

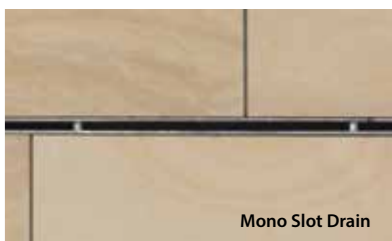


Drexus Slot Drain

D400



Duo Slot Drain



Mono Slot Drain

Drexus Slot Drain

Slot Drainage System



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

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

n55Plus

Q10 170

Drexus Slot Drain

Slot Drainage System

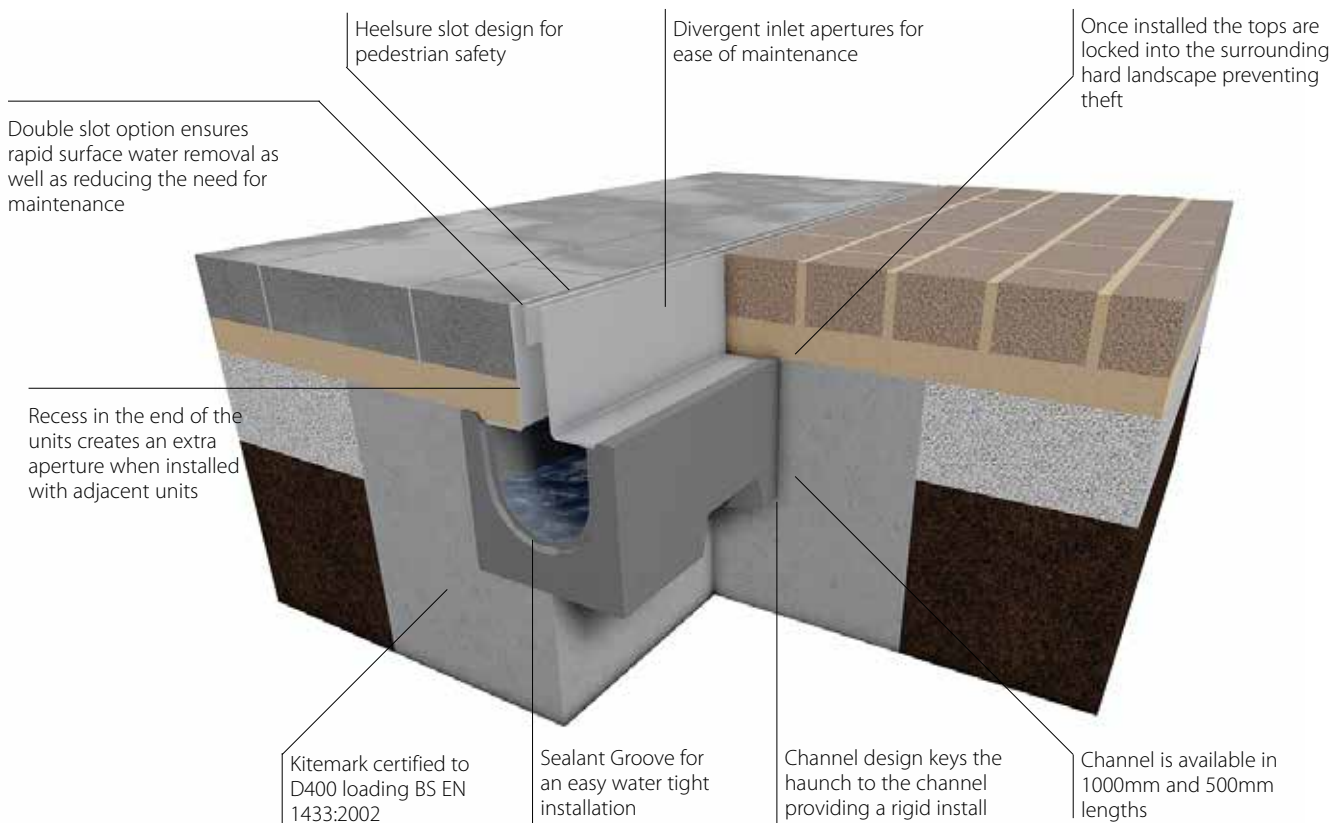


Drexus Slot Drain Mono, Olympic Village, London

- Discreet linear drainage system.
- Single or double slot entry with offset duo option.
- Constant and transition fall bases available.
- Bespoke solutions available, including stainless steel radius units.
- Drexus Slot Drain Mono load classification D400.
- Drexus Slot Drain Duo load classification D400.
- Ideally suited for all paved areas where discreet yet efficient drainage is required, from prestigious pedestrian areas to motorway crossovers.
- Fully compatible with Marshalls range of paving materials and with extra care, other surfacing materials such as tarmac or in-situ concrete.
- Drexus Slot Drain Duo offset top available for threshold drainage applications.

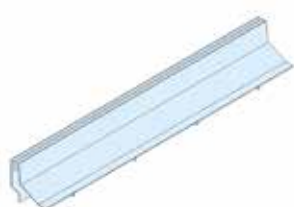
How It Works

- An innovative solution that combines a fabricated, galvanised steel slot drain top to a base channel unit.
- The Drexus Slot Drain top seats itself on a Drexus Channel unit.
- Access units allow for maintenance of the channel system.
- Bespoke solutions can be manufactured including alternative depth of top units, use of stainless steel and increased width, i.e. 150 or 200mm enabling solutions to suit your project demands.

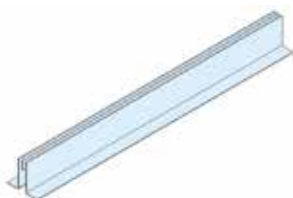


Components

TOP COMPONENTS



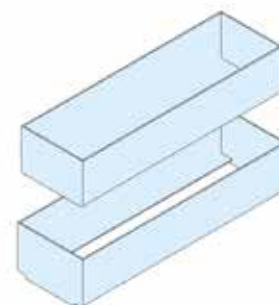
Offset Duo Slot Top



Duo Slot Top



Mono Slot Top



Access Cover

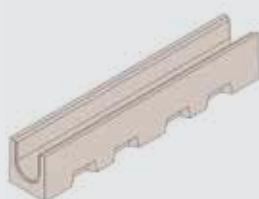
BASE COMPONENTS

Base channels are available in 1000mm or 500mm lengths

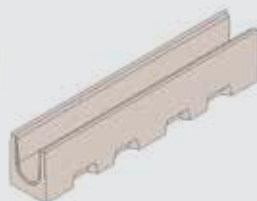
BASE CHANNELS



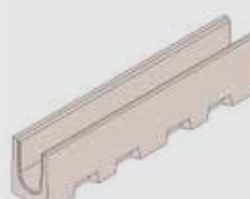
0/0 Channel



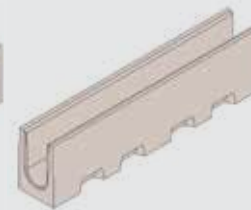
5/0 Channel



10/0 Channel

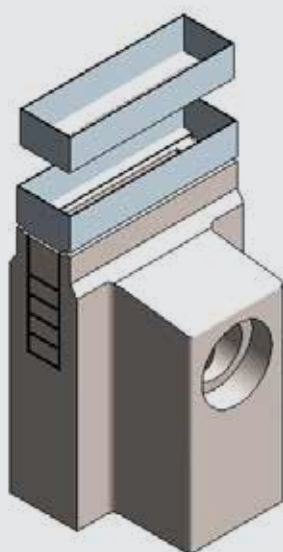


15/0 Channel



20/0 Channel

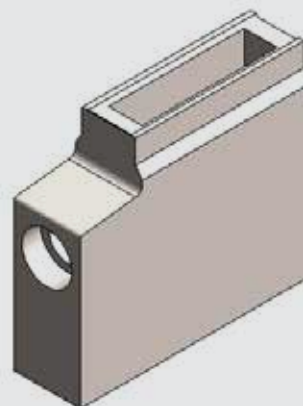
OUTFALLS



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 seal.
- Cut-out panels in the silt box allows Drexus Slot Drain runs from both sides

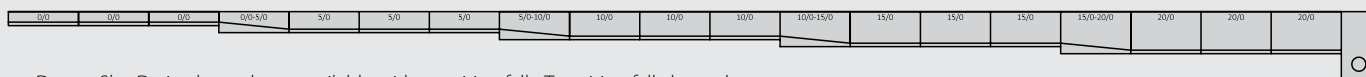
Note: Drexus Slot Drain Access Cover and Frame available separately.



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 Slot Drain runs from both side.

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

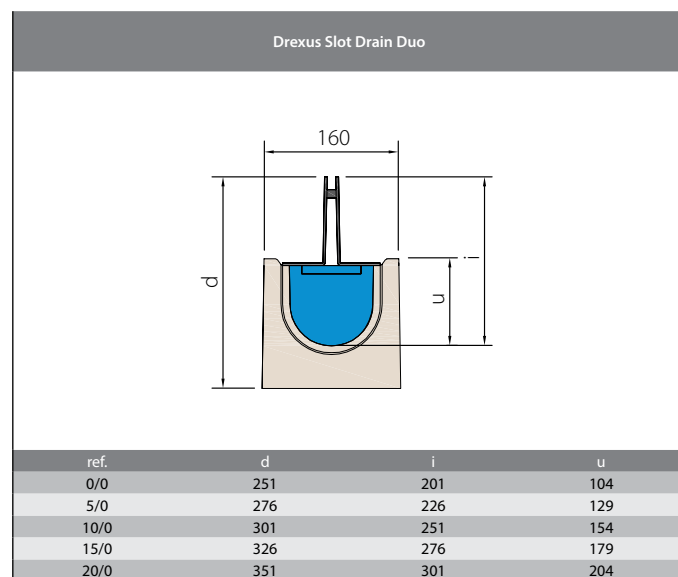
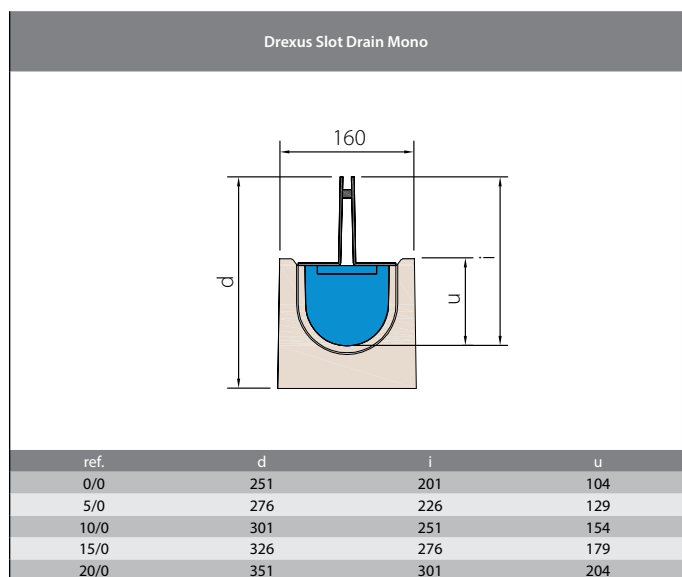
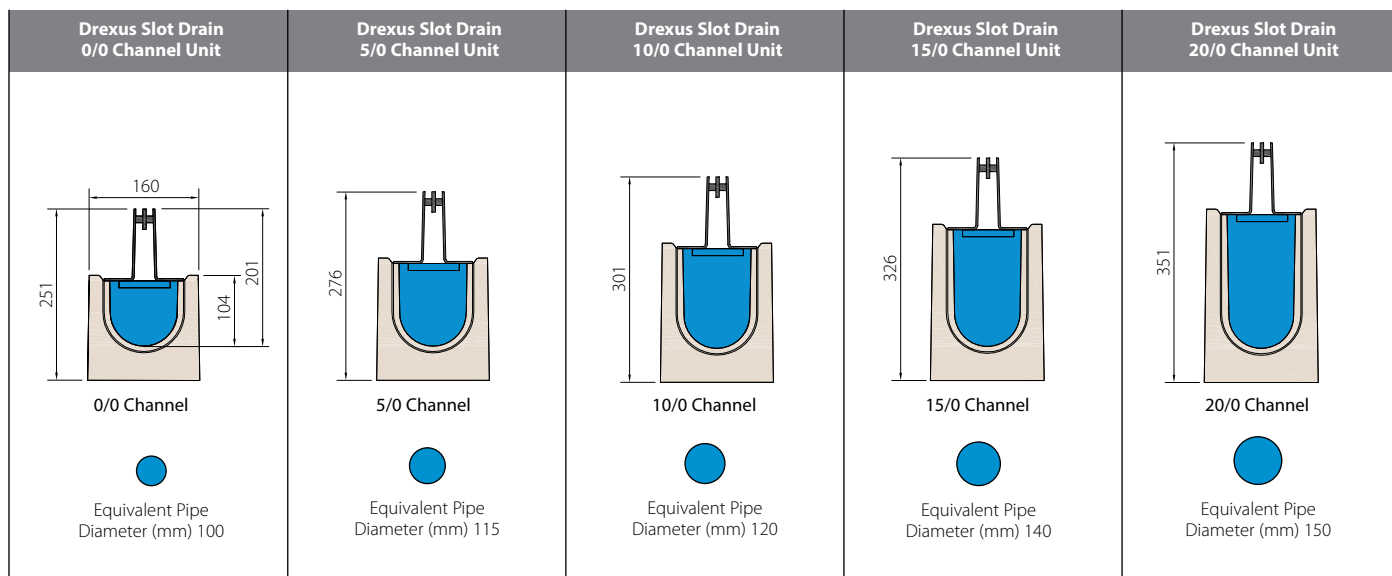


Drexus Slot Drain channels are available with transition falls. Transition fall channels increase drainage discharge capacity by improving flow rates and thereby increasing the overall discharge capacity of the system. Transition falls are 1000mm long

Fig.11 Stepped constant depth channels laid on sloping ground

Hydraulic Data

FLOW CAPACITY



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

*-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 Slot Drain hydraulic data stated in the following tables comprises of 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.

Slot Drain Mono										
Channel Type	0/0		5/0		10/0		15/0		20/0	
	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
Gradient "1 in"										
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	

Slot Drain Duo										
Channel Type	0/0		5/0		10/0		15/0		20/0	
	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s	l/s	m/s
Gradient "1 in"										
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 Slot Drain Mono Inline End Outlet Outfall	100mm	2.23	11
Drexus Slot Drain Mono Inline Side Outlet Outfall	150mm	2.39	26

Drexus Slot Drain Component Codes

A Top Units

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

B Constant Depth Channels

Constant Depth Channels	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
Channel 0/0	1000	160	100	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

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

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





D Channel Transitions

Channel Transitions	Length (mm)	Width (mm)	Invert Width (mm)	Depth (mm)	Invert Depth (mm)	Unit Weight (kg)	Item Code
0/0 - 5/0	1000	160	100	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 Slot Drain Channels are available with transitions. Transition Channels increase drainage discharge capacity by improving flow rates and thereby increasing the overall discharge capacity of the system. Transition channels are 1000mm long.

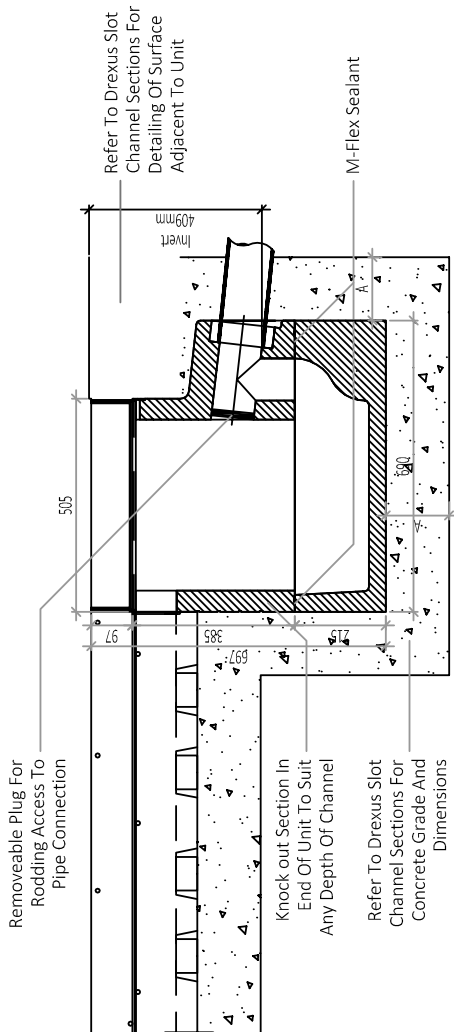
E End Cap/Cap Outlets

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

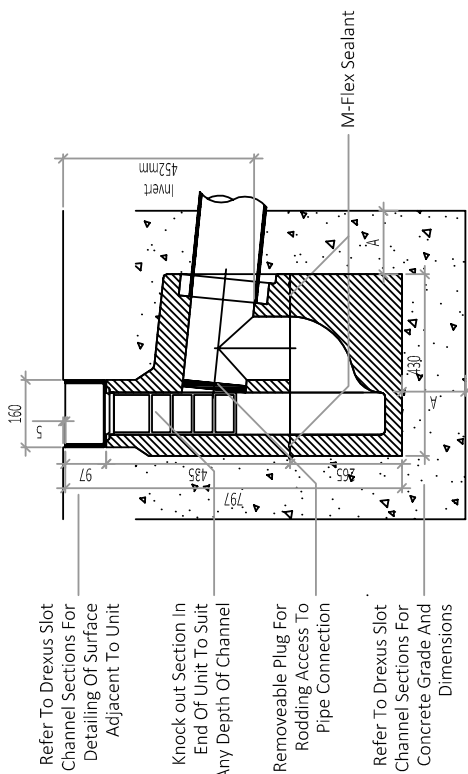
F Outfall & Access Covers

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

Standard Details

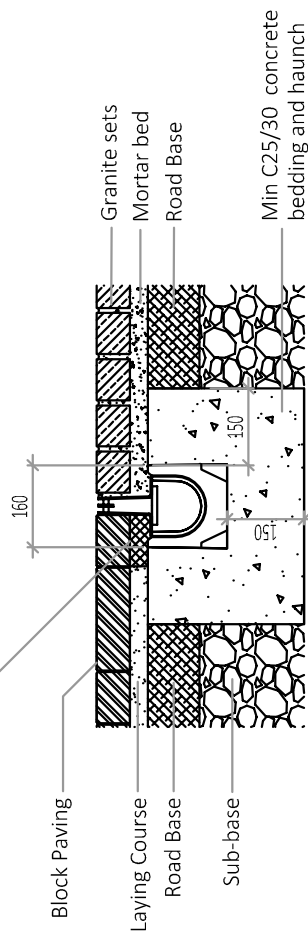


Drexus Slot Inline End Outfall



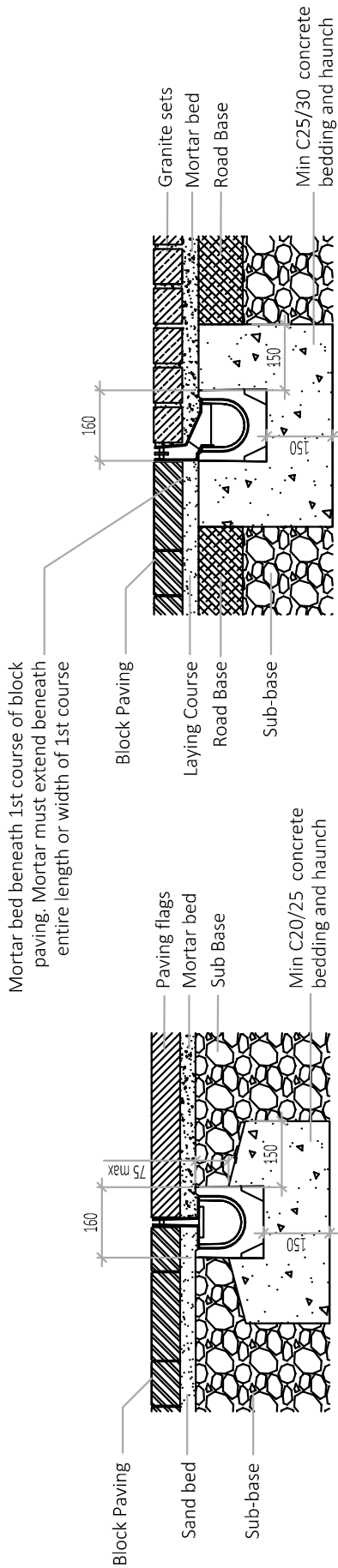
Drexus Slot Inline Side Outfall

Mortar bed beneath 1st course of block paving. Mortar must extend beneath entire length or width of 1st course



Drexus Slot Drain Duo

Loading class up to D400



Standard Details

Notes for Drexus Slot 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 Slot 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 Slot 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 slot shall be 5mm below the finished pavement level.
10. Bedding mortar shall be Class 12, nominal 10 mm thick 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 Slot Drain linear drainage system including ancillary fittings and is compatible with the standard detail drawings.

Drexus Slot Drain

1. The linear drainage system shall be Drexus Slot 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 Slot Drain manufactured in pre-cast concrete, with the exception of certain fittings manufactured in galvanised steel as supplied by Marshalls in accordance with Standard Detail Sheets.
4. The linear drainage shall be a two part system consisting of **galvanised/stainless*** steel slotted cover set on to precast concrete drainage channels reference **(0/0; 5/0; 10/0; 15/0; 20/0)*** deep or as indicated in the contract documents.
5. All components of the Marshalls Drexus Slot Drain System shall comply with Load Classification **A15/B125/C250/D400*** in accordance with BS EN 1433:2002 and the following:
 - i. The slot channel shall have a nominal longitudinal central **mono/offset mono/central duo/offset duo*** slot.
 - ii. The slot channel shall have a **clear slot width of 10 mm/combined slot width of 20 mm***.
 - iii. The slot shall be divergent with a nominal depth of 105 mm.
 - iv. The system shall have a minimum of **10,000/20,000*** mm²/m water inlet aperture area.
 - v. The slot channel will have a nominal 3mm thick galvanised/stainless* steel edge.
 - vi. The drainage channels shall have an invert width of 100 mm.
 - vii. The overall width of the channel shall be 160 mm.
 - viii. The vertical channel surfaces and joints shall be made water tight using Marshalls M-Flex sealant.
 - ix. Slot channel tops shall be made watertight using Marshalls M-Tape
 - x. The covers shall be **laid dry/bonded** on to the drainage channel with **Marshalls M-Bond/Mortar Class 12**.
 - xi. The distance between access points shall be no more than **15/25/50 m***.
6. The linear drainage system comprising gratings, 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 Slot 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 Slot Drain outfalls should be installed first.
2. Sufficient material should be excavated to accommodate the trapped Drexus Slot 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 Slot Drain outfall so as to provide a seal between the top and bottom sections
6. The top section of the two part Drexus Slot Drain outfall is lowered into position
7. The bedding concrete should be laid and brought up level with underside of the pavement bedding course.
8. 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 Unit 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 dry laid onto the channel, use a mortar bed for levelling purposes if required to class 12 from BS EN 998-2:2003
3. The top units 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 unit 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 should be sealed with Marshalls M Tape to prevent ingress of bedding material from the surrounding pavement.
7. Where cutting is necessary, one or two Units shall be cut so that no single Unit is less than 350mm in length. All cutting and trimming of the Units shall be carried out with a concrete saw or disc cutter.
8. Any cut galvanised steel shall be renovated using Defcon Z or similar approved material.

End Caps

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

Pavement Installation

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

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

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