run does not terminate at an outfall, the base unit shall be sealed using the Beany Block End Cap.
- The end cap shall be securely placed against the vertical end of the base unit and haunched with fresh concrete (ST1 mix to BS 8500-1&2).

10. Pavement Installation

- Where Beany Block is laid on or adjacent to existing or proposed concrete slabs, transverse joints shall be formed within the units and haunching adjacent to the slab joints and also longitudinal movement joints between the haunching and the slabs.
- Where necessary, the top unit drainage openings shall be protected against the ingress of material during concreting operations by covering with waterproof cloth tape.

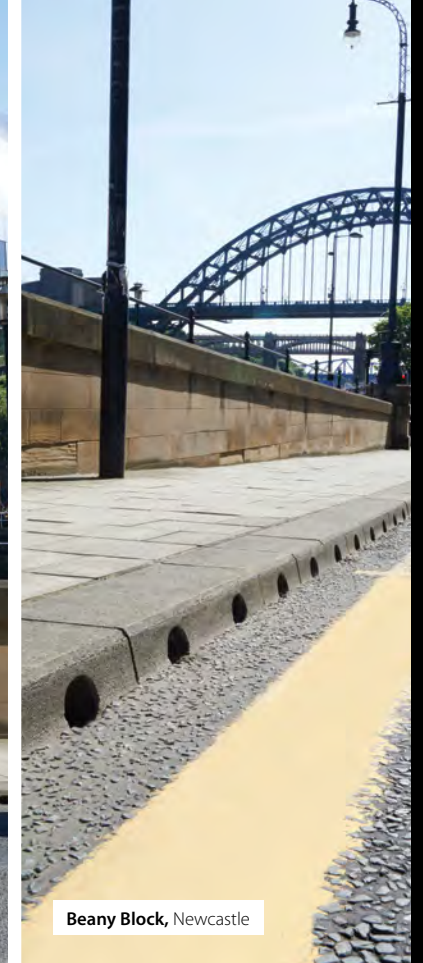
In accordance with the Health and Safety at Work etc Act 1974, the Manual Handling Operation Regulations 1992 (as amended 2004) and the Construction (Design and Management) Regulations 2015, risk assessments should be carried out to protect workers from risks associated with musculoskeletal disorders and work related upper limb disorders.

This may require the use of lifting aids to assist installation.

Scan the QR Code to watch the installtion video



Beany Block, Newcastle



Beany Block, Newcastle



Mini Beany, Bedford



Mini Beany, Ely



Mono Beany, A259



Mono Beany, A21





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