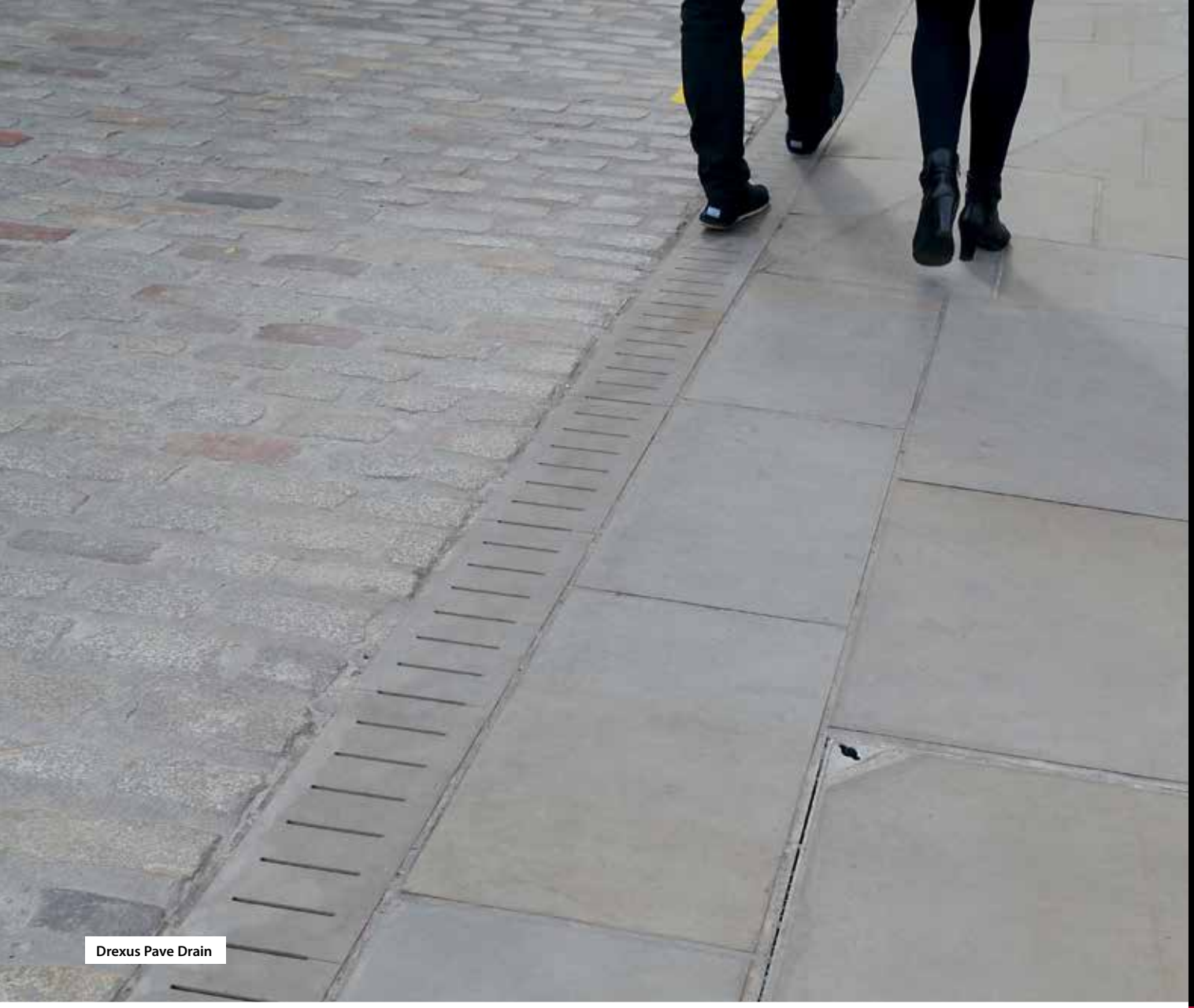
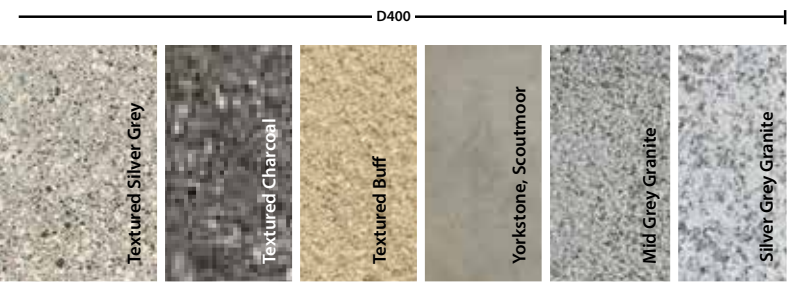


Drexus Pave Drain



Drexus Pave Drain

Concrete Drainage System

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

NBSPlus
Q10 180

* Not suitable for public road carriageways or motorways

Drexus Pave Drain

Concrete Drainage System

- Low Capacity.
- Discreet and complementary to the Marshalls paving ranges..
- Ideal for pedestrian areas and areas of occasional vehicle over run.
- Constant and transition channels.
- Load classification D400.

Marshalls Drexus Pave Drain is a linear drainage system for areas where a more aesthetic drainage solution is required to complement the adjoining paving.

Not only is it effective for removing surface water, it performs almost without trace as the concrete or stone top units can be designed to blend with the hard landscaping materials.

The top units used in the Drexus Pave Drain are 500mm long with nine 6mm slots spaced along the unit.

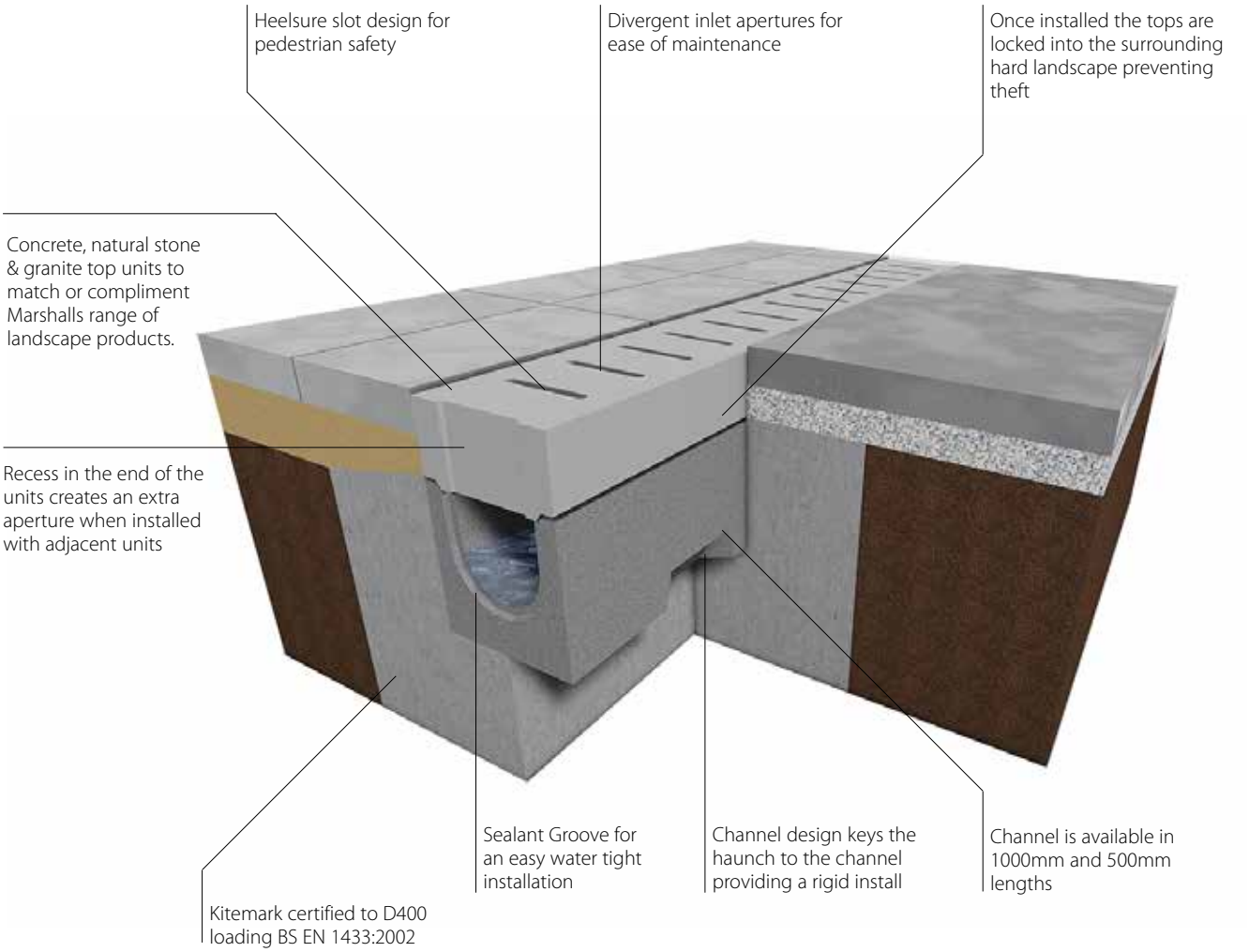
How the System Works

Drexus Pave Drain comprises a top unit and a channel unit. The top unit is available in a range of colours, finishes and materials to complement the extensive Marshalls paving range.

Coupled with the range of channel units, this leaves the designer scope to incorporate the linear drainage system discreetly into any landscape scheme.

Where the System Works

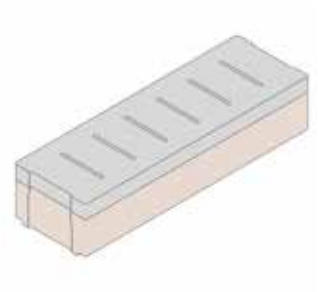
Utilised in a wide range of projects to date, from pedestrian areas and car parks to town centre developments and landscape schemes.



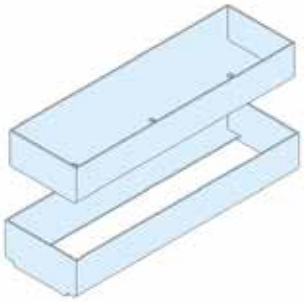
Components

TOP COMPONENTS

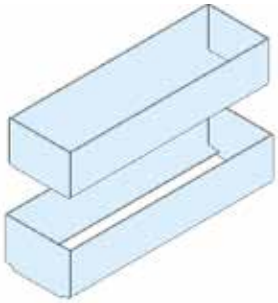
Concrete Top



Natural Stone Top



Concrete Top Access Cover



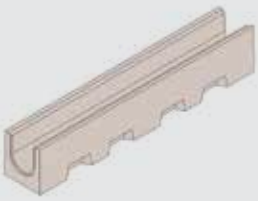
Natural Stone Access Cover

BASE COMPONENTS

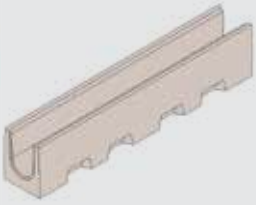
Base channels are available in 1000mm or 500mm lengths

BASE CHANNELS

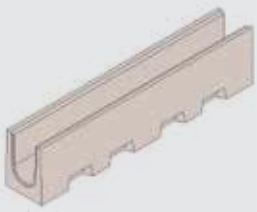
0/0 Channel



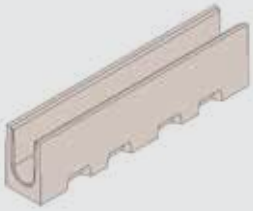
5/0 Channel



10/0 Channel

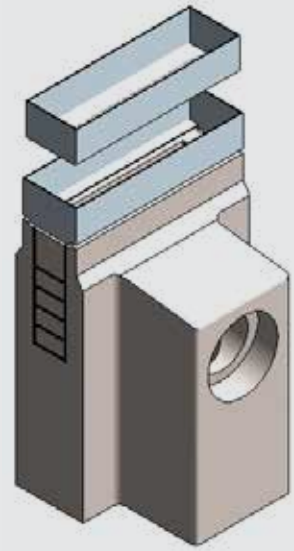


15/0 Channel



20/0 Channel

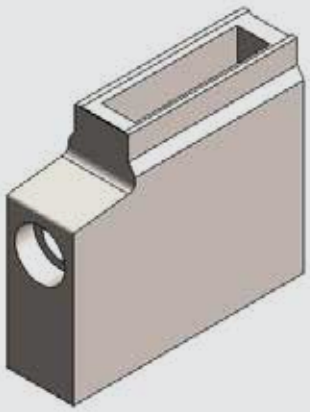
OUTFALLS



Inline Side Outlet Outfall

- A 2 section concrete trapped outfall, with an inlaid access cover and frame.
- Side outlet for 150mm diameter pipework with universal sea.
- Cut-out panels in the silt box allows Drexus Pave Drain runs from both sides

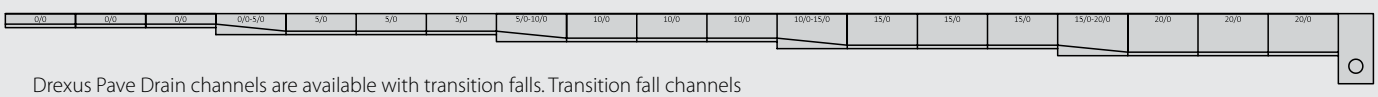
Note: Drexus Pave Drain Access Cover and Frame available separately.



Inline End Outlet Outfall

- A 2 section concrete trapped outfall, with an inlaid access cover and frame.
- End outlet for 100mm diameter pipework with universal seal.
- Cut-out panels in the silt box allows Drexus Pave Drain runs from both side.

Note: Drexus Pave Drain Access Cover and Frame available separately.

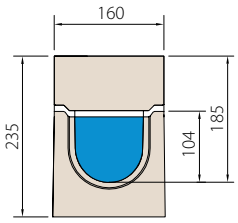
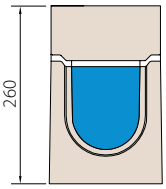
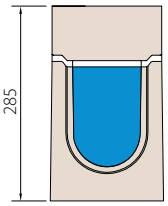
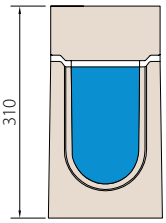
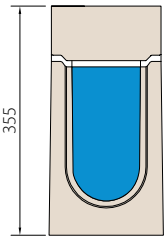


Drexus Pave Drain channels are available with transition falls. Transition fall channels increase drainage discharge capacity by improving flow rates and thereby increasing the overall discharge capacity of the system. Transition falls are 1000mm long

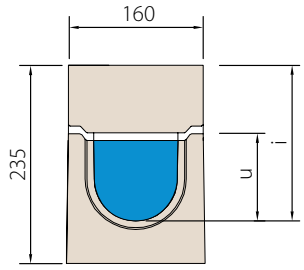
Fig.11
Stepped constant depth channels laid on sloping ground

Hydraulic Data

FLOW CAPACITY

Drexus Pave Drain with 0/0 Channel Unit	Drexus Pave Drain with 5/0 Channel Unit	Drexus Pave Drain with 10/0 Channel Unit	Drexus Pave Drain with 15/0 Channel Unit	Drexus Pave Drain with 20/0 Channel Unit
				
0/0 Channel	5/0 Channel	10/0 Channel	15/0 Channel	20/0 Channel
Equivalent Pipe Diameter (mm) 100	Equivalent Pipe Diameter (mm) 115	Equivalent Pipe Diameter (mm) 130	Equivalent Pipe Diameter (mm) 140	Equivalent Pipe Diameter (mm) 150

Drexus Pave Drain



ref.	d	i	u
0/0	235	185	104
5/0	260	210	129
10/0	285	235	154
15/0	310	260	179
20/0	335	285	204

*-dimensions at downstream end; deduct 10mm for upstream end.
All dimensions measured from top unit surface, pavement should be 5mm above this level.

Hydraulic Data

The Drexus Pave Drain hydraulic data stated in the following tables comprises of the flow capacity, in litres per second (l/s) and velocity in metres per second (m/s). This data has been calculated using the Colebrook-White formulae.

Drexus Pave Drain

Channel Type	**0/0**		**5/0**		**10/0**		**15/0**		**20/0**	
Gradient "1 in"	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
10	25	3	34	3.15	43	3.24	52	3.31	60	3.36
20	18	2.12	24	2.22	30	2.29	36	2.33	42	2.37
30	14	1.73	20	1.81	25	1.87	30	1.9	35	1.93
40	12	1.49	17	1.57	21	1.61	26	1.65	30	1.67
50	11	1.33	15	1.4	19	1.44	23	1.47	27	1.5
75	9	1.09	12	1.14	16	1.17	19	1.2	22	1.22
100	8	0.94	11	0.99	13	1.02	16	1.04	19	1.05
150	6	0.76	9	0.8	11	0.83	13	0.84	15	0.86
200	5	0.66	7	0.69	9	0.71	11	0.73	13	0.74
300	4	0.54	6	0.56	8	0.58	9	0.59	11	0.6
400	4	0.46	5	0.49	7	0.5	8	0.51	9	0.52
500	3	0.41	5	0.43	6	0.45	7	0.46	8	0.46
750	3	0.33	4	0.35	5	0.36	6	0.37	7	0.38
1000	2	0.29	3	0.3	4	0.31	5	0.32	6	0.32
1500	2	0.23	3	0.25	3	0.25	4	0.26	5	0.26
2000	2	0.2	2	0.21	3	0.22	3	0.22	4	0.23
Equivalent pipe diameter	100mm		115mm		130mm		140mm		150mm	

Theoretical Outfall Capacities

Outfall Type	**Outlet Pipe Diameter**	**m/s**	**l/s**
Drexus Pave Drain Inline End Outlet Outfall	100mm	2.23	11
Drexus Pave Drain Inline Side Outlet Outfall	150mm	2.39	26

Drexus Pave Drain Component Codes

A Tops

Top	Loading	Length (mm)	Width (mm)	Depth (mm)	Unit Weight (kg)	Horizontal Slot
Textured Grey	D400	500	160	80	15	**DR544810**
Textured Buff	D400	500	160	80	15	DR544820
Textured Charcoal	D400	500	160	80	15	**DR544830**
Granite Silver Grey	D400	500	160	110	17	DR544840
Granite Mid Grey	D400	500	160	110	17	DR544850
Yorkstone Scoutmoor	D400	500	160	110	17	DR544860

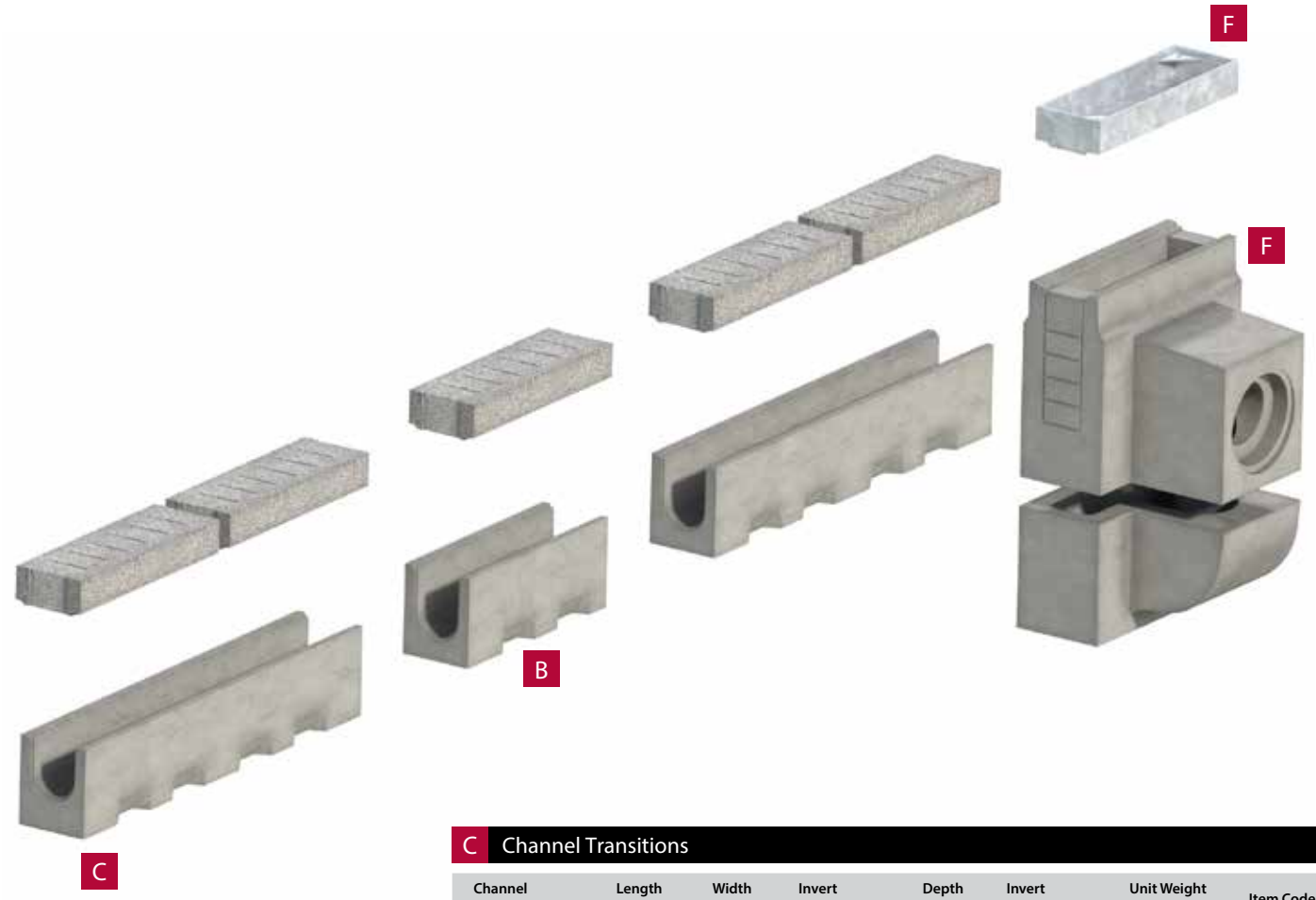
B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 0/0	1000	160	100	154	104	37	**DR541015**
Channel 5/0	1000	160	100	179	129	45	**DR541025**
Channel 10/0	1000	160	100	204	154	53	**DR541035**
Channel 15/0	1000	160	100	229	179	61	**DR541045**
Channel 20/0	1000	160	100	254	204	69	**DR541055**
Channel 0/0	500	160	100	154	104	18.5	DR541515
Channel 5/0	500	160	100	179	129	22.5	DR541525
Channel 10/0	500	160	100	204	154	26.5	DR541535
Channel 15/0	500	160	100	229	179	30.5	DR541545
Channel 20/0	500	160	100	254	204	34.5	DR541555

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

D Junction Channels

Junction Channels	Unit Weight (kg)	Item Code
Junction Channel 0/0 LH	19	DR543750
Junction Channel 0/0 RH	19	DR543755
Junction Channel 10/0 LH	27	DR543760
Junction Channel 10/0 RH	27	DR543765
Junction Channel 20/0 LH	35	DR543770
Junction Channel 20/0 RH	35	DR543775



C Channel Transitions

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

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

E End Cap/Cap Outlets

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

F Outfall & Access Covers

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

Standard Details

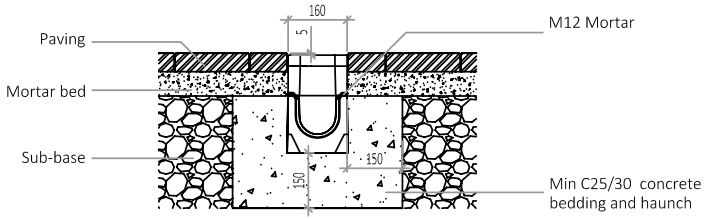
Drawing 1 of 2

Drexus Pave Drain - Block paving / Paving flags

Loading class up to D400

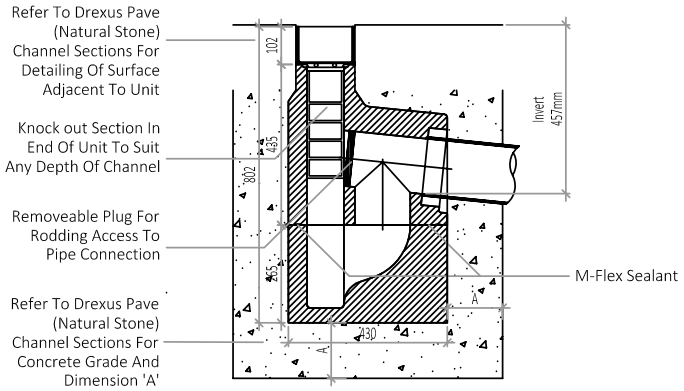
Drexus Pave Inline End Outfall

Drexus Pave Inline Side Outfall

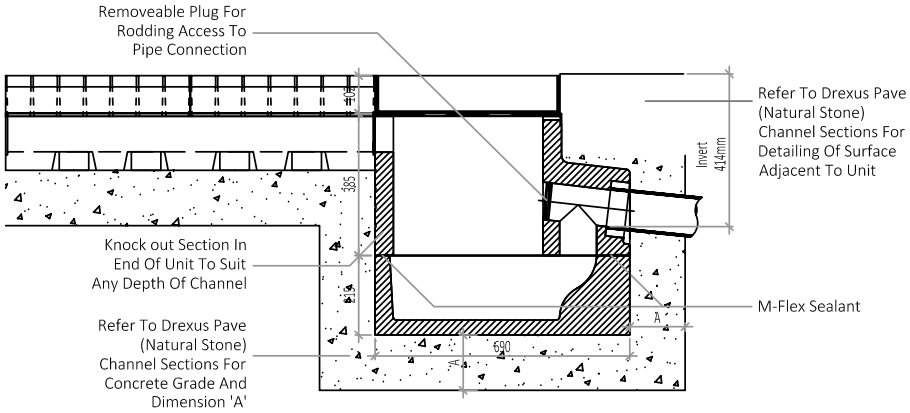


Drexus Pave (Natural Stone) -
Paving flags

Loading class up to D400



Drexus Pave (Natural Stone)
Inline Side Outfall



Drexus Pave (Natural Stone)
Inline End Outfall

Standard Details

Notes for Drexus Pave Drain

Drawings 1 to 2

1. All dimensions are in millimetres.
2. All loading applications are as defined in BS EN 1433:2002 "Drainage Channels for Vehicular and Pedestrian Areas - classification, Design, Testing Requirements, and Evaluation of Conformity'".
3. Outfall sections shall be jointed using Marshall's' M-Flex sealant.
4. Vertical joints shall be jointed using Marshall's M-Flex sealant.
5. The concrete grade and dimensions for bed, haunch and surround are shown in the Drexus Pave Drain section of the Design Guide.
6. Where the concrete surround is taken to the surface; the concrete should have the appropriate freeze thaw resistance.
7. In applications with poor native ground conditions, consideration may be given to the local thickening of the sub-base.
8. Movement joints details that fully isolate the Drexus Pave Drain system whilst maintaining restraint shall be provided adjacent to all concrete slabs even when the slab is covered by another material. The use of dowel bars in concrete slab joints is common and should be considered especially for higher loading applications.
9. The top surface of the grating shall be 5mm below the finished pavement level.
10. Mortar shall be Class 12 to BS EN 988-2:2003
11. The standard details show the general arrangements used by Marshalls for product evaluation and load test classification purposes. These may differ from customer requirements and site conditions and should be checked and accepted by the Engineer for project use.

Specification

Introduction

The following specification covers the complete Drexus Pave Drain linear drainage system including ancillary fittings and is compatible with the standard detail drawings.

Drexus Pave Drain

1. The linear drainage system shall be Drexus Pave Drain supplied by Marshalls plc. All channel materials and ancillary products detailed in this specification shall be supplied by Marshalls.
2. All components of the system shall be type tested and be fully compliant with the requirements of BS EN 1433:2002: Drainage channels for vehicular and pedestrian areas – Classification, design and testing requirements, marking and evaluation of conformity' when installed as per manufacturers recommendations.
3. The linear drainage system shall be Drexus Pave Drain manufactured in pre-cast concrete, with the exception of certain fitments manufactured in steel or cast iron, as supplied by Marshalls in accordance with Standard Detail Sheets.
4. The linear drainage shall be a two part system consisting of ***natural stone/precast concrete*** covers bonded to precast concrete drainage channels reference ***(0/0; 5/0; 10/0; 15/0; 20/0)**** deep.
5. All components of the Marshalls' Drexus Pave Drain System shall comply with minimum Load Classification B125/C250/D400* in accordance with BS EN 1433:2002 and the following:
   i. The cover shall be ***natural precast concrete/granite/yorkstone****.
   ii. The cover shall have a nominal ***horizontal/diagonal**** slot width of ***10/6 mm****
   iii. The system shall have a minimum of ***11,100/8,300 **** mm^2/m water inlet aperture area.
   iv. The drainage channels shall have an invert width of 100 mm.
   v. The overall width of the channel shall be 160 mm.
   vi. The vertical channel surfaces and joints shall be made water tight using Marshalls' M-Flex sealant.
   vii. The covers shall be bonded to the drainage channel with ***Marshall's' M-Bond/Mortar Class 12***.
   viii. The distance between access points shall be no more than ***15/25/50m****.
6. The linear drainage system comprising covers, constant depth and transition channels, outfalls, T junctions channels, end caps, cap outlets, and sealants shall be installed to the line and levels indicated in the contract documents and in accordance with the manufacturer's instructions and Standard Details.
7. The drainage system shall be installed in accordance with manufacturers recommendations, industry best practice or ***as detailed in the contract/WRc Sewers for Adoption; 7th Edition: 2012/BS EN 752:2008/BS 8000: Part 14:1989****

Note: * delete as required

Construction

Excavation

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

Setting Out

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

Outfalls

1. Drexus Pave Drain outfalls should be installed first.
2. Sufficient material should be excavated to accommodate the trapped Drexus Pave Drain outfall units
3. 150mm of C25/30 mix (BS 8500-1&2) concrete is placed in the bottom of the excavation
4. The bottom section of the two part outfall is lowered into position
5. Sufficient M-Flex sealant is gunned onto the top horizontal surface of the bottom section of the two part Drexus Pave Drain outfall so as to provide a seal between the top and bottom sections
6. The bedding concrete should be laid and brought up level with underside of the pavement bedding course.
7. The Access Cover & Frame Units should be set directly onto a 10mm bed of mortar with mortar Class12 to BS EN 998-2:2003 along each side of the outfall unit

Channel Installation

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

Channel Joint Sealant

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

Top Block Installation

1. The string line should be set to the level of the top corner of Units.
2. Again, starting at the Outfall, the Units should be set directly onto a 10mm bed of mortar to mortar class 12 BS EN 998-2:2003.
3. The Top Blocks should be tamped into position close to previously laid Units and the alignment checked.
4. The levels should be checked using the string line and a spirit level.
5. In addition, the general alignment should be checked from all directions as each Block is laid. Any Unit deviating by more than 3mm in 3m from line and level shall be made good by lifting and relaying.
6. The joints between adjacent top units are dry and units should be laid hand tight to achieve either a 6mm or 12mm opening as detailed on drawing.
7. Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 200mm in length. All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter.
8. The Drexus Pave Drain top units should be protected during the construction phase to prevent debris entering the slots.

End Caps

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

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

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