



Water Management & Drainage Solutions

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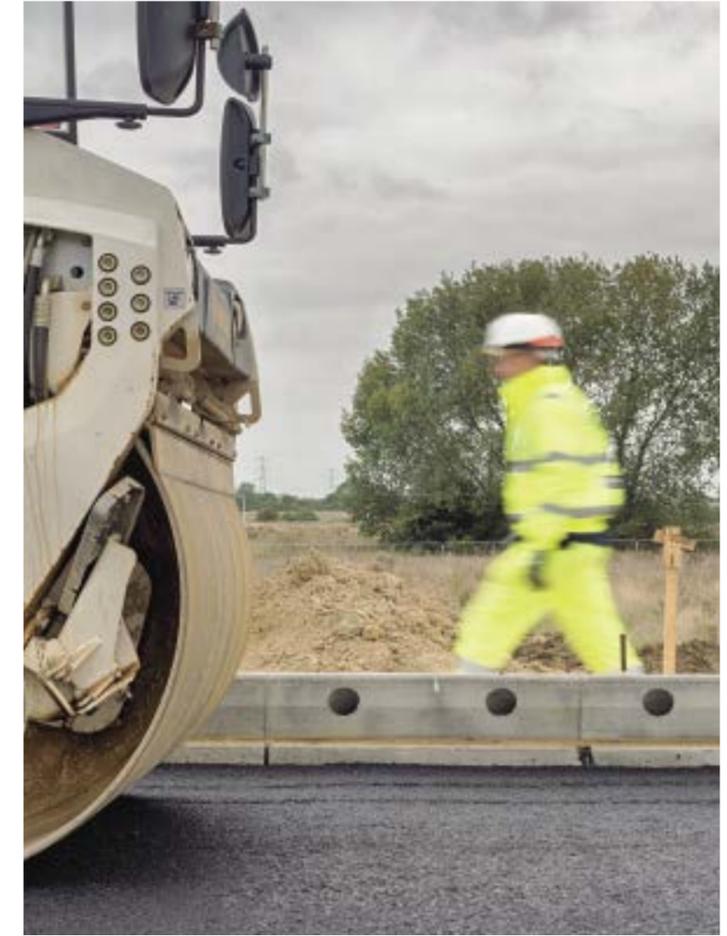


Introducing Marshalls Civils & Drainage

Since the acquisition of CPM in 2017, Marshalls Civils & Drainage is the only manufacturer to offer an end to end integrated water management solution, with products that intercept, infiltrate, attenuate, treat, convey, release and protect from surface, flood, foul and stormwater drainage.

Made primarily in the UK and built on a solid reputation, we design, manufacture and deliver sustainable infrastructure, water management and retaining wall solutions for a safer and better environment.

We work across every sector of the industry, having built established partnerships with clients and collaborators alike, including National Highways, Network Rail and the Environment Agency.





Introduction

Why choose Marshalls?

Design & engineering

Our design and engineering experts include Structural Engineers, Civil Engineers, CAD Technicians and Drainage Engineers. They are available for all things water management and drainage from pre-planning to installation. Involve them early to make the most of the team, and save you time and costs.

The team is always available to discuss your water management and drainage needs - from pre-planning to installation, and aim to save you time and money on every project.

Ease and flexibility of design with reduced maintenance

Marshalls precast concrete products can be used for a number of purposes, including sewerage, infrastructure, civils and sustainable drainage systems (SuDS) applications, such as stormwater attenuation and storage.

Our design and technical teams are available to offer design help and technical assistance, as systems can perform more efficiently when designed, delivered and installed correctly.

We offer solutions that are easier and less costly to maintain than other systems, with ease of access and a proven service life.

Modern Methods of Construction (MMC)

We provide engineering knowledge, solutions that look to reduce waste, and valued-added designs that offer security, as well as accuracy, tolerances and cost savings that enable the groundworker or contractor to meet, if not improve their project programme dates.

With manufacturing works and teams throughout the UK mainland, we are never far away, whether you are looking for a delivery of goods or a question on what product to use, we are always on hand to help.

Training & CPDs

We recognise the value in sharing the knowledge we have gained over the years on subjects including highway drainage, coastal erosion, water management solutions, flood protection as well as wider Marshalls sessions, that include BS 7533-101 pavement design and climate resilient spaces.

These sessions can be delivered online or in person, either at your office, a local Marshalls Design Space or your preferred meeting venue. To book a CPD please email lch@marshalls.co.uk

Customer service

Our hassle-free end to end water management solutions include surface water management support from early engagement design through to delivery and installation.

Our foul and stormwater drainage solutions come with a 120-year design life and the certainty of a proven system and a team who know their drainage. Our team are here to help at every stage from planning to installation and everywhere in between to make your life easier.

Health & safety as a priority

Ensuring the safety of our team within our facilities is of paramount importance to us.

We have invested in better ways of working that ensure accountability for safety, including procurement of state-of-the-art machinery to increase personal safety of workers

We are externally accredited to ISO 45001.

Integrated water management



Intercept, infiltrate, attenuate, treat, convey, release and protect with Marshalls Civils & Drainage



1 Airports

- Linear drainage (Birco 300)
- Attenuation Tanks
- Flow Control Chambers
- Catchpits
- Concrete Pipes
- Headwalls
- Manholes

2 Highways

- CKD (Beany® Block, Mini Beany®, Mono Beany®, Traffic Drain, Max-E Channel)
- Gullies
- Caissons
- Chamber Rings
- Box Culverts
- Direct Pipe Access System
- Flow Control Chambers
- Downstream Defenders
- Headwalls

3 Housing estates

- Linear drainage (Drexus 100, Drexus Pave Drain, Birco 100)
- CKD (Mono Beany®, Mini Beany®)
- Gullies
- Sealed Manhole
- Box Culverts
- Concrete Pipes
- Headwalls
- Soakaways

4 Public realm

- Linear drainage (Birco 100, Drexus 100, Drexus Slot Drain, Drexus Pave Drain)
- CKD (Beany® Block, Mini Beany®, Conservation)
- Gullies
- Biofiltrations
- Sealed Manholes/Cover Slabs/Adjusting Units
- Flow Control Chambers
- Catchpits
- Concrete Pipes

5 Business/commercial parks

- Linear drainage (Birco 100, 150, 200, 300)
- CKD (Beany® Block)
- Gullies
- Pipes/Dry Weather Flow Pipes/Caissons/Preformed Manholes
- Flow Control Chambers
- Box Culverts
- Biofiltration System

6 City centre

- Sealed Manholes/Pipes/Adjusting Units
- Box Culverts
- Biofiltration System
- Linear drainage (Drexus 100, Drexus Slot Drain, Birco 100, Birco 150, Drexus Pave Drain)
- CKD (Beany® Block, Mini Beany®, Conservation)
- Gullies
- Cover Slabs/Adjusting Units
- Flow Control Chambers
- Catchpits
- Concrete Pipes

Our water management solutions



Surface water

The growing demand for a more cost-effective and less complicated surface water drainage system has led us to combine the clear advantages of linear drainage with the benefits of high-quality concrete. This enables us to combine the ease of design with the ease of installation and the need for reduced maintenance, eliminating the risk of surface water flooding and making your scheme safer.



Stormwater management

We can help you on a large range of precast concrete stormwater management systems - whether they be attenuation systems, stormwater control or stormwater treatment. Precast solutions suit a wide range of construction projects and drainage schemes that reduce flooding and secure both domestic and commercial properties.



Wastewater management

Marshalls Civils & Drainage can supply precast concrete modular tanks, wall panels, flat pack chambers, circular chamber systems, surge flushing manholes, valve chambers or wet well chambers which will save you on both installation costs and time spent on site with modern methods of construction (MMC).



Flood protection & prevention

With the effects of environmental concerns being felt on a daily basis, we continue to be at the forefront of product development and sustainability. We have developed a range of flood protection products that offer a long service life with the security of being a proven solution.



Sustainable to the core

At Marshalls, our approach to sustainability is based on strong foundations, including our Code of Conduct and The Marshalls Way of doing the right things, for the right reasons, in the right way.

Our sustainability strategy is to Create Better Futures for Everyone: Socially, Environmentally and Economically. Within Civils & Drainage, we look to offer water management and retaining wall products that offer safe and secure solutions for all.

Climate change is undoubtedly one of the biggest challenges facing us all today and as a business, we know that we have a role to play in reducing

carbon emissions. Day to day, our approach includes reducing environmental impacts and taking responsibility within our operations.

This includes changing the lighting systems within our facilities from traditional halogen and strip lightening to LED lighting systems, with motion detectors, that automatically dim or deactivate when no motion is detected. This has resulted in a reduction in energy consumption.

We also recycle water, including rainwater within our production units.



Find out more:
marshalls.co.uk/commercial/product-sustainability

Sustainable partnerships & charters

As full members of MPA (Mineral Products Association) Precast we have signed up to their Sustainability Charter. Launched in 2007, it goes beyond legislation in leading the construction industry in sustainability, reducing carbon footprint and adopting responsible sourcing systems.

We're also active members of the Sustainability Supply Chain School and work passionately and diligently to uphold the United Nations Global Compact (UNGC) pillars of human rights, labour, environment and anti-corruption.

Impacting customer sustainability

We look at solutions that favour customers and end-users positively, in terms of sustainability, construction programmes and cost savings. Take for instance the sealed manhole system that saves installers from benching manholes, reducing confined space working. These manholes can be installed within an hour, saving on time and site costs.

Our Design team offer the best surface water solution for highway drainage, in terms of loading classifications, product selection and sustainability.

Sustainable drainage systems

Precast SuDS can be integrated with natural and soft SuDS, or used independently. They offer proven long-term performance that can significantly minimise lifetime costs and flooding, as well as structural and hydraulic performance, and are fully accessible for cleaning and maintenance.

Water management security

Our commitment to sustainable solutions extends to products for surface water, storm water, flood protection, wastewater management and flood prevention, as the working life of many of our precast concrete solutions exceeds that of other drainage materials.

Reducing carbon

We are constantly looking to reduce our carbon footprint, which includes sourcing our raw materials close to our three sites in Halifax, Pollington and Mells, to lessen supply routes and in turn carbon emissions. The energy used throughout our production facilities and offices is generated by **100% renewable energy**, reducing our carbon footprint.

Managing waste

We manage our waste, with most being recycled. Any products that do not pass our strict quality control procedures are recycled back into the manufacturing process where possible. This is all certified to BS EN ISO 14001 Environmental Management Certificate.

Recycled materials

We use crushed and recycled materials in our manufacturing processes and replace cement content in our products. This reduces the need for virgin material and the associated impacts on carbon emissions, and reduces material extraction and the carbon generated by additional processes and vehicle movements.

As specialists in water management solutions, we understand the value of capturing and recycling rainwater, which is used throughout our works, both within the manufacture of products and to reduce cement dust, during the summer months. This decreases our need on precious water resources.

Timber is reused where possible.

Construction, Design & Management (CDM)

Marshalls Civils & Drainage is committed that its products are designed and manufactured to ensure the safety of users. Installation of products involves breaking ground and is thus considered as construction work under the Construction (Design and Management) Regulations 2015.

We put a great deal of effort into ensuring that our designs are safe, and will provide structural details to the Principal Designer nominated by the Construction Site Client.

Our accreditations



Surface water solutions

With a well-documented increase in climate change, our range of surface water management solutions has been developed to help keep infrastructure safe and mitigate the risk of these changes.

From infiltration to surface water attenuation, we offer products to combat surface water flooding combined with the support of our experienced team, who can help you with design and delivery of CKD and linear drainage products.

Combined kerb and drainage systems

Our award-winning CKD approach offers a cost-effective water management method with an efficient, high-flow channel system within the structure of the kerb. Designed to collect surface water run-off and offer protection from stormwater, but also to extend the project lifecycle, improve the environment and increase safety for road users.

Linear drainage systems

Quick and easy to install, our robust linear drainage eliminates ponding and efficiently intercepts running water for infrastructure projects, including airports and shopping centres. From low capacity through to heavy duty systems, we offer numerous linear drainage solutions with hydraulic capacities and load classifications to meet a variety of project needs.



Find out more:
marshalls.co.uk/commercial/civils-and-drainage



Beany® Block

Marshalls Civils & Drainage Beany® Block is a reliable, effective, medium to high capacity drainage solution that's been used by professionals since the 1980s. It has a reputation for solving drainage problems where other systems may fail, or where project restrictions make other solutions impractical.

With over 3 million linear metres installed, the Beany® Block has a proven pedigree across a range of applications. Its durability and lack of remedial work offer peace of mind and lower ongoing costs. Manufactured as a two-piece concrete system and

available in a variety of finishes, it has excellent slip skid properties and can be used alongside a range of accessories for optimum flexibility.

Beany® Block combines the largest hydraulic capacity with a loading classification up to E600. Robust concrete construction enables it to withstand installation damage and its simplicity makes it highly cost-effective and versatile.

Features

- Available in standard or textured finishes
- Loading capacity of E600
- Medium to high capacity road and kerb drainage solution
- Available with Conservation colour option

Technical data

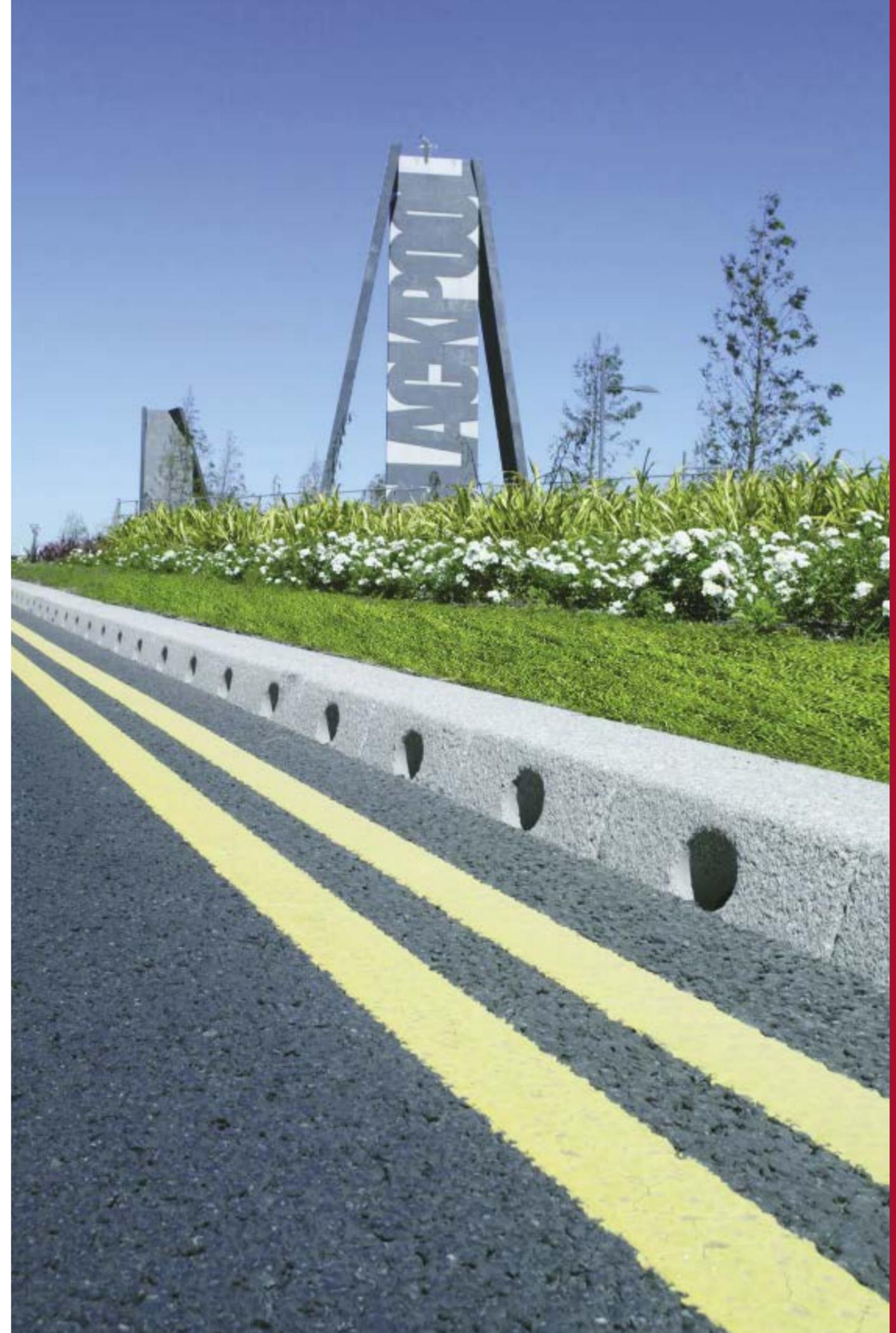
	430 x 500 x 205mm
	430 x 500 x 295mm
Base dimensions (W x L x D)	440 x 500 x 365mm
	490 x 500 x 630mm
Units per pack	All units are loose stacked suitable for crane offload or are available on timber pallets
Avg. pack weight	Pallets packed for individual contracts
Packaging	Banded and shrink-wrapped

Colours & textures

Standard Grey



Conservation Silver Grey



Mini Beany®

Evolved from the successful Beany® range, the Marshalls Civils & Drainage Mini Beany® combined kerb and drainage system is a medium capacity water management solution. Excellent flow rates alongside a robust concrete construction make it the ideal choice for low to medium capacity requirements, and areas with abnormally heavy wheel loads.

The two-piece design of the Mini Beany® (comprising top unit and base channel) reduces the risk of damage during the installation process. It also allows for a choice of top finishes to complement a wide range of aesthetics, from urban to rural. Choose from two colour options to make the most of your design.

Features

- Innovative two-piece design
- Available in two colour options to suit your requirements, including conservation silver grey
- Available in granite
- Low to medium capacity road drainage and kerb drainage solution
- Loading capacity of E600

Technical data

Base dimensions (W x L x D)	280 x 1000 x 210/260/310/360mm
Apparent density	2300kg/m ³ (typically)
Slip/skid resistance	(polished) Mean polished skid resistance value PSRV: >45
	(unpolished) Mean unpolished skid resistance value USRV: >45
Units per pack	All units are loose stacked suitable for crane offload or are available on timber pallets
Avg. pack weight	Pallets packed for individual contracts
Packaging	Banded and shrink-wrapped

Colours & textures

Standard Grey



Conservation Silver Grey



Mono Beany®

Manufactured as a single piece and with a loading classification of D400, this solution is suitable for all road-going vehicles across a variety of applications. Suitable for use with a range of accessories, Mono Beany® provides a comprehensive and highly effective drainage system which carries the BSI Kitemark.

With an innovative design that combines strength and durability with aesthetics, Mono Beany® provides a practical and long-lasting solution to kerb drainage that's known throughout the industry.

Its construction combines high-strength M-Tech concrete, cast around a 100% recycled polyethylene core, which provides superior hydraulic flow rates.

The Marshalls Mono Beany® is available in two depths and in both Half Battered and 45° Splayed profiles.

Features

- Available in two depths in both half battered and 45° splayed profiles
- D400 loading classification
- Available with a range of accessories for ease of use
- Available with a granite finish
- Manufactured from high-strength M-Tech concrete with a recycled PE core

Technical data

Base dimensions (W x L x D)	150 x 1000/500 x 321/502mm
Apparent density	2300kg/m ² (typically)
Slip/skid resistance	(polished) Mean polished skid resistance value PSRV: >45 (unpolished) Mean unpolished skid resistance value USRV: >45
Units per pack	Pallet packed for individual contracts
Avg. pack weight	Maximum 1.0 tonnes
Packaging	Banded and shrink-wrapped

Colours & textures

Standard Grey



Bridge Beany®

A surface water drainage solution with the lowest cost over its lifetime that's environmentally sustainable, meets various loading requirements and is a trouble-free, Type I system.

With proven durability, strength and impact resistance, our ductile iron Bridge Beany® is a proud member of the award-winning Marshalls Beany® range. Offering a tailored, value-engineered combined kerb and drainage solution that can be used as a standalone product or in conjunction with other products in our range, the Bridge Beany® is a great

surface water management solution, that helps keep our roads and highways safe from surface water flooding.

Made in the UK, allowing for shorter supply and delivery routes, the Bridge Beany® is a real sustainability winner, when compared to other products, as its produced using 80% of recycled materials and can be repeatedly cleaned and re-laid. 100% reclaimable, time and time again, the Bridge Beany® is a real winner in terms of sustainability.

Features

- Type I system (no haunching)
- Fully compatible with other CKD solutions in the Marshalls range
- One-piece cast iron unit
- Manufactured using 80% recycled materials
- D400 and E600 loading classifications available

Technical data

Base dimensions (W x L x D)	150 x 500 x 175/200mm
	175 x 500 x 175/200mm
	240 x 500 x 175/200mm
	300 x 500 x 175/200mm
	350 x 500 x 175/200mm
	450 x 500 x 175/200mm
Units per pack	Dependant on site
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped

Colours & textures

Cast Iron



Birco 100

Available in a variety of loading ratings up to F900, Birco 100 is a low-capacity linear drainage system suitable for a range of purposes across civic, commercial, rail and industrial projects.

Made from high-quality pre-cast concrete with heavy-grade galvanised steel angles cast into the top of the channel walls to ensure strength in heavy loading applications, the system is reliable and durable whether deployed in areas of light or heavy traffic.

As well as functionality, Birco 100 offers a pleasing aesthetic, combining a robust concrete channel with

a choice of cast iron, stainless steel or galvanised gratings in various patterns. Grates are secured by stainless steel bolts that are anchored into threaded steel sockets and cast into the channel wall, for extra durability.

Marshalls Civils & Drainage Birco 100 comes in a range of lengths and depths, with additional accessories for project flexibility. It can be used alongside most landscaping surfaces, including paving, and can be used in the design of a SuDS for impermeable surfaces.

Features

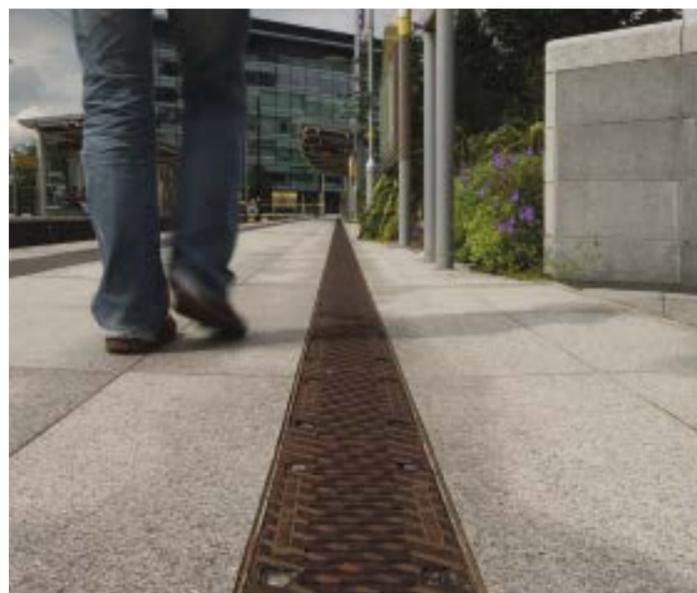
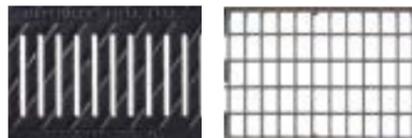
- Available in a range of loadings up to F900
- Manufactured from high quality pre-cast concrete
- Suitable for light and heavy traffic
- Low capacity
- Choice of metal grating

Technical data

	200 x 1000/500 x 180mm
	200 x 1000/500 x 230mm
Base dimensions (W x L x D)	200 x 1000/500 x 280mm
	200 x 1000/500 x 330mm
	200 x 1000/500 x 380mm
Units per pack	Dependant on site
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped onto non-returnable pallets

Colours & textures

6mm Heelsure Cast Iron 20x30mm Galvanised Steel Mesh



Birco 150

Offering an increased flow capacity over the 100 unit, the Birco 150 combines concrete channels with a diverse range of metal coverings to produce a linear drainage solution that is both effective and aesthetically pleasing.

The Birco 150's water drainage channels are constructed of a robust precast concrete to ensure reliable performance. The channel walls are also reinforced with heavy grade rolled galvanised steel angles cast into the top, increasing durability and ability to handle heavy loads.

With the correct grate application, the Birco 150 can achieve a load classification of F900, the highest possible rating, making it the perfect solution for rail, commercial and industrial projects. The grates are secured by bolting stainless steel bolts into the threaded steel sockets cast into the channel wall.

Birco 150 comes in a range of grate styles to complement any scheme.

Features

- Low to medium capacity
- Robust precast concrete
- Can withstand loads up to the highest classification
- Suitable for commercial, industrial or rail applications

Technical data

Base dimensions (W x L x D)	200 x 1000/500 x 230mm
	200 x 1000/500 x 280mm
	200 x 1000/500 x 330mm
	200 x 1000/500 x 380mm
	200 x 1000/500 x 430mm
Units per pack	Dependant on site
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped onto non-returnable pallets

Colours & textures

6mm Heelsure Cast Iron



Solid Cast Iron



20x30mm Galvanised Steel Mesh



Birco 200

Manufactured from high-quality precast concrete, Birco 200 is a medium-capacity linear drainage system with a flow rate of 88-131 litres per second (at a 1 in 40 gradient). It is also available with inbuilt falls, which improve flow rates to increase drainage discharge capacity.

Heavy-grade rolled galvanised steel angles cast into the top of the channel walls add to the durability of the product, providing superior strength in heavy

loading applications. With a loading capacity of up to F900 depending on the grating system installed, Birco 200 is suitable for use in a range of projects where heavy vehicle traffic is anticipated.

There's also a choice of grating options, dependent on your loading requirements and the look your project requires. These are secured by stainless steel bolts fitted into threaded steel sockets cast into the channel wall, providing additional durability.

Features

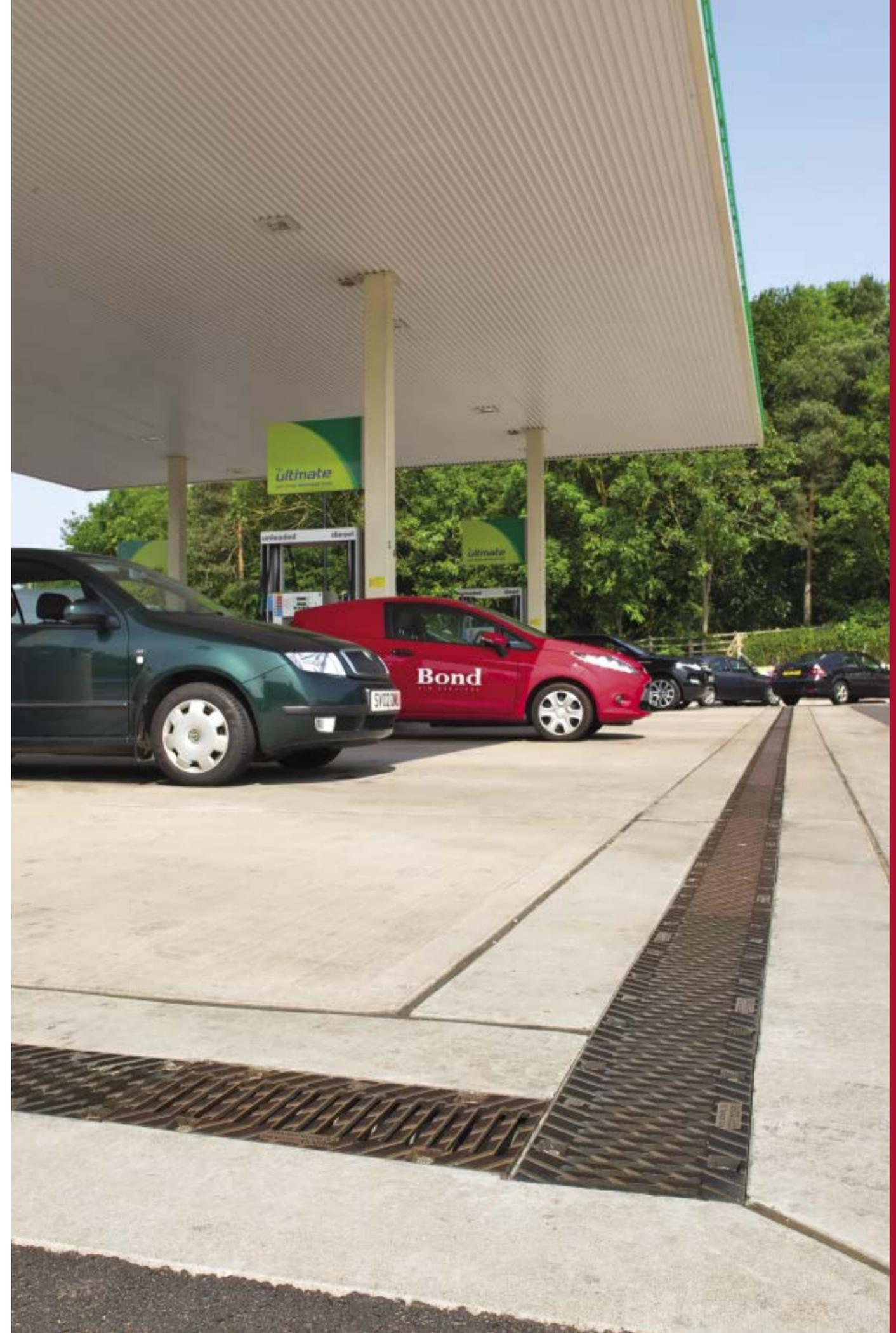
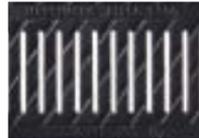
- Manufactured in high-quality precast concrete
- Galvanised steel angles for added strength
- Available with inbuilt falls to improve drainage capacity
- Suitable for heavy traffic with loadings up to F900
- Cast iron grating

Technical data

Base dimensions (W x L x D)	330 x 1000 x 310mm
	330 x 1000 x 335mm
	330 x 1000 x 360mm
	330 x 1000 x 385mm
Units per pack	Dependant on site
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped onto non-returnable pallets

Colours & textures

8mm Heelsure and 18mm Slotted Cast Iron available



Birco 300

Marshalls Civils & Drainage Birco 300 is specially designed for use in projects with abnormally heavy loads, including ports or aircraft depot paving.

Manufactured from superior precast concrete, Birco 300 boasts heavy-grade rolled galvanised steel angles at the top of its channel walls to provide superior strength in heavy loading applications.

Cast iron grating secured by stainless steel bolts that fit into threaded steel sockets cast into the channel wall, allow Birco 300 to bear loads up to F900.

A high-capacity linear drainage system, offering increased flow capacity, Birco 300 delivers the strength and durability required for high traffic areas.

Features

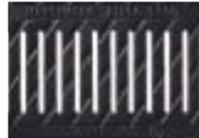
- Manufactured in high-quality precast concrete
- Galvanised steel angles cast into the top for added strength
- Suitable for heavy traffic with loadings up to F900
- Cast iron grating

Technical data

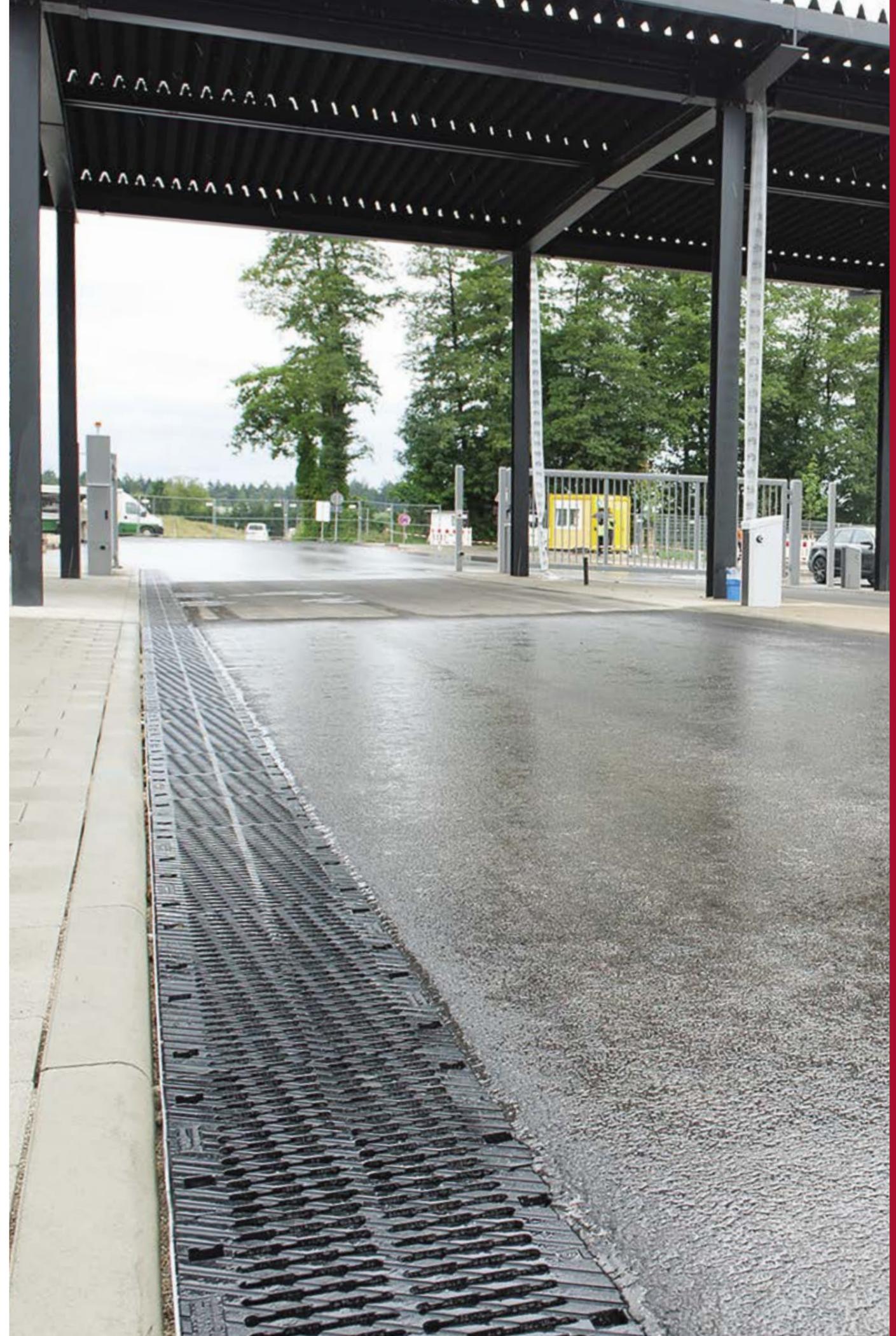
Base dimensions (W x L x D)	450 x 1000 x 410mm
	450 x 1000 x 550mm
Units per pack	Dependant on site
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped onto non-returnable pallets

Colours & textures

20mm Slotted Cast Iron



Available as E600 and F900 loading options



Birco Shallow

Birco Shallow is an outstanding low to medium capacity system. A flexible drainage solution, particularly if there are limitations on excavation depths or where sub-soil drainage would be hindered.

Available in different widths for customer choice and benefitting from full compatibility with other Birco units and loadings of up to F900 can be achieved when the appropriate grating is used, making Birco

Shallow an ideal choice for public, commercial and rail applications.

A choice of cast iron, galvanised and stainless steel gratings in a variety of patterns means designers can select the most appropriate style depending on project aesthetics, as well as loading requirements.

Features

- Shallow drainage channel for when excavation is limited
- Suitable for loadings up to F900 depending on grating
- Grating options available
- Available in various widths

Technical data

Base dimensions (W x L x D)	200-430 x 1000 x 80-300mm
Units per pack	Dependant on site
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped onto non-returnable pallets

Colours & textures

6mm Heelsure Cast Iron



Drexus 100

Drexus 100 is a low-capacity, cost-effective linear drainage system, suitable for installation within civic, commercial and rail projects where pedestrian or standard traffic application is needed.

The lightest unit in our channel range, the Drexus 100 features 30mm thick scalloped side walls. Despite being lightweight, the system is robust and, when combined with Drexus 100 cast iron grates, provides for load classes of B125 - D400.

Drexus 100 channels can be specified with 1000mm-long transitions, which improve flow rates and increase the system's overall discharge capacity.

Grating is available with customised options, including cast iron, galvanised and stainless steel. All attached securely to the system via a single integrated bolt locking bar.

Features

- Suitable for load classes up to D400
- Lightweight yet robust
- Provides efficient drainage
- Grating material options

Technical data

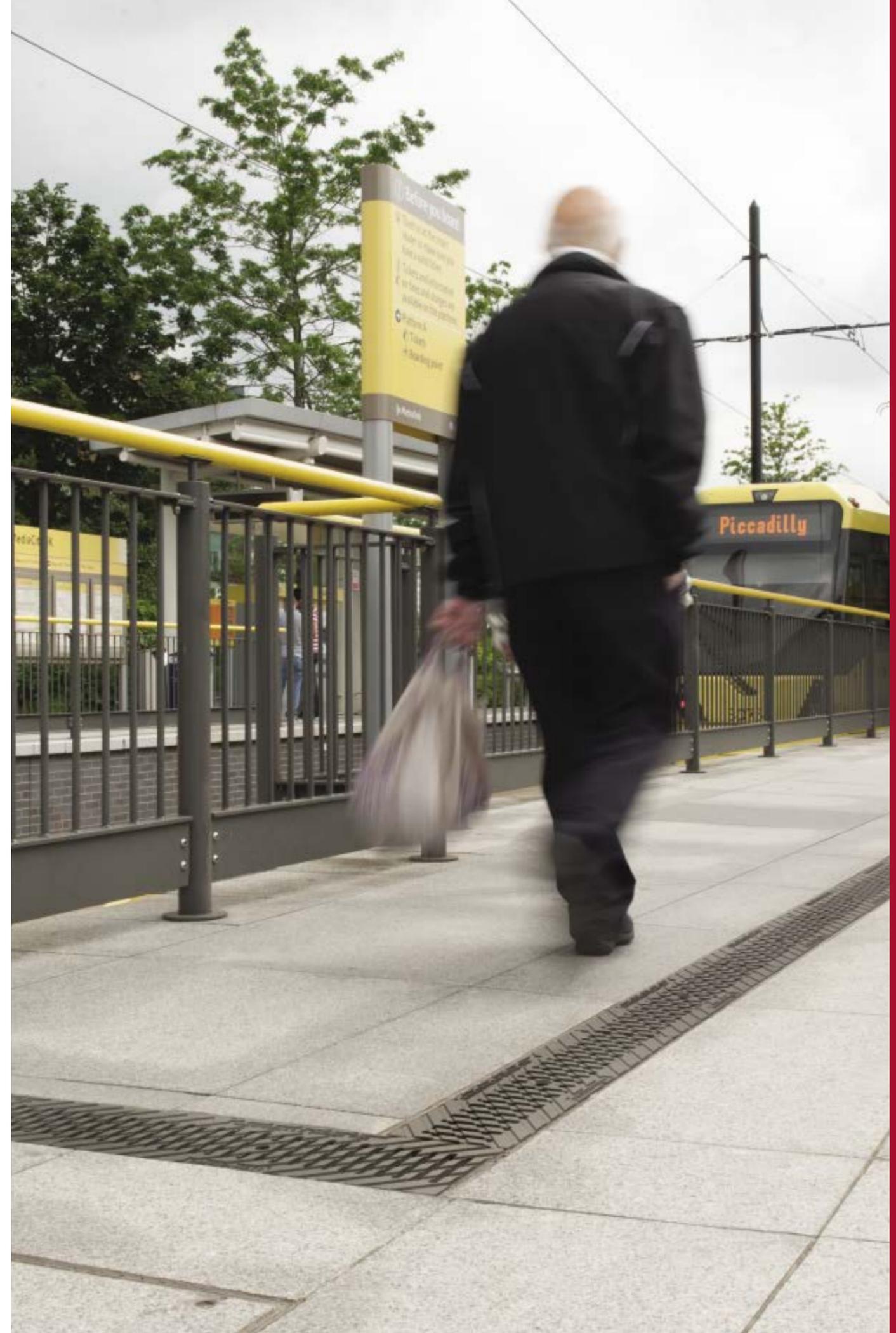
Base dimensions (W x L x D)	160 x 1000/500 x 170mm
	160 x 1000/500 x 195mm
	160 x 1000/500 x 220mm
	160 x 1000/500 x 245mm
	160 x 1000/500 x 270mm
Units per pack	Dependant on site
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped onto non-returnable pallets

Colours & textures

6mm Heelsure Cast Iron



30x15mm Galvanised Steel Mesh



Drexus Pave Drain

Designed to complement Marshalls most popular paving products, the robust Drexus Pave Drain is available in a variety of finishes, which means you don't have to compromise the look of your project for effective drainage.

Drexus Pave Drain has a loading rating up to D400 and is suitable for a range of public realm developments, with the exception of public road carriageways or motorways.

This low capacity drainage solution has been designed for flexibility and appearance using Marshalls Civils & Drainage expertise in concrete and natural stone.

Features

- Available in a range of finishes and colourways
- Low capacity drainage
- Suitable across a range of applications including pedestrian and lower traffic areas
- Complements Marshalls most popular paving ranges

Technical data

Base dimensions (W x L x D)	160 x 1000/500 x 170mm
	160 x 1000/500 x 195mm
	160 x 1000/500 x 220mm
	160 x 1000/500 x 245mm
	160 x 1000/500 x 270mm
Units per pack	Dependant on site
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped onto non-returnable pallets

Colours & textures

Textured Grey



Yorkstone



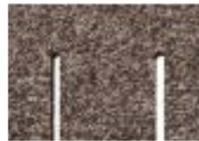
Textured Buff



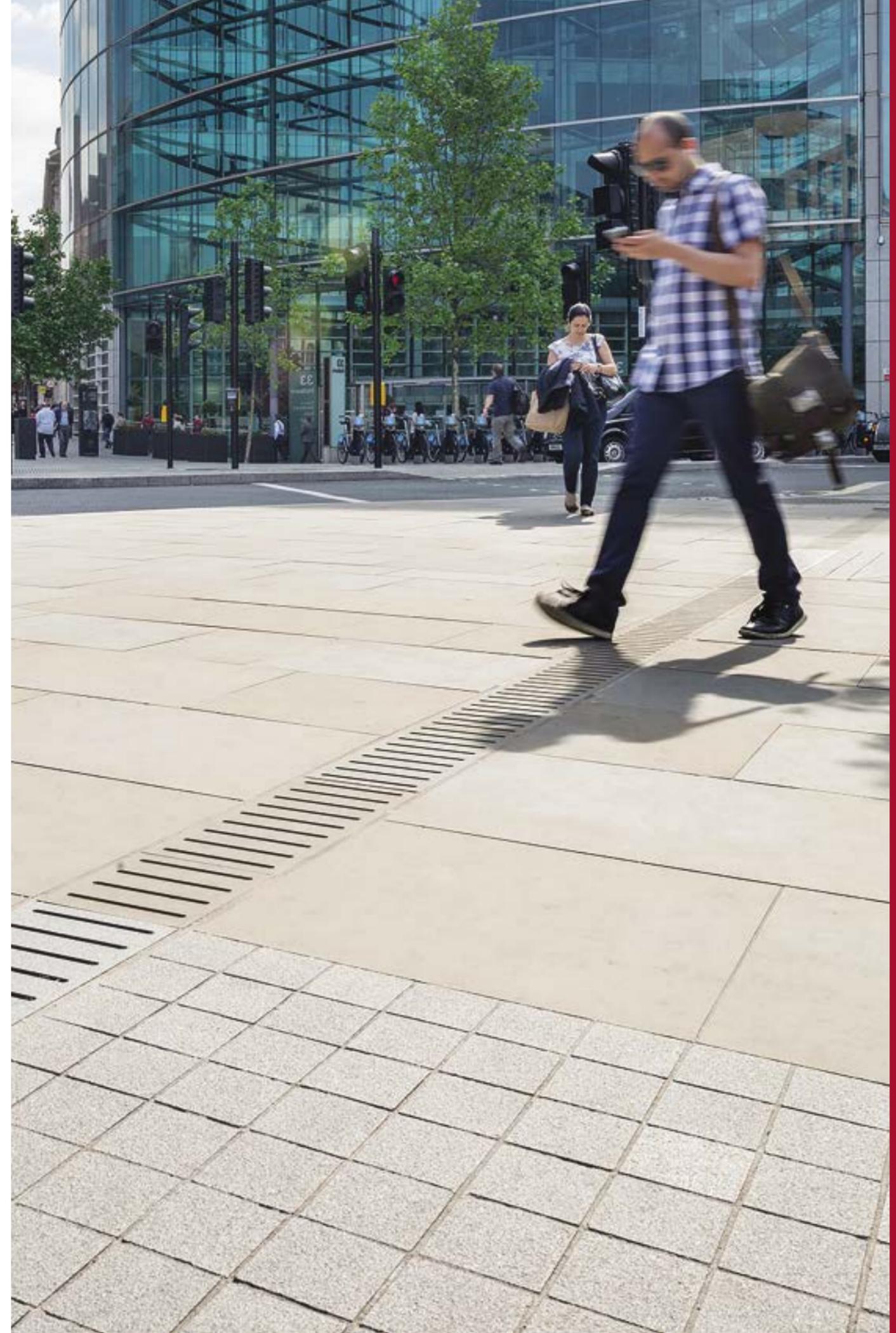
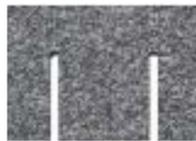
Silver Grey Granite



Textured Charcoal



Mid Grey Granite



Drexus Slot Drain

Marshalls Civils & Drainage Drexus Slot Drain is the ideal solution for projects requiring an effective drainage solution that doesn't compromise on the aesthetics of the overall landscape.

Particularly well suited to natural stone applications, the low-capacity Drexus Slot Drain hides the Drexus 100 channel beneath a galvanised steel slot, featuring slimline mono or duo linear aperture.

Suitable for use across a range of applications and public developments, Marshalls Civils & Drainage can also design and manufacture a bespoke Drexus Drain Slot to meet project requirements including true radius curved apertures and stainless steel finishes.

Features

- Suitable across a range of applications
- Can integrate into Natural Stone product-based landscapes
- Low capacity drainage
- Bespoke options available

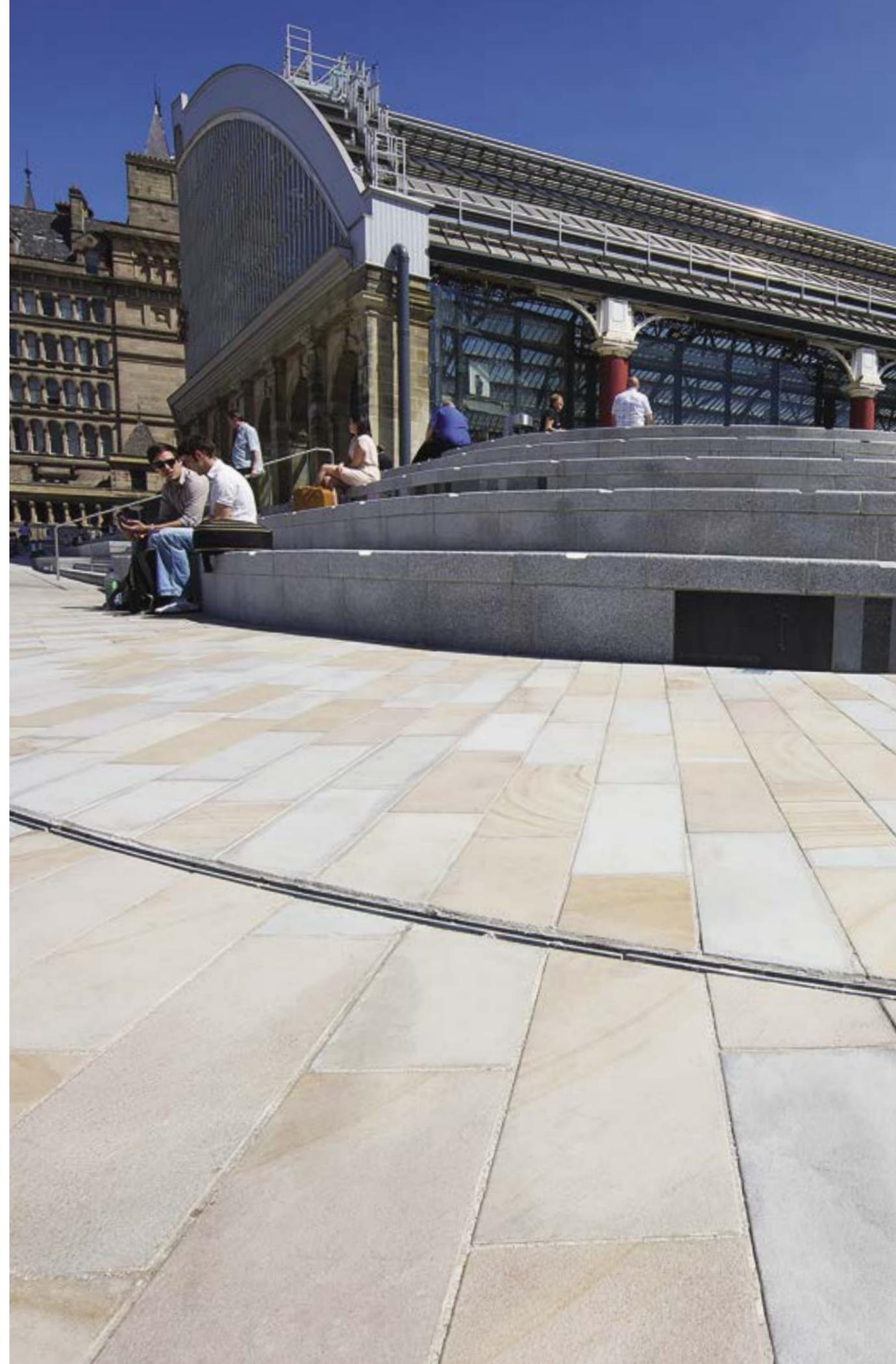
Technical data

	160 x 1000/500 x 170mm
	160 x 1000/500 x 195mm
Base dimensions (W x L x D)	160 x 1000/500 x 220mm
	160 x 1000/500 x 245mm
	160 x 1000/500 x 270mm
Units per pack	Dependant on site
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped onto non-returnable pallets

Colours & textures

Mono

Duo



Max-E Channel

Marshalls Max-E Channel range is a high capacity linear drainage system that complements the Beany® range to ensure continuity between kerb and top units

Max-E integrates with the Beany® Block top units creating a unique system capable of providing continuous drainage of the carriageway at road and vehicular crossings.

With the appropriate top options, Max-E Channel can achieve a load bearing classification of F900, the

highest possible rating, making it a perfect option for rail, commercial and industrial deployment.

Max-E Channel is available in a range of top units that will complement any aesthetic, regardless of the project. Concrete slotted top units are offered in Conservation Silver Grey, Standard Grey and Reinforced Standard Grey. The blocks can be textured to provide an appealing finish. Alternatively, cast-iron options can be deployed.

Features

- Compatible with all Beany® products
- Can withstand loads up to the highest loading classification - F900
- Suitable for commercial, industrial or rail applications
- Available in concrete slotted top and cast-iron top finishes

Technical data

	430 x 500 x 205mm
Base dimensions (W x L x D)	430 x 500 x 295mm
	440 x 500 x 365mm
	490 x 500 x 630mm
Apparent density	2300kg/m ² typically
Units per pack	All units are loose stacked suitable for crane offload or are available on timber pallets
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped onto non-returnable pallets

Colours & textures

Standard Grey



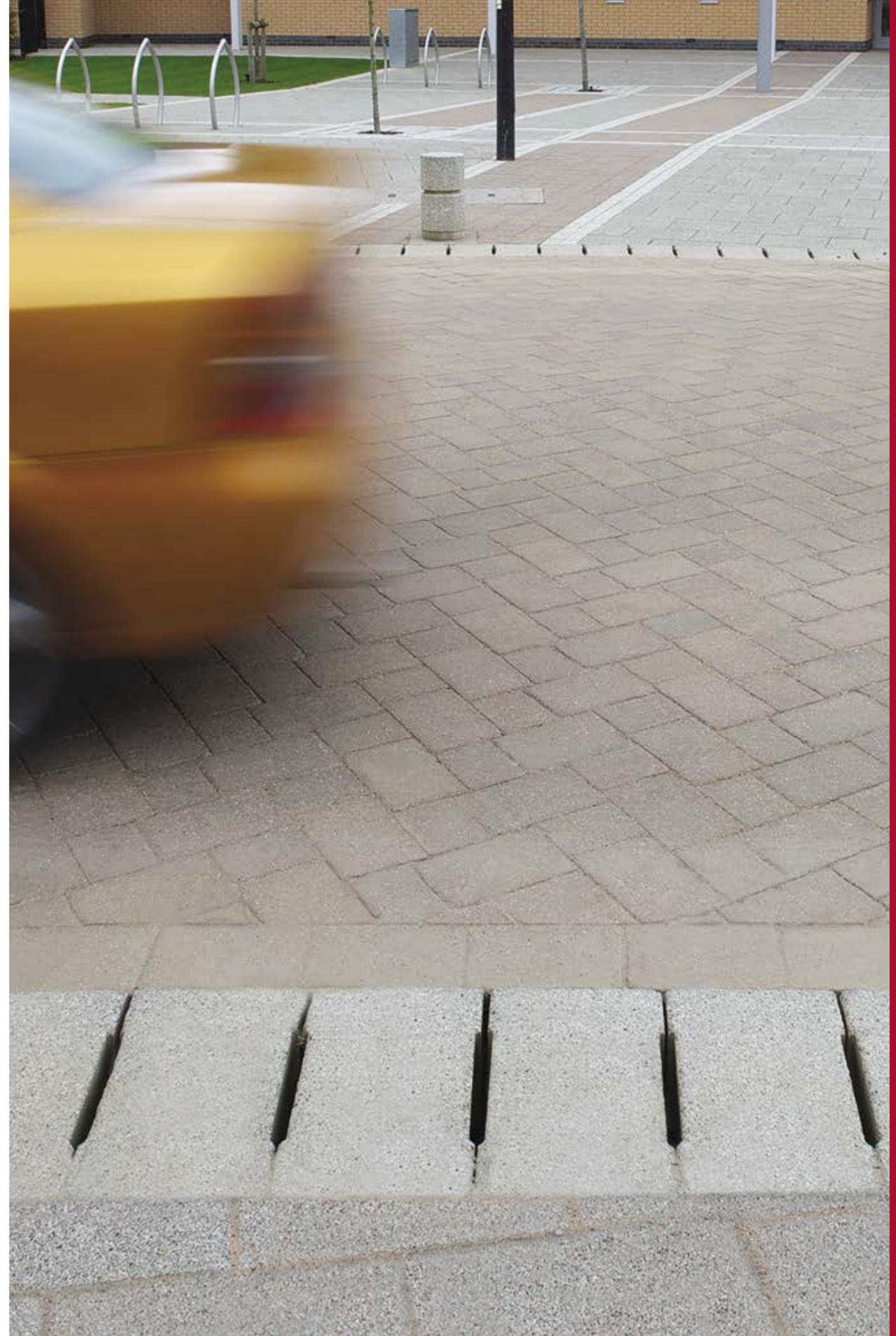
Conservation Silver Grey



Reinforced Standard Grey



Cast Iron



Traffic Drain

Traffic Drain provides a comprehensive solution to your project's drainage needs, offering unique design elements, ease of installation and low maintenance costs. Designed to complement the Mini Beany® range, the Traffic Drain connects the flow between kerb and slot units and is fully compatible with Mini Beany® junctions, outfalls and other ancillary units.

Providing medium-capacity drainage, Traffic Drain combines a robust concrete channel with

high-strength cast iron grates, which allow it to take loadings up to F900. Its ability to withstand fast-moving vehicles and heavy loads makes it ideal for high volume highway applications.

Manufactured as a simple two-piece design, Traffic Drain is strong enough to withstand any damage during transit and installation.

Features

- Robust precast concrete
- Requires little maintenance
- Suitable for loadings up to F900
- Compatible with the Mini Beany® range

Technical data

Base dimensions (W x L x D)	280 x 1000 x 210mm
	280 x 1000 x 260mm
	280 x 1000 x 310mm
	280 x 1000 x 360mm
Units per pack	All units are loose stacked suitable for crane offload or are available on timber pallets
Avg. pack weight	Pallet packed for individual contracts
Packaging	Banded and shrink-wrapped onto non-returnable pallets

Colours & textures

Cast Iron



Gully Pots, Covers and Adaptors

Marshalls gullies are typically used in highways and parking areas. They are produced monolithically on fully automated machines, providing strong, robust units that need no concrete surround, and are not subject to flotation.

Marshalls gully pots are manufactured to BS5911-6, and are delivered inverted. Precast road gullies can be supplied with adaptors for connection to clay or plastic pipes.

Available in both square and 'u' shaped with handling recesses for lifting brackets. Gully cover slabs are

designed as seating for a gully grate and used on top of a 450mm gully. Our gully cover slabs are quick and easy to install, and sit flush to the kerb for enhanced stability, eliminating brickwork joint weakspots.

The gully adaptor is a versatile elastomeric sealing ring, manufactured in EPDM rubber (to BS 2494, Type D). The table below shows the tolerance of a range of pipe diameters and profiles, for use only with the Marshalls Civils & Drainage kitemarked concrete gullies.

Features

- Strong and durable
- Fully universal, suitable for all plastic and clay drainage from 150mm to 186mm diameter
- Gully pots are composed of concrete, for no loss of shape
- Quick and easy to install, delivered in a one piece unit
- No concrete surround needed due to its concrete composition

Technical data

Gully pots

Nominal size (DN)	375 x 750	375 x 900	450 x 750	450 x 900	450 x 1050
Wall thickness (mm)	55				
Capacity (L)	50	69	70	95	120
Outlet internal dia. (mm)	150				
Weight per unit (kg)	188	216	260	290	320
No. per full load	125	108	90	80	73

Gully cover slabs

Slab	Square	'U' shaped
Dimensions (mm)	750 x 650 x 100	585 x 650 x 100
Weight (kg)	80	50

Gully adaptors

To suit pipe (DN)	Type of pipe	
160	uPVC pipe to BS4660	Plastic
	Aquapipe (corrugated)	Plastic
	Ultrarib	Plastic
	Twin wall PVC (corrugated)	Plastic
150	Supersleeve	Clay
	Densleeve	Clay
	Hepseal	Clay



Biofilter™ Biofiltration System

Harness the natural treatment action of vegetation and the filtration power of specially engineered soils with Marshalls Civils & Drainage Biofilter™, a unique system that looks just like a normal tree box but provides innovative pollution control.

Filter out pollutants from stormwater whilst remaining aesthetic qualities. At pavement level, passers-by can see a plant growing through a decorative grating in a precast concrete cover slab. But beneath is a layer of enhanced mulch, on top of a unique soil filter medium delivering high levels of surface water treatment for a high-performance, high-flow filtration.

It targets sediment, hydrocarbons and heavy metals to remove pollutants from nutrients. No limitations in usage, Biofilter™ is suitable for residential or commercial settings, car parks or roadways and can be retrofitted to your scheme. It is available in either a pipe or kerbside inlet; alternatively, water can be channelled directly from the surface.

Features

- Suitable across a range of applications
- Available in either a pipe or kerbside inlet
- Filters pollutants effectively

Technical data

	1200 x 1200mm
Biocell with filled base (L x W)	1800 x 1200mm
	2400 x 1200mm
Biocell with piped base (L x W)	1200 x 1200mm
	2400 x 1200mm
Biocell with piped lid (L x W)	1200 x 1200mm
	1800 x 1200mm
	2400 x 1200mm



Foul and stormwater drainage systems

Foul water can cause harm to the wider population if untreated, which is why it's important that it is dispensed with correctly. If not, the surrounding area can become heavily contaminated, and the surrounding population affected.

Since this water is potentially contaminated with effluent chemicals or other harmful pollutants, it is usually directed through the main sewer network to a sewage treatment plant - and that's where we can help. Our stormwater management solutions include attenuation systems, control and treatment products that help reduce flooding, securing both domestic and commercial properties and infrastructure.



Find out more:
marshalls.co.uk/commercial/civils-and-drainage

Flexible Jointed Pipes

As one of the UK's leading precast concrete pipe solutions manufacturers, Marshalls Civils & Drainage has a range of flexible sewer pipe joint fittings available that are produced and tested under factory conditions.

Our precast concrete pipes offer the security of a 120-year design life, ensuring costs are kept to a minimum. All of which are manufactured to class 4 (DC4) sulphate resistance in accordance with the recommendations of BRE Special Digest.

Features

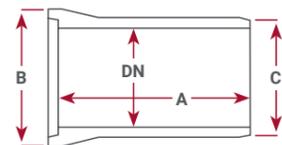
- Manufactured and UKCA marked in accordance with BS EN 1916 Class 120
- British Standard Kitemarked to BS 5911
- Manufactured to DC Class 4 BRE Special Digest 1



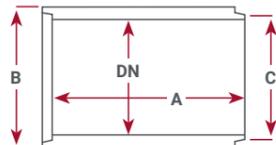
Technical data

Nominal size (DN)	Dimensions A x B x C (mm)	Angular deflection (°)	Joint type	Weight (kg)	Rocker pipe length (mm)	Butt pipe length (mm)	Pipes/full loads
300	1250 x 480 x 410	2.40	Integral	217	600	600	127
	2500 x 497 x 410	2.40		420			64
375	2500 x 575 x 490mm	1.90		510			52
450	2500 x 675 x 575mm	1.60		705			38
525	2500 x 760 x 670mm	1.40		900			31
600	2500 x 850 x 770mm	1.20		1200			23
675	2500 x 980 x 820mm	1.05		1275	1000	1250	16
750	2500 x 1060 x 980mm	0.95		1924			14
825	2500 x 1131 x 1005mm	0.90		1820			15
900	2500 x 1235 x 1080mm	0.80		1920	1250	1250	14
1050	2500 x 1420 x 1260mm	0.70		2590			10
1200	2500 x 1590 x 1440mm	0.60		3550			8
1350	2500 x 1840 x 1620mm	0.53	4600	6			
1500	2500 x 1810 x 1810mm	0.48	'G' ring	5230	1250	1250	5
1600	2500 x 1920 x 1920mm	0.44	Lamell	5702			4
1800	2500 x 2160 x 2160mm	0.40		7150			3

For DN 300 - DN 1350



For DN 1500 - DN 1800/in-wall joint



Largest pipe diameter (DN)	Recommended minimum chamber diameter (mm)
Less than 375mm	1200
375 - 450mm	1350
500 - 700mm	1500
750 - 900mm	1800
Greater than 900mm	Pipe DN + 900



Flexible Jointed Pipes

Rocker pipes and butt pipes

Rocker pipes and butt pipes allow for any differential settlement between the manhole and the pipeline.

Once the spigot/socket butt pipe is built into the manhole wall, a rocker pipe is then laid connecting the butt pipe to the incoming/outgoing pipe run, thereby incorporating a flexible joint close to the manhole.

Features

- Quick and easy to install
- Delivered with pipes, ready for site installation
- Durable and chemical resistant
- Suitable for wide range of water applications

Uni-junctions

Marshalls Civils & Drainage uni-junctions are 150mm diameter connections pre-installed on 300 - 1800mm pipes, and are an alternative to a fixed branch junction.

Features

- Quicker and easier installation
- Less susceptible to site and transport damage
- Allows for more flexibility when positioning the branch along the pipeline, including ability to accommodate different pipe materials using adaptors
- Angular connections can be made using bends

Technical data

Nominal size (DN)	Effective length (mm)	
	Rocker pipes	Spigot/socket butts
225 - 600mm	600	600
675 - 750mm	1000	1250
825mm or greater	1250	1250

Junctions

Branches of 100mm upwards can be fitted into all pipe sizes. Branches can be made from drainage materials other than concrete, and are normally fitted to both full and short length pipes to suit customer requirements.



Above: Uni-junction pipe connectors

Opposite page, clockwise from top-left: Spigot butt pipes; rocker pipe; socket butt pipes; junctions



Flexible Jointed Pipes

Pipe bends

Precast concrete bends are manufactured by cutting pipes into two or three segments and joining them together at the required angle using an epoxy resin. Where specific angles, centre line lengths or radii are required, these must be specified at the time of order. Bends may not necessarily have the same load-bearing capacity as the pipes with which they are laid, so it is therefore recommended that they should be surrounded by suitably designed in-situ concrete where significant load conditions have to be met, or where anchorage of the pipeline is required.

Bends have the same manufactured internal diameter and wall thickness as the pipes with which they are to be laid.



Technical data

Degree of bend	Nominal size (DN)	Leg (mm)	Effective length (mm)
11.25°	300 - 600mm	300	600
	675 - 750mm	500	1000
	825 - 1200mm	625	1250
	1350 - 1800mm	625	1250
22.5°	300 - 600mm	300	600
	675 - 750mm	500	1000
	825 - 1200mm	625	1250
	1350 - 1800mm	625	1250
45°	300 - 600mm	300	600
	675 - 750mm	500	1000
	825 - 1200mm	625	1250
	1350 - 1800mm	1250	2500
90°	300 - 600mm	415	1250
	675 - 750mm	415	1250
	825 - 1200mm	585	1750
	1350 - 1800mm	835	2500
	1350mm and above	Please contact the technical department on 01902 356 220 to discuss	



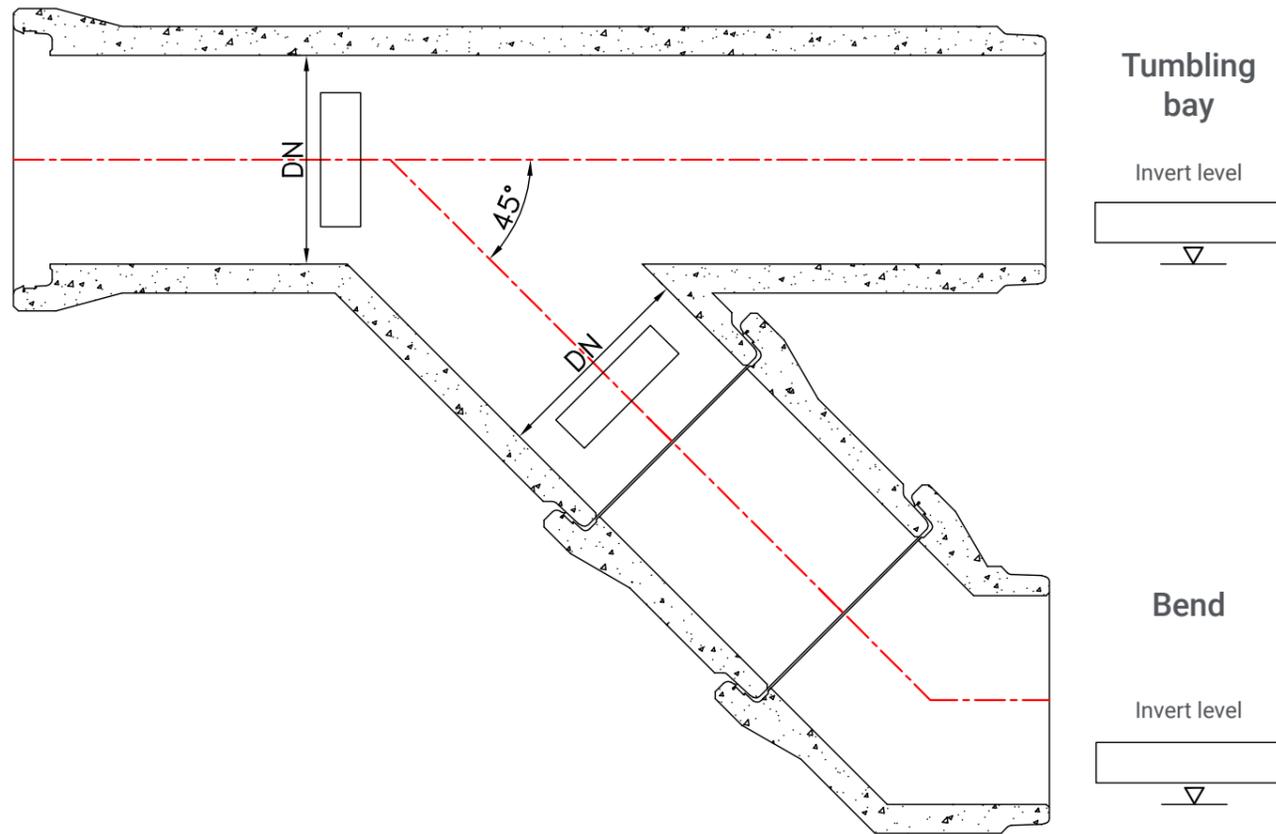
Tumbling bay: Oblique

An oblique tumbling bay junction is traditionally designed at 45 degrees. These are made to order and bespoke to individual project requirements, please supply the pipe diameter and invert levels and we will complete the other information and return it to you for customer approval.

All dimensions except diameter +/- 10mm. All bends are manufactured to +/- 4° tolerance.

Please note, individual pieces (such as rockers and bends) need to be ordered individually as they do not come as a complete unit.

Illustration



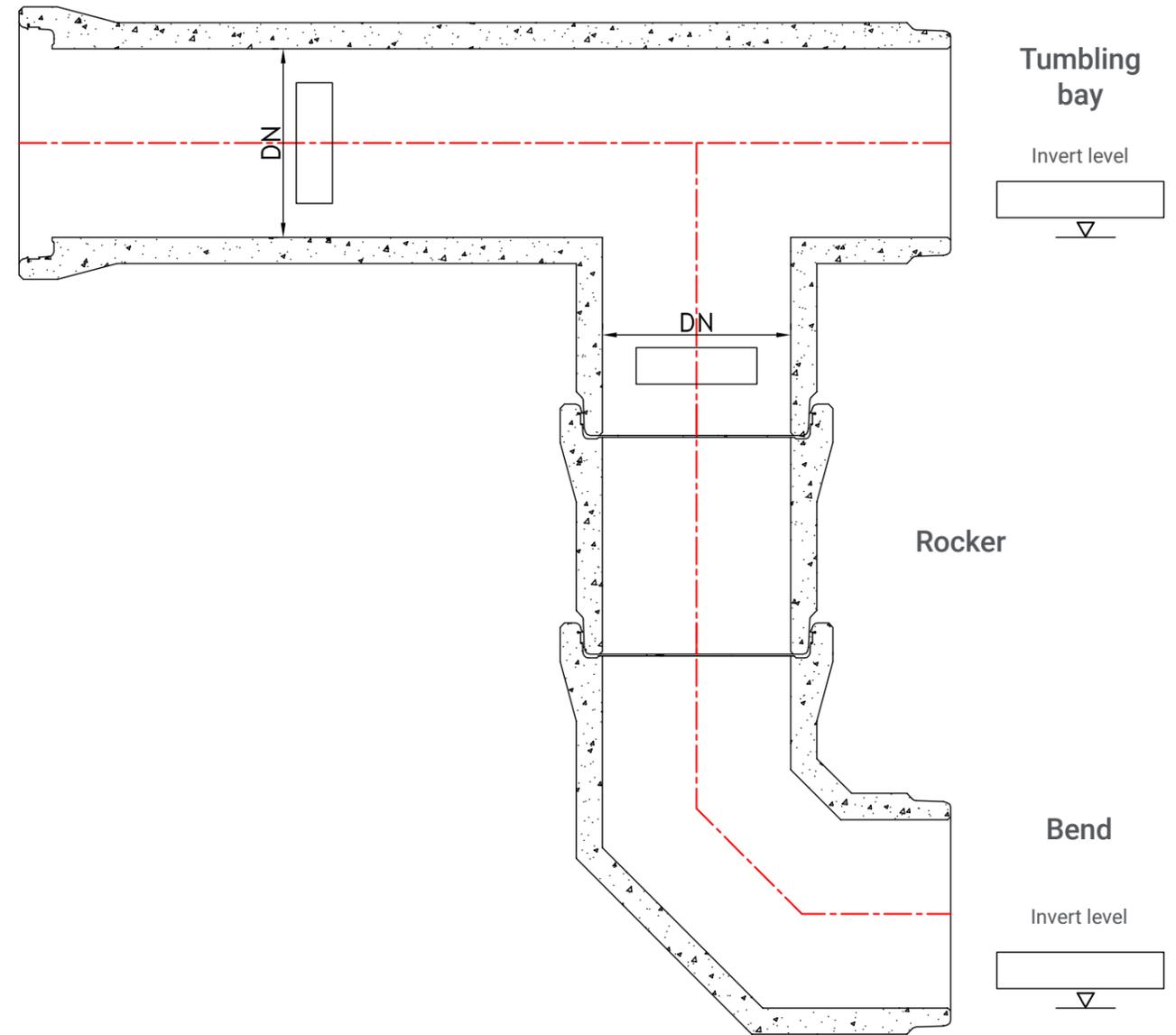
Tumbling bay: Square

Square tumbling bay junctions are traditionally designed at 90 degrees. These are made to order and bespoke to individual project requirements, please supply the pipe diameter and invert levels and we will complete the other information and return it to you for customer approval.

All dimensions except diameter +/- 10mm. All bends are manufactured to +/- 4° tolerance.

Please note, individual pieces (such as rockers and bends) need to be ordered individually as they do not come as a complete unit.

Illustration



Ovoid Pipes

With higher velocity at low flows, reducing the risk of siltation and sewer blockages, egg-shaped ovoid pipes can offer lower operating costs, as sewers may be laid without the need for pumping. They are commonly found in brick-built sewers, and can be used to replace parts of an existing sewer network.

Marshall's Civils & Drainage ovoid concrete pipes are produced and tested in accordance with BS EN1916:2002/BS5911-1:2002 Class 150 including dimensional tolerances, crushing, hydrostatic, water absorption and joint tests.

Available are various lifting options depending on size. The 600mm x 900mm and 800mm x 1200mm pipes are supplied with two lift anchors cast in the top for use with 'Flexilift' lifting/jointing system, whereas the 'C' hook is available for lifting/jointing 400mm x 600mm ovoid's. All ovoid pipes have lifting jointing equipment available on request.

Features

- Lower operating costs, where some sewers may be laid without the need for pumping
- Better self-cleansing and therefore less risk of siltation and blockage
- Reduced costs of trench excavation resulting from shallower gradients

Technical data

Internal W x H (mm)	Overall/effective length (mm)	Weight (T)	Joint type
400 x 600	1350/1250	0.910	Sliding
600 x 900	2610/2500	2.170	Lamell
800 x 1200	2620/2500	3.300	Lamell



Perforated Pipes

We manufacture precast concrete pipes up to 600mm diameter that transport and distribute storm water into a rock-filled trench, then into the surrounding area through circular perforations.

Perforated pipes are no longer a British Standard product. The pipes are drilled whilst wet and the semi-dry nature of the concrete used in the manufacturing process leads to spalling on the inner and outer surfaces around the holes. This is cosmetic only and does not affect the integrity of the pipes for land drainage use.

Perforated pipes comply with the Department of Transport Specification for Highway Works, which states the total area of drainage holes should not be less than 1000mm² per metre length of pipe. If you require a larger diameter than 600mm, please contact our specialist team who may be able to help.

Features

- The perforated pipe design ensures that the system can accommodate the required volume of rainfall runoff water
- The perforated drain must be able to fulfil two functions. Firstly, the required volume of runoff water must be able to enter the pipe quickly enough and secondly the perforated pipe must be large enough to convey the required volume of runoff water.



Dry Weather Flow Pipes

Marshalls Civils & Drainage has developed an offsite solution for installing a dry-flow channel into flexible jointed concrete pipes to respond to the needs of contractors and designers alike.

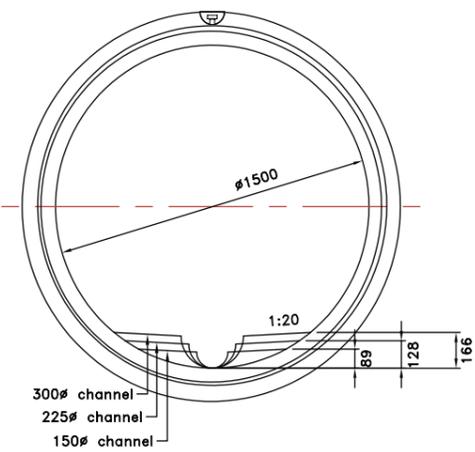
The machine made, one-piece concrete drainage channel solution is available in 1500mm concrete pipes with channel options of 150, 225 and 300mm. It increases the water flow velocity, allowing flow to move freely; when flooding or high flow levels are in action, the open channel overflows, stimulating the full volume of pipe. This enables water and sewage to move freely, during high and low flow levels, preventing the settlement of solids or water in the system and eliminating blockages.



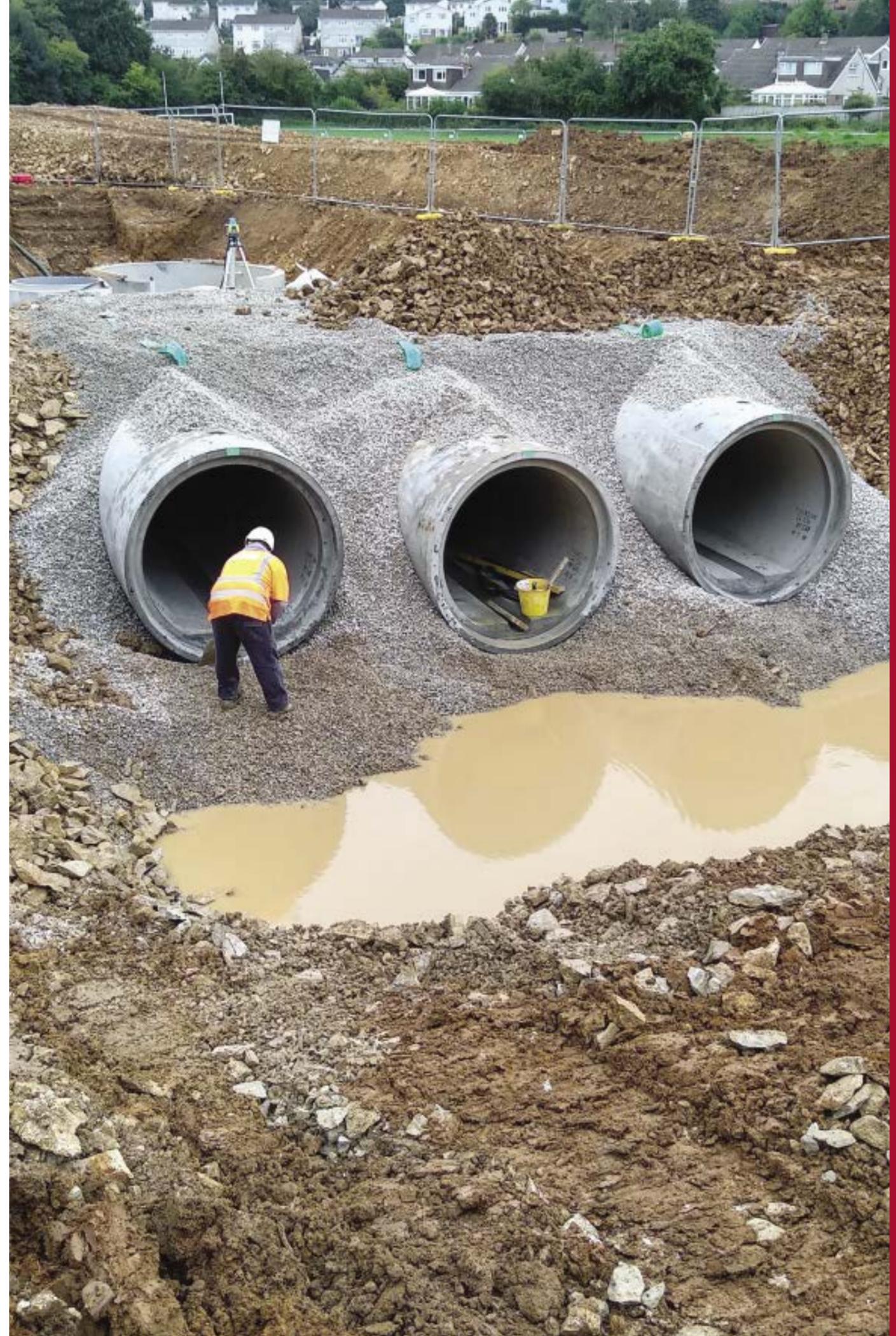
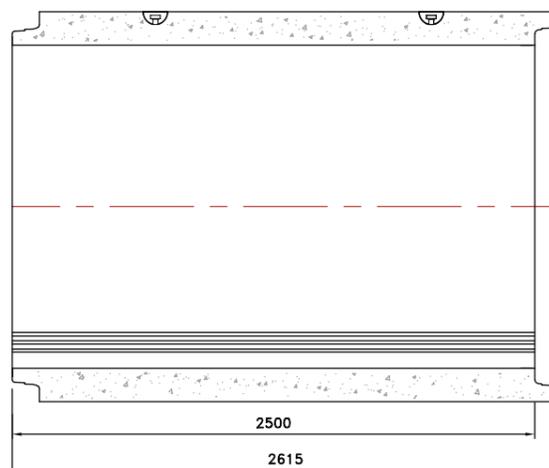
Features

- Removes confined space working on-site
- Offsite solution enabling a reduction in on-site construction time
- Can reduce costs associated with in-situ construction by 50%
- Can reduce over-pumping costs by 15%
- Can be included as part of Offsite Attenuation components

End elevation



Longitudinal section



Pipe handling & jointing

We recommend that prior to laying the pipeline, all products and equipment are checked to ensure that they are in good working order.

1. Avoid damage when handling, especially to the ends of the concrete pipes and never drag or roll pipes over rough ground
2. Use the correct crane for offloading, utilising canvas/fabric slings with central lift or if ordered, large diameter pipes incorporate lift pins where Marshalls Civils & Drainage head link and chain set can be used
3. Pipes should be handled individually using a properly designed 'C' hook, beam sling or other purpose-designed system. Small diameter pipes may be slung through in order to avoid damage to jointing surfaces and consequent leakage of the laid pipe.
4. Pipe lifters are available that are designed to improve site safety and speed up installation. The pipe lifter removes the need for operatives to climb on the back of vehicles, eliminating working at height during the offloading of deliveries.
5. Joint rings (when supplied loose) must be stored away from sunlight, heat or possible contact with any oils
6. Stack pipes on even ground on timbers to protect the joints, making sure the bottom row is securely chocked

Technical notes

1. Seals are normally SBR complying with BS EN 681-1. Other compounds such as Nitrile or EPDM can be supplied but may not be available from stock.
2. For details of the recommended Pipe Lifter for use in offloading, handling and installing pipes please visit www.precastdrainage.co.uk/downloads
3. Marshalls Civils & Drainage Flexi-lift system for handling and jointing of pipes from 1200mm to 1800mm is available upon request.
4. Lorries with crane off load facilities are available for pipes up to 600mm upon request, site assistance is required on certain diameters.
5. When ordering pipes which may have to joint with pipes already on site or those previously laid, particularly extensions to contracts, it is important to advise the sales team in order to eradicate any jointing issues.
6. Marshalls Civils & Drainage lubricant is advised for use on integral pipes, Marshalls Civils & Drainage cannot guarantee that the jointing of concrete pipes with the use of other lubricants will be successful.

Air testing

The air test is not covered by the European Standard, but a pipe which complies with the standard will usually comply with the air test. Failure to pass the air test will not normally preclude the acceptance of the pipeline if a successful water test can be achieved.

Ensure the test equipment is in good condition. Inflatable stoppers are recommended for ease of use.

The test should be carried out after every three or four correctly laid and jointed pipes prior to commencement of backfill. A successful test is achieved if the equipment shows a fall in pressure of no more than 25mm after 5 minutes, having allowed a suitable period for stabilisation. If the pressure falls sharply and the pipes appear to have failed, the following checks must be made before contacting Marshalls Civils & Drainage for assistance:

1. Check the test equipment is in good condition
2. Check if the stoppers are leaking - use industrial soap around the edge of the stopper to provide an effective seal if necessary
3. Check the joint rings are correctly located

Dramatic temperature changes both inside and outside of the pipe could affect the air test. Reference should be made to BS EN 752.

All pipes

Check and pack (if necessary) the bedding material underneath the pipe barrel. An internal gap of between 10 and 25mm should be obtained upon completion of jointing.

For larger pipes

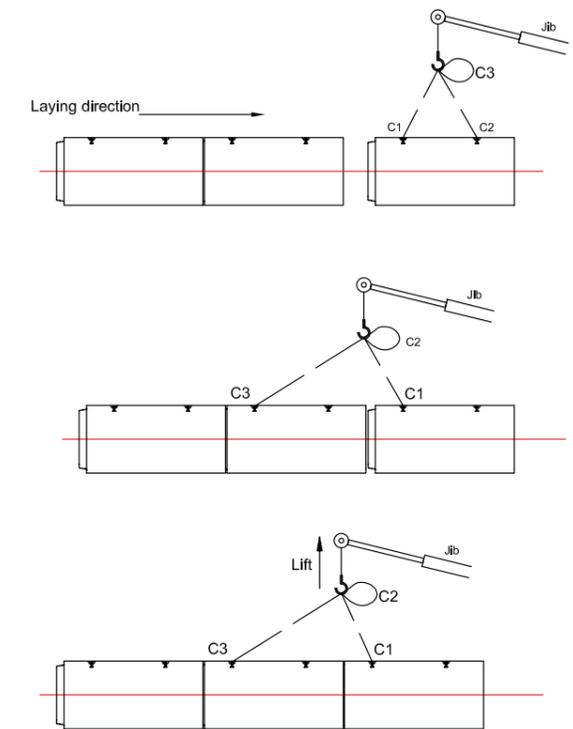
Use 'Flexi-lift' lifting/jointing chains

For 1200mm pipes and above, plus larger size ovoid pipes, we recommend the use of the 'Flexi-lift' lifting system where special lifting anchors can be cast into the concrete pipes at manufacture.

Use the equal length chains C1 and C2 for lifting and placing each pipe in the trench.

Use the correct crane for offloading, utilising canvas/fabric slings with central lift or if ordered, large diameter pipes incorporate lift pins where our head link and chain set can be used.

Pipes should be handled individually using a properly designed 'C' hook, beam sling or other purpose-designed system. Small diameter pipes may be slung through in order to avoid damage to jointing surfaces and consequent leakage of the laid pipe.

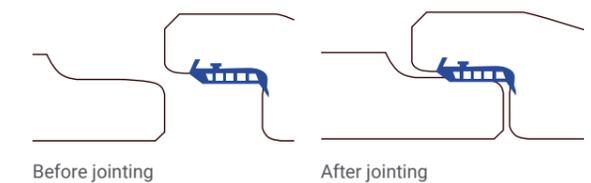


Jointing of integral seal joints

(seals cast during manufacture)

1. Lubricant should be applied to the spigot end of the pipe, ensuring the radius area and entire length of the spigot is covered. Additional lubricant may also be applied to the seal face to assist jointing.
2. Enter the spigot carefully into the socket and ensure that the pipes are correctly aligned.

Integral seal - lubricated

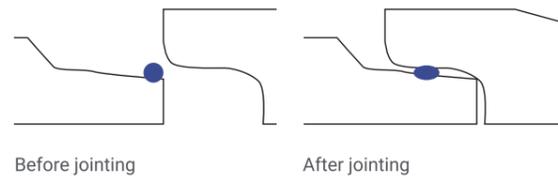


Our integral pipes should only be jointed using a Marshalls Civils & Drainage approved lubricant, which is available from our sales team. We cannot guarantee the successful jointing of concrete pipes with the use of other lubricants.

For rolling ring joints ('G' ring)

1. Stretch and position the seal onto the spigot of the pipe and ensure it is not twisted. Even out the stretch by lifting and releasing at several points around the spigot.
2. Offer the pipe spigot to the socket, but keep clear of engagement by 25mm so that the joint ring is not disturbed.
3. Enter the spigot carefully into the socket ensuring that the seal is correctly positioned and that the pipes are correctly aligned.
4. Under no circumstances should joints be lubricated.
5. Ensure that pipe bedding material does not enter the joint at any time.

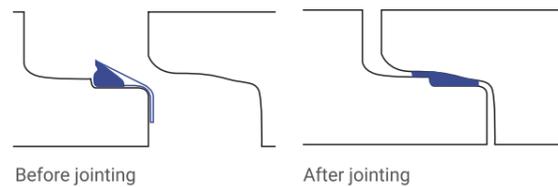
Integral seal - lubricated



For lamell joints

1. Correctly position and bed the first pipe. Prepare the bedding for the second pipe and hollow out for the incoming spigot to prevent bedding material entering the joint.
2. Check the spigot profile for cleanliness and that the seal is the correct size. Place the seal on the spigot with the small step on the underside.
3. It is important that the seal is placed squarely back against the shoulder on the spigot and that the stretch is even around the joint. This is achieved by lifting and releasing the seal at opposite quarter points on the circumference.
4. Ensure that the socket of the previous pipe is wiped free of dirt and grit and reasonably dry. Under no circumstances should the joint be lubricated. Enter the spigot checking that the pipes are correctly aligned.
5. The joint may now be closed whilst the pipe is still being supported by the crane

Lamell seal - no lubrication



Pipe Lifter

The Marshalls Pipe Lifter makes light work of waste water pipeline installation. Simply attached it to your excavator in seconds, using a quick-hitch coupling. There are no hydraulic links or additional energy requirements.

There's no need for anyone to stand on the vehicle bed during offloading, or in the trench during installation. No slings or chains to trap hands either, making the whole operation much safer and up to 50% faster than traditional methods. And with a smaller team size needed, labour costs are lower.

The Pipe Lifter is also suitable for standard UK specification BS EN 1916 concrete pipes from DN 300 to DN 1200. We offer a type 2 Pipe Lifter for larger concrete pipes of DN 1350 to DN 2000.

Features

- Safer: No operative needed on the vehicle during offloading, or in trench during installation
- Easier: Simple to use thanks to no special equipment and minimal training required
- Faster: Around 50% saving in installation time
- Cheaper: Fewer operatives plus greater productivity

Contact us for further information
civildrainagesales@marshalls.co.uk



Traditional Manholes

The Marshalls Civils & Drainage traditional manhole range consists of precast concrete manhole rings and heavy duty manhole covers to manhole risers and drain cover slabs. They come in all shapes and sizes too, from rectangular drain covers to circular concrete chamber sections.

Our traditional tongue and groove range of concrete manhole rings comply with BS EN 1917:2002 and/or BS 5911-3:2010 from 900mm to 3000mm. Although

our 3660mm and 4000mm manhole chambers are not covered by the British or European standard, they do comply with all the relevant provisions of the standards.

Our range of precast concrete chamber rings are all available in BIM (Building Information Modelling) format – this is now a requirement for all government construction projects.

Features

- Ensure compliance - Marshalls Chamber Rings comply with the British Standard and are Kitemarked with the exception of the 3660mm and 4000mm, which comply with all the relevant provisions of the European Standard
- Achieve a range of overall depths with our range of depth sizes
- Easily integrate our Concrete Manhole Chamber Rings into your designs with our BIM models



Traditional Manholes

Chamber rings & soakaways

Marshalls Civils & Drainage precast concrete manhole chamber rings provide access to foul and surface below ground water management drainage systems and are suitable for a range of applications. Compliant with BS EN 1917:2002/BS 5911-3:2010, they are manufactured with tongue and groove joints for quick and easy chamber installation.

Standard chamber rings can be perforated with 75mm holes for use as soakaways, providing a minimum area of exfiltration of 50,000mm² per meter nominal diameter per meter of depth.

Chamber sections can be supplied with fixed double steps or integrated ladder system; holes, cut-outs or bases cast in; and Marshalls Civils & Drainage strip and primer. For safety reasons, all chamber sections are loaded and delivered chimney fashion. When offloaded, they should always be laid flat and not on the barrel.



Technical data

DN (mm)	Depth (mm)	Wall thickness (mm)	Outside diameter (mm)	Approx. weight (kg/m depth)	Soakaway holes (no./m depth)
900	250/500/750/1000	70	1040	530	12
1050		80	1210	710	16
1200		90	1380	912	
1350	500/750/1000	95	1540	1080	20
1500		105	1710	1330	
1800		115	2030	1760	
2100		125	2350	2140	24
2400		140	2680	2740	28
2700	750/1000	150	3000	3400	32
3000		165	3330	4140	36
3660+		185	4030	5300	44
4000+		200	4400	6360	48

+ Two-part chamber



Traditional Manholes

Rectangular manholes

Rectangular manhole units have a tongue and groove joint and are manufactured and tested in accordance with BS EN 1917/BS 5911-3.

These units comply with the recommendations in the 'Sewers for Adoption' in Scotland and Sewer Sector Guidance - Appendix C in England and Wales, where the manhole from ground level to the soffit of the pipes is less than 1.5m in light or main road situations.

Meets DCG (Design Construction Guidance) for acceptance by all major water companies.

Technical data

Manhole section	Internal dimensions (mm)	External dimensions (mm)	Depth (mm)	Approx. weight (kg)	No. per pallet	Pallet weight (kg)	Banded pack size
Cover (heavy duty)	1200 x 675 access	1350 x 900	150	239	4	956	
	600 x 600 access	1380 x 930		300	5	1500	
Cover (light duty)			90	180			750
Chamber	1200 x 750	1350 x 900	150	115	8	920	8
			225	173	5	865	5



Manhole jointing compound

Manholes are designed and manufactured to provide accurate joint profiles with a high quality finish. When used in conjunction with polymer modified bituminous jointing strip, contractors can construct watertight manholes quickly and easily to the details described in BS EN 752 Drains and Sewer Systems Outside Buildings; BS EN 1610 Construction and Testing of Drains and Sewers; Civil Engineering Specification for the Water Industry; The Building

Regulations; The Building (Scotland) Regulations; and Specification for Highways Works.

The use of precast concrete products with flexible jointing compound also meets the requirements of SSG, Appendix C Design and Construction Guidance.

Technical data

Sealant size (mm)	12 x 60		12 x 80				12 x 120				12 x 75	12 x 25
Chamber DN (mm)	900	1050	1200	1350	1500	1800	2100	2400	2700	3000	3660 / 4000	
Sealant length / joint (m)	3.5	4	4.5	5	5.5	6.5	7.5	8.5	9.5	10.5	13.5 / 16.5	2.5
Chamber	5 litres / 100m		5 litres / 75m				5 litres / 50m				None required	



Cover Slabs

We manufacture large circular precast cover slabs up to 3000mm that comply with BS EN 1917:2002 and BS 5911-3:2002, as well as 3660 and 4000mm diameter (which are not covered by the British Standard but comply with all the relevant provisions of the British Standard and Eurocodes).

Available with a standard cover slab access or a bespoke range for specialist projects, all accesses have 75 x 75 corner chamfers, and all concrete cover slabs are available in BIM (Building Information

Modelling). All cover slabs are also heavy duty and suitable for use in main roads.

The reinforced concrete biscuits are used to cap a manhole chamber and provide a base for regulating brickwork or seating/adjusting rings prior to installing the manhole cover and frame.

Features

- Access is 150mm from the inside of the chamber wall position (unless otherwise stated)
- All accesses have 75 x 75mm corner chamfers
- All cover slabs are 'heavy duty' and are suitable for use in main roads

Technical data

Chamber DN (mm)	Max. thickness (mm)	Overall DN (mm)	Standard access sizes (mm)					Weight 6752 access (kg)
			600 x 600	675 x 675	750 x 750	750 x 600	1200 x 675	
900	150	1230	C	C	X	X	X	235
1050	150	1230	E	E	C	E	X	235
1200	150	1400	E	E	To order*	E	X	356
1350	150	1560	E	E	To order*	E	C	503
1500	170	1730	E	E	To order*	E	C	890
1800	175	2050	E	E	To order*	E	E	1208
2100	178	2370	E	E	To order*	E	E	1745
2400	178	2700	E	E	To order*	E	E	2200
2700	205	3020	E	E	To order*	E	E	3380
3000	225	3350	E	E	To order*	E	E	4300
3660+	300	3960	E	E	To order*	To order*	To order*	8800
4000+	300	4500	E	E	To order*	To order*	To order*	11400

+ 3660mm and 4000mm cover slabs are supplied in two sections and not kitemarked

1050mm cover slab 750 x 750 central opening is 1400 OD

1350mm cover slab 1200 x 675 central opening is 1730 OD



Special Cover Slabs

As the demand for high loading and multi-access precast concrete cover slabs has risen, Marshalls Civils & Drainage have become experts at both design and manufacture, bringing together the expertise of both the Technical, Design and Production teams. Extra-large heavy duty concrete slabs have been manufactured for airports and seaports as well as those designed to comply with the National Highways Specifications, as well as special cover slabs to customers' own reinforcement design.

Cover slabs can either be a one-piece heavy-duty cover slab or a segmental unit depending on the diameter. Our qualified engineers are on hand to give advice with design and installation.

We also provide landing slabs and reducing slabs. Contact our sales team to discuss the range in further detail.

Features

- Manufactured offsite using modern methods of construction so they are delivered to site ready to install
- Ease of installation with full construction details available

Typical examples

- Pumping stations, incorporating davits and/or rebates
- Extra heavy duty slabs for airports and ports
- Extra large accesses
- Slabs designed to comply with Highways Agency specifications
- Multiple accesses
- Non-circular slabs
- Slabs with customers own reinforcement design



House Inspection Chambers

The Marshalls Civils & Drainage precast concrete household inspection chambers are available in a variety of depths, with tongue and groove joints. The concrete inspection chambers are economic and versatile and meet the demands of domestic drainage installation. They are easily handled and excavation below ground level is reduced to a minimum.

Features

- Made to BS EN 1917:2002/BS 5911-4:2002
- Meet the requirements of domestic drainage installation
- Can be supplied banded

Technical data

Internal W x H (Mm)	Section depth (mm)	Wall thickness (mm)	Section weight (kg)	No. per pallet	Pallet weight (kg)
600 x 450	150	50	44	32	1410
600 x 450	225	50	58	20	1160
600 x 450	300	50	86	16	1380
750 x 600	150	60	67	16	1070
750 x 600	225	60	100	10	1000
750 x 600	300	60	134	8	1070
1000 x 675	150	65	83	16	1330
1000 x 675	225	65	130	10	1300

Concrete cover slabs

House inspection concrete cover slabs are supplied to suit the top sections, and are 695mm x 540mm overall, 60mm thick and weigh 55kgs.

Marshalls Civils & Drainage house inspection chambers (HICs) can be jointed quickly and easily with bituminous or butyl compounds providing a watertight seal without the use of a concrete surround. For depths in excess of 1.5m the use of a concrete surround is recommended. Please see the concrete cover specification table for further details.

Metal cover slabs

Top sections for 750mm x 600mm and larger chambers act as reducing slabs, enabling standard 600mm x 450mm covers to be fitted irrespective of the size of chambers involved.

To provide concrete top section for 1000mm x 675mm requires a top section for metal household inspection cover and frame 1000mm x 675mm i.e., reducer or a top section for concrete cover 600mm x 450mm and concrete cover slab. Please see the metal cover specification table for details.

Technical data

	To suit chamber sections (mm)	Dimensions (mm)	Effective depth (mm)	Overall depth (mm)	Section weight (kg)	No. per pallet	Pallet weight (kg)
Concrete cover slabs	600 x 450	845 x 680	120	120	46	10	1010
	750 x 600	865 x 715			67		1220
	1000 x 675	1150 x 825	160	170	190	N/A	N/A
Metal cover slabs	600 x 450	825 x 675	50	85	42	10	420
	750 x 600	870 x 720		60	44		440
	1000 x 675	1150 x 825			89		890



Caissons

The caisson shaft sinking system was originally designed for use in microtunnelling, but is now more widely used for pumping station, wet well and manhole construction, particularly in difficult ground conditions.

Marshalls Civils & Drainage offer a range of reinforced precast concrete manhole units specially designed for sinking by the caisson method from 2000 to 4000mm internal diameter in varying depths. These are made in accordance to BS EN 1917 and kitemarked where relevant to BS 5911-3.

Features

- Suited to weak soils, high-plasticity clays, silts, sands and gravel
- Minimal site labour costs
- Easy to install with fast, accurate construction
- Immediate permanent shafts
- Suitable for jacking pits

Technical data

Caisson units

Internal diameter (mm)	Wall thickness (mm)	Outside diameter (mm)	Overall depth (mm)	Weight per unit (kg)	Jointing plates (no.)
2000+	130	2260	500	1065	3
			750	1598	
			1000	2103	
2400	140	2680	522	1370	3
			772	2065	
			1022	2740	
2740+	160	3060	500	1790	6
			750	2685	
			1000	3580	
3000	175	3350	500	2135	6
			750	3203	
			1000	4270	
3660+	185	4030	769	3980	6
			1019	5300	
4000+	200	4400	769	4770	6
			1019	6360	



Caisson cover slabs

Internal diameter (mm)	Effective thickness (mm)	Overall thickness (mm)	Overall diameter (mm)	Approx. weight (kg)
2000	185	200	2370	1960
2400	163	178	2700	2200
2740	185	200	3060	3170
3000	200	225	3350	4300
3660	290	300	3960	8800
4000			4500	11400



Integrated Manhole Ladder System

Together with Caswick, the market leading manhole step producer, Marshalls Civils & Drainage has developed an Integrated Manhole Ladder system

This innovative product has been designed to provide safe access and egress to precast concrete manholes, caisson shafts and inspection chambers. A range of rungs are pre-fitted into the chamber to make the installation of the ladder quick, cost effective, reliable and safer than conventional ladders.

Features

- Ladder rungs pre-fitted into the chamber rings, therefore delivered to site partly pre-installed
- Ladder steps are always inline
- Granted WRc approval



Benefits

Ease of installation

The rungs are prefitted at 250mm centres into the chamber sections, leaving only the stringer, locating bracket and end caps to fit. Minimal access is required to a confined space to fit ladder stringers, with no lifting, drilling or temporary access required to the chamber.

Durability and strength

Ladder rungs are pre-fitted to ensure factory-controlled performance and are pull out and deflection tested to BS5911 part 3. The chemical resistance of polypropylene can be considered equivalent to Grade 316 stainless steel.

Safety

The polypropylene polymer encapsulation gives high visibility and no sharp edges. Rungs have a tread pattern to give good slip resistance, while the stringer has a circular cross section designed to give a secure hand grip unlike a conventional ladder (which is normally too large to safely hold on to).

Flexibility

The incorporation of the ladder rung in the manhole automatically takes account of the variation in depth to design, so no bespoke ladder needs to be surveyed, ordered or manufactured. There's also no need to hire equipment compared to fitting a traditional galvanised steel ladder.

Product standards

The system has been designed and manufactured in accordance with the requirements specified in: BS EN 13101 Steps for underground man entry chambers / BS EN 14396 Fixed ladders for manholes.

Quality

Ladder rungs are kitemarked to BS EN 13101, and are reinforced with high tensile steel tubing, whilst the ancillary fitting brackets are made from stainless steel Grade 304 or 316.



Adjusting Units/Seating Rings

To offer maximum customer choice, Marshalls Civils & Drainage offer precast concrete adjusting units or seating rings in either a one-piece or two-piece manhole riser.

Cover frame adjusting units are reinforced and 65mm deep, which can be used in place of engineering bricks to adjust the ductile or cast-iron covers to the required level. They are kitemarked to BS EN1917:2002/BS5911-3:2010.



Features

- Quick and easy to install using semi-skilled labour
- Fewer joints which reduce likelihood of infiltration
- All concrete units can be ordered from one source
- There is less risk of on-site damage or pilferage

Technical data

	Access size (mm)	Access position (mm)	External dimensions (mm)	Depth (mm)	Weight (kg)
One-piece units	600 x 600	Central	1000 x 950	65	70
	675 x 675				60
	750 x 600				75
	600 x 600*	Eccentric	1000 x 860		80
	750 x 750	Central	1000 x 1000		
Two-piece units	600 x 600	Central	860 x 860	65	48
	675 x 675		935 x 935		65
	1200 x 675		1400 x 950		78
Lothian slabs	600 x 600	Central	1125 x 1125	150	269
	675 x 675				236
	750 x 600				
	750 x 750				196

600 x 600 Eccentric/Corbel units have an eccentric opening which is used in conjunction with a 750 x 600 cover slab opening*



Sealed Manhole

After an extensive research programme, Marshalls were the first to introduce the 1200mm Sealed Manhole system to the UK in 2009 to meet the challenges of modern-day construction. Since then, it has gone from strength to strength.

Available in 1200, 1500 and 1800mm, the Sealed Manhole comprises of a monolithic precast concrete base (available pre-benched in any configuration), a sealed chamber ring (with a thicker wall than a standard ring), a rubber joint (so no tokstrip of similar product is required) and a sealed cover slab which is supplied with your required access.

The system can be installed in as little as 30 minutes with reduced need to work in confined space, making safe site practice a real winner. It eliminates the need for wet trades resulting in rapid construction compared to traditional methods as well as a reduction in the time the excavation is open.



Benefits

Compliance

The Sealed Manhole complies with BSEN 1917:2002 and BS5911-3 and has been accepted for use by all major UK companies.

Safer construction

Less requirement to work in confined spaces, and no requirement to form a concrete surround with reduced time needed for open excavation.

GHG savings

Up to 40% savings on GHG emissions compared with traditional build

Fast installation

The modular solution eliminates the need for wet trades resulting in rapid construction compared to conventional methods. No need to surround in concrete unless specifically required (130mm wall thickness).

Design freedom

All designed monolithic perfect base characteristics (such as location of the inlets, outlets and invert configuration) can be manufactured according to the specifier and client where possible

Watertight

The combination of a thicker wall and rubber joints ensures a watertight structure. No water ingress into sewerage network reduces treatment costs – a 130mm wall and sealed rubber joint can withstand a minimum pressure of 5m head of water

Perfect hydraulics

Optimised flow characteristics by customised base configuration of all inlets and precise drop in channels and pipe connections

Concrete for life

High quality durable concrete with a minimum 120-year design life in normal groundwater conditions, with a full take-off service available.

Help with lifting

Lifting apparatus available for fast, effective and safe handling

Design options

Available pre-benched or plain bottom, with or without inlet/outlets, with hydro-brakes, penstocks, non-return valves and filters that can be pre-fitted at the factory. The perfect manhole can also connect to plastic, clay or concrete.

Efficient construction

Combined seal includes load distributor, ensuring even distribution of vertical loads. This allows for joint inspection; correct installation can be visually confirmed. It's also available in varying depths.

Dedicated team

With extensive precast drainage and manhole knowledge, our sealed manhole team are there to help at every stage.

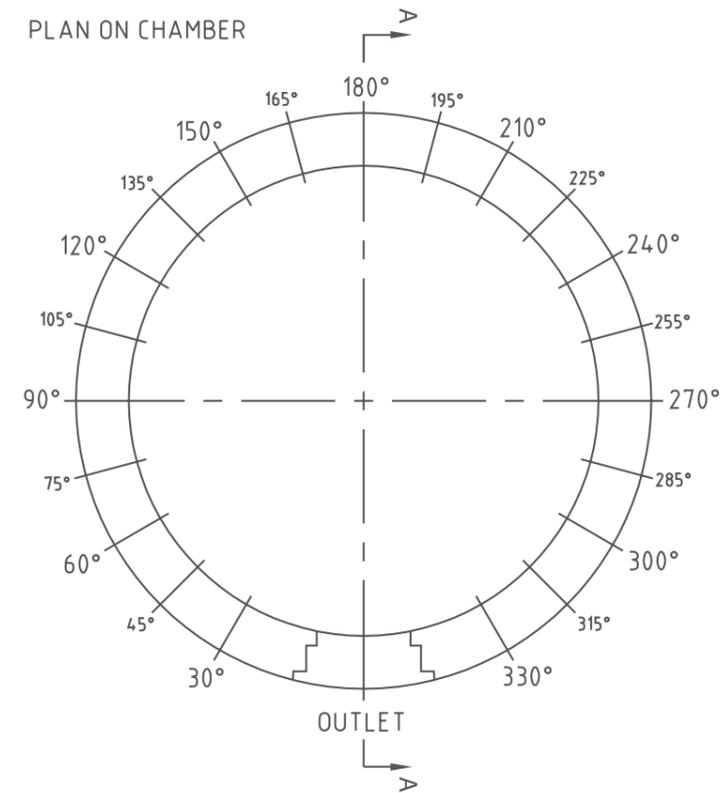




Customer		Product ref.	
Site		Originator	
Customer's MH ref			
Required fall across main channel (E1 To A0)			
Double steps position if required (DEG)			

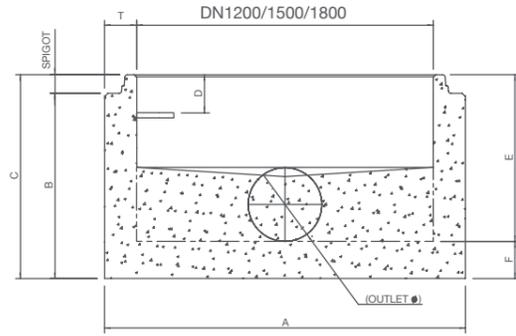
Outlet/Inlet Positions (DEG)	Pipe size	Gradient	Pipe type
Outlet - A0			
Inlet - E1			
Inlet - E2			
Inlet - E3			
Inlet - E4			

Illustration

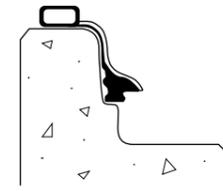


Please note that there is a 1 in 9 gradient for the 1200mm perfect manhole and a 1 in 18 gradient for pipes 450mm upwards for the 1500mm perfect manhole and the angles between adjacent connection cannot be less than 24 degrees.

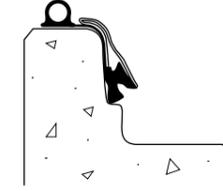
 Please use this diagram to scan/photocopy and forward your requirements to sealed_manhole@marshalls.co.uk



Seal types



DS - SDV Seal



Forsheda - F171 Seal

Technical data

Base units

	Outlet diameter (mm)	Overall diameter (mm)	Height min/max (mm)	Height min/max inc. spigot (mm)	Depth to double step (mm)	Depth to invert min/max (mm)	Fill height (mm)	Wall thickness (mm)	Weight (kg)
1200mm standard base unit	100	1460	400/600	475/675	155	325/525	150	130	1550
	150		450/650	525/725	155	375/575			1700
	225		525/725	600/800	155	450/650			1900
	300		600/800	675/875	155	525/725			2100
1500mm standard base unit	100	1820	440/640	525/725	155	375/575	150	160	2450
	150		490/690	575/775	155	425/625			2750
	225		565/765	650/850	155	500/700			3100
	300		640/840	725/925	155	575/775			3450
	375		715/915	800/1000	155	650/850			3700
1500mm thick wall base unit	450	1960	815/1015	900/1100	155	725/925	175	230	4050
	525		965/1165	1050/1250	155	850/1050	200	230	5550
	600		1040/1240	1125/1325	155	925/1125	200	230	5850
1800mm standard base unit	675	2440	1115/1315	1200/1400	155	1000/1200	275	320	5950
	100		675/875	760/960	155	485/685			5800
	150		725/925	810/1010	155	535/735			6300
	225		800/1000	885/1085	155	610/810			7000
	300		875/1075	960/1160	155	685/885			7650
	375		950/1150	1035/1235	155	760/960			8250
	400		975/1175	1060/1260	155	785/985			8400
	450		1025/1225	1110/1310	155	835/1035			8700
	525		1100/1300	1185/1385	155	910/1110			9100
	600		1175/1375	1260/1460	155	985/1185			9600
	675		1250/1450	1335/1535	155	1060/1260			9900
	750		1325/1525	1410/1610	155	1135/1335			10100
825	1400/1600	1485/1685	155	1210/1410	10300				
900	1475/1675	1560/1760	155	1285/1485	10700				

Technical data

Perfect manhole rings

	Dimensions (mm)	Weight (kg)
DN 1200	1200 x 1500	1950
	1200 x 1250	1625
	1200 x 1000	1300
	1200 x 750	975
	1200 x 500	650
	1200 x 250	330
DN 1500	1500 x 1000	1730
	1500 x 750	1330
	1500 x 500	860
DN 1800	1800 x 1000	2060
	1800 x 750	1545
	1800 x 500	1030

Perfect manhole cover slabs

	Dimensions (mm)	Weight (kg)
DN 1200	600 x 600 access	615
	675 x 675 access	600
	750 x 600 access	600
	1200 x 675 access	470
DN 1500	600 x 600 access	1170
	675 x 675 access	1120
	750 x 600 access	1120
DN 1800	1200 x 675 access	960
	600 x 600 access	1590
	675 x 675 access	1590
	750 x 600 access	1590
	1200 x 675 access	1440

Perfect cover slabs
Effective thickness for 1200mm and 1500mm is 150mm, for 1800 it is 175mm

Perfect raised cover slabs
Effective thickness for 1200mm and 1500mm is 400mm, for 1800 it is 425mm

Please note, the maximum and minimum dimensions are spaced over 5 available height variations, which are spaced in 50mm increments. The max weight is based on the tallest unit for that outlet size. 1200mm chambers have a nominal fall of 20mm +/-10mm north to south across the major incoming to outgoing inlets. 1500mm chambers have a nominal fall of 25mm +10mm/-13mm north to south across the major incoming to outgoing inlets. Please note that all weights and measurements are approximate.

Catchpits

Using modern methods of construction Marshalls precast catchpits and silt trap manholes are available as a one-piece chamber unit, saving on site installation time and giving more health and safety benefits to those on site. Why spend days constructing an in-situ catchpit or silt trap when our offsite chamber is available?

The reinforced watertight one-piece chamber structures offer greater design flexibility with a range of cored or pre-formed holes/cut-outs for inlet/outlet holes which come complete with seals. The units can also accommodate uPVC, twinwall, clay, ductile iron and concrete pipe connections.

Features

- Reduced costs in construction time and on-site personnel
- Sump depths to suit design requirements
- Increased Health and Safety benefits as it reduces on-site construction
- Eliminates extra transport and material wastage used with on-site construction methods
- 1050mm unit weighs less than one tonne
- Bespoke design to suit customer requirements, with reduced installation times

Design options

- 1050mm to 1800mm standard tongue and groove complete with a cast-in base
- 1200mm, 1500mm and 1800mm sealed manhole joint complete with cast-in base
- Pipe inlet/outlet diameters covered by system 100mm to 900mm



Preformed Manholes

Marshalls Civils & Drainage has developed an offsite large modular preformed manhole system that is designed to speed up the installation of the manhole, whilst providing a safe working environment for personnel working within it.

Preformed Manhole sections are available in a range of diameters in three different depths, manufactured to the requirements of BS5911-3. The 2100, 2400, 2700 and 3000mm chambers are kitemarked.

The manhole base chamber is manufactured with a 200mm deep, grade C40, reinforced concrete base

doweled into the chamber unit. Concrete has a minimum cover to reinforcement of 30mm. The preformed system can be bolted together using a minimum 4No T16 Grade 8.8 continuous threaded rods if required.

The inlets and outlets are either pre-scored, preformed or cored holes (depending on size) to suit the customer's needs. Cover slabs to suit the system are manufactured to the requirements of BS EN 1917:2002 and BS 5911-3:2010 and can be manufactured with a standard or bespoke access.

Features

- An established and proven product range that is quality assured
- Supplied with a reinforced, cast-in base
- Provides preformed inlet and outlet holes to suit pipe requirements
- Manufactured in fixed steel moulds that give a superior dimensional accuracy

Technical data

Nominal diameter (mm)	Outside diameter (mm)	Weight/ 500mm (kg)	Weight/ 750mm (kg)	Weight/ 1000mm (kg)
2100	2350	1070	1605	2140
2400	2680	1370	2055	2740
2700	3000	1700	2550	3400
3000	3330	2070	3105	4140
3660	4030	N/A	3980	5300
4000	4400	N/A	4770	6360



Box Culverts

Box culverts are available in square or rectangular units and can be used as single or multi-unit runs, giving excellent mechanical and hydraulic performance. They are suitable for a variety of applications such as highways, sewers, tunnels and subways, stream crossings, attenuation and storage tanks.

Made in the UK, precast concrete box culverts are designed and manufactured in accordance with EN 14844. Available with end walls, access points, inlets, outlets, splayed ends, starter bars can be added to facilitate any additional casting on site which may be required as part of the finished work.

Features

- Minimal maintenance and a 120-year design life
- Quick and easy installation as delivered to site ready to install
- Get optimum flow rates with the culverts' smooth finish, allowing water to flow through seamlessly

Technical data

Reference	Eff. area	Internal width (m)	Internal height (m)	External width (m)	External height (m)	Length (m)	Wall thickness (mm)	Slab thickness (mm)	Weight (tonnes)
MC 10.05	0.485	1.000	0.500	1.300	0.800	2.000	150	150	2.76
MC 12.07	0.904	1.250	0.750	1.550	1.050	2.000	150	150	5.26
MC 15.10	1.440	1.500	1.000	1.850	1.350	2.000	175	175	3.60
MC 15.15	2.190	1.500	1.500	1.850	1.850	2.000	175	175	6.13
MC 17.07	1.252	1.750	0.750	2.100	1.100	2.000	175	175	5.26
MC 20.10	1.940	2.000	1.000	2.350	1.350	2.000	175	175	6.13
MC 20.20	3.940	2.000	2.000	2.400	2.400	2.000	200	200	9.06
MC 25.15	3.690	2.500	1.500	2.900	1.950	1.500	200	225	7.32
MC 27.18A	4.800	2.700	1.800	3.150	2.300	1.500	225	250	9.11
MC 30.10A	2.940	3.000	1.000	3.450	1.500	1.500	225	250	8.33



Attenuation Tanks

In line with current SuDS guidance, precast concrete attenuation tanks are perfect for collecting and storing excess rainwater and increasing capacity in the system. With an increase in climate change, house building and population growth, local sewers and watercourses do not have the capacity to manage, which creates an issue in the local pipeline and surrounding area.

The excess water is stored in the precast attenuation tank and then released under control, using a water

management device, such as a hydro-brake. The held water can be released via a headwall into a water source, such as a river or reservoir or into the local watercourse.

Our attenuation tanks can be used with a variety of fittings, including flow controls and head walls.

Please note, box culverts and the direct pipe access system can also be used as attenuation tank options.

Features

- Factory made under ISO 9001 controlled manufacturing
- BS EN 1916, BS EN 1917 and BS 5911-1 compliant
- Wide range of applications, including infrastructure and highways

Benefits

- Delivered to site for direct installation
- Made from durable, robust concrete and resistant to impact damage
- Fire resistant
- Low maintenance
- Tried, tested and proven long-term solution
- Adoptable by water companies
- Flexible in design, made to suit project requirements
- Can be fitted with a range of flow controls



Direct Access Pipe System

The Marshalls Direct Access Pipe System (DAPS) is the use of our sealed pipe systems connected together to create a secure solution for the attenuation of water system.

The bespoke offsite solution allows for the layout of the system to be adjusted to suit the volume of water that needs to be stored by adding additional pipework or by using a larger diameter of pipe.

The layout of DAPS can also be adjusted to suit the available space on site by interconnecting the pipe runs, which also allows for the flooding of the tank to be simultaneous through all pipe runs as the water enters. The bespoke DAPS pipe entries can be pre-cored or pre-sealed for push-fit connection and end entry units have saddles precast, so chamber rings can be used to meet the required surface levels, with unit having the option to have ladders pre-fitted.

To make the installers life easier, we have designed end entry options for ease of access

Features

- Established and proven product range that is a quality assured and kitemarked
- Inherent structural strength of concrete with an 120 year design life
- Systems can be designed to suit most structural and hydraulic specification including installation under roads
- Long-term easy access into the system for maintenance
- Watertight joints to both pipes and manholes, including load bearing seals
- Can be installed by the roadside or in areas where space is limited

and maintenance, with the DAP system allowing for any variance in surface levels and the height of the access manhole easily adjusted with standard chamber rings and cover slabs. Offering material choice and availability for designers, contractors and installers, our precast DAP system can be used to replace plastic attenuation crates, plastic twin wall pipe and galvanised steel corrugated pipe and requires no special aggregates to be shipped into site to facilitate installation and can be backfilled with the excavated earth at site.

The DAP system does not require membrane wrapping as required on attenuation crate installation and the connection to the DAP system is simple with either new or existing pipework via the pre-cored entry points and can be viewed as an extension to the drainage system. A minimum cover level of 600mm at the pipe collar is all that is required for D400 loading which can reduce costs on excavation at site and save on installation times.

Technical data

Nominal size (DN)	Effective length (mm)
225 - 600mm	600
675 - 750mm	1000
825mm or greater	1250





End entry manholes

An end entry manhole is used at the end of either an in-line or off-line tank. It consists of a standard pipe, with a reinforced end wall, a saddle slab, prefitted onto the barrel, complete with an access hole to suit and a 1200mm sealed manhole joint.

Side entry manholes

Side entry manholes are normally used to gain mid run access entry into in-line or off-line tanks and consists of a standard concrete pipe complete with access shaft. Depending upon the overall depth, a sealed manhole cover slab or reducing slab to a 1200mm sealed manhole complete with a load bearing seal can be supplied. 1200mm rings are used to make up the desired shaft height and double steps or ladders can be fitted into the unit.

Side entry manholes can be supplied with a separate bend to provide a change of direction and access can be to either side of the pipe. Side entry manholes are classified as a junction within the scope of BS EN 1916:2002.

Mid entry manholes

Mid entry manholes are usually used for mid run access into either in-line or off-line tanks and consist of a standard pipe with a saddle slab and cored access hole. The saddle slab has a joint for a 1200mm sealed manhole to fit onto and can be further reduced to restrict access for cameras only.

Available from 1350mm and above, the system is designed for access only with a winch or via a removable ladder into the main tank and can be supplied with a separate bend to provide a change of direction should you wish. Contact us to discuss smaller diameter requirements. Mid entry manholes are classified as a junction/bend within the scope of BS EN 1916.

Side and mid entry manholes complete with bend

A side or mid entry manhole complete with bend is an economic method for access to a tank system, eliminating the requirement for a traditional manhole and is usually used for mid access into an in-line run requiring a change of direction, it consists of a side or mid entry manhole that incorporates a bend in the barrel of the pipe.

Available on 900mm to 1800mm pipe sizes, depending upon the bend angle and manhole type, sealed manhole shafts can be used to make up the desired height with double steps or ladders being fitted to permit access. A side and mid entry manhole complete with bend is classified as a junction/bend within the scope of BS EN 1916.

Clockwise from top-left: Stop end bend; side entry manhole in ground; stop end pipe installation; side and mid entry manhole complete with bend; mid entry manhole; end entry manholes

Stop end bends

Stop end bends consist of a 90° bend used in an upright position as an access into the pipeline and are mainly used at the downstream end depending upon the overall depth required, 1200mm manhole shaft can be used to make-up the desired height, with double steps or ladders being incorporated into the unit to permit access.

Inlet and outlet connections can be cored or formed to suit drainage requirements. Stop end bends are available from 1200mm diameter and above, although smaller diameters can be manufactured upon request. Stop end bends are classified as a bend within the scope of BS EN 1916:2002.

Stop end pipes

A stop end pipe is normally used at the end of an off-line tank and does not include access points.

They can be manufactured with an inlet and outlet hole at any position with any diameter hole size complete with a seal. The 200mm thick reinforced concrete end wall has a dowelled connection complete with a Hydrotite seal, to achieve a waterproof connection.

Stop end manholes are available across the Marshalls Civils & Drainage standard length pipe range.

Integrated pipe flow control chambers

Our integrated pipe flow control chambers have been designed to keep the flow control chamber the same internal diameter as the pipe. This system is commonly used for in-line attenuation schemes in sizes ranging from 1200mm to 1800mm.

Flow Control Chambers

With UK flooding events on the increase Marshalls offer a storm attenuation management flow control precast concrete manhole, for stormwater events at different peak levels, such as 1 in 20, 1 in 30 and 1 in 50-year storm events.

In an innovative joint venture with Hydro International, this bespoke range of Hydro-Brake Chambers with long-term flow control solutions are both quick and

easy to install and are offered with a range of pre-fitted flow control components from 1200mm up to 3000mm chamber sections.

They are suitable for most infrastructure, residential and commercial applications.

Features

- Catered to individual and applicational requirements through bespoke chamber options with various flow control components available
- Take control of discharge flow rate with this offsite solution that accommodates different peak levels
- No need for on-site fabrication this solution is developed offsite and supplied ready to install
- Remove risk associated with construction skills shortage, these flow control chambers have a reduced need for skilled labour
- Feel reassured with this long-term, sustainable solution



One Piece Chamber Systems

Marshalls Civils & Drainage one-piece flow control chamber designs include a pre-fitted flow control device installed in either a 1200mm, 1500mm, 1800mm or 2100mm one-piece chamber.

Holes are either formed or cored to suit customer requirements and the chamber is supplied in either standard or wide wall tongue and groove joint or sealed manhole joint profile.

Benefits

- Option of chamber joint profile - traditional manhole, wide wall tongue and groove or a sealed manhole joint
- Offsite flow control chamber delivered ready to install
- Controlled manufacture under factory conditions



Wide Wall Chambers

Marshalls Civils & Drainage introduced the sectional chamber system as a quicker and safer alternative to traditional methods of manhole construction.

Available from 2100mm to 3000mm complete with formed inlet and outlet holes to suit, sectional wide wall flow control chambers are designed for use when either weight or access is an issue on site.

Benefits

- Designed for use when either weight or access is an issue on site.
- Reduced weight compared to a one-piece unit
- Available with choice of flow control devices



Weir Wall Chambers

In most cases, a weir wall chamber separates silt and oil and prevents it from continuing into the drainage system, improving the quality of the water before progressing into the water management system.

The chamber is designed to accommodate a weir wall that can be pre-fitted with a Hydro-Brake Optimum™, Hydro-Brake®, Penstock, Non-Return Flap Valve, Orifice plate, or a combination. The precast concrete chamber can be designed to suit most

connecting pipe sizes and at the optimum chamber depth to create maximum benefit to the stormwater system.

The design usually includes a twin access heavy duty precast concrete cover slab and an additional hole can also be provided for the penstock spindle should it be required. Sectional weir wall chamber systems are available in 2100mm, 2400mm, 2700mm, or 3000mm lengths.

Features

- Weir wall chambers require little space making them excellent for space saving
- Lower construction costs as they are built off-site
- Quick and easy to install using regular chamber joint
- Bespoke option, designed individual site requirements
- Offsite solution so no need for on-site fabrication
- Made offsite using modern methods of construction within a Marshalls factory resulting in a high-quality finish

Split wall chambers

The split wall chamber has been designed to allow for inspection of either side of the flow control device. Marshalls Civils & Drainage can supply either sectional weir wall chambers from 1800mm to 3000mm or a 2100mm one-piece unit.

The split wall chamber can be manufactured to any height and be supplied with pre-fitted flow control devices.

Complete flow control chambers

Marshalls Civils & Drainage complex flow control chambers can be supplied in any of our chamber systems. The term complex flow is used when different storm events need an individual control, i.e. 1 in 20, 1 in 50 etc, requiring the installation of two or more flow control devices.



Clockwise from top-left: 1800mm sectional weir wall chamber; 3000mm sectional weir wall chamber; complete flow control chamber

Flat Pack Systems

Marshall's Civils & Drainage produce a bespoke range of flat pack systems that can be used in situations where conventional circular chambers are not appropriate and can be supplied with pre-installed holes or be pre-fitted with pipe equipment to suit.

Offering lower construction costs, faster installation and a design life of 100 years, bespoke flat pack chambers are suitable for attenuation tanks, large CSOs, pumping stations and water storage tanks.

These systems are self-standing when assembled, with loading capabilities to suit all Eurocodes or BS EN standards C250, D400, E600 and F900.

The base slab is seated onto a compacted Type I or similar base. Cover slabs are manufactured to suit each system with access openings.

Features

- Flexible solution with health and safety benefits to those on-site, including the lower need for confined space working
- No concrete surround needed, saving on both time and installation costs
- Reduction in waste disposal costs, long-term maintenance costs and traffic movements
- Chambers can be manufactured to suit most dimensional requirements and the system comes with pre-fitted watertight wall seals for jointing
- Manufactured offsite under factory conditions, using modern methods of construction
- Made to site requirements



Downstream Defender® Select

Customise the capture and retention of sediment, oils and floatables from stormwater runoff over a wide range of flows in a small footprint.

The Downstream Defender® Select is the new generation of hydrodynamic vortex separator for treatment of stormwater runoff to protect the environment and meet water quality requirements. Engineers can customise the performance of the unit to meet specific stormwater quality objectives

through model selection and other additional options. An extended range of chamber sizes allows engineers to tailor their drainage designs to meet specific pollutant removal standards.

The Downstream Defender® Select also offers easier installation with much more flexibility of pipe sizes and connections and can accept up to three inlets.

Targeted pollutants

- Fine particles
- Gross pollutants
- Liquid and sediment bound hydrocarbons
- Sediment bound heavy metals
- Sediment bound nutrients



Up-Flo™ Filter

The Up-Flo™ Filter is an advanced stormwater filter that delivers high-performance, multi-stage treatment in a small footprint device.

The Up-Flo™ Filter combines sedimentation and screening along with fluidised bed filtration to remove a range of pollutants from stormwater. Designed with efficiency, longevity and upkeep in mind, the Up-Flo™ Filter has high loading rates and long media life, which means you'll get high quality water treatment for longer periods between servicing.

Ideal for use in high-density urban environments where high pollutant loadings need to be managed in limited space, or where it is difficult to control stormwater quality using conventional or natural SuDS techniques alone. Applications include industrial areas; highways; car parks; pre-treatment for natural SuDS features (such as swales and ponds); use with other natural SuDS treatment to meet required performance standards; and retrofit surface water treatment for space-constrained urban areas.

Targeted pollutants

- Fine particles
- Gross pollutants
- Liquid and sediment bound hydrocarbons
- Sediment bound heavy metals
- Sediment bound nutrients

Benefits

- Meet stormwater quality objectives cost effectively in a small footprint
- Can be used in conjunction with other treatment solutions, including natural SuDS, to help meet more stringent stormwater quality objectives
- Deliver exceptional treatment on any catchment
- Modular components deliver high-performance, multi-stage treatment, achieving a high quality of surface water discharge. It is ideal for use in urban environments where high pollutant loadings need to be managed in limited space.
- Rely on verified performance
- A proven track record and verified performance with regulation agencies around the world



Headwalls

Marshall's precast concrete headwall system is designed to connect pipe work discharging into open water courses.

A cost-effective alternative to in-situ structures, as well as outlet points from ponds and swales, precast headwalls control erosion and scour resulting from excessive velocities and turbulence, helping prevent adjacent soil from sloughing into the watercourse.

As with all concrete products, the headwalls will weather and natural coverage helps them blend into their environment.

Concrete headwalls can be pre-fitted with Hydro-Brakes®, Penstocks and non-return flap valves depending upon application. Please ask us about our time saving solutions for your headwall requirements.

Features

- Erosion control options suited to your requirements
- Greatly reduced installation time and cost - no on-site shuttering or formwork required
- Low maintenance, secure solution

Technical data

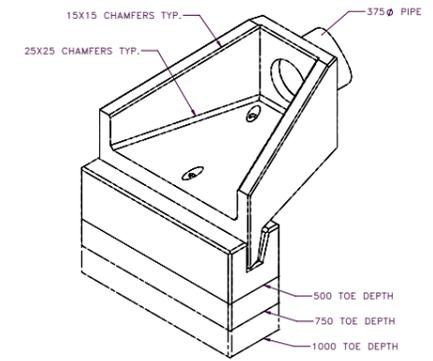
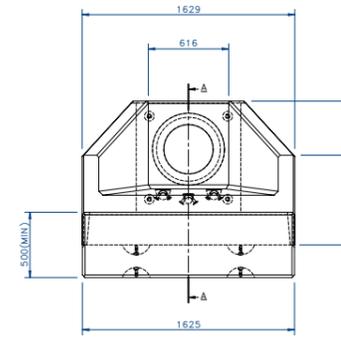
Hole sizes

Designed pipe diam. (mm)	Minimum hole size (mm)	Stock	Made to order	Headwall sizes	Pipe diameters (mm)
100	130	S20		S20	Up to 225
150	198	S20, S40*, S60*, S90		S40	Up to 375
225	320			S60	Up to 600
300	460	S40*, S60*, S90		S90	Up to 900
375	540				
450	635	S90	S60		
525	720				
600	825				
675	870		S90		
750	950				
825	1035				
900	1135				

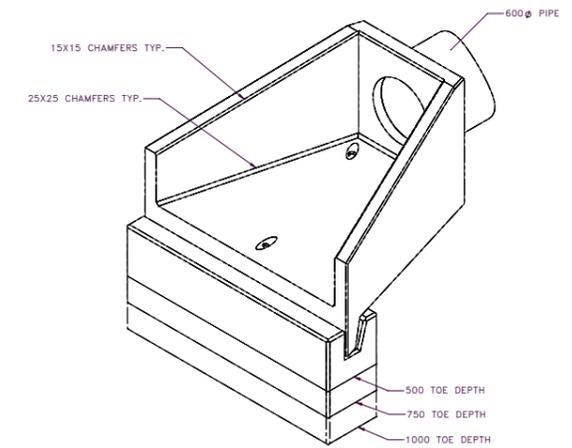
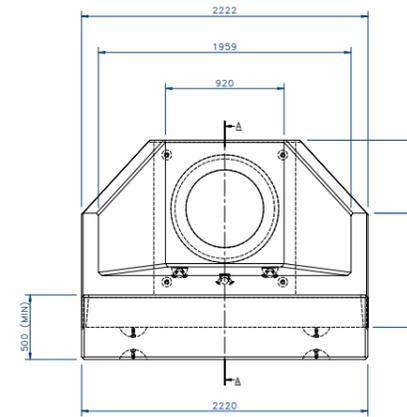




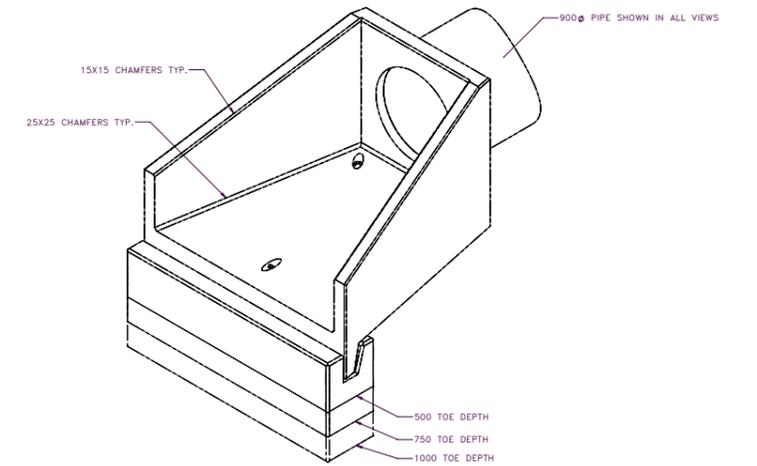
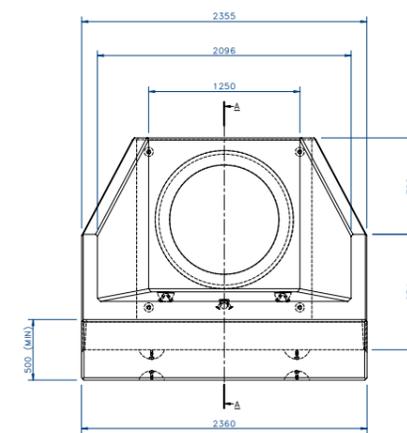
Spillway Headwall S40



Spillway Headwall S60



Spillway Headwall S90



Pump Chambers

Marshalls Civils & Drainage produces a range of wet well pump chambers that are available in either a sealed manhole or wide wall chamber system.

Chambers can have pre-cored holes to suit or can be pre-fitted with pipe equipment to suit.

Heavy duty cover slabs with rebated accesses and pre-fitted davit sockets can be manufactured to suit most dimensional requirements.

Features

- Delivered ready to install, reducing on-site construction time and cost
- Offers a reduced footprint and land usage
- Quick and easy to install using regular chamber joint
- Designed to suit specific application
- High quality finish



Eurocodes

Technical advice note: Bespoke product designs to Eurocodes

Eurocodes have now been integrated into most specifications and consequently bespoke designs undertaken by Marshalls Civils & Drainage will be in accordance with Eurocodes. BS-5911-3:2014 'Specification for reinforced and unreinforced manholes' has been revised such that the test

Design standards: Loading

The loading options in Eurocodes are covered by 2 separate parts of Eurocode 1.

- Part 1: Covers 'General Loadings including trafficked areas'
- Part 2: Specifically covers 'Traffic loads on bridges'

Loading options

1. For locations such as pumping chamber compounds where slabs will not be routinely loaded. Suitable where the only loading would be accidental apart from maintenance activities. Designed in accordance with Eurocode: BS EN 1991-2 UK NA.2.38 & 2.43 'Accidental presence of a heavy vehicle' axle loads of 115kN and 65kN with wheels at 1.3m centres on each axle.
2. Vehicles on buried structures up to 48T gross weight. Suitable for normal roads, access routes, parking areas. Generally suitable for non-adaptable applications. Design in accordance with BS EN1991-2:2003 'Traffic loads on bridges' clause NA.2.1 for buried structures Vehicle Model as Fig NA6, 4 axle loads varying from 115kN - 65kN.
3. Heavy vehicles on bridges. Specifically, for road and rail traffic loading on bridges. BS EN 1991-2 defines as where 'heavy industrial international traffic is expected' and is intended for 'Highways and Motorways'. However, it is generally required for all adoptable roads i.e estate and main roads. Designed in accordance with Eurocode: BS EN 1991-2 'Traffic loads on Bridges' Loading:
4. Load Model 1: Multiple axle loads of 300/200 KN
Load Model 2: Single axle load of 400KN
Customer Specific Loading: As customer specifies but could still be designed in accordance with Eurocodes albeit the loading would not be a standard Eurocode load model.

loads for standard slabs covered by BS5911-3 are consistent with Eurocode Loadings.

The following summarises the options available for loadings complying with Eurocodes.

Design options: Durability

Durability requirements can be determined from Eurocode 2-1-1 'Design of Concrete Structures – General Rules' however UK requirements are more specific in BS8500-1, which is consistent with Eurocodes.

BS 8500-1 'Concrete – Method of specifying and guidance for the supplier' recommends to levels of exposure which can be offered.

Exposure Class: XC2/3 (100-year design life)

- Suitable for reinforced concrete surfaces sheltered from or exposed to direct rain, alternate wetting and drying and high humidity
- Generally covers most concrete not exposed to de-icing salts
- Concrete cover depth for C40/50 concrete is 40mm (Cnom +/- 10mm)

Exposure Class: XC3/4 (100-year design life)

- Covers concrete surfaces exposed to de-icing salts and chlorides other than sea water
- Generally used for highway structures installed in roads whereby XD2 is for cover depths > 1.0 and XD3 < 1.0m
- Concrete cover depth for C40/50 concrete is 50 and 55mm (Cnom +/-10mm) for XD2 and XD3 respectively

Why use concrete?

Concrete pipes have been proven to outperform other pipeline materials in a number of areas including installed cost savings as they can often be laid without a full granular bedding and surround. Excavated material can be reused with imported materials being kept to a minimum, also reducing disposal costs including landfill tax.

Durability

Actual service life performance is critical in determining an authentic whole life cost. Many studies including DEFRA's White Paper 'Water for Life' (Dec 2011), estimate an average 800 years' service life requirement for sewers in England.

Building Research Establishment Special Digest-1:2005 Concrete in aggressive ground (BRE SD-1) provides guidance on the installation of concrete products with a predicted durability exceeding 100 years of service life. Concrete drainage systems do not deteriorate - they get stronger with age - which is not the case for alternatives as physical characteristics can be adversely affected over time.

Resistant to damage, abrasion and corrosion

Concrete drainage products are strong and robust, with no special protection requirements against sunlight, heat or general site activities. They do not deform over their service life, preserving their structural integrity and hydraulic efficiency. And unlike other materials, they aren't affected by rats!

Fire resistant

Concrete products are highly resistant to fire; unlike many thermoplastics, they don't lose their structure when exposed to heat, and won't release harmful emissions during fires. This makes them the only realistic drainage option for areas such as airports, fuel storage depots and filling stations. Wastewater can be transported through concrete pipes and manholes at temperatures well over 80°C, when fitted with appropriate seal systems specifically designed for such high temperatures.

Sustainability

Precast concrete pipes outperform other pipeline materials in a wide range of environmental impact categories, including human toxicity levels and chemical/hazardous waste generated. The CO₂ emissions from concrete and cement production is relatively small when compared to other building materials.

A high percentage of materials used in the production of concrete products are locally sourced. Shorter supply routes have a positive impact on the carbon footprint and fuel consumption associated with transporting these materials can be achieved.

Precast concrete storm and foul water drainage systems have a proven service life of over 120-years, demonstrating lower whole life costs.

Resistant to jetting

Every year, Water Companies in England & Wales deal with up to 300,000 sewer blockages, costing water companies £100 million annually to clear them (Water UK, 2019). The damage from such blockages can be significant; in 2016/17 alone well over 5,000 properties and 30,000 private lands and gardens experienced flooding due to sewer blockage.

Concrete pipes and manholes are resistant to damage by high-pressure water jetting. According to WRC's Sewer Jetting Code of Practice, concrete pipeline systems can withstand a pressure of 5,000 psi. In contrast, according to the same code, the maximum water jetting pressure for plastic pipeline systems is 2,600 psi.

Inertness

Concrete drainage products do not leach harmful chemicals into surroundings - an essential property for any material used in a substructure with direct groundwater contact, designed to carry flows that discharge into the environment. It makes concrete a safe option as it doesn't cause contamination.

High quality

Marshalls manufacture a wide range of precast concrete products which are required to be of consistent high quality, designed and manufactured to British/European Standards as well as customer requirements, and independently certificated (Kitemarked and UKCA approved marked where applicable). We also apply a quality management system which has been developed in accordance with the requirements of ISO 9001:2015 certification.

Inherent strength

Concrete drainage solutions are less susceptible to inadequate bedding and poor installation. The strength and structure of a concrete pipeline system comes from the pipe itself, different to flexible systems which are reliant on the quality of installation.

Beyond water management, we offer a range of other solutions

As a complete external landscaping products business, we cover all manner of outdoor space designs and functions.

Beyond drainage, here are the other hard landscaping, infrastructure and paving solutions we supply:

Landscape Protection & Street Furniture

We supply both protective and non-protective street furniture solutions which blend seamlessly into urban landscape design.

Bricks & Masonry

We offer a variety of manufactured concrete products for the construction industry that come in multiple finishes and colours to suit all building and aesthetic requirements.

Paving

Concrete paving technology has come a long way from standard sizes and colours. Marshalls has decades of experience producing a wide range of styles and finishes that are not only robust and durable, but also vary in styles and designs that deliver long lasting quality.

Mortars & Screeds

We provide ready-to-use mortar, screed and flow screed delivered from a network of wholly owned manufacturing locations located across the UK.

Aggregates

From a network of wholly owned and trusted British quarries, we offer a choice of products from general purpose building sand to aggregates for groundworks or pipe bedding.



Creating Better Spaces

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