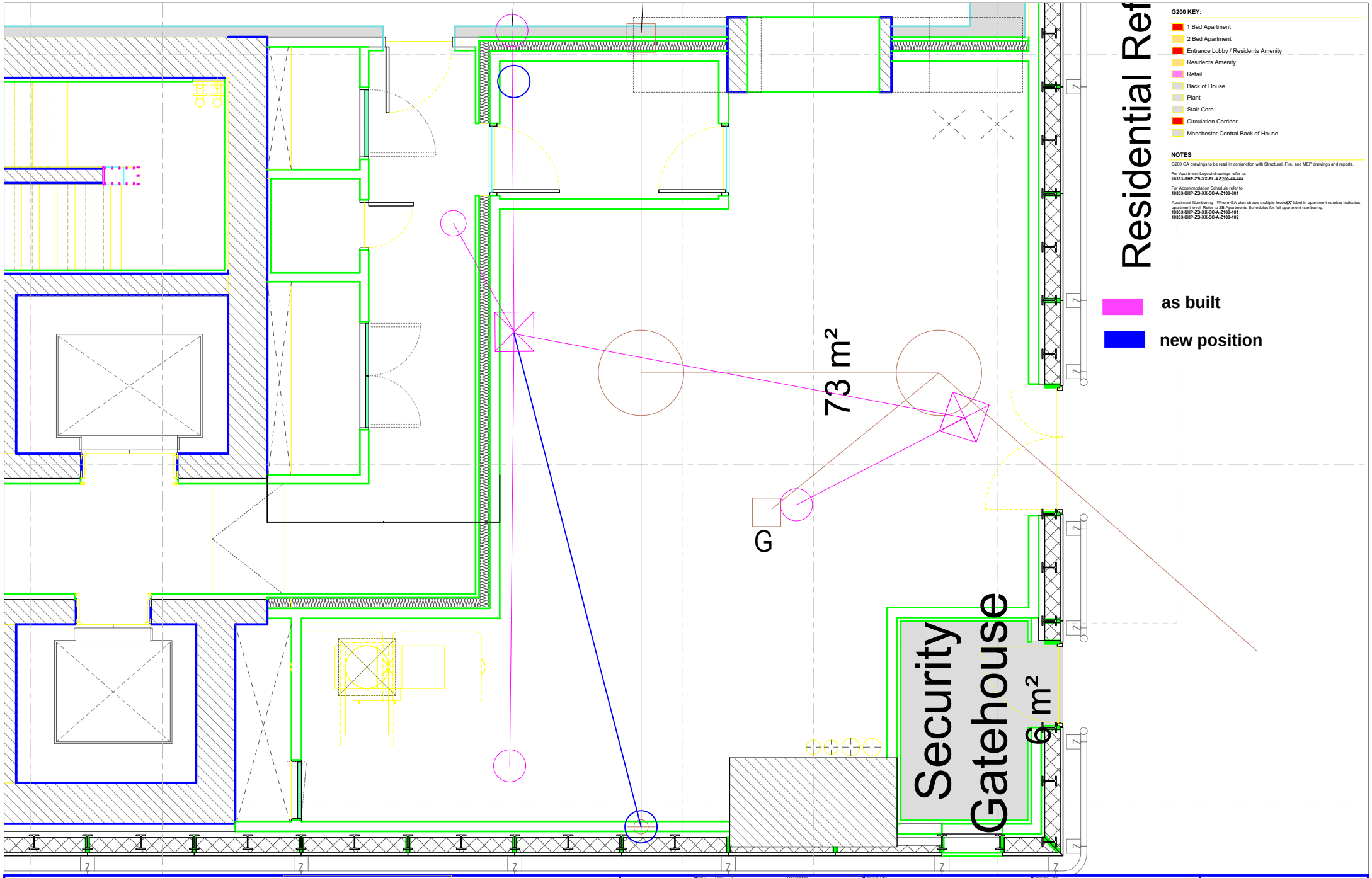


This drawing is copyright
Do not scale off dimensions.

All dimensions to be checked on site by contractor.

Contractor to report any dimensional discrepancies, errors or omissions prior to commencing on site.

Drawing to be read in conjuction with SHP specification.

Indicative details to illustrative visual intent only. All to contractors design.

All details to be co-ordinated with adjacent trades and SE and M+E Engineers details.

The contractor is responsible for meeting the specified performance criteria

ZONE KEY PLAN

B D C C

NORTH

Rev	Date	Description
P01	11-05-2020	First Issue
P02	19-06-2020	Stage 3 Issue
P03	31-07-2020	Structure, Amenity Space and Apartment Updates
P04	14-12-2020	Stage 4 Issue
P05	11-02-2021	Service Yard Bollards and Aco Drainage Added
P06	24-03-2021	L+L layouts incorporated, interior finishes to be confirmed
P07	16-07-2021	Levels 00,01,01M and 02 updated with approved L+L layouts
P08	02-09-2021	Stage 4 Issue (Level 00 - 02)
P09	22-08-2022	General Layout Updates

Project Title
Viadux
Manchester

Status
Stage 4

Drawing Title
Zone B - GA Plan - Level 01

Job No
10333

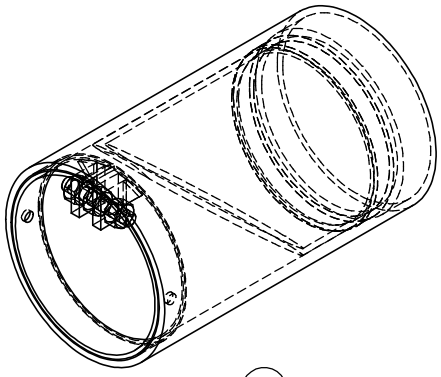
Scale
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1 : 100@ A1

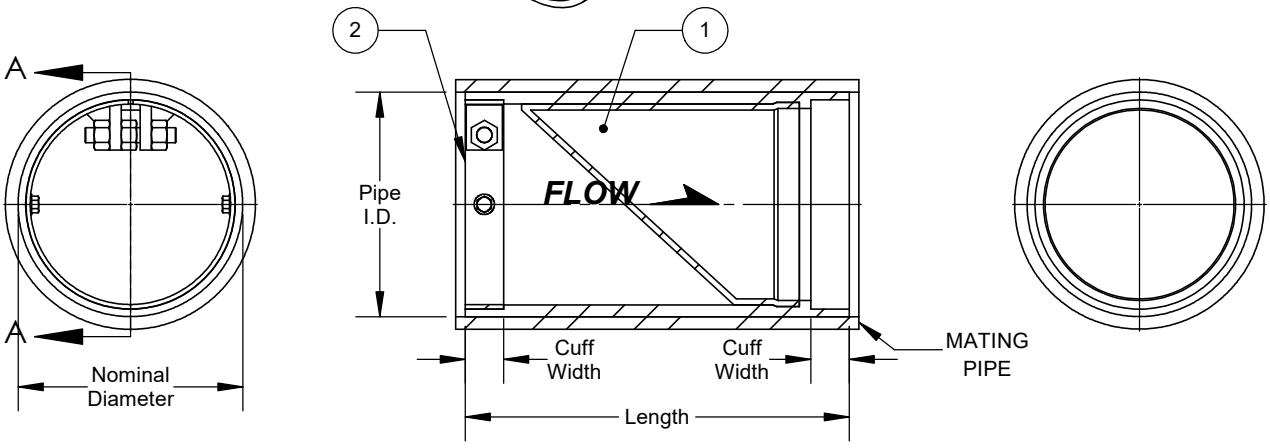
SHP Drawing Code
10333-SHP-ZB-01-PL- A-G200-001

Revision
P09

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London +44 (0)20 7549 4000

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SECTION A-A

Bill of Materials		
Item No.	**Description**	**Material**
1	CheckFlex CF-IL-G5: In-Line Check Valve	NN
2	Internal Expandable Clamp	316 SS

Notes:

1. Dimensions are approximate and may change due to pipe dimension, inlet pressure, back pressure and flow rates.
2. Installation, Operation & Maintenance Manuals

Nominal Diameter	**Qty.**	**Pipe I.D.**	**Clamp Installation Position**	**Standard Valve Dimensions**		**Flow Data**					**Approx. Weight**
				Cuff Width	**Length**	**Flow Media**	**Max. Flow Rate**	**Max. Flow Velocity**	**Line Pessure**	**Back Pessure**	
in. (mm)				**in. (mm)**	**in. (mm)**						**lbs (kgs)**
9.0 (225)		225mm	DISCHARGE END	1.97 (50)	16.1 (410)						18 (8.17)

Elastomer Material Code	**Cover Elastomer**	**Tube Elastomer**	**Maximum Operating Temperature**
			°F (°C)
EE	EPDM	EPDM	250 (121)
NN	NEOPRENE	NEOPRENE	225 (107)
NN-NSF61	ANSI/NSF 61 NEOPRENE	ANSI/NSF 61 NEOPRENE	225 (107)
PP	NITRILE	NITRILE	225 (107)
NR	NEOPRENE	NATURAL RUBBER	180 (82)
VV	VITON	VITON	250 (121)

225mm Check-Flex Inline Valve Gen5

Althon

CF-IL-G5-S0225-NN-316-IDP

PROJECT NOTES:

PROJECT NAME:

CUSTOMER:

SIZE	SCALE	DRAWING No.	SHEET
A	NTS	CF-IL-G5-S0225-NN-316-IDP	1 OF 1

CF-IL-G5-S0250-NN-316-IDP

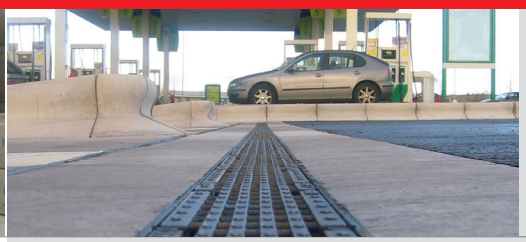
ACO Water Management:
Civils + Infrastructure

Uniclass L7315 + L2123	EPIC J3413
CI/SfB (52.5)	

ACO S Range







ACO S Range

Heavy-duty channel drainage system

VIENITE
THE SUSTAINABLE CHOICE

ACO

Introduction to the ACO Group

Throughout the world ACO branded drainage and surface water management systems are recognised for their innovative design, high quality manufacture, environmental excellence and industry leading performance.

Today the ACO Group has a research and production base that reaches across four continents. This unmatched resource pioneers the development of solutions that are tailored to individual applications, meeting the need for high performance, sustainable products that deliver optimum value throughout their operational life.



ACO Technologies plc

ACO operates as ACO Technologies plc in the United Kingdom. Founded over 30 years ago, the company has grown quickly on a reputation for design innovation and customer service.

There are now 2 divisions within ACO Technologies that serve every sector of the construction industry, providing solutions for applications as diverse as rail, highways, airports, landscaping, retail, distribution centres and environmentally sensitive projects.



To help architects, designers and contractors meet the legal requirements that now tightly control the way surface water is managed, ACO has created its unique system chain that combines a 'Surface Water Management Cycle' – Collect, Clean, Hold, Release, with the service support of Train, Design, Support and Care.

These processes enable ACO to offer a combination of product and service expertise necessary for the complete and sustainable management of surface water drainage.



The ACO Group / www.aco.com

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ACO S Range System

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ACO S300	20

ACO S Range: Problem Solving Drainage Solutions

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Introduction to ACO S Range

ACO S Range is an accessible grated channel drainage system, specifically designed for surface water management in heavy-duty and industrial applications such as petrol station forecourts, HGV parking and warehousing.

What is ACO S Range?

ACO S Range delivers high performance drainage for heavy-duty and industrial applications and is fully certified to BS EN 1433:2002 load class F 900*.

Manufactured from Vienite®, ACO's sustainable high strength polymer concrete material the S Range channels are available in four widths, 100mm, 150mm, 200mm and 300mm in a variety of depths and slopes.

Where a higher capacity drainage system is required the S150, S200 or S300 constant depth units are ideal for dealing with larger volumes of water. This keeps the water closer to the surface and reduces the need for costly underground pipe networks.

Depending on the application and anticipated traffic the S100 range is available with a choice of ductile iron grating and cover designs including Slotted, Heelguard™, Intercept and Solid.

The S150, S200 and S300 ranges are supplied assembled with slotted ductile iron gratings. All gratings are fastened with a secure bolt locking system.



Typical applications

- Car parking
- HGV parking
- Petrol station forecourts
- Industrial
- Distribution and warehouses
- Ports and docks
- Aircraft pavements

If you need help with specification, design or installation, or just wish to learn more about this and other Surface Water Management products from ACO, contact our free, no obligation ACO Water Management Design Services Team who can provide advice and dedicated design support for your project – 01462 816666 or visit www.aco.co.uk.

***Not suitable for carriageways of public roads or motorways**

Why Choose ACO S Range?

Heavy-duty

S Range is specifically designed for heavy-duty and industrial applications fully certified to BS EN 1433:2002 for applications up to and including F 900*.

The polymer concrete's high strength characteristics means the material is four times stronger than traditional concrete.

All S Range channels are supplied with integral cast iron rails for channel body protection. The rails not only provide strength and wear resistance to the channels for long service life, but also ensure each heavy-duty grating can be fully secured from movement by our proven and reliable four point, M10 high tensile bolt locking system.

Durability & water tightness

Manufactured from Vienite® the S Range channel bodies have many benefits including excellent resistance to dilute acids and alkalis, is unaffected by road salts, fuels and oils typically encountered during service.

Having a water absorption level of only 0.01% by weight, Vienite® ensures water tight installations can be achieved to prevent unwanted contamination of surrounding soil or ground water in applications such as petrol stations.

Accessibility

The S Range has a full range of sumps and gullies to provide a complete solution for efficient drainage and long term silt management with maintenance by standard jet washing techniques.

Each heavy-duty grating is accessible by our proven and reliable four point, M10 high tensile bolt locking system.



System benefits:

- Range of constant and sloped depth channels
- Caters for extreme wheel loads such as aircraft pavements, ports and docks
- Strong and robust design
- CE Marked and BS EN 1433:2002 certified to Load Class F 900*
- Caters for a range of catchment depths
- Choice of slotted, Heelguard™, intercept and solid cover gratings on the 100mm wide system
- All gratings come complete with locking bolts
- Sump and gully outlets available for connection to underground drainage

NEW ACO QuAD Hydraulic Design Software

Register online for our free, secure online design software:

- All designs are securely stored and easily accessed online
- Data always up-to-date
- Proven calculation methodology - more accurate and efficient designs
- Flexible catchment design
- Integrated rainfall data
- Automated product optimisation
- PDF summary documents



Register Now - It's Free

www.aco.co.uk/quad-hydraulic-design-2.0

*Not suitable for carriageways of public roads or motorways

ACO S RANGE FEATURES OVERVIEW

S150, S200 and S300 channels come with ductile iron grates pre-bolted to the channel

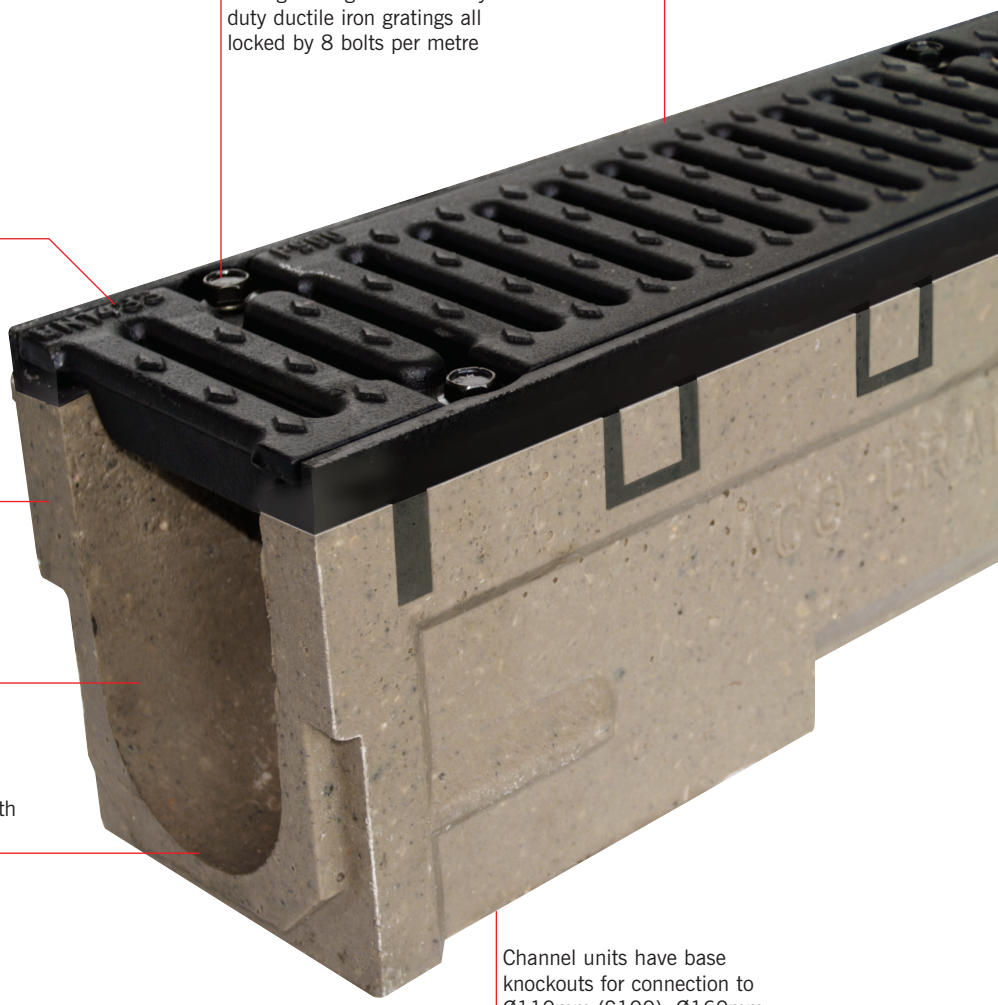
A range of high intake heavy-duty ductile iron gratings all locked by 8 bolts per metre

S100 channels are compatible with a choice of four ductile iron grates

Interconnecting channel end detail to aid alignment during installation

Smooth polymer concrete channel bore for efficient hydraulic performance

Constant and sloping depth channels available



Channel units have base knockouts for connection to Ø110mm (S100), Ø160mm (S150 and S200) and Ø200 (S300) U-PVC pipes

LOAD CLASSES



A 15

Pedestrian, cycleways, minimally trafficked area (light domestic vehicles only).



B 125

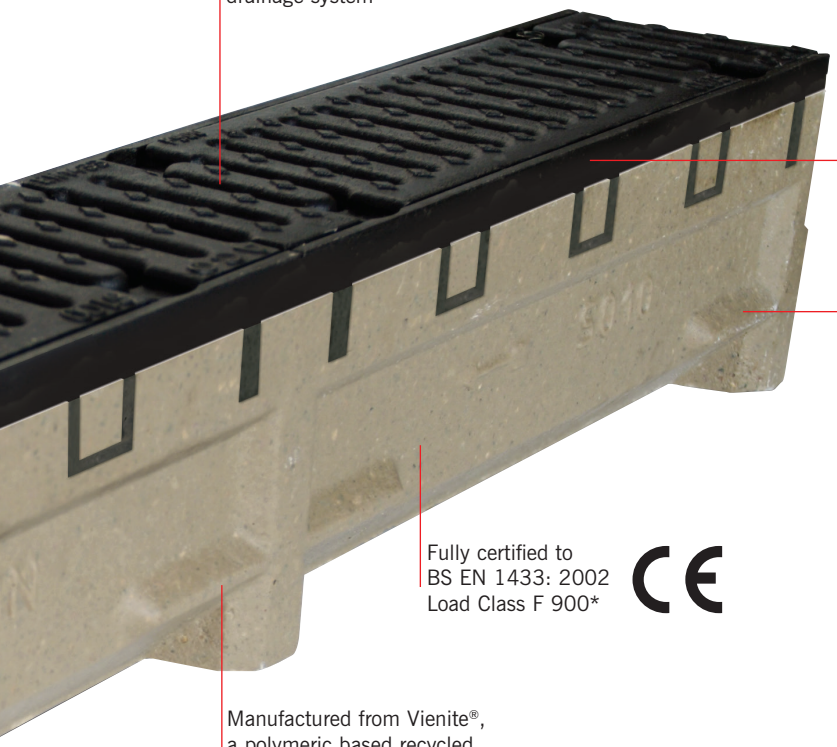
Pedestrian precincts, light vehicles, private car parks and drives.



C 250

Parking areas, service stations (cars) and slow-moving light commercial vehicles.

Traditional channel and grating drainage system



Integral cast iron edge rails provide maximum strength and protection for channel body

The ACO S Range system is available in four channel widths: 100mm, 150mm, 200mm and 300mm

Fully certified to BS EN 1433: 2002 Load Class F 900*

Manufactured from Vienite®, a polymeric based recycled material, strong and lightweight design, improves stability and anchors product into concrete surround.

ACO S100 channels come with a choice of intercept, slotted, Heelguard™ and solid cover grates in ductile iron.
See page 14 for further details.

D 400*

Parking areas for all vehicle types, distribution yards.

E 600*

Industrial areas, heavy wheel loads, slow-moving HGV's and forklifts, service stations.

F 900*

Airport runways, very heavy industrial and military installations, service yards and lorry parks.

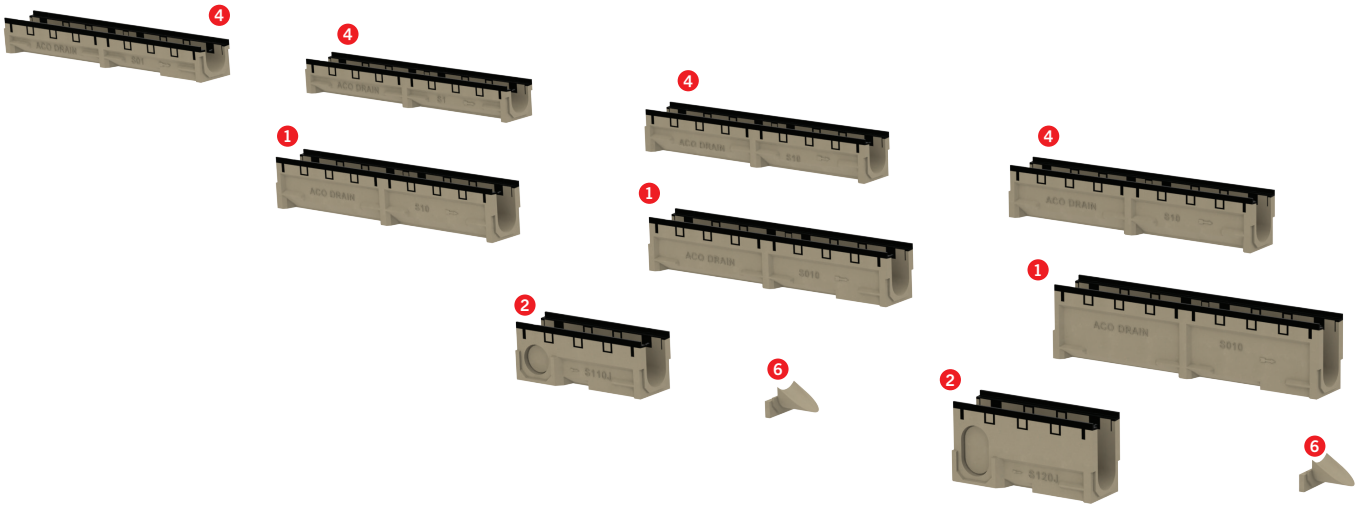
*Not suitable for carriageways of public roads or motorways

ACO S Range Layout

To support a wide variety of catchment depths, hydraulic capacities and applications, the system is available in four channel widths, 100mm, 150mm, 200mm and 300mm and has a range of constant depths and sloping depth channels to suit the drainage design.

The layout below illustrates the channels and accessories available within the ACO S Range and to aid product selection, a summary of the function and feature of each component is provided.

All ACO S Range channels are supplied with ductile iron edge rails.



1 Constant depth channels – 1m



- **100mm wide bore:** Five constant depth channel units are available in 1m lengths with overall depths ranging from 137mm to 311mm.
- **150mm wide bore:** Three constant depth channel units are available in 1m lengths with overall depth ranging from 220mm to 320mm.
- **200mm wide bore:** One constant depth channel unit available in a 1m length with overall depth of 309mm.
- **300mm wide bore:** One constant depth channel unit available in a 1m length with overall depth of 390mm.

These channels include a vertical knockout for connection to Ø110mm (100mm wide bore channels), Ø160mm (150mm and 200mm wide bore channels) and Ø200mm (300mm wide bore channel) pipework.

2 Constant depth channels – 0.5m



- **100mm wide bore:** Three 0.5m constant depth channel units are available with overall depths ranging from 191mm to 311mm
- **150mm wide bore:** Two 0.5m constant depth channels with overall depths ranging from 220mm to 270mm.
- **200mm wide bore:** One 0.5m constant depth channel with overall depth of 309mm.
- **300mm wide bore:** One constant depth channel unit available in a 1m length with overall depths of 390mm.

These channels include a vertical knockout for connection to Ø110mm (100mm wide bore channels), Ø160mm (150mm and 200mm wide bore channels) and Ø200mm (300mm wide bore channel) pipework and side knockout for 90° channel connections.

3 Sump



- **100mm wide bore:** One 0.5m sump for connection to each constant depth 0.5m channel.
- **150mm wide bore:** One 0.5m sump with a depth of 900mm.
- **200mm wide bore:** the Universal Gully is used with this range.
- **300mm wide bore:** One gully top with either shallow or deep base units with an overall depth of 655mm to 910mm

Each system width has one 0.5m universal sump for connection to all channels. Outlet options for Ø110mm and Ø160mm pipes and foul air traps. Plastic silt bucket provided with each unit.

4 Sloping depth channels



- **100mm wide bore:** Thirty 1m sloping channels with 0.6% fall in depths from 137mm to 317mm.

5 Universal Gully

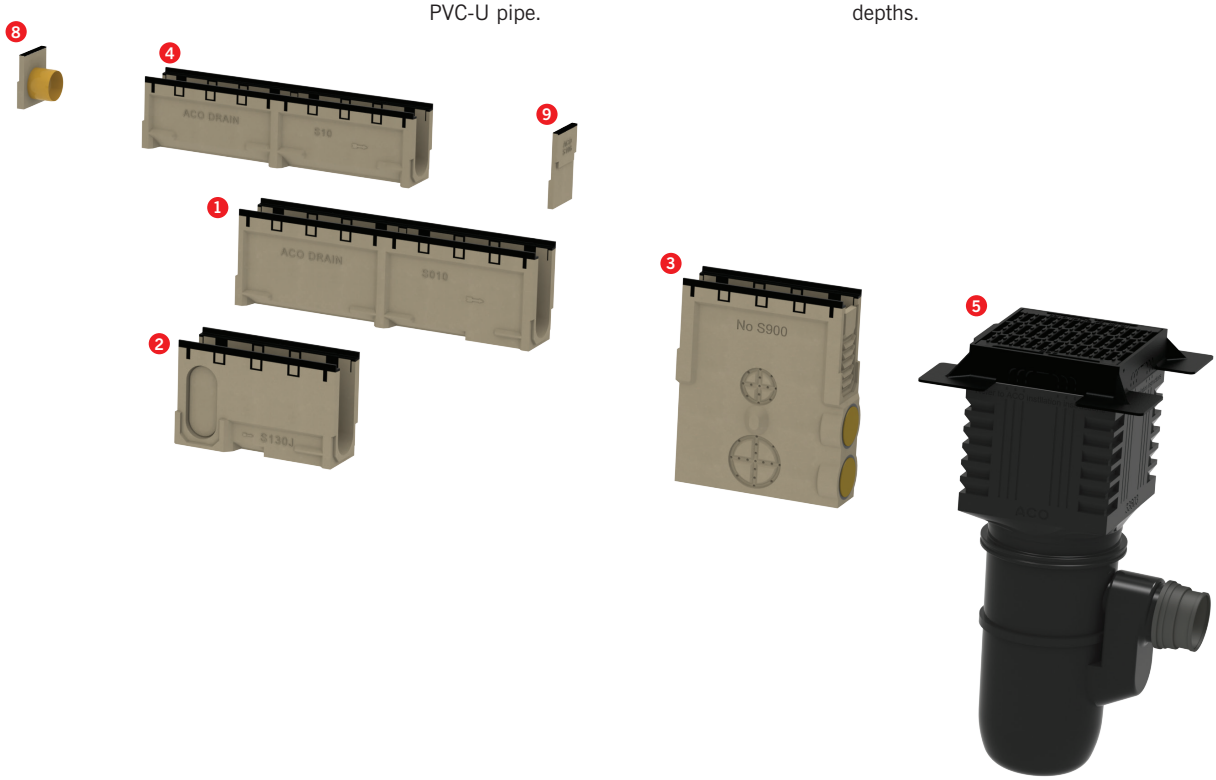


One universal gully for all applications compatible with S100, S150 and S200 ranges and certified up to Load Class F 900. Standard features include ductile cast iron cover, silt bucket and roddable foul air trap for connection to Ø160mm PVC-U pipe.

6 Step Connector



A polymer concrete unit which helps provide smooth water transition between constant depth channels when used in a stepped system design. The step connector is suitable for the 60mm step between each of the constant channel depths.



7 Inlet Endcap



Three depths of Polymer concrete Inlet Endcaps to be used at specific points in the channel run.

8 Outlet Endcap



Three depths of Polymer concrete Outlet Endcaps to be used at specific points in the channel run.

9 Closing Endcap



Three depths of Polymer concrete Closing Endcaps with integral cast iron edge to be used at specific points in the channel run.

ACO S100

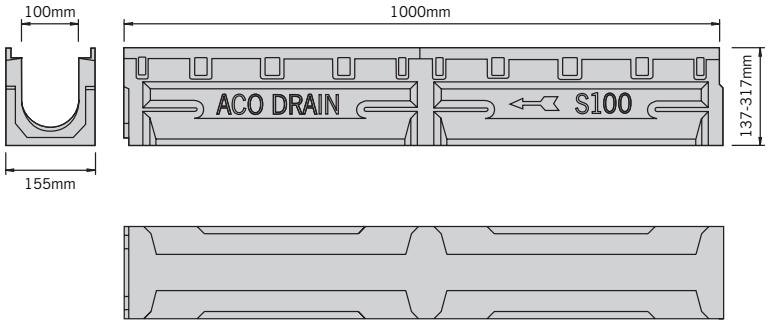
ACO S100 channels listed below are provided with integral cast iron edge rails.

Suitable for applications up to and including BS EN 1433:2002 load class F 900*. For the S100 range of gratings to suit these channels refer to page 14.

The ACO universal gully can be used with all S100 channels see page 18 for further details.

Sloping depth channels with cast iron edge rails

Product code	Description	Length (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)	Sump	Gully unit	Closing endcap	Outlet endcap	Inlet endcap
0270	S1	1000	137/143	112/118	20.0	-	601/602/607	S106	-	-
0271	S2	1000	143/149	118/124	20.3	-	601/602/607	S106	-	-
0272	S3	1000	149/155	124/130	20.4	-	601/602/607	S106	-	-
0273	S4	1000	155/161	130/136	20.9	S900	601/602/607	S106	-	-
0275	S5	1000	161/167	136/142	21.0	-	601/602/607	S106	-	-
0276	S6	1000	167/173	142/148	21.1	-	601/602/607	S106	-	-
0277	S7	1000	173/179	148/154	22.9	-	601/602/607	S106	-	-
0278	S8	1000	179/185	154/160	23.3	-	601/602/607	S106	-	-
0279	S9	1000	185/191	160/166	24.1	S900	601/602/607	S106	S108	-
0281	S10	1000	191/197	166/172	24.7	-	601/602/607	S106	-	S109
0282	S11	1000	197/203	172/178	24.8	-	601/602/607	S206	-	-
0283	S12	1000	203/209	178/184	24.9	-	601/602/607	S206	-	-
0284	S13	1000	209/215	184/190	25.0	-	601/602/607	S206	-	-
0285	S14	1000	215/221	190/196	25.7	S900	601/602/607	S206	-	-
0286	S15	1000	221/227	196/202	25.8	-	601/602/607	S206	-	-
0287	S16	1000	227/233	202/208	26.3	-	601/602/607	S206	-	-
0288	S17	1000	233/239	208/214	27.4	-	601/602/607	S206	-	-
0289	S18	1000	239/245	214/220	27.7	-	601/602/607	S206	-	-
0290	S19	1000	245/251	220/226	28.5	S900	601/602/607	S206	S208	-
0292	S20	1000	251/257	226/232	28.8	-	601/602/607	S206	-	S209
0293	S21	1000	257/263	232/238	29.2	-	601/602/607	S306	-	-
0294	S22	1000	263/269	238/244	29.3	-	601/602/607	S306	-	-
0295	S23	1000	269/275	244/250	30.0	-	601/602/607	S306	-	-
0296	S24	1000	275/281	250/256	31.1	S900	601/602/607	S306	-	-
0297	S25	1000	281/287	256/262	31.2	-	601/602/607	S306	-	-
0298	S26	1000	287/293	262/268	31.3	-	601/602/607	S306	-	-
0299	S27	1000	293/299	268/274	32.3	-	601/602/607	S306	-	-
0300	S28	1000	299/305	274/280	32.7	-	601/602/607	S306	-	-
0301	S29	1000	305/311	280/286	33.1	S900	601/602/607	S306	S308	-
0303	S30	1000	311/317	286/292	34.7	-	601/602/607	S306	-	S309



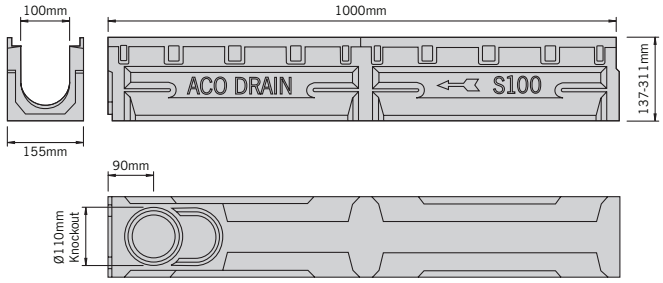
S100 1m sloping depth channel

***Not suitable for carriageways of public roads or motorways**

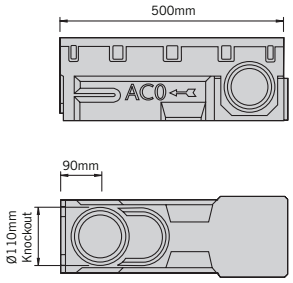
ACO S100

Constant depth channels with cast iron edge rails

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)	Knockout union	Sump	Gully unit	Closing endcap	Outlet endcap	Inlet endcap	Step connector
0269	S01*	1000	100	155	137	112	20.4	820/821	-	601/602/607	S106	-	-	-
0274	S05*	1000	100	155	161	136	21.9	820/821	S900	601/602/607	S106	-	-	-
0403	S010*	1000	100	155	191	166	25.3	820/821	S900	601/602/607	S106	S108	S109	123
0280	S110J*	500	100	155	191	166	13.7	820/821	S900	601/602/607	S106	S108	S109	123
0405	S020*	1000	100	155	251	226	28.9	820/821	S900	601/602/607	S206	S208	S209	123
0291	S120J*	500	100	155	251	226	17.4	820/821	S900	601/602/607	S206	S208	S209	123
0407	S030*	1000	100	155	311	286	33.3	820/821	S900	601/602/607	S306	S308	S309	-
0302	S130J*	500	100	155	311	286	19.7	820/821	S900	601/602/607	S306	S308	S309	-



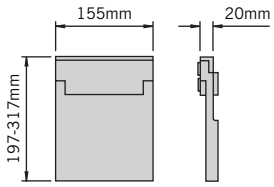
S100 1m constant depth channel



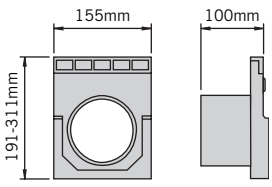
S100 0.5m constant depth channel

Closing outlet and inlet endcaps

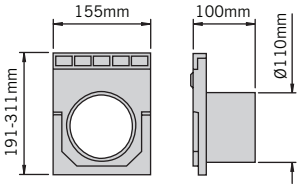
Product code	Description	Length (mm)	Spigot length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
0411	S106 - Closing	20	-	155	197	-	1.0
0413	S206 - Closing	20	-	155	257	-	1.3
0414	S306 - Closing	20	-	155	317	-	1.7
0415	S108 - Outlet	100	80	155	191	166	1.2
0416	S208 - Outlet	100	80	155	251	226	1.5
0418	S308 - Outlet	100	80	155	311	286	1.9
0419	S109 - Inlet	100	80	155	191	166	1.1
0420	S209 - Inlet	100	80	155	251	226	1.5
0421	S309 - Inlet	100	80	155	311	286	1.9



Closing endcaps



Outlet endcaps



Inlet endcaps

* These level invert channels have a vertical Ø110mm knockout.
J Indicates availability of side junction for 90° bends.

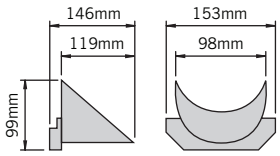
Note: Level invert channels can be inserted to extend a run. Please refer to the channel range layout on page 8. See channel parts table to match endcap with correct channel.

These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.

ACO S100

Step connector

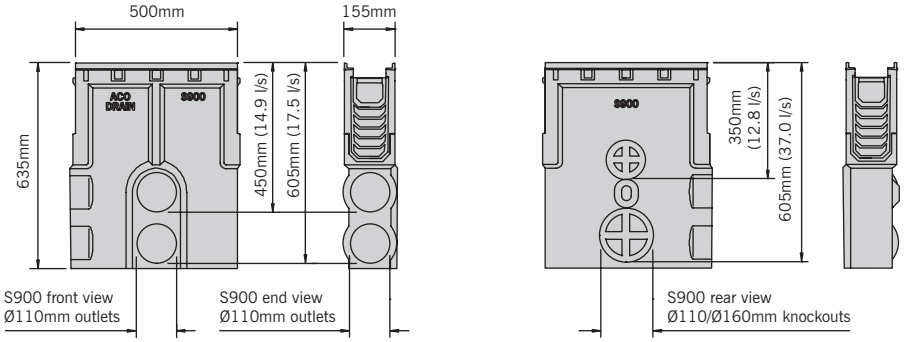
Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
0858	60mm step S123	119	98	153	99	60	1.1



Step connector

Sump unit with cast iron edge rails

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
4223	Sump unit and polypropylene bucket assembly S900	500	100	155	635	605	38.3



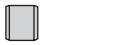
Sump unit

Note: For universal gully details please refer to page 18.

These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.

Drain unions and foul air traps

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
0056	820 Drain union PVC-U Ø110mm	100	100	110	-	-	0.1
0057	821 Drain union oval to round PVC-U 110/Ø160mm	175	150	160	-	-	0.5
0058	822 Drain union PVC-U Ø160mm	150	150	160	-	-	0.5
2640	920 Foul air trap PVC-U Ø110mm	-	100	110	-	360	0.5
2638	922 Foul air trap PVC-U Ø160mm	-	150	160	-	340	1.9
7931	940 Roddable foul air trap MDPE Ø110mm	-	100	110	-	450	0.6
7932	950 Roddable foul air trap MDPE Ø160mm	-	150	160	-	400	0.8



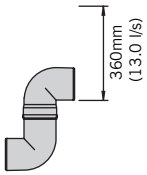
820 Drain union PVC-U Ø110mm



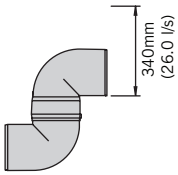
821 Drain union oval to round PVC-U 110/Ø160mm



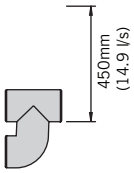
822 Drain union PVC-U Ø160mm



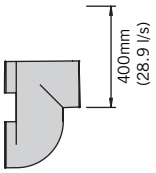
920 Foul air trap PVC-U Ø110mm



922 Foul air trap PVC-U Ø160mm



940 Roddable foul air trap MDPE Ø110mm



950 Roddable foul air trap MDPE Ø160mm

Polymer repair kit

Product code	Description	Weight (kg)
32599	Polymer concrete repair kit	1kg†



Polymer repair kit

Note: For universal gully details please refer to page 18.
†Repair kit includes 0.5kg tin of natural colour polyester concrete repair resin, grey and black pigment, hardener paste, mixing instructions and material safety data sheets.

These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.

Gratings for use with ACO S100 channels complete with four locking bolts

Gratings for Load Class E 600 applications

E 600

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width / hole dia (mm)	Intake area mm²/m	Anti-shunt feature	Weight (kg)
0776	Intercept heavy-duty ductile iron ref. 776	500	139	15	10	29000	n/a	6.8



Intercept heavy-duty ductile iron grating

Gratings for Load Class F 900 applications

F 900

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width / hole dia (mm)	Intake area mm²/m	Anti-shunt feature	Weight (kg)
4604	Slotted heavy-duty ductile iron ref 772	500	139	15	10	32000	n/a	5.6
0774	Heelguard™ heavy-duty ductile iron ref 774	500	139	15	5	16100	n/a	6.7
7626	Solid cover ductile iron ref 778	500	139	15	n/a	n/a	n/a	6.7



Slotted heavy-duty ductile iron grating



Solid cover ductile iron



Heelguard™ heavy-duty ductile iron grating

Note: All ACO S Range gratings come complete with bolts to ensure the system can be locked and accessed when required.

Grating accessories

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Slot width / hole dia (mm)	Intake area mm²/m	Anti-shunt feature	Weight (kg)
2324	Spare S100 bolt	30	10	-	-	-	-	0.03
1367	Grating lifting tool 835	n/a	n/a	n/a	n/a	n/a	n/a	0.1



S100 bolt



835 grating lifting tool

ACO S150

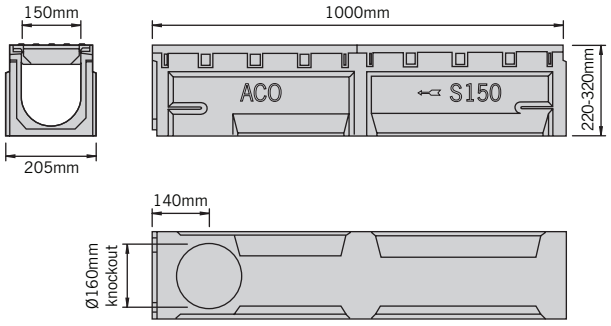
ACO S150 channels listed below are provided with integral cast iron edge rails complete with slotted ductile iron gratings and locking bolts.

Suitable for applications up to and including BS EN 1433:2002 load class F 900*. Gratings have 14mm wide slots providing an intake area of 63400mm²/m.

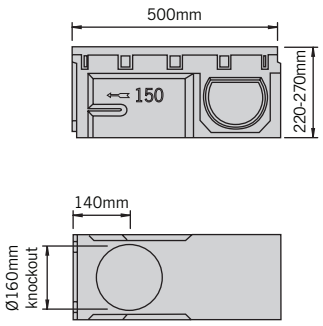
The ACO universal gully can be used with all S150 channels see page 18 for further details.

Constant depth channels complete with ductile iron gratings

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)	Knockout union	Sump	Gully unit	Closing endcap	Outlet endcap	Inlet endcap	Step connector
1151	S150 1501**	1000	150	205	220	195	44.1	822	0875	601/602/607	1130	1131	-	1159
1152	S150 1502**	1000	150	205	270	245	52.8	822	0875	601/602/607	1130	1132	-	1159
1153	S150 1503**	1000	150	205	320	295	57.2	822	0875	601/602/607	1130	1133	-	1159
1176	S150 1504J**	500	150	205	220	195	26.1	822	0875	601/602/607	1130	1131	-	1159
1154	S150 1505J**	500	150	205	270	245	28.6	822	0875	601/602/607	1130	1132	-	1159



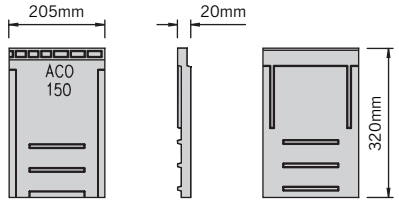
S150 1m constant depth channel



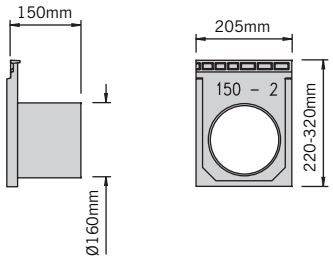
S150 0.5m constant depth channel

Endcaps

Product code	Description	Length (mm)	Spigot length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
1130	Closing S150**†	20	-	205	320	-	2.6
1131	Outlet S150 1131	150	130	205	220	195	2.4
1132	Outlet S150 1132	150	130	205	270	245	2.7
1133	Outlet S150 1133	150	130	205	320	295	3.0



Closing endcap



Outlet endcaps

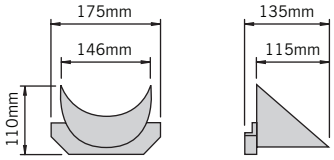
*Not suitable for carriageways of public roads or motorways
**These Level Invert Channels have a vertical Ø160mm knockout
J Indicates availability of side junction for 90° bends
† Can be cut on site to suit invert depth

Note: As with all pre-cast products, polymer concrete units are subject to weight and dimensional tolerances.

ACO S150

Step connector

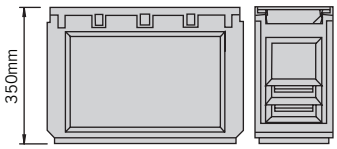
Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
1159	50mm step connector	115	146	175	110	50	1.0



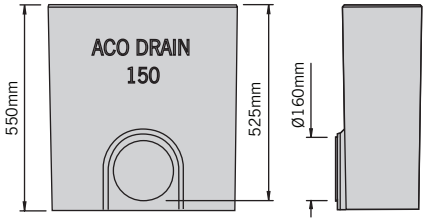
Step connector

Sump units

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
0875	Sump assembly top and base*	500	150	205	900	875	62.7
1168	Raising piece	500	150	205	350	240	18.5



Sump top unit



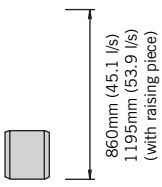
Sump base unit



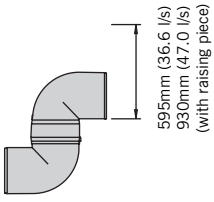
Sump raising piece

Drain unions & foul air trap

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
0058	822 Drain union PVC-U Ø160mm	150	150	160	-	-	0.5
2638	922 Foul air trap PVC-U Ø160mm	-	150	160	-	Varies	1.9



822 Drain union
PVC-U Ø160mm



922 Foul air trap
PVC-U Ø160mm

***Note: For a deeper sump, the raising piece may be inserted between the top and base units. For universal gully details please refer to page 18. For repair kit information please see page 13. As with all pre-cast products, polymer concrete units are subject to weight and dimensional tolerances.**

ACO S200

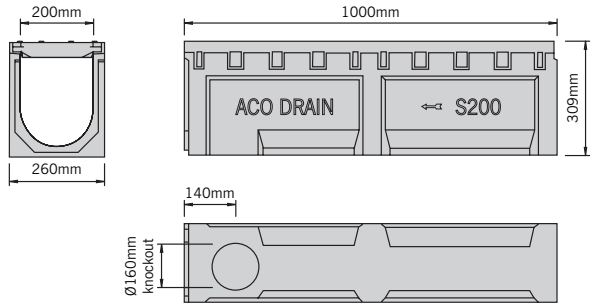
ACO S200 channels listed below are provided with integral cast iron edge rails complete with slotted ductile iron gratings and locking bolts.

Suitable for applications up to and including BS EN 1433:2002 load class F 900*. Gratings have 16mm wide slots providing an intake area of 90900mm²/m.

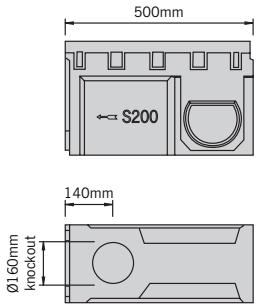
The ACO universal gully can be used with all S200 channels see page 18 for further details.

Constant depth channels with ductile iron gratings

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)	Knockout union	Sump	Gully unit	Closing endcap	Outlet endcap	Inlet endcap
1427	S200 2300**	1000	200	260	309	279	82.5	822	n/a	601/602/607	1516	1517	-
2847	S200 2310J**	500	200	260	309	279	40.0	822	n/a	601/602/607	1516	1517	-



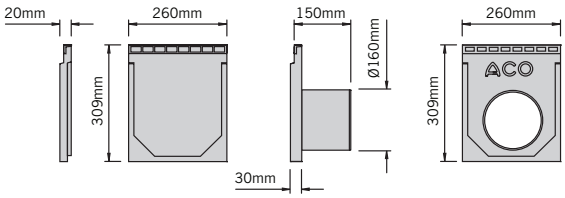
S200 1m constant depth channel



S200 0.5m constant depth channel

Endcaps

Product code	Description	Length (mm)	Spigot length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
1516	Closing S200	20	-	260	309	-	3.7
1517	Outlet S200 Ø160mm	150	130	260	309	274	3.5



Closing endcap

Outlet endcap

Drain union

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
0058	822 Drain union PVC-U Ø160mm	150	150	160	-	-	0.5



822 Drain union PVC-U Ø160mm

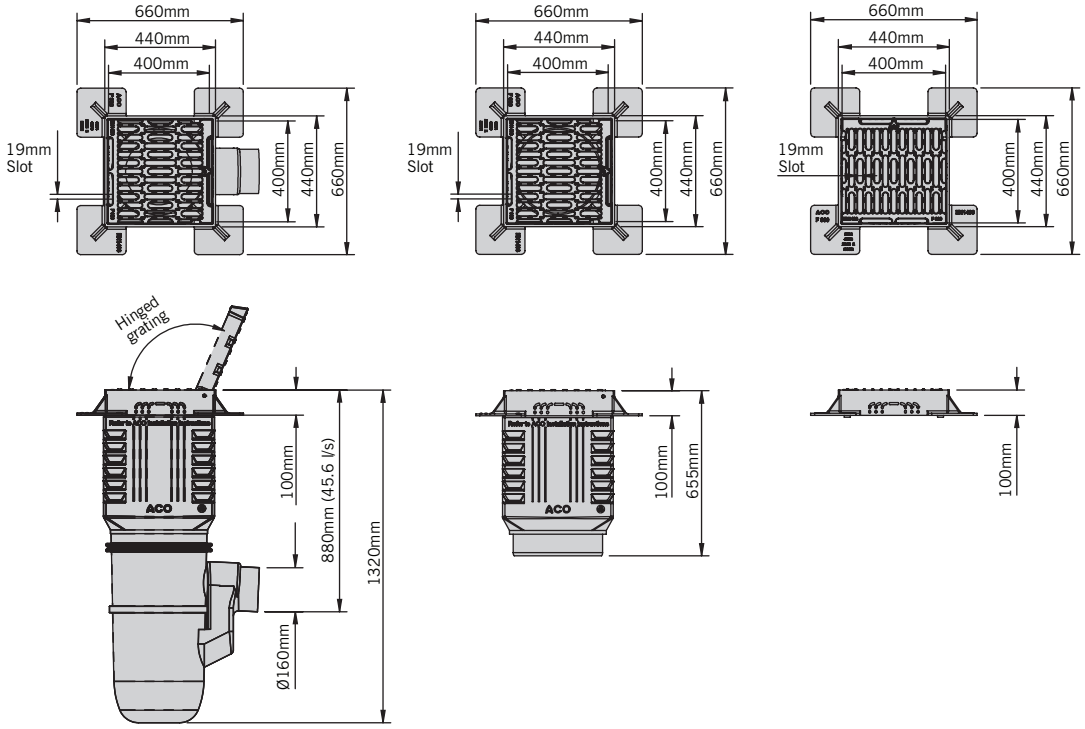
*Not suitable for carriageways of public roads or motorways
**All Level Invert Channels have a vertical Ø160mm knockout.
J Indicates availability of side junction for 90° bends.

For universal gully details please refer to page 18. For repair kit information please see page 13. These products are subject to weight and dimensional tolerances. The dimensions shown on this page are for guidance purposes only.

ACO Universal Gully

ACO Universal Gully for S100, S150 and S200 channels

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Slot width (mm)	Weight (kg)
33601	Gully assembly and bucket 601F	440	440	1315	870	19	78.8
33602	Gully assembly no bucket 602F	440	440	1315	870	19	77.4
33607	Gully top assembly only 607F	440	440	655	-	19	73.1
33604	Grating and frame 604F	400*	660††	100	-	19	69.5



Gully assembly No 601F and No 602F

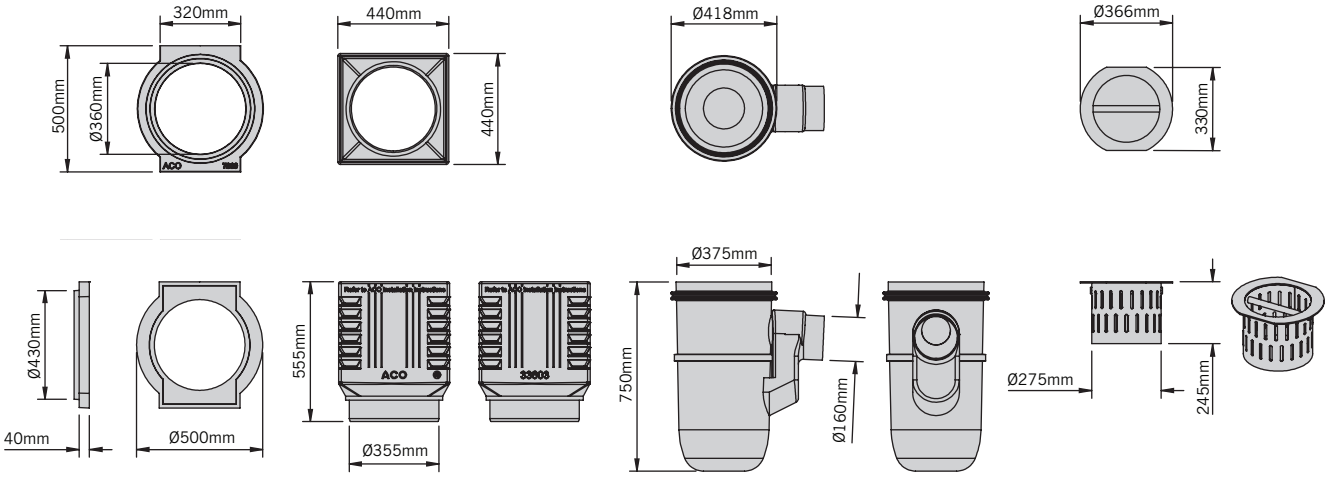
Gully top assembly No 607F
(Gully pot supplied by others)

Gully grating and frame only No
604F

* Clear opening size
†† Over frame size

ACO Universal Gully components

Product code	Description	Length (mm)	Width overall (mm)	Depth overall (mm)	Invert (mm)	Weight (kg)
7060	Gully connector 615	500	Ø500	40	-	7.0
33603	Gully intermediate unit 603	440	440	555	-	5.1
33605	Gully base unit 605	-	Ø375	750	310	4.3
33606	Bucket polyethylene 606	-	Ø275	245	-	1.4



Gully connector No 615 | Gully intermediate unit No 603 | Gully base unit No 605 | Gully bucket No 606

ACO S300

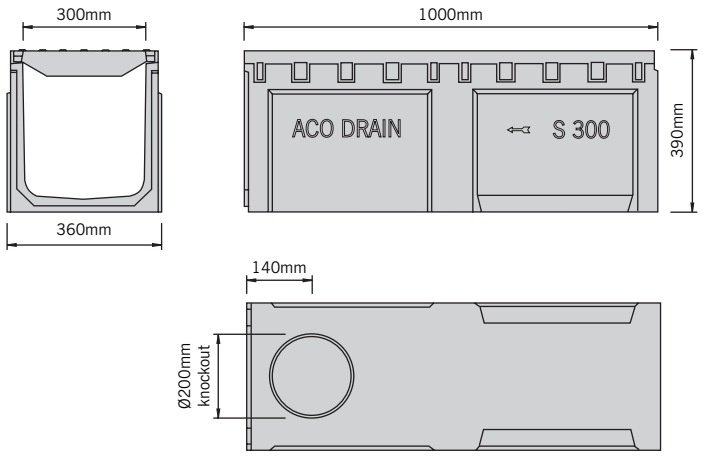
ACO S300 channels listed below are provided with integral cast iron edge rails complete with slotted ductile iron gratings and locking bolts.

Suitable for applications up to and including BS EN 1433:2002 load class F 900*.

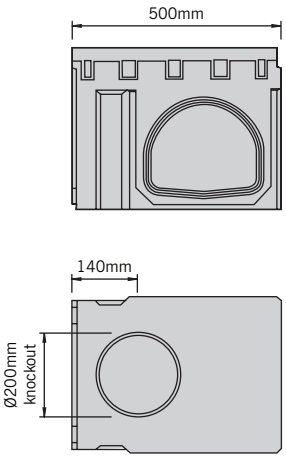
Gratings have 16mm wide slots providing an intake area of 137100mm²/m.

Constant depth channels complete with ductile iron gratings

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)	Knockout union	Closing endcap	Outlet endcap	Inlet endcap
2632	S300 2400**	1000	300	360	390	360	132.5	823	2573	2574	-
1766	S300 1766J**	500	300	360	390	360	62.83	823	2573	2574	-



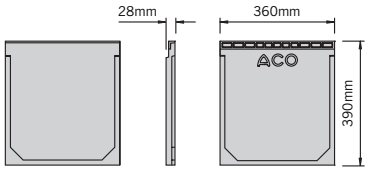
S300 1m constant depth channel



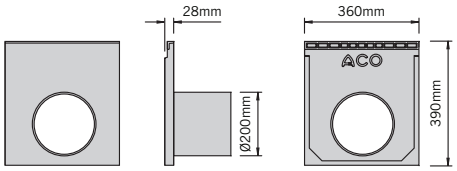
S300 0.5m constant depth channel

Endcaps

Product code	Description	Length (mm)	Width bore (mm)	Width invert (mm)	Width overall (mm)	Depth overall (mm)	Weight (kg)
2573	Closing S300	28	-	-	360	390	6.3
2574	Outlet S300 Ø200mm	205	190	358	360	390	3.0



Closing endcap



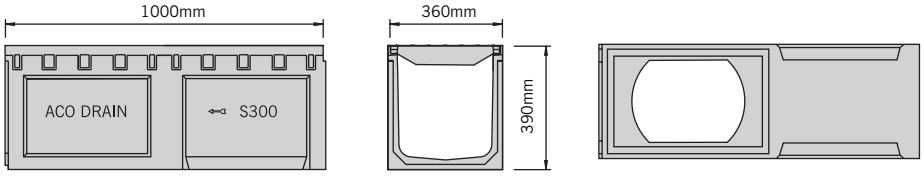
Outlet endcap

*Not suitable for carriageways of public roads or motorways
**All Level Invert Channels have a vertical Ø200mm knockout.
J indicates availability of side junction for 90° bends.

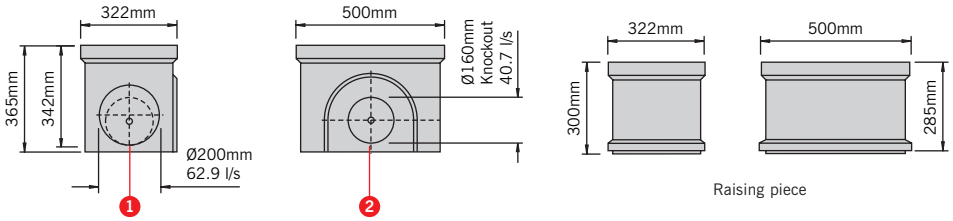
Note: As with all pre-cast products, polymer concrete units are subject to weight and dimensional tolerances.

ACO S300 gully units and accessories

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)	Knockout union	Closing endcap	Outlet endcap
3102	S300 Gully top 2410	1000	300	360	390	360	133.2	-	2573	2574
1614	Shallow base unit	500	-	320	365	-	25.4	822/823	-	-
4520	Deep base unit only	500	-	320	520	-	37.2	822/823	-	-
1697	Raising piece	500	-	320	300	-	24.0	822	-	-
1616	Silt bucket	-	-	-	-	-	4.7	-	-	-



S300 Gully top 2410

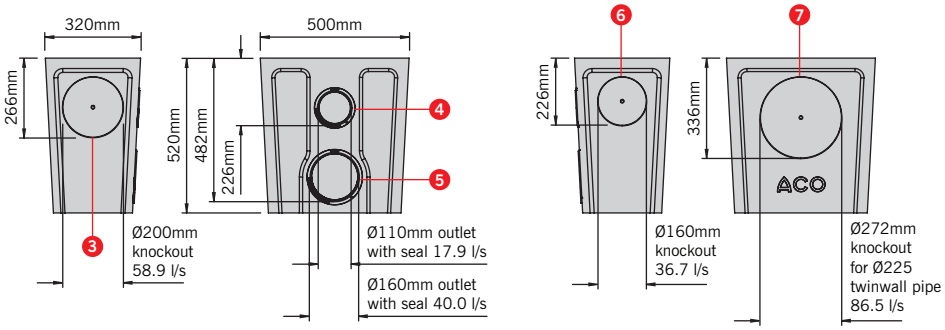


Shallow base unit

Raising piece

Invert Depths (without raising piece)

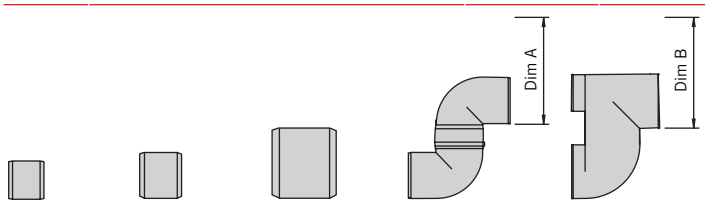
1. 717mm
2. 717mm
3. 641mm
4. 631mm
5. 857mm
6. 601mm
7. 711mm



Deep base unit only

Drain unions and foul air traps

Product code	Description	Length (mm)	Width bore (mm)	Width overall (mm)	Depth overall (mm)	Invert depth (mm)	Weight (kg)
0056	820 Drain union PVC-U Ø110mm	100	-	-	-	-	0.1
0058	822 Drain union PVC-U Ø160mm	150	150	160	-	-	0.5
2723	823 Drain union PVC-U Ø200mm	200	190	200	-	-	0.7
2638	922 Foul air trap PVC-U Ø160mm	-	150	160	-	Varies	1.9
7932	950 Roddable foul air trap PVC-U Ø160mm	-	160	-	-	-	0.8



820 Drain union PVC-U Ø110mm

822 Drain union PVC-U Ø160mm

823 Drain union PVC-U Ø200mm

922 Foul air trap PVC-U Ø160mm

952 Roddable foul air trap MDPE Ø160mm

Units	Dim A	Dim B
1614/3102	452mm (33.91 l/s	509mm (36.41 l/s
1614/1697/3102	737mm (45.11 l/s)	660mm (42.31 l/s)
4520/3102	592mm (39.81)	649mm (41.91)
4520/1697/3102	877mm (49.61 l/s)	800mm (47.21 l/s)

Note: Inverts shown are related to S300 grating level. For repair kit information please see page 13.
As with all pre-cast products, polymer concrete units are subject to weight and dimensional tolerances.

Designing an ACO S Range drainage system

ACO Technologies online Hydraulic Design Software has been developed to give specifying engineers the option of designing and selecting the most appropriate channel drainage system for themselves, or using the tool in partnership with our dedicated Technical and Design Service. Using differential equations for spatially varied flow, this free online tool calculates the hydraulic capacity of channels accepting flow along their entire length. The software accurately analyses flow in the selected channel to check it has sufficient capacity. Furthermore it can optimise the selection and potentially downsize all or part of a channel run if it is oversized.



Designing a drainage system

The designer must input the rainfall intensity and total catchment area draining to each run of channel to calculate inflow to that channel system.

For normal situations Building Regulations (Approved Document Part H, 2015) suggests a default value of 50 mm/hour rainfall intensity should be an appropriate for catchments <4,000m^2. For larger drainage areas the designer should refer to BS 752

Where a specifier seeks to design their project in accordance with National Planning Policy Framework, the requirements of a Sustainable Drainage System and to Sewers for Adoption (7th edition) criteria, rainfall runoff will need to be managed at source and an allowance made for the effects of climate change over the lifetime of the development.

It should be noted that other calculation methods will not give the correct results for channel drainage systems. In particular the use of equations of steady uniform flow, such as Manning's equation, is not appropriate for channel drainage design. They will not work with level channels and give grossly inaccurate results at shallow gradients.

Using Flood Studies Report procedures to analyse rainfall frequency, intensity and duration, the Design Software allows the specifier to change the selected storm intensity and duration to the required standard (e.g. to the 1 in 30 and 1 in 100 year return periods), and to make allowance for the effects of climate change on rainfall over the lifetime of the development.

The design software also allows the end user to estimate alternative storage requirements.

ACO can also provide specifiers with conduit files for use in proprietary software like QuAD Hydraulic Design 2.0. Please contact the Design Services Team if you require any further information.

ACO Water Management Design Services Team

ACO has embraced the concept of value engineering as an approach to on-site construction that saves both time and money. ACO will review any design to minimise the total scheme and life cost of a proposal. By using ACO S Range water can be contained and conveyed close to the surface conforming to the National Standards of Sustainable Drainage Systems.

For detailed designs using the ACO Hydraulic Design Software, please contact the ACO Water Management Design Services Team. The team should also be consulted for advice where the inflow is not uniformly distributed along the channel.

The hydraulic performance tables within the relevant sections have been produced from the ACO QuAD Hydraulic Design 2.0 software, to facilitate a quick manual design method for the determination of the drainage requirements.

ACO Water Management Design Services Team

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Design method

ACO S Range channels are available in four widths (100mm, 150mm, 200mm and 300mm). Whilst channel can be laid flat, where longitudinal falls exist the hydraulic capacity of the system will be increased, allowing greater spacing between outfalls.

Channel systems can be provided with constant invert depth (Type 1) as a series or stepped invert depths (Type 3) or for the 100mm wide system as a pre-sloped channel invert system able to provide a fall of 0.6% over a 30m length (Type 2). The extent of pre-sloped invert systems can be extended further by incorporating lengths of constant invert channel.

Analysis of channel hydraulic capacity requires the use of a proprietary software programme like ACO Technologies QuAD Hydraulic Design 2.0 Software. Our design software enables users to develop an optimised design of stepped sizes of channels, increasing in size down the run of the channel. For more information visit www.aco.co.uk

For detailed designs using ACO Technologies QuAD Hydraulic Design 2.0 Software, please contact the ACO Water Management Design Services team. The team may also be consulted for advice where the inflow is not uniformly distributed along the channel.

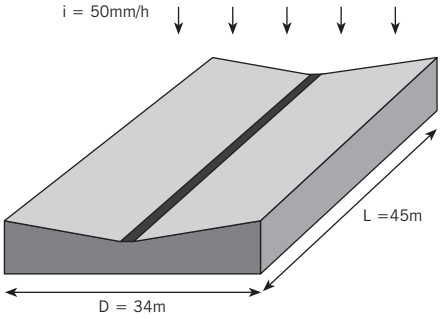
The tables on the following page have been produced from the ACO Hydro software to facilitate a quick manual design method for the determination of the drainage requirements.

The columns of drainage catchment area (A m2) are based on a rainfall intensity of 50mm/h, but can be adapted for use at any rainfall intensity. The columns of maximum flow rate (Q l/s) and maximum lateral inflow (q l/s/m) can be used at any rainfall intensity. The table of sloping invert channel capacities can be used for the design of ACO S100 sloping invert channels.

ACO Water Management
Design Services Team

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DESIGN EXAMPLE



For a design of ACO S Range S100, assume the following figures:

D = 34m (depth of catchment area)

L = 45m (length of channel run = length of catchment)

i = 50mm/h (design rainfall intensity)

Ground slope = 0%

Note that any other rainfall intensity may be used. Typical intensities (from BS EN 752) are 50mm/h for areas where some ponding could be tolerated for a few minutes after heavy rainfall, or 75mm/h where ponding cannot normally be tolerated.

1. Determine the area

Area = L x D = 45 x 34 = 1530m²

For a quick analysis, see the tables and the columns for Area.
1530m² is too large for one 45m run of ACO S Range S100 (S020)
Try 1530 x 1/2 = 765m²
L x 1/2 = 22.5m

Estimating between the rows for 20m and 30m lengths

One 22.5m run of ACO S Range S100 (S020) can drain approx 765m²
Hence two runs can drain the 1530m²

Or for a more detailed analysis, determine the total flow rate, as follows

2. Determine total flow (Q)

Q = (Area x i) / 3600 = (1530 x 50) / 3600 = 21.3 l/s

3. Determine lateral inflow (q)

q = Q / L = 21.3 / 45 = 0.473 l/s/m

4. Determine suitable channel sizes and lengths

For example, would a sump at 1/3 length work with a lateral inflow of 0.473 l/s/m²
1/3 L = 15m, ACO S Range S100 (S010) will be adequate
2/3 L = 30m, ACO S Range S100 (S030) will be adequate

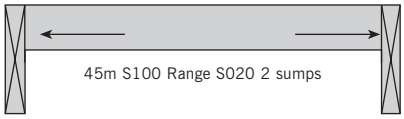
5. Check Outlet capacity

Ensure that the proposed outlet has sufficient hydraulic capacity by reference to the product technical pages.

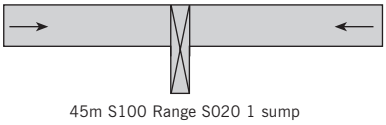
6. Solutions

Three options are sketched (right). There are other options, including S100 sloping invert channels or a 45m length run to an outfall using S150 (S1503) channels.

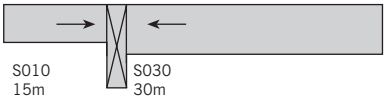
Option 1



Option 2



Option 3



ACO S100 Range hydraulic performance tables

Notes for ACO S100 hydraulic tables

The tables opposite shows the maximum capacity of the unit, assuming uniform lateral inflow. The capacity will depend on the length of the unit to the outlet and on any slope along the unit.

Q (l/s) is the maximum total flow that the channel can carry.

q (l/s/m) is the maximum possible lateral inflow.

A (m^2) is the maximum area that can be drained and will depend on the design rainfall intensity chosen.

The tabulated areas are for a rainfall of 50mm/hr (0.014 l/s/m^2) and will generally comply with the requirements stated in guidance to The Building Regulations (Part H 2002). Where the project must comply with the National Standards for Sustainable Drainage Systems, multiple rainfall events using design rainfall specific to the geographical location of the site must be analysed. The ACO Water Management Design Services Team will be able to assist with this process.

At other rainfall intensities, the area can be determined by proportion, e.g. at 75mm/hr, the maximum area drained will be the tabulated area x 50/75.

ACO Water Management Design Services Team

Please contact the ACO Water Management Design Services Team on 01462 816666 for advice on channels with non-uniform inflow, or channels receiving point inflows at the end or at intermediate locations. The ACO Water Management Design Services Team will be pleased to assist with any technical queries, scheme designs or parts schedules.

Designing a drainage system

An example design method is provided on page 23 to help determine your drainage requirements.

This example will enable you to use the hydraulic performance tables on these pages.

ACO S100 constant depth channels

ACO S100 S01

Length to Outlet (m)	Slope 0%								
	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)
10	3.2	0.32	230	4.8	0.48	346	5.8	0.58	420
20	2.9	0.15	210	5.2	0.26	377	6.6	0.33	476
30	2.7	0.09	194	5.5	0.18	394	7.0	0.23	506
40	2.5	0.06	182	5.6	0.14	404	7.3	0.18	525
50	2.4	0.05	172	5.7	0.11	411	7.5	0.15	539
60	2.3	0.04	164	5.8	0.10	416	7.6	0.13	548
70	2.2	0.03	156	5.8	0.08	420	7.7	0.11	556
80	2.1	0.03	150	5.9	0.07	423	7.8	0.10	562
90	2.0	0.02	144	5.9	0.07	426	7.9	0.09	567
100	1.9	0.02	139	5.9	0.06	427	7.9	0.08	571

ACO S100 S05

Length to Outlet (m)	Slope 0%								
	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)
10	4.7	0.47	336	6.6	0.66	477	7.9	0.79	571
20	4.3	0.21	308	7.2	0.36	516	8.9	0.45	642
30	4.0	0.13	287	7.5	0.25	538	9.5	0.32	683
40	3.7	0.09	270	7.7	0.19	552	9.8	0.25	709
50	3.6	0.07	256	7.8	0.16	561	10.1	0.20	727
60	3.4	0.06	244	7.9	0.13	567	10.3	0.17	741
70	3.2	0.05	233	7.9	0.11	572	10.4	0.15	751
80	3.1	0.04	224	8.0	0.10	576	10.6	0.13	760
90	3.0	0.03	216	8.0	0.09	579	10.7	0.12	768
100	2.9	0.03	209	8.1	0.08	582	10.7	0.11	772

ACO S100 S010

Length to Outlet (m)	Slope 0%								
	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)
10	6.8	0.68	487	9.1	0.91	657	10.8	1.08	775
20	6.2	0.31	448	9.8	0.49	704	12.0	0.60	863
30	5.8	0.19	419	10.1	0.34	730	12.7	0.42	914
40	5.5	0.14	395	10.4	0.26	747	13.2	0.33	947
50	5.2	0.10	375	10.5	0.21	758	13.5	0.27	972
60	5.0	0.08	359	10.6	0.18	766	13.7	0.23	990
70	4.8	0.07	344	10.7	0.15	771	13.9	0.20	1003
80	4.6	0.06	331	10.8	0.13	776	14.1	0.18	1014
90	4.4	0.05	319	10.8	0.12	779	14.2	0.16	1023
100	4.3	0.04	309	10.9	0.11	782	14.3	0.14	1030

ACO S100 Range hydraulic performance tables

ACO S100 S020									
Length to Outlet (m)	Slope 0%								
	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m²)	Q (l/s)	q (l/s/m)	A (m²)	Q (l/s)	q (l/s/m)	A (m²)
10	11.7	1.17	843	14.8	1.48	1064	17.0	1.70	1225
20	10.8	0.54	777	15.5	0.78	1119	18.6	0.93	1343
30	10.1	0.34	729	16.0	0.53	1151	19.6	0.65	1411
40	9.6	0.24	690	16.3	0.41	1171	20.2	0.51	1456
50	9.1	0.18	657	16.4	0.33	1183	20.7	0.41	1488
60	8.7	0.15	629	16.5	0.28	1191	21.0	0.35	1512
70	8.4	0.12	604	16.6	0.24	1198	21.2	0.30	1530
80	8.1	0.10	582	16.7	0.21	1202	21.4	0.27	1544
90	7.8	0.09	563	16.7	0.19	1205	21.6	0.24	1556
100	7.6	0.08	545	16.8	0.17	1207	21.8	0.22	1566

ACO S100 S030									
Length to Outlet (m)	Slope 0%								
	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m²)	Q (l/s)	q (l/s/m)	A (m²)	Q (l/s)	q (l/s/m)	A (m²)
10	17.5	1.75	1262	21.2	2.12	1528	24.0	2.40	1730
20	16.1	0.81	1162	22.0	1.10	1582	25.9	1.30	1866
30	15.2	0.51	1092	22.4	0.75	1614	27.1	0.90	1948
40	14.4	0.36	1034	22.7	0.57	1634	27.8	0.70	2002
50	13.7	0.27	987	22.9	0.46	1646	28.3	0.57	2040
60	13.1	0.22	945	23.0	0.38	1653	28.7	0.48	2068
70	12.6	0.18	909	23.0	0.33	1658	29.0	0.41	2089
80	12.2	0.15	877	23.1	0.29	1661	29.3	0.37	2106
90	11.8	0.13	848	23.1	0.26	1662	29.4	0.33	2120
100	11.4	0.11	822	23.1	0.23	1663	29.6	0.30	2131

Hydraulic performance table

ACO S100 sloping invert channel systems

Total Flow Rate (litres/sec), site fall 0%

Total Flow Rate (litres / sec)						
Length to outlet (m)	Start channel number					
	1	6	11	16	21	26
4	4.3	6.2	8.5	10.8	13.6	16.6
9	5.5	8.0	10.5	13.0	16.5	
14	7.8	9.6	12.0	16.1		
19	9.6	11.0	13.8			
24	11.0	13.8				
29	12.9					

NB Constant invert depth channels can be used to extend the channel length. Please contact ACO Design Services Team for further advice.

Notes on table usage.

This table may be used for ACO S100 sloping invert channels.

It is assumed that the gratings are laid level and that a constant invert fall of 0.6% is maintained for the full length of the channel.

Laid with a longitudinal ground slope, the Total Flow Rates can be considerably increased or alternatively, the length of the channel to an outlet can be greatly extended. Please contact the ACO Water Management Design Services Team for further guidance.

ACO S150 Range hydraulic performance tables

Notes for ACO S150 hydraulic tables

The tables opposite shows the maximum capacity of the unit, assuming uniform lateral inflow. The capacity will depend on the length of the unit to the outlet and on any slope along the unit.

Q (l/s) is the maximum total flow that the channel can carry.

q (l/s/m) is the maximum possible lateral inflow.

A (m^2) is the maximum area that can be drained and will depend on the design rainfall intensity chosen.

The tabulated areas are for a rainfall of 50mm/hr (0.014 l/s/m^2) and will generally comply with the requirements stated in guidance to The Building Regulations (Part H 2002). Where the project must comply with the National Standards for Sustainable Drainage Systems, multiple rainfall events using design rainfall specific to the geographical location of the site must be analysed. The ACO Water Management Design Services Team will be able to assist with this process.

At other rainfall intensities, the area can be determined by proportion, e.g. at 75mm/hr, the maximum area drained will be the tabulated area x 50/75.

ACO S150 constant depth channels

ACO S150 S1501

Length to Outlet (m)	Slope 0%								
	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)
10	13.2	1.32	952	17.3	1.73	1249	20.3	2.03	1461
20	12.4	0.62	894	18.9	0.94	1360	23.0	1.15	1657
30	11.8	0.39	849	19.9	0.66	1432	24.8	0.83	1785
40	11.3	0.28	812	20.6	0.51	1481	26.0	0.65	1871
50	10.8	0.22	780	21.1	0.42	1517	26.9	0.54	1936
60	10.4	0.17	751	21.5	0.36	1545	27.6	0.46	1986
70	10.1	0.14	726	21.8	0.31	1567	28.1	0.40	2024
80	9.8	0.12	703	22.0	0.28	1585	28.6	0.36	2057
90	9.5	0.11	682	22.2	0.25	1598	29.0	0.32	2085
100	9.2	0.09	663	22.4	0.22	1610	29.3	0.29	2109

ACO S150 S1502

Length to Outlet (m)	Slope 0%								
	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)
10	19.9	1.99	1429	24.8	2.48	1787	28.5	2.85	2054
20	18.6	0.93	1342	26.6	1.33	1917	31.9	1.60	2298
30	17.8	0.59	1279	27.8	0.93	2005	34.1	1.14	2458
40	17.0	0.43	1225	28.7	0.72	2066	35.7	0.89	2570
50	16.4	0.33	1179	29.3	0.59	2111	36.9	0.74	2658
60	15.8	0.26	1138	29.8	0.50	2145	37.8	0.63	2722
70	15.3	0.22	1101	30.2	0.43	2172	38.5	0.55	2776
80	14.8	0.19	1068	30.5	0.38	2193	39.1	0.49	2818
90	14.4	0.16	1038	30.7	0.34	2211	39.6	0.44	2855
100	14.0	0.14	1011	30.9	0.31	2225	40.0	0.40	2883

ACO S150 S1503

Length to Outlet (m)	Slope 0%								
	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)
10	27.4	2.74	1970	33.1	3.31	2384	37.5	3.75	2702
20	25.7	1.28	1850	35.1	1.75	2524	41.5	2.07	2986
30	24.5	0.82	1764	36.4	1.21	2624	44.1	1.47	3177
40	23.5	0.59	1692	37.4	0.94	2695	46.0	1.15	3313
50	22.6	0.45	1630	38.1	0.76	2746	47.4	0.95	3415
60	21.9	0.36	1576	38.7	0.64	2786	48.6	0.81	3499
70	21.2	0.30	1527	39.1	0.56	2817	49.5	0.71	3563
80	20.6	0.26	1482	39.5	0.49	2841	50.2	0.63	3616
90	20.0	0.22	1441	39.7	0.44	2861	50.8	0.56	3660
100	19.5	0.20	1404	40.0	0.40	2877	51.3	0.51	3696

ACO S200 and S300 hydraulic performance tables

Notes for ACO S200 and S300 hydraulic tables

The tables opposite shows the maximum capacity of the unit, assuming uniform lateral inflow. The capacity will depend on the length of the unit to the outlet and on any slope along the unit.

Q (l/s) is the maximum total flow that the channel can carry.

q (l/s/m) is the maximum possible lateral inflow.

A (m^2) is the maximum area that can be drained and will depend on the design rainfall intensity chosen.

The tabulated areas are for a rainfall of 50mm/hr (0.014 l/s/m^2) and will generally comply with the requirements stated in guidance to The Building Regulations (Part H 2002). Where the project must comply with the National Standards for Sustainable Drainage Systems, multiple rainfall events using design rainfall specific to the geographical location of the site must be analysed. The ACO Water Management Design Services Team will be able to assist with this process.

At other rainfall intensities, the area can be determined by proportion, e.g. at 75mm/hr, the maximum area drained will be the tabulated area x 50/75.

ACO S200 constant depth channels

ACO S200									
Length to Outlet (m)	Slope 0%								
	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)
10	30.9	3.09	2228	38.2	3.82	2749	43.7	4.37	3144
20	29.4	1.47	2115	41.3	2.06	2971	49.3	2.46	3547
30	28.2	0.94	2034	43.5	1.45	3133	53.2	1.77	3829
40	27.3	0.68	1964	45.2	1.13	3255	56.2	1.40	4044
50	26.4	0.53	1903	46.5	0.93	3348	58.4	1.17	4203
60	25.7	0.43	1848	47.6	0.79	3425	60.2	1.00	4332
70	25.0	0.36	1798	48.4	0.69	3484	61.6	0.88	4434
80	24.3	0.30	1752	49.1	0.61	3534	62.8	0.79	4522
90	23.8	0.26	1710	49.7	0.55	3575	63.9	0.71	4599
100	23.2	0.23	1671	50.2	0.50	3611	64.8	0.65	4664
120	22.2	0.19	1601	51.0	0.42	3669	66.3	0.55	4773
140	21.4	0.15	1540	51.6	0.37	3713	67.5	0.48	4857
160	20.6	0.13	1485	52.1	0.33	3748	68.4	0.43	4925
180	19.9	0.11	1436	52.5	0.29	3777	69.2	0.38	4980
200	19.3	0.10	1391	52.8	0.26	3801	69.8	0.35	5024

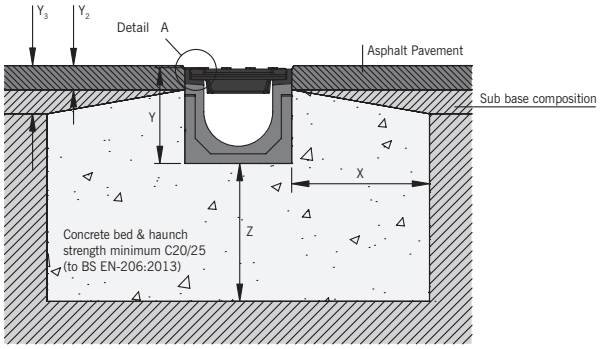
ACO S300 constant depth channels

ACO S300									
Length to Outlet (m)	Slope 0%								
	0%			0.5%			1%		
	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)	Q (l/s)	q (l/s/m)	A (m^2)
10	76.5	7.65	5505	90.1	9.01	6488	101.0	10.10	7271
20	73.1	3.66	5264	96.4	4.82	6942	113.0	5.65	8135
30	71.0	2.37	5109	101.8	3.39	7327	122.3	4.08	8805
40	69.1	1.73	4978	106.1	2.65	7636	129.5	3.24	9327
50	67.5	1.35	4863	109.6	2.19	7889	135.6	2.71	9766
60	66.1	1.10	4759	112.5	1.88	8101	140.6	2.34	10120
70	64.7	0.92	4661	115.0	1.64	8278	144.7	2.07	10415
80	63.5	0.79	4571	117.1	1.46	8431	148.1	1.85	10661
90	62.3	0.69	4486	119.0	1.32	8571	151.2	1.68	10888
100	61.2	0.61	4407	120.6	1.21	8686	154.0	1.54	11085
120	59.2	0.49	4261	123.3	1.03	8878	158.6	1.32	11420
140	57.4	0.41	4130	125.5	0.90	9034	162.4	1.16	11691
160	55.7	0.35	4010	127.2	0.80	9161	165.5	1.03	11915
180	54.2	0.30	3902	128.7	0.71	9266	168.1	0.93	12101
200	52.8	0.26	3802	129.9	0.65	9356	170.1	0.85	12245

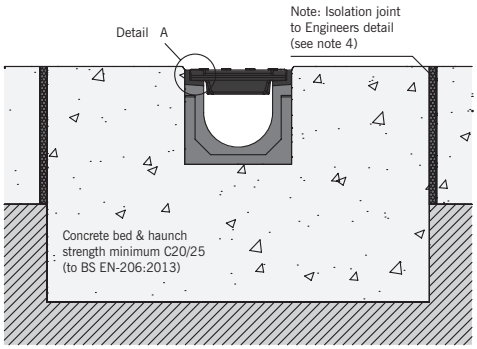
Installation detail

ACO S RANGE LOAD CLASS F 900

Asphalt pavement



Concrete pavement



1.0 Load Class

Installation recommendations shown are ACO minimum recommendations for BS EN 1433:2002 load class requirements.

2.0 Ground Conditions

The long term performance of a channel installation to sustain vertical and lateral loads depends upon A) ground conditions B) stability of the adjacent pavement and C) a durable concrete bed and surround. The recommended installation detail may require the minimum dimensions to be revised to achieve site specific load class requirements (referred to in 1.0 above).

3.0 Cutting and Jointing

Mitre joints are formed by cutting the channels to the required angle and butting them together with appropriate sealant (e.g. Sikaflex 11FC or similar) or ACO Repair Kit. Where possible 90° joints and T's should be formed so that gratings do not have to be cut. Angles can be formed by connecting them using proprietary PVCu pipework attached to ACO inlet/outlet endcaps. For further details please contact ACO Design Services Team.

Note: For Load Classes higher than C 250, mitred joints are not recommended in vehicular areas. Where requested ACO can custom manufacture angled junctions to order.

4.0 Isolation Joints

The channel must be isolated from the surrounding environment. An isolation joint must be positioned up to 1500mm from the channel wall. Any dowel bars must be located no nearer than 150mm from the channel wall. Other isolation joints in surrounding slab must be continued through the channel.

Additional crack control may be required to comply with specifier requirements.

5.0 Installation into in-situ Slab

Where a channel is to be installed into an existing concrete slab it is necessary to cut a suitably sized pocket in the slab. The channel will then need to be bedded in polymer modified mortar of 25mm minimum thickness (this may vary depending on the type of mortar used). Engineering advice may be necessary.

6.0 Temporary Installation

A channel installation is not complete until the final surfacing is laid. In any temporary condition, i.e. with the channel walls projecting above adjacent ground, site traffic should not cross channels. Loose boards, stone fill or cover plates will not protect the channel walls or grating. A temporary channel crossing should be formed by raising the ground level locally, to 3 - 6mm above top of edge rail, either side of a channel for a distance of 750 to 1000mm, to form ramps. Note that the channel load class should be adequate to carry the site traffic.

7.0 Block Pavements

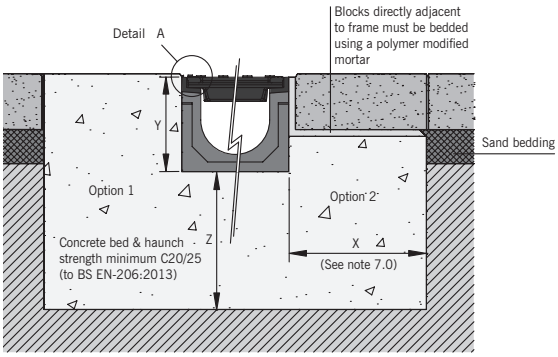
The channel must be supported laterally. Blocks laid directly against a channel must be laid as a soldier course and restrained from movement by bedding securely on the concrete haunch e.g. by using a polymer modified mortar for bed and perpendicular joints (e.g. RONAFIX mortar mix C or similar). Blocks or slabs bedded on sand remote from the channel should be set at a higher level to compensate for possible settlement of the paving in service.

8.0 Grate Locking System

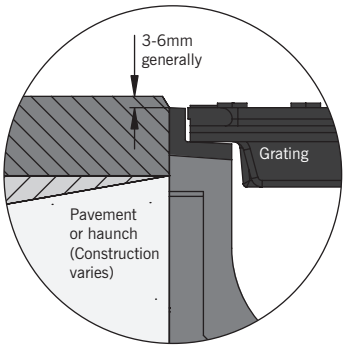
Gratings should be securely fixed to the channel, where required, using an appropriate grate lock system (where available).

Where the grate locking system incorporates fixing bolts, these should be tightened to the torque of 40Nm.

Block pavement options 1 and 2



Detail A



9.0 Channel Protection

Avoid contact between compaction equipment and top of ACO channel edge rail. The installer must ensure that the finished surface level lies above the top of the edge rail (by at least 3-6mm). Covering or protecting the grating, before concreting the haunch or laying blocks, removes the time and cost associated with cleaning the channel and grating of cement material and embedded stones. (Please note that ACO channels must be installed with the grating in place to prevent deformation of the channel).

10.0 Watertight installation to BS EN 1433:2002

Where ACO channel joints/fittings and channel/pavement interfaces are to be sealed, an appropriate sealant must be used (e.g., Silkaflex 11FC or similar).

Guidance on the necessary surface preparation and/or priming should be sought from the sealant manufacturer.

Best practice and workmanship

ACO can give guidance with respect to the most suitable methods of installation for each of the products in the ACO S Range. ACO S Range should be installed using acceptable levels of workmanship and according to the National Code of Practice (UK: BS8000: Part 14: 1989) in keeping with EN 1433:2002 (Drainage channels for vehicular and pedestrian areas).

Detailed installation statements and methodologies will vary for all sites as each will have different aspects deserving particular consideration, consequently the relevant approvals should be sought from the consulting engineer and/or the installer.

For further information please contact our Design Services Team (technical@aco.co.uk) or the ACO website www.aco.co.uk

11.0 Minimum dimensions of concrete surround

Load Class		F 900*
Minimum dimensions (mm)	x	200
	y	Full depth of channel (Less Y2 if necessary)
	z	200
Maximum dimensions (mm)	Y2	35
Asphalt pavement only	Y3	70

***Not suitable for carriageways or roads or motorways**

These details are available to download in DWG or PDF format from the ACO website. Please go to www.aco.co.uk and sign in or register to access this information.

Chemical resistance chart

Vienite®, ACO's sustainable high strength material, has a high resistance to dilute acids and alkalis, and are unaffected by road salt, fuel and oil, and other commonly encountered chemicals. Further details of the chemical resistance can be obtained from the ACO Water Management Design Services team or, for particular chemicals, samples of the polymer concrete can be supplied to customers for their own testing. The chemical resistance will also depend on the temperature of the effluent. Clean water should not exceed 80ºC.

The resistance of the gratings and edge rails should also be considered.

This chemical resistance chart refers to chemicals at ambient temperatures (20ºC) and the results are for general guidance only.

Chemical medium	% conc	Resistance: Polyester concrete
Acetic acid, glacial	100	No
Acetic acid	10	Yes
Acetic anhydride	100	No
Acetone	10	No
Acetone	100	No
Alum	100	Yes
Aluminium sulphate	100	Yes
Ammonium chloride	100	Yes
Ammonium nitrate	100	Yes
Ammonium phosphate	65	Yes
Ammonium sulphate	100	Yes
Aniline (aminobenzene)	100	No
Barium chloride	100	Yes
Benzaldehyde	100	No
Benzene	100	No
Benzyl alcohol	100	Yes
Benzyl chloride	100	No
Borax	100	Yes
Boric acid	100	Yes
Bromine	100	No
Bromine water	Saturated	No
Butyl acetate	100	No
Butyric acid	100	Yes
Calcium carbonate	100	Yes
Calcium chloride	100	Yes
Calcium chlorate	8	Yes
Calcium hydroxide	100	Yes
Calcium nitrate	100	Yes
Carbon disulphide	100	No
Carbon tetrachloride	100	Yes
Castor oil	100	Yes
Chlorine gas, wet	100	No
Chlorine water	Saturated	No
Chlorobenzene	100	Yes
Chloroform (trichloro-methane)	100	No
Chromic acid	12	Yes
Citric acid	100	Yes
Copper chloride	100	Yes
Copper nitrate	100	Yes
Cyclohexane	100	Yes
Diesel fuel (DERV)	100	Yes
Dimethyl formamide	100	No
Dimethyl phthalate	100	Yes
Dioctyl phthalate	100	Yes
Ethanol	95	No
Ethanolamine	100	Yes
Ethyl acetate	100	No
Ethylene glycol	100	Yes
Ferrous chloride	100	Yes
Ferric chloride	100	Yes
Ferrous sulphate	100	Yes
Formaldehyde	30	Yes
Formic acid	10	Yes
Formic acid	100	No
Fuel oil	100	Yes
Gasoline	100	Yes
Glycerine	100	Yes
Hydrazine	50	No

Chemical medium	% conc	Resistance: Polyester concrete
Hydrobromic acid	48	Yes
Hydrochloric acid	10	Yes
Hydrofluoric acid	10	No
Hydrogen peroxide	30	Yes
Lactic acid	100	Yes
Lead acetate	100	Yes
Magnesium chloride	100	Yes
Magnesium sulphate	100	Yes
Maleic acid	100	Yes
Methyl ethyl ketone (MEK)	100	No
Motor oil	100	Yes
Nickel chloride	100	Yes
Nickel sulphate	100	Yes
Nitric acid	5	No
Nitrobenzine	100	No
Oleic acid	100	Yes
Oxalic acid	100	Yes
Perchloric acid	10	Yes
Perchlorethyline	100	Yes
Phosphoric acid	20	Yes
Phosphorus trichloride	100	No
Potassium carbonate	50	Yes
Potassium chloride	100	Yes
Potassium dichromate	100	Yes
Potassium hydroxide	10	Yes
Potassium nitrate	100	Yes
Potassium permanganate	10	No
Potassium sulphate	100	Yes
Pyridine	100	No
Sodium acetate	100	Yes
Sodium bromide	100	Yes
Sodium carbonate	35	Yes
Sodium chlorate	100	Yes
Sodium chloride	100	Yes
Sodium hydroxide (caustic soda)	50	No
Sodium hypochlorite	18	No
Sodium nitrate	100	Yes
Sodium nitrite	100	Yes
Sodium phosphate	10	Yes
Sodium sulphate	100	Yes
Sodium sulphide	100	Yes
Sodium sulphite	100	Yes
Sodium thiosulphate	100	Yes
Stearic acd	100	Yes
Styrene	100	No
Sulphuric acid	75	No
Sulphuric acid	50	Yes
Sulphuric acid at up to 40ºC	10	Yes
Tetachloroethylene	100	Yes
Thioglycolic acid	80	Yes
Thionyl chloride	100	No
Toluene	100	Yes
Toluene sulphonic acid (aqueous solution)	Saturated	Yes
Trichloroacetic acid	50	Yes
Turpentine	100	Yes
Water	100	Yes
Xylene	100	Yes
Zinc sulphate	100	Yes

Specification clause

The surface drainage system shall be ACO Drain S100/S150/S200/S300† channel system as supplied by ACO Technologies plc; all materials and components within the scope of this channel system shall be obtained from this manufacturer. The system shall be certificated to Load Class F 900 as defined in BS EN 1433:2002; load test certificates shall be supplied to the Supervising Officer.

Declarations of Performance (DoP) shall be supplied to the Supervising Officer upon request. The system shall be of 100mm/150mm/200mm/ 300mm† nominal internal width, manufactured in polyester resin concrete with cast-in grey iron edge rails. The channels shall be installed with manufacturer's grating appropriate to the Load Class of the place of installation and locked securely in place using 4 bolts per half metre.

The system shall be installed in accordance with the manufacturer's printed instructions, and the work carried out as specified in drawing no. (*) and in accordance with recognised good practice. Standards of workmanship shall generally be as specified in BS EN 752:2008 and BS 8000:Part 14:1989.

* insert appropriate information
† delete non-appropriate information

Recycled content

ACO Technologies aim to incorporate as much recycled material or waste material as is practicable in their manufactured products. Typically, cast iron materials contain 40% to 90% recycled iron, The total recycled content of each product in the ACO S Range system will vary as the proportion of the different materials (in channels, edge rails, gratings etc.) varies.

The ACO S Range products are themselves intended for a long life with low maintenance, to reduce the need to recycle, but when eventually they are no longer needed, much of their content can be readily recycled with a very low risk of pollution to the environment.

NBS Specifications

ACO S Range should be specified in section Q10:180. Assistance in completing this clause can be found in the ACO Water Management entry in NBS Plus, or please contact the ACO Water Management Design Services Team.

Note: A specification in NBS format is available to download from www.thenbs.com or www.aco.co.uk

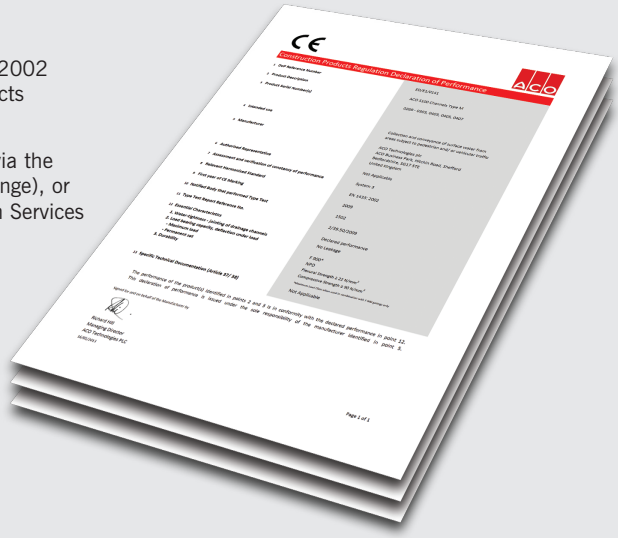
Conformity

The ACO S Range system is fully certified to BS EN 1433:2002 and CE marked in accordance with the Construction Products Regulation.

Declarations of Performance are available on the side bar via the product page on our website (www.aco.co.uk/products/s-range), or on request. Please contact ACO Water Management Design Services Team on 01462 816666 for further information.

BS EN 1433:2002

CE



General information
ACO products are subject to weight and dimensional tolerances. The weights and dimensions shown in this document are for guidance purposes only. ACO products are made from naturally occurring materials and may be subject to variations in colour, texture and marking. These aesthetic variations do not affect the performance or functionality of our Goods. The appearance of products shown in our company documentation are for illustration purposes only.

ACO Technologies plc

- ACO Water Management
  Civils + Infrastructure
  Building + Landscape
- ACO Building Drainage
- ACO Sport
- ACO Wildlife

ACO Water Management

A division of ACO Technologies plc
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e-mail Enquiries: awmenquiries@aco.co.uk
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e-mail Technical: technical@aco.co.uk

website: www.aco.co.uk

The ACO Group: A strong family you can depend on.

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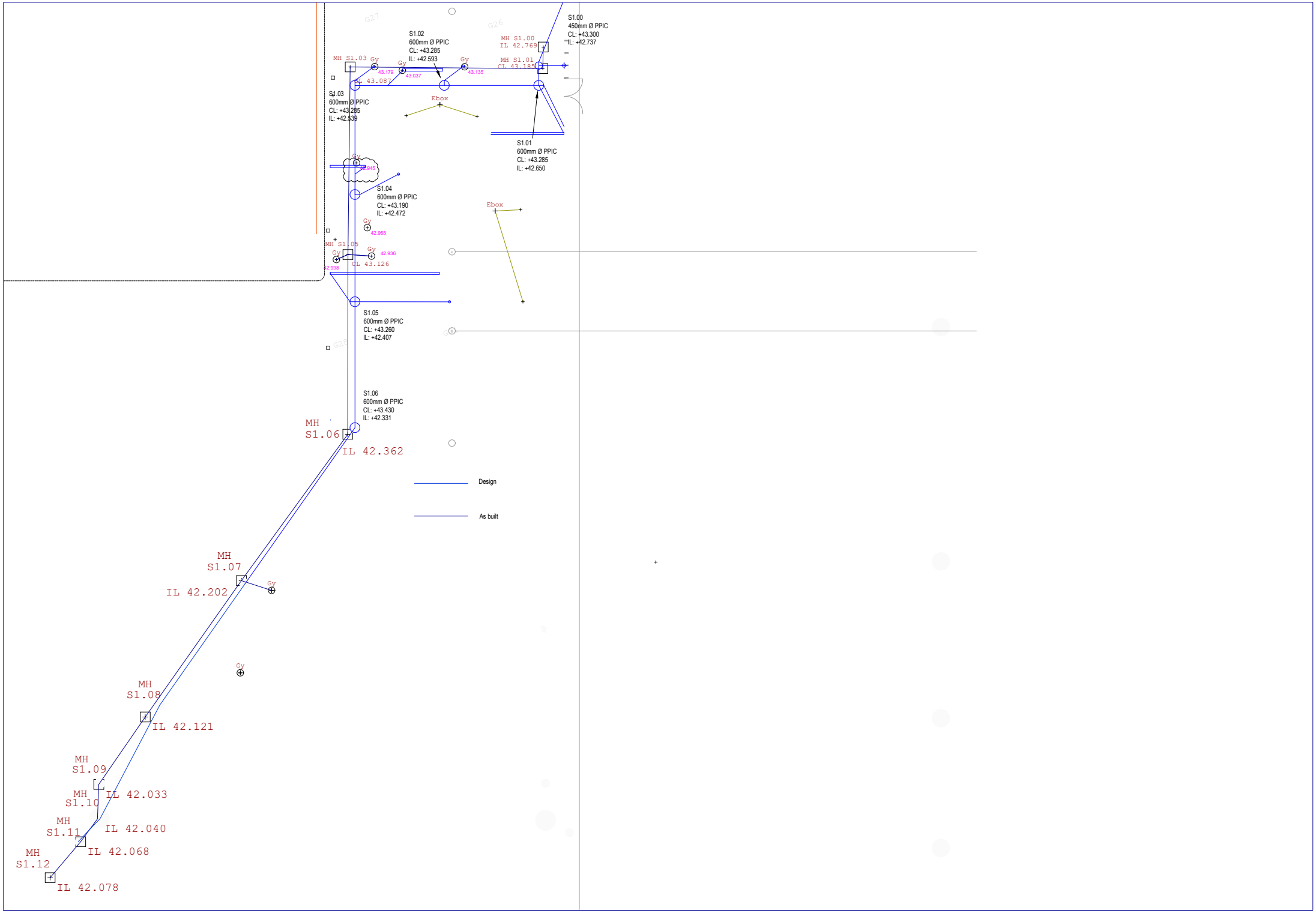
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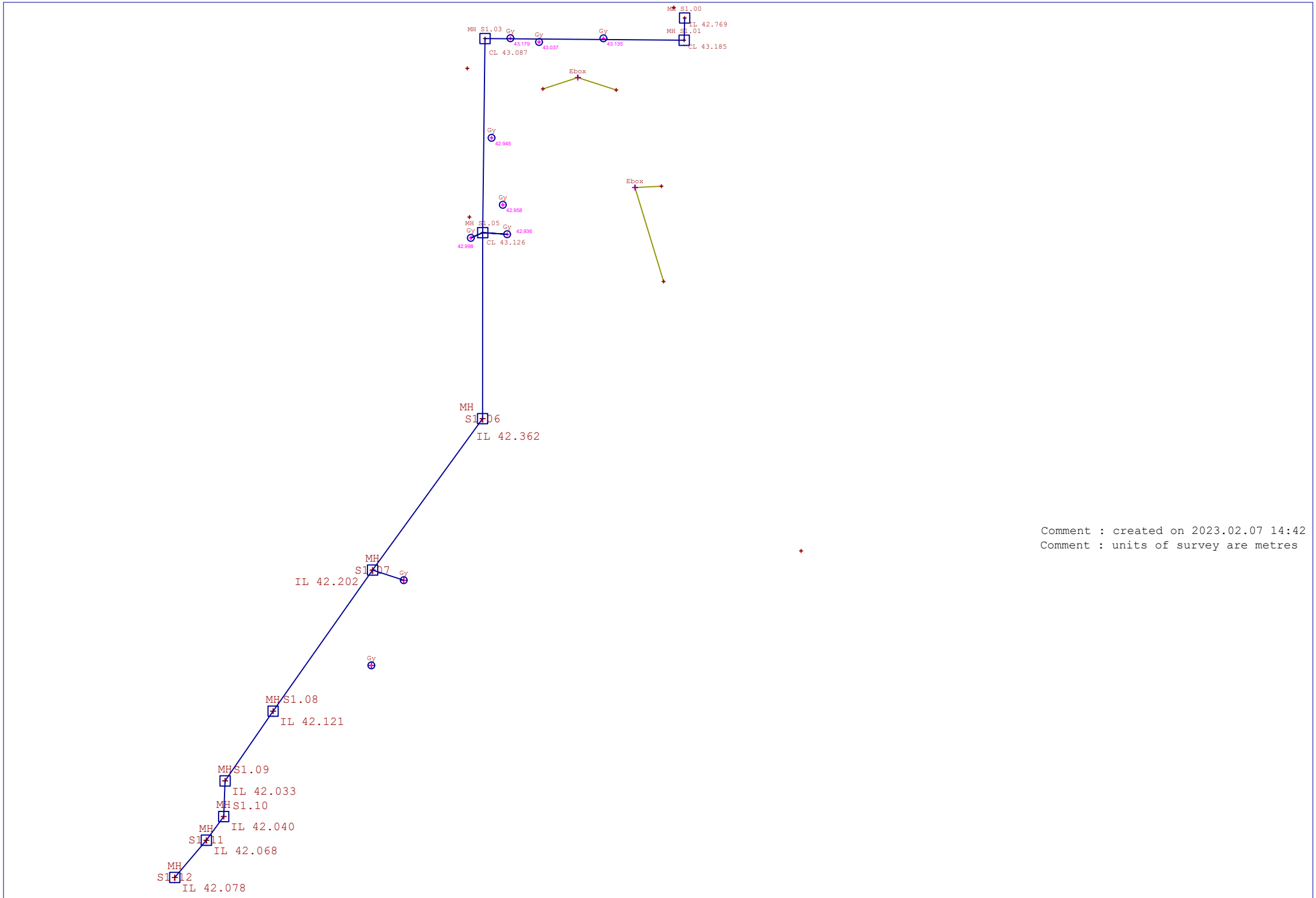
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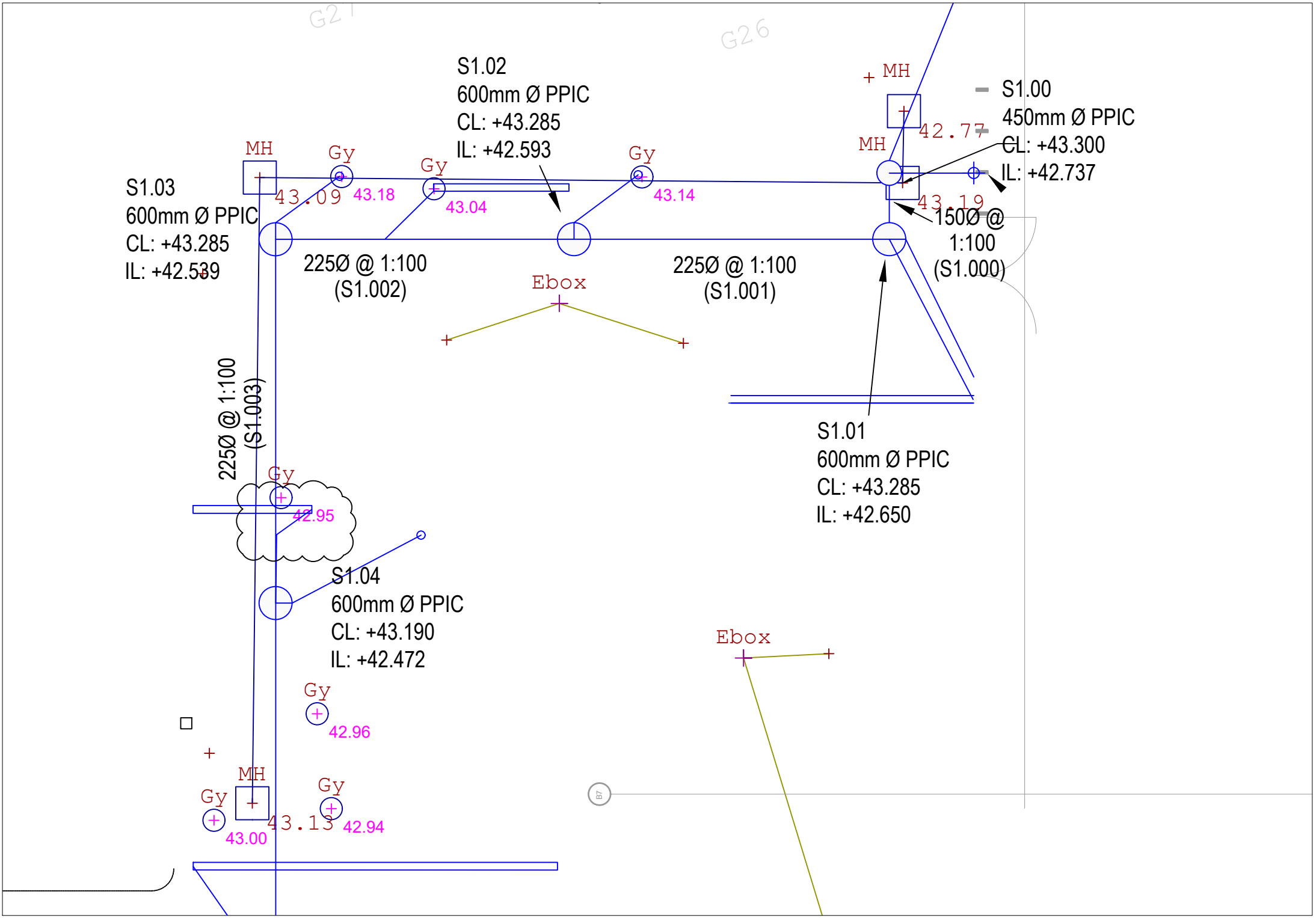
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MH S1.00
IL 42.769
S1.02
600mm Ø PPIC
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IL: +42.593
MH S1.03
MH S1.01
CL 43.185
CL 43.087
Ebox
S1.03
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IL: +42.539
S1.01
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S1.04
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S106 Part 1 'Application to connect to a public sewer' Approval Notice

	SC5169
Applicant details	
Applicant name	**Joe Bullough**
Applicant address *(including postcode)*	**Renaissance** **Carvers Warehouse, 77 Dale Street** **Manchester, M1 2HG**
Applicant email	**joebullough@renaissance-ltd.com**
Site details: The site / property which is proposed for connection to the public sewer	
	Former Bauer Millett Site (apartments) **Albion Street** **Manchester** **M2 5QA**

APPROVED

Your application for connection to the public sewer has been approved, to be made via a new connection:

To a private drain	☐	You may appoint your contractor and advise your appointed building control body (who should inspect the work). United Utilities should be advised when this work is complete.
Direct to the public sewer	☒	**Further action required** You may now appoint an appropriately qualified contractor. Your appointed contractor is responsible for obtaining authorisation to work on a public sewer. (The S106 Part 2 application form **'Request for permission to work on a public sewer'** is available on our website; unitedutilities.com).

Mode of connection approved	**Connection into existing manhole**					
Sewer connection type	Foul	☐	Surface water	☐	Combined	☒

This approval is valid for 12 months from the date below.
This approval does not grant access to third party land, permission should be sought if required between applicant and land owner
If the new connection renders access unsafe or is otherwise detrimental to the manhole or sewer, a new/upgraded manhole will be requested.

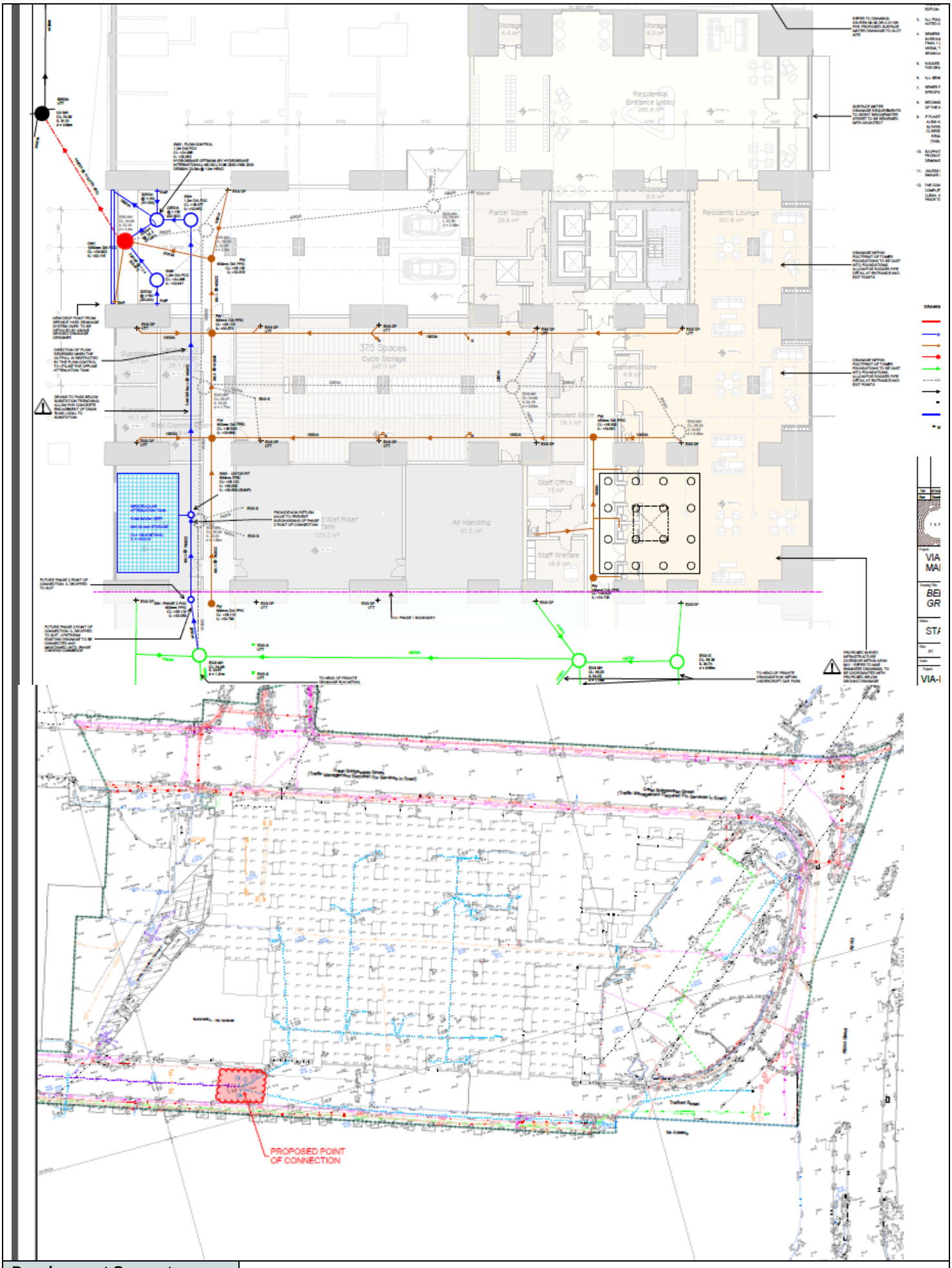
Comments

Approval for the 450mm combined connection to the existing 900X525 mm combined sewer in Trafford Street via an existing manhole Surface water attenuation indicated with a flow control restricted to 23.3l/s

as agreed with pre development regarding the additional flow of 6.9l/s from the blue roofs with an overall SW discharge of 30.2l/s

Any connection to an existing manhole should be made soffit to soffit, with a swept bend in the direction of flow. The connection must not be made in the landing area. The exact condition, location and depth of the existing manhole and surrounding services should be established as early as possible to avoid site delays. If the existing manhole is in poor condition but otherwise the connection would be acceptable, the applicant should be aware they may have to rebuild/renew the manhole if it deteriorates as a result of your contractor working on or near it.

Please note, if you are proposing to connect to an existing, unchartered drain or sewer then it is the developers responsibility to confirm that it communicates with the Public Sewer
Connections may be made to private lateral drains or to existing neighbouring drain. A part 1 approval does not give permission to access third party land. The applicant must seek permission from the relevant land owner.



Development Support Technician	**Lynne Berry**
Contact number	**07881 034558**
Date	**13/10/2020**

United Utilities Water Ltd
Developer Services & Metering
Second Floor, Grasmere House,
Lingley Mere Business Park,
Warrington
WA5 3LP

Telephone: 0345 072 6067
Wastewaterdeveloperservices@uuplc.co.uk

Your Reference	EC5169
Our Reference	4200033422
Date	23RD September 2021

Dear Stewart

Location:	Former Bauer Millett Site Albion Street Manchester M2 5QA

The '**Request for Permission to work on a public sewer**' (Part 2) has been approved and you may now arrange to carry out the connection.

Any work on the public sewer should be carried out between the hours of 8am–4pm Monday to Friday and the site agent needs to log on and off with our central team on **07826 539459**.

You are reminded that a minimum of **five clear working days**' notice shall be given to the **Marcus Jones Tel 07823553970**
before work commences to enable the necessary inspection to be arranged. Please quote your reference number **EC5169**

Should the works be covered before inspection, the company reserves the right to carry out any excavation and work necessary (including CCTV inspection) to ensure a proper connection has been made. The cost of such work will be recoverable from you.

This approval does not constitute consent to enter onto private land or to break open the public highway for the purpose of making the connection. Such permissions are required from the landowner or Highway Authority, as appropriate. The sewer connection should not be made until all necessary permissions under the Planning or Building Acts are obtained.

Should you require further information please call 0345 072 6067.

Yours faithfully

Sharon Hitch

For Developer Services and Metering

THINKING PRECAST?
THINK FP MCCANN

DRAINAGE AND WATER MANAGEMENT

v3.9

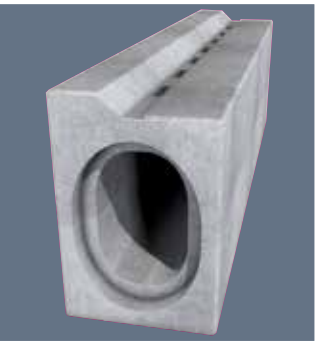
CONCRETE PIPES





EASI-BASE™ MANHOLE SYSTEM





STORM-CHANNEL™

HEAVY DUTY PRECAST DRAINAGE CHANNEL







STORM-BRAKE™

VORTEX FLOW CONTROL CHAMBER UNIT







STORM-STORE™

TANK & CHAMBER SYSTEMS





STORM-HOLD™

STORM WATER MANAGEMENT SYSTEM





DRAINAGE AND WATER MANAGEMENT

With one of the largest drainage and water management product ranges in the UK and Ireland, FP McCann has become the first choice for all of our customers.

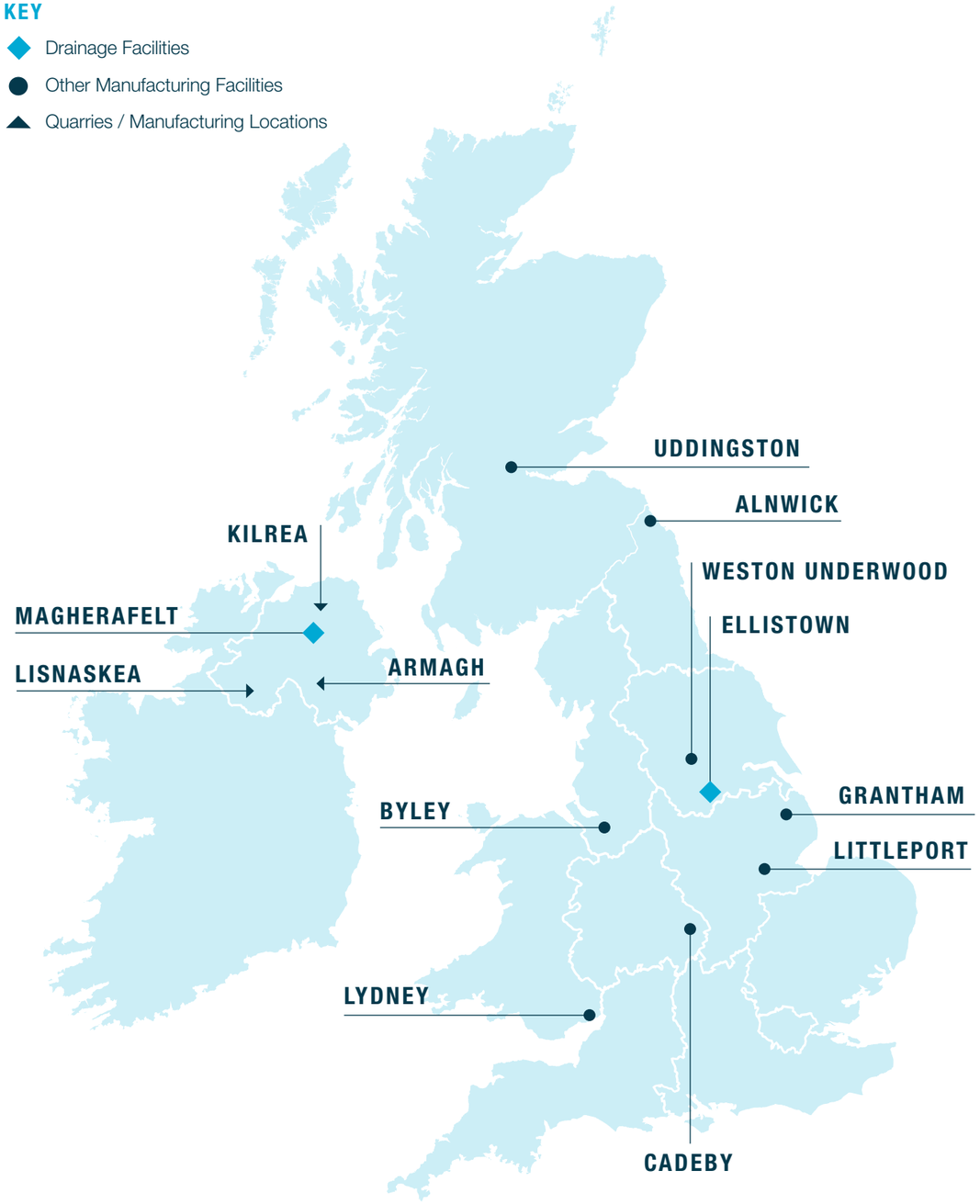


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OUR COMPANY

KEY

- Drainage Facilities
- Other Manufacturing Facilities
- Quarries / Manufacturing Locations



OUR COMPANY

FP McCann is the UK's market leader in the manufacture, supply and delivery of precast concrete solutions. Our comprehensive precast concrete business extends to include:

AGRICULTURE I BOX CULVERTS I BUILDING PRODUCTS I CONCRETE ROOF TILES
DOCK LEVELLER PITS I DRAINAGE I FENCING I FILTER BED SYSTEMS
FLOORING I POWER & INFRASTRUCTURE I PRECAST OFF-SITE BUILDING SOLUTIONS
RAIL I SPECIALIST PRECAST I TANKS & CHAMBERS I TUNNELS & SHAFTS I WALLING

Modern manufacturing plants at Alnwick (Northumberland), Armagh (Northern Ireland), Byley (Cheshire), Cadeby (Leicestershire), Ellistown (Leicestershire), Grantham (Lincolnshire), Lisnaskea (Northern Ireland), Littleport (Cambridgeshire), Lydney (Gloucestershire), Kilrea (Northern Ireland), Magherafelt (Northern Ireland), Uddingston (Lanarkshire) and Weston Underwood (Derbyshire) incorporate the latest computerised batching, distribution, casting, curing and handling systems and are operated by skilled and experienced workforces to ensure consistency of quality. Their geographical spread gives us an unrivalled ability to serve the construction industry throughout the UK and Ireland.

By applying the DFMA principles, FP McCann's design engineers are able to evaluate individual precast concrete products part by part, in addition to documenting the assembly process step by step. This allows them to generate the cost, part count and assembly time to provide a benchmark to measure its success and identify the parts and process improvement opportunities. In turn, this has allowed FP McCann to design and manufacture more cost-effective and efficient high-quality precast concrete products with less wastage and greater on-site recycling. As a result, increased productivity, combined with a reduction in production time and costs, allows FP McCann to be more competitive within the marketplace.

Please note: all information is correct at time of going to print.



8 GOOD REASONS WHY YOU SHOULD USE CONCRETE DRAINAGE

1 SUSTAINABILITY

Concrete pipes outperform other types of pipeline solutions in a number of the environmental impact categories, such as human toxicity levels and chemical / hazardous waste generated. The CO2 emissions from concrete and cement production are relatively small compared to other building materials. Some 95 to 99% of ingredients used in the production of concrete pipes are sourced locally, so a considerable positive impact on the carbon footprint and fuel consumption associated with transporting these materials can be achieved.

2 STRENGTH

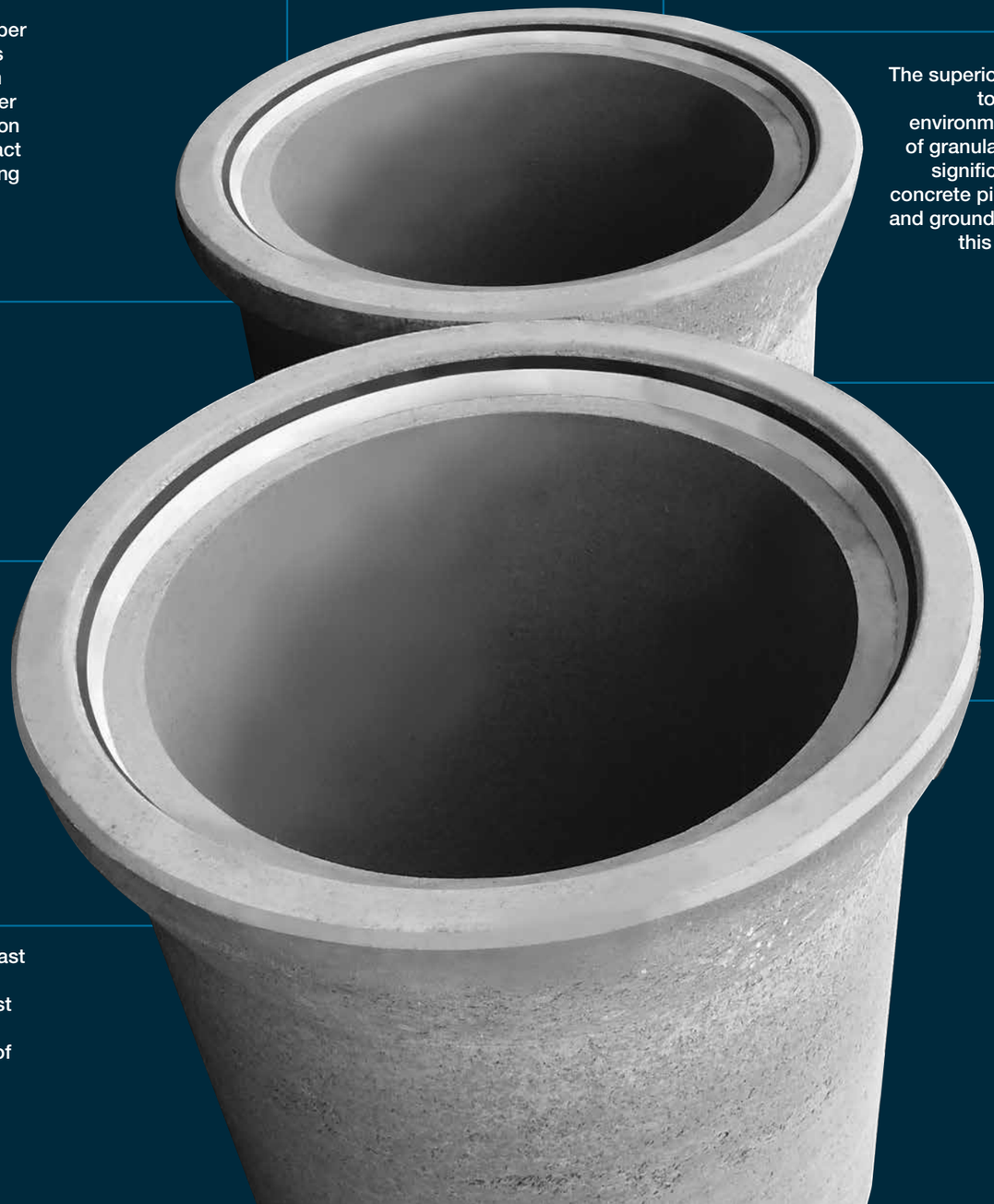
Concrete is much more durable than any other kind of pipe. Hence, it can carry more load at any given time and gains strength over time. It cannot be weakened by heat, moisture, mould or pests, nor will it rust. Underground concrete pipes have the ability to resist chemical attacks and massive impacts such as jetting, so blockages can be cleared easily.

3 QUALITY

Since precast concrete pipes are produced in highly controlled plant environments under rigid production standards and testing specifications, they achieve consistent high quality levels of performance.
The pipe production process will normally include computer-controlled mixing systems, computer-controlled weighing and proportioning systems, absorption testing and automated recording systems.
FP McCann's concrete pipes are manufactured in accordance with BS EN 1916 and BS 5911, and certified by Quality Assessment under the Kitemark Scheme and ISO 9001.

4 WHOLE LIFE VALUE

Due to its amazing structural properties and functional benefits, precast concrete pipes tend to attract lower insurance premiums than those built from other construction materials. The natural strength of precast concrete pipes enables recycled aggregate to be used as a bedding material, significantly reducing installation costs and the elimination of waste disposal costs.



5 FIRE-RESISTANCE

Being naturally fire-resistant, concrete forms a highly effective barrier to fire spread and it does not emit any toxic fumes when affected by fire. It will not produce smoke or drip molten particles. Therefore, in the majority of applications, concrete can be described as virtually 'fireproof'. Due to its inbuilt fire resistant properties, concrete not only maintains an airtight construction that stops smoke spreading, but also has the ability to keep its strength during a fire.

6 BEDDING PERFORMANCE

The superior strength of concrete pipes enables recycled aggregate to be used as a bedding material, thus reducing costs and environmental impact during installation. Since a full trench depth of granular material can actually be more expensive than the pipe, significant pipe bedding savings can be achieved when using a concrete pipe instead. FP McCann can advise on the optimum soil and ground conditions from geotechnical reports, to establish when this sustainable and cost-efficient solution can be deployed.

7 CHEMICAL RESISTANCE

Concrete pipes and manholes are resistant to sulphate and chemical attack. Concrete pipeline products with higher design chemical classes of DC3 and DC4 are capable of withstanding attack from the vast majority of aggressive ground environments in the UK.

8 HYDRAULIC EFFICIENCY

The rigidity and mass of concrete pipes (both within the pipe and pipe joints) allows it to retain its shape over its long service life, preserving structural integrity and hydraulic efficiency, by minimising the resistance to water flow that often occurs when the shape or integrity of a flexible pipe is compromised through deformation.

fpmccann DRAINAGE

SPIGOT AND SOCKET PIPES

All of our spigot and socket pipes are manufactured and CE marked in accordance with European Standard BS EN 1916, the specification for unreinforced and reinforced concrete pipes (including jacking pipes) and fittings with flexible joints. They are also designed to meet BS 5911 for concrete pipes and ancillary products.



STANDARD PIPES

Nominal Size	DN	300	375	450	525	600	675	750	825	900	1050	1200	*1350	*1500	*1800	*2100	*2400
Internal Diameter	A	300	375	450	525	600	675	750	△805	900	1050	1200	1350	1500	1800	2100	△2380
Barrel Diameter	B	416	505	590	685	790	901	996	975	1080	1266	1460	1620	1800	2130	2460	2750
Socket Diameter	C	497	575	665	760	852	960	1060	1130	1235	1420	1590	1800	2010	2380	2650	2750
Effective Length	MM	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Actual Weight	KG	454	616	812	996	1420	1856	2194	1690	2060	2760	3630	4290	5330	7300	9160	10070
Reinforced		N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Approx. Pipes per load		61	45	34	28	22	15	12	17	13	10	8	6	5	4	3	2
Chamber Ring to suit †		1200	1350	1350	1500	1500	1500	1800	1800	1800	2100	2100	2400	2400	2700	3000	3600
Crushing Strengths	Kn/M	36	45	54	63	72	81	90	99	108	126	144	162	180	216	252	288
Nominal Joint Gap	MM	4	4	4	4	4	4	4	4	4	5	5	5	7	7	7	-
Maximum Joint Gap	MM	34	34	34	34	34	34	34	34	34	34	36	36	36	41	41	-
Maximum Deflection	° Degrees	2	2	2	2	2	2	1	1	1	1	1	0.5	0.5	0.5	0.5	-

† Minimum chamber ring size to suit pipe = DN size of pipe + 900

* Lifting anchors available
△ Please note internal dimensions

PIPE LUBRICANT

Pipes should only be joined using an FP McCann lubricant

Nominal size	DN	300	375	450	525	600	675	750	825	900	1050	1200	1350	1500	1800	2100
No. of joints per	KG	27	22	18	15	13	12	10	9	9	8	7	6	5	4	4

Sold in 2.5kg Tubs



ROCKER PIPES

Nominal Size	DN	300	375	450	525	600	675	750	825	900	1050	1200	*1350	*1500	*1800	*2100
Effective Length	MM	600	600	600	600	600	1000	1000	1250	1250	1250	1250	1250	1250	1250	1250
Approx. Weight	KG	145	180	220	300	365	800	950	1020	1020	1200	1605	2020	2755	4440	4620

* Lifting anchors available



SOCKET BUTT PIPES

Nominal Size	DN	300	375	450	525	600	675	750	825	900	1050	1200	*1350	*1500	*1800	*2100
Effective Length	MM	600	600	600	600	600	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
Approx. Weight	KG	145	174	230	270	370	960	1175	945	1105	1500	1930	2435	3100	4300	5400

* Lifting anchors available



SPIGOT BUTT PIPES

Nominal Size	DN	300	375	450	525	600	675	750	825	900	1050	1200	*1350	*1500	*1800	*2100
Effective Length	MM	600	600	600	600	600	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
Approx. Weight	KG	100	135	155	205	270	870	980	750	910	1170	1585	1850	2230	3005	3800

* Lifting anchors available



ONE PIECE BEND

Degree	11.25º			22.5º			45º			90º		
Nominal size (DN)	Length (mm)		Weight (kg)	Length (mm)		Weight (kg)	Length (mm)		Weight (kg)	Length (mm)		Weight (kg)
	a	b		a	b		a	b		a	b	
300	115	103	66	160	148	79	257	245	112	618	509	167
375	239	140	117	294	195	142	413	314	199	735	636	270
450	127	79	109	196	148	139	344	296	232	745	698	352
525	97	194	140	179	276	200	335	436	400	828	965	750
600	149	137	188	240	228	289	437	425	513	973	961	898
750	384	115	502	499	230	661	744	475	1087	1412	1143	1810



TWO PIECE BENDS - 11.25º, 22.5º & 45º

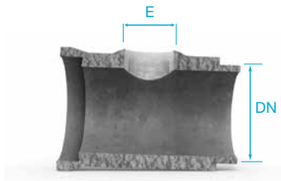
Nominal Size	DN	675	750	900	1050	1200	1350	1500	1800
Effective Length	MM	1000	1000	1250	1250	1250	1250	1250	1250
Approx. Weight	KG	775	925	1140	1515	1955	2425	2965	4105



THREE PIECE BENDS - 90º

Nominal Size	DN	675	750	825	900	1050	1200	1350	1500	1800	2100
Effective Length	MM	1750	1750	2500	1750	2500	2500	2500	2500	2500	3000
Approx. Weight	KG	850	1200	1900	2000	2600	3500	4200	5100	6800	7100

Any fabricated/cut bends need to be surrounded in concrete.



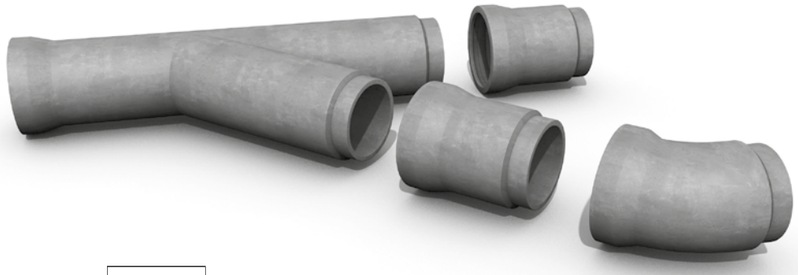
FASTFIT JUNCTIONS

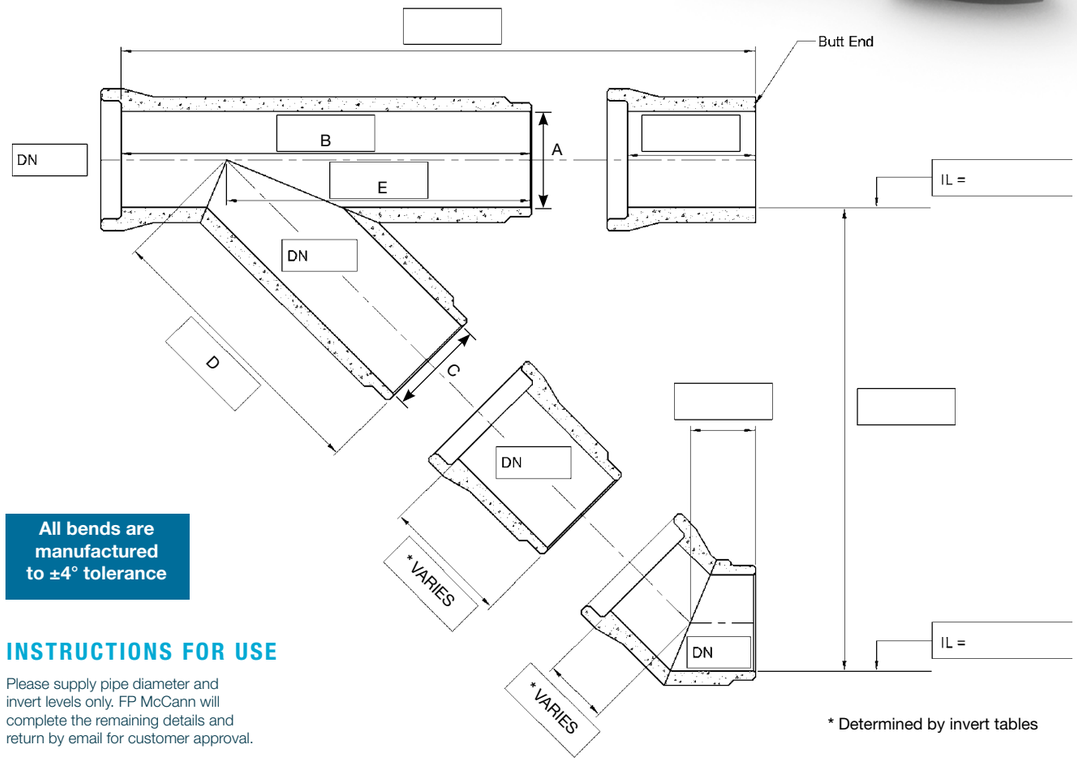
Nominal Size	DN	300	375	450	525	600	675	750	825	900	1050	1200	1350	1500	1800
Branch Size	E	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Effective Length	MM	600	600	600	600	600	1000	1000	1250	1250	1250	1250	2500	2500	2500
Approx. Weight	KG	132	169	211	277	350	750	905	800	1140	1513	2427	4416	5120	7360

All junctions are to be fitted on their side. Junctions are not designed for vertical surface compaction and need to be surrounded in concrete.

For information on our different Pipe Sealing options, please view pages 31-33.

OBLIQUE (45º) TUMBLING JUNCTION (SPIGOT)





* Determined by invert tables

All bends are manufactured to ±4° tolerance

INSTRUCTIONS FOR USE

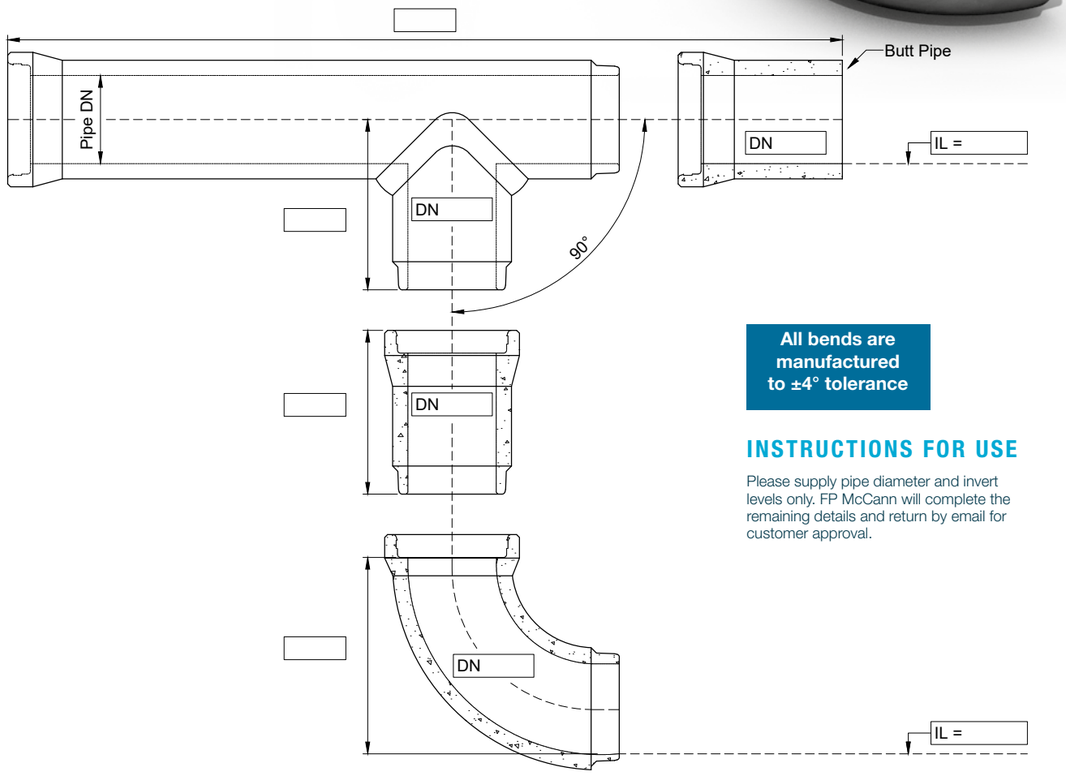
Please supply pipe diameter and invert levels only. FP McCann will complete the remaining details and return by email for customer approval.

Oblique (45°) Spigot Tumbling Bay Junction											
Main Pipe	Nominal Size	A	300	375	450	525	600	675	750	900	1050
	Effective Length	B	2500	2500	2500	2500	2500	2500	2500	2500	2500
Branch Pipe	Nominal Size	C	300	375	450	525	600	675	750	900	1050
	Effective Length	D	870	985	1087	1177	1329	1433	1558	1679	1896
	Effective Length	E	1424	1495	1533	1533	1652	1790	1739	1703	1795
	Approx Weight	Kg	520	696	873	1350	1458	2311	2828	3654	3875

Oblique (45°) Socket Tumbling Bay Junction											
Main Pipe	Nominal Size	A	300	375	450	525	600	675	750	900	1050
	Effective Length	B	2500	2500	2500	2500	2500	2500	2500	2500	2500
Branch Pipe	Nominal Size	C	300	375	450	525	600	675	750	900	1050
	Effective Length	D	870	985	1087	1329	1329	1433	1558	1679	1896
	Effective Length	E	1014	989	943	864	862	819	759	623	535
	Approx Weight	Kg	572	748	940	1450	1550	2400	3090	3885	4199

SQUARE (90º) TUMBLING JUNCTION (SPIGOT)





All bends are manufactured to ±4° tolerance

INSTRUCTIONS FOR USE

Please supply pipe diameter and invert levels only. FP McCann will complete the remaining details and return by email for customer approval.

Square (90°) Spigot Tumbling Bay Junction												
Main Pipe	Nominal Size	A	300	375	450	525	600	675	750	900	1050	1200
	Effective Length	B	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Branch Pipe	Nominal Size	C	300	375	450	525	600	675	750	900	1050	1200
	Effective Length	D	580	628	670	708	770	818	865	1163	1005	1100
	Effective Length	E	1219	1242	1238	1229	1257	1250	1250	915	1165	1165
	Approx Weight	Kg	484	640	827	1098	1396	1453	2457	2964	3370	4374

Square (90°) Socket Tumbling Bay Junction												
Main Pipe	Nominal Size	A	300	375	450	525	600	675	750	900	1050	1200
	Effective Length	B	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
Branch Pipe	Nominal Size	C	300	375	450	525	600	675	750	900	1050	1200
	Effective Length	D	580	628	670	708	770	710	865	915	1005	1100
	Effective Length	E	1219	1242	1238	1229	1257	1250	1249	1163	1165	1165
	Approx Weight	Kg	540	685	854	1098	1453	1550	2542	3144	3398	4582

PIPE HANDLING/ LAYING INSTRUCTIONS



Recommended site work practice - open cut flexible jointed pipes

HANDLING & STORING PIPES

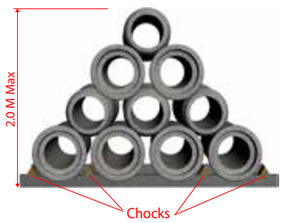
1. Time and place of off-loading should be agreed before the units arrive at site. The contractor should provide suitable equipment for off-loading, stacking and stringing out of pipes on-site.
2. Off-loading should take place at the nearest hard road to the point of installation. To ensure the safety of all personnel, units must be left in a stable position, well clear of the edge of the trench.
3. Pipes should be inspected before off-loading to ensure that materials delivered correspond with the order placed.
4. Pipes should be carefully checked during off-loading to ensure no units are damaged. Any discrepancies should be recorded on the delivery docket.
5. Where stacking is necessary, this should be done on level ground and the bottom layer of pipes securely chocked to prevent the stack from collapsing. Pipes should be supported under the barrel so that the socket is free of load and to prevent the jointing faces from getting damaged. Preferably, they should be stacked barrel to barrel with sockets hanging over alternative sides.
6. For safety reasons and to prevent damage to the lower layers of pipe in the stack, pipes should not be loaded or stacked in a greater number of layers than is shown in the table below.
7. Avoid damage when handling, especially to ends of concrete pipes. Never drag or roll pipes over the ground.

Note: FP McCann's spigot and socket pipes from DN1350 can be handled using our purpose-built Anchor System. Special lifting anchors can be cast into pipes at manufacture. A Universal Head Link (available from FP McCann) can then be hooked onto the exposed anchor heads to lift the pipe. Lifting anchors are fitted to order.

LAYING PIPES

1. **Trench Excavation** The trench should be excavated to the line, gradient and width, as indicated in the contract documents or as agreed with the engineer. The safety of the public and site personnel is of paramount importance. Care should be taken to ensure personal safety at all times.
2. **Trench Width** Any increase in trench width above that specified could increase the load on the pipe, increasing the quantity of excavation and the bedding material required. A trench narrower than the specified width may impede the proper placing of bedding or backfill material, or the correct jointing of pipes.
3. **Formation** Uniform support along the pipeline is essential. Rock outcrops and soft zones, which can cause differential settlement, should be dug out and replaced with compacted specified backfill material. De-watering may be necessary during pipe laying and subsequent backfilling operations. The specified bedding material should be placed as detailed in the contract specification, and trimmed to ensure uniform support of the pipe throughout the length of its barrel. Recesses should be prepared for the pipe sockets.
4. **Pipe Laying** Before being lowered into the trench, pipes and fittings should be inspected to ensure that they have not been damaged during handling and storage on-site. Units should be lowered carefully into the trench using a recognised lifting tackle, such as a concrete mechanical pipe lifter.
5. **Jointing** Using our pipe jointing instruction guide, all pipe spigots must be fully lubricated with the pipe lube supplied, just prior to being lowered into the trench. Please note: pipes should only be jointed using a FP McCann lubricant. The socket of the laid pipe should, at this stage, be prepared by removing the polystyrene forming ring to leave a clean seal, free from debris. The adjoining pipe should be lowered into position, as level as possible, centring the pipe spigot with the seal of the laid pipe so that the pipes are in line. On achieving this, apply pressure to the socket end of the adjoining pipe using a substantial piece of timber to protect the pipe from damage when pushing the pipe home. (see page 47 for details)
6. **Testing** Acceptance tests on the completed pipeline give an indication of the level of control of workmanship and materials during construction.
7. **Visual Testing** Check for obstructions and debris within the pipe, the structural soundness of pipes, that joints are properly sealed and that the pipe invert is even. Note: pipes smaller than DN750 may be inspected from manholes or by means of TV cameras.
8. **Watertightness** The watertightness of a pipeline may be checked using a water or air test. Such tests will reveal the existence of cracked or porous pipes or faulty joints. These tests should be made during and after laying and before backfilling. The test method will be detailed in the contract specification or referenced to an appropriate code of practice. In certain circumstances (e.g. where the distance between manholes is great, or when site conditions are such that backfilling must take place immediately or when laying small diameter pipelines), it is recommended that the pipeline is tested at regular intervals (say every 2/3 pipes) during construction (s ee page 47).
9. **Backfilling** This should take place after inspection and testing. The attention given to the backfill selection is of great importance. The placing and compaction of inappropriate backfill may cause damage to a new pipeline. The structural strength of the completed pipeline depends as much on good site workmanship as on the strength of individual pipes. Consequently, all backfill material must be selected and placed as detailed in the contract specification or recognised code of practice.

Note: For additional information on laying and testing pipes, please refer to the BPDA website: precastdrainage.co.uk



DN	No of layers
300 - 375	4
450 - 600	3
750 - 900	2
> 1050	1

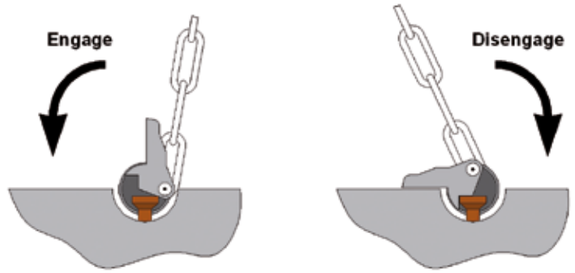
ANCHOR SYSTEM

FP McCann's pipes from DN1350 should be handled using our purpose-built anchor system. Special lifting anchors are cast into pipes at manufacture. A universal head link (available from FP McCann online) can then be hooked onto the exposed anchor heads to lift the pipe.

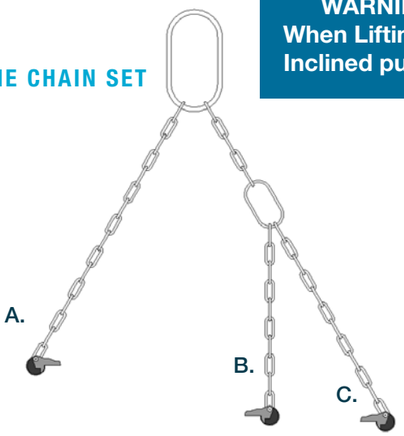
Use the equal lengths (A & B) for lifting the pipe. Join the longer chain (C) onto the pipe already laid and place the shorter length (B) onto the hook. The pipe can then be jointed without moving the jib of the crane. www.fpmccann.co.uk/anchor-system

WARNING
When Lifting ≥45°
Inclined pull only

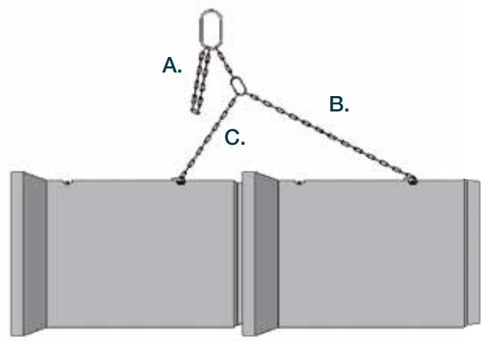
ENGAGING AND DISENGAGING THE EYE



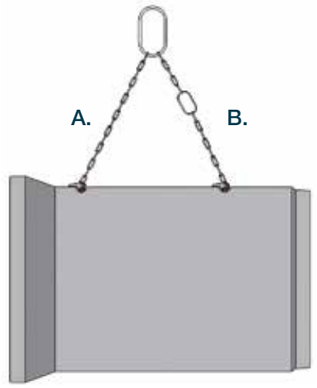
THE CHAIN SET



JOINTING



LIFTING AND HANDLING



Nominal Size	DN	300	375	450	525	600	675	750	825	900	1050	1200	1350	1500	1800	2100	2400
Anchor Availability		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	✓	✓	✓	✓	✓

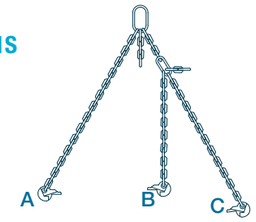
Anchor system available from 1350mm diameter upwards (Available in DN1200 in NI only) / * Lift only not jointing

NOTES:

1. All dimensions are in mm.
2. Weights in kg are based on a concrete density of 2500kg/m³.
3. Where relevant, pipes are manufactured in accordance with BS EN1916.
4. Normal practice is to determine left or right branch laterals to the main line by looking up the flow i.e. from the socket end.
5. Right hand or left hand junctions (viewed socket to spigot) should be specified when ordering reduced junctions in pipe diameters DN1350 and above.
6. Lifting chains are not suitable for joining purposes in pipes of diameter DN2400. Joint in the traditional method.
7. Do not install vertical junctions.

PIPE LIFTING INSTRUCTIONS

LIFTING CHAINS



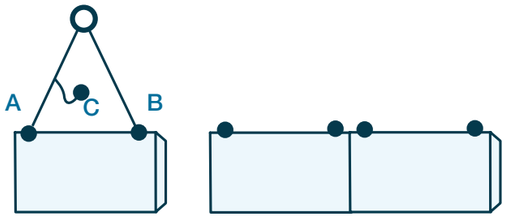
Nominal Size (mm)	1800	2100	2400
Medium Duty Chain Set	3	3	X
Heavy Duty Chain Set	X	X	*3

*Only suitable for Lifting not Jointing

HANDLING/LIFTING INSTRUCTIONS

DN1800 to DN2400 pipes are designed and manufactured to incorporate FP McCann's jointing and lifting systems.

LIFT SYSTEM



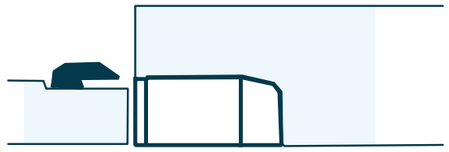
The Lift

To lift the pipes, select the two short legs A and B on the chain set. Place the spherical coupling over the cast-in anchor and engage by turning the tail of the head link down to the concrete. The pipe can then be lifted as normal.

Never pass slings or other lifting appliances through the barrel and never lift more than one pipe at a time.

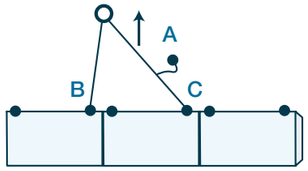
JOINTING

Ensure pipe sockets and spigots are not damaged. Ensure that integral seals are not damaged and apply the approved lubricant. For pipes without an integral seal, ensure the seal is of the correct size and is not damaged. Position the rubber ring on the end of the spigot. Under no circumstances use lubricants when using seals of this type, as they are pre-lubricated internally.



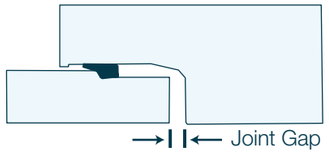
Ensure the tension is even.

Ensure each pipe to be laid is aligned with the laid pipeline and is fully supported along its length. Recommended method of joining pipes is shown below.



Lift joint

To joint the pipe using the chain system, attach the long leg A and the short leg B to the already laid pipe C. Take up the slack in the chains with the lifting pulley over the anchor of the laid pipe, and increase the upward force to joint the pipes. When jointed, ensure that there is no excessive slew or misalignment, this can easily be checked by reference to the joint gap.



Joint Gap

WARNING
When Lifting ≥45°
Inclined pull only

NOTES:

1. All dimensions are in mm.
2. Weights in kg are based on a concrete density of 2500kg/m³
3. Where relevant, pipes are manufactured in accordance with BS EN 1916.
4. Normal practice is to determine left or right branch laterals to the main line by looking up the flow i.e. from the socket end.
5. Right hand or left hand junctions (viewed socket to spigot) should be specified when ordering reduced junctions in pipe diameters DN1350 and above.
6. Lifting chains are not suitable for joining purposes in pipes of diameter DN2400. Joint in the traditional method.
7. Do not install vertical junctions.
8. In-wall pipes do not require lubrication.

ONE PIECE INTEGRAL RUBBER SEAL









FP McCann now provide a new type of integral seal for their precast concrete pipes. This new integrated seal is a simple, one-piece rubber compression connector which is embedded in the concrete when the pipe is cast. The seal is compressed between the pipe and the concrete, creating a flexible watertight seal.

FEATURES

- The seal complies with all relevant European standards, including EN 681-1, ISO 90001 and QR 4060
- Durable synthetic EPDM rubber seal with over 100 years shelf life
- Seal is cast accurately and stable at the precast factory
- Pipe is cast with numerous holding parts to keep the seal in place
- Clean, high quality sockets
- Ideal for use with mechanical laying techniques such as pipelifter
- Pipes arrive at site ready to be connected

Please note: During the changeover phase, our new integral seal is fully compatible with our current seal

BENEFITS

- Integrally cast into the structure of the pipe
- Environmentally friendly as it eliminates the need for the polystyrene strip
- Reduction in waste on site
- No cavities or steps in joints
- Almost zero push back
- Requires low insertion force
- Seal not sensitive to weather
- No clamps required to tighten or forget
- Fast and easy installation
- Pipes may be backfilled immediately
- Less time in excavation
- Durable, reusable casting forms

Important Jointing Information
The integral pipe-seal jointing system used in FP McCann's drainage products requires the use of a FP McCann proprietary lubricant, which can be supplied with all pipeline orders from us. Failure to use the proprietary lubricant in accordance with the instructions provided by the pipe-seal manufacturer / FP McCann, may give rise to problems with pipe jointing and seal performance and invalidate any warranty, implied or otherwise. FP McCann accepts no responsibility whatsoever for problems or loss of performance arising from any such failure.

AIR TEST ONLY (A.T.O.)

INFLATABLE PIPE STOPPER

Air testing is a quick and easy way of checking a pipeline following installation. Correct assembly of joints, workmanship and the prevention of site handling damage can be identified by this test. FP McCann recommends the use of inflatable stoppers when air testing concrete pipes. Associated test equipment should be in good condition and in full working order. FP McCann recommends that this test is done every 2-3 pipes before backfilling, regularly following backfill during the installation and then at the finish; preferably before both manholes have been constructed.

The pipeline should be pressurised with air until the 'U' guage (manometer) indicates 100mm. Allow a minimum of 5 minutes for stabilisation of the air pressure, longer may be needed in cold or very hot weather. Observe the fall in indicated pressure over a 5 minute test period. The test is successful if the residual pressure does not fall below 75mm within the 5 minute test period.

If the pressure falls sharply and the pipeline appears to have failed, the following checks should be carried out:

- Inspect the seal of the inflatable stopper against the inside of the pipe using soapy water. Use pipe lubricant or industrial soap to assist in providing a seal where necessary
- Check the connections, rubber tube and stoppers for leaks
- Temperature and humidity changes can significantly affect the test. It may be necessary to allow more time for stabilisation or repeat the test in extreme weather conditions

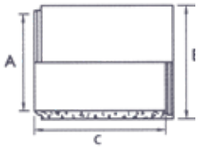
If difficulties are still being experienced following these checks, please contact FP McCann for further assistance.

Please note that failure to adhere to the advice given above and on the FP McCann website may result in any subsequent claims being invalid. Call-out charges may also apply if FP McCann's technical personnel have to attend on site.

Failure to successfully pass an air test does not prohibit the acceptance of pipeline if a successful water test can be obtained in accordance with BS EN 1610.

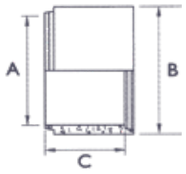


PRE-LUBRICATED PIPES



STANDARD PIPES

Nominal Size	DN	1800	2100	2400
Internal Diameter	A	1830	2076	2380
Barrel Diameter	B	2140	2410	2750
Effective Length	C	2500	2500	2500
Approx. Weight	KG	6525	7960	10070
Pipes per Load	Qty	4	3	2

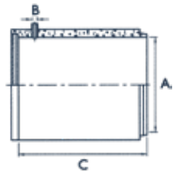


ROCKER PIPES

Nominal Size	DN	1800	2100	2400
Internal Diameter	A	1830	2076	2380
Barrel Diameter	B	2140	2410	2750
Effective Length	C	2500	2500	2500
Approx. Weight	KG	6525	7960	10070

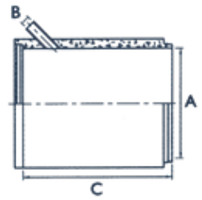
TWO PIECE BENDS

Nominal Size	DN	1800	2100	2400
Internal Diameter	A	1830	2076	2380
Angle Øº	11.25	3	3	3
Angle Øº	22.5	3	3	3
Angle Øº	45	3	3	3



RIGHT ANGLE (90°) REDUCED JUNCTION

Nominal Size	DN	1800	2100	2400
Branch Supersleeve	A	100	100	100
Branch Supersleeve	B	150	150	150
Effective Length	C	2500	2500	2500
Approx. Weight	KG	6525	7960	10070



OBLIQUE (45°) REDUCED JUNCTION

Nominal Size	A	1800	2100	2400
Branch Supersleve	B	100	100	100
Effective Length	C	2500	2500	2500
Approx. Weight	KG	6525	7960	10070

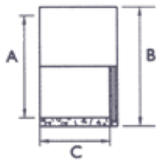
NB: Dimensions above are in mm.

Fastfits available 150mm Super sleeve made to order. Can connect to other pipes via additional adaptors not supplied

Note:

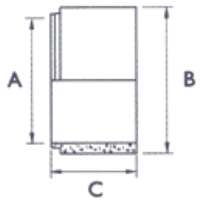
All junctions are to be fitted on their side. Junctions are not designed for vertical surface compaction.

Under no circumstances should lubricants be used when assembling pre-lubricated pipes; the seal is lubricated internally.



SPIGOTT/SOCKET BUTT PIPES

Nominal Size	DN	1800	2100	2400
Internal Diameter	A	1830	2076	2380
Barrel Diameter	B	2140	2410	2750
Effective Length	C	1250	1250	1250
Approx. Weight	KG	3370	4095	5195



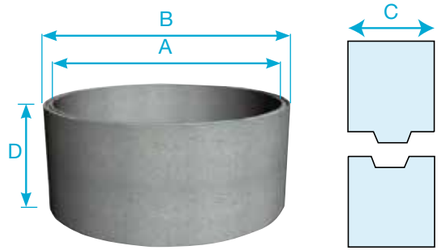
SPIGOT BUTT PIPES

Nominal Size	DN	1800	2100	2400
Internal Diameter	A	1830	2076	2380
Barrel Diameter	B	2140	2410	2750
Effective Length	C	1250	1250	1250
Approx. Weight	KG	3020	3610	4670

MANHOLE CHAMBERS



MANHOLE CHAMBERS (TONGUE & GROOVE JOINT)



Tongue and Groove Joint Profile

Nominal Size (A) (DN) (mm)	Available Depth of Section (D) 250mm (±25mm)	500mm (±25mm)	750mm (±50mm)	1000mm (±50mm)	Wall Thickness (C) mm	Litres per metre	Barrel Diameter (B) mm	Approx Weight Kg. (per metre)	Approx. Products per load Qty. (metre)	Lifting Hole Qty/Dia. (per /unit) (mm)
900	✓	✓	✓	✓	70	656	1040	520	38	3 x 45
1050	✓	✓	✓	✓	80	894	1210	690	34	3 x 45
1200	✓	✓	✓	✓	90	1167	1380	880	26	3 x 45
1350		✓	✓	✓	95	1478	1540	1050	22	3 x 45
1500		✓	✓	✓	100	1824	1710	1300	16	3 x 45
1800		✓	✓	✓	115	2544	2030	1750	12	3 x 45
2100		✓	✓	✓	125	3464	2350	2040	10	4 x 50
2400		✓	✓	✓	140	4514	2680	2790	8	4 x 50
2700		✓	✓	✓	150	5725	3000	† 3400	8	4 x 50
3000		✓	✓	✓	190	7069	3380	† 4700	5	4 x 50
3600		✓	✓	✓	185	10179	3970	5400	5	△ 3 x RD30
4000			✓	✓	200	12566	4400	*7200	4	△ 4 x RD36
										Dia ± 5mm

MOL from 900-1500 / * 2 piece chamber ring - 3600kg per piece (4m diameter)

△ 570 long wavy tail anchors † 5% Safety Factor

PRODUCT INFORMATION

- FP McCann's manhole chamber rings are manufactured with tongue and groove joints and comply with BS EN 1917 / BS 5911-3
- Manhole chambers from DN900 -DN1800 have 3 lifting points.
- Manhole chambers from DN2100 - DN3000 have 4 lifting points.
- DN3600 and DN4000 are outside of the scope of the British Standard (Non-Kitemark), but comply with all relevant provisions of the European Standard. DN4000 is supplied in two halves

NB: NI have 3 lifting points

WARNING
When Lifting ≥45° Inclined pull only

RECOMMENDED SITE WORK PRACTICE - MANHOLE CHAMBERS

RECOMMENDED LIFTING EQUIPMENT

Nominal Size DN (mm)	Lifting Hole Qty/dia (p/Unit)	36mm lifting pin 3.5 t SWL	42mm lifting pin 3.5 t SWL	3 leg lifting chain 3.1t	4 leg lifting chain SWL 6.7 t
900	3 x 45mm dia	✓		✓	
1050	3 x 45mm dia	✓		✓	
1200	3 x 45mm dia	✓		✓	
1350	3 x 45mm dia	✓		✓	
1500	3 x 45mm dia	✓		✓	
1800	3 x 45mm dia	✓		✓	
2100	4 x 50mm dia		✓		✓
2400	4 x 50mm dia		✓		✓
2700	4 x 50mm dia		✓		✓
3000	4 x 50mm dia		✓		✓
3600	3 x RD30 (Loops)			✓	
4000	4 x RD36 (Loops)				✓

Dia + 5mm

HANDLING & INSTALLING MANHOLES

1. Time and place of off-loading should be agreed before the units arrive at site. The contractor should provide suitable equipment for off-loading. For safety reasons, all chamber sections are loaded and delivered chimney fashion.
2. Off-loading should take place at the nearest hard road to the point of installation. When off-loaded, units should never be stored on their side (on the roll) but always be laid in the 'as installed' upright position.
3. Carefully inspect units during off-loading to verify that products are undamaged and comply with order placed. Note any discrepancies on the delivery docket and advise accordingly.

CONSTRUCTION

To ensure that the manhole structure is vertical, accurate levelling of the formation or the in-situ concrete foundation is essential. Please note: the depths of each manhole can vary and are subject to tolerances; it is recommended that each unit installed has it's depth measured prior to installation, to ascertain if the levelling requirements are satisfactorily met. Tongue and groove joints should be installed with the groove facing upward. Manhole sections fitted with double steps can be used at any depth. However, it is recommended that the deepest section of manhole units should be used whenever possible, in order to minimise the number of joints and costs. Precast cover slabs can be laid directly onto the shaft or chamber rings. To allow for any differential settlement between manhole and pipeline, a flexible joint incorporating short length rocker pipes should be constructed as close as possible to the outside of the manhole or the concrete surround, if used. Extra care must be taken to ensure that joints are properly made.

JOINTING

Precast manhole components are provided with joints formed within the wall section. These are sealed with cement and sand mortar, or with proprietary FP McCann mastic sealants. Precast concrete manhole units, well jointed, provide an adequate seal under normal conditions.

REINSTATEMENT

A well-constructed precast manhole is a strong, durable structure with its own inherent strength and will only require an in-situ concrete surround for exceptional structural reasons. A concrete surround is usually specified to assure the chamber is watertight. Generally, adoption authorities prescribe a concrete surround is used with traditional precast manhole units (wall thickness less than 125mm) but it is not required for the wide walled precast units (wall thickness 125mm and above). However, watertightness should be given consideration where the distance from ground level to the base of the chamber exceeds 5m. Further measures may be required for the chamber rings below 5m depth in these instances, such as the use of a concrete surround. Where a concrete surround is required, it should have a minimum thickness of 150mm, backfilling should take place as each precast manhole section is assembled and it must be brought up evenly and compacted around the manhole to prevent displacement.

TESTING

It is generally unnecessary to apply water tests to manholes. In normal working conditions, manholes are not normally full of water. Prevention of infiltration is of more relevance than exfiltration. If infiltration does occur, it can be seen and remedied by sealing using an appropriate method.

Note: When handling precast products on site, it is recommended that the contractor has the correct lifting equipment in place and adheres to the relevant lifting guidelines and standards.
Refer to the BPDA website for further information:
https://www.precastdrainage.co.uk/page/pipe-laying-lifting

MANHOLE SOAKAWAYS

MANHOLE SOAKAWAY CHAMBERS

Nominal Size DN (mm)	No. of 75mm holes per chamber			Wall Thick-ness mm	Litres per metre ring	Barrel Dia. mm	Approx Weight Kg. (p/metre)	Approx. Products per load Qty. (metre)
	500 mm	750 mm	1000 mm					
900	5	8	10	70	656	1040	520	46
1050	6	9	12	80	894	1210	690	34
1200	7	10	14	90	1167	1380	880	26
1350	8	11	15	95	1478	1540	1050	22
1500	8	13	17	100	1824	1710	1300	18
1800	10	15	20	115	2544	2030	1750	12
2100	12	18	24	125	3464	2350	2040	10
2400	14	20	27	140	4514	2680	2790	8
2700	15	23	31	150	5725	3000	† 3400	6
3000	17	25	34	190	7069	3380	† 4700	5
*3600	20	31	41	185	10179	3970	5400	5
*4000	23	34	45	200	12566	4400	6800	1.5

* DN3600/4000 see Manhole Chambers / DN3600/4000 Manhole Soakaways made to order
† 5% Safety Factor



SEALING STRIP

Nominal Size DN (MM)	Sealant Size (metres)	No. of rolls p/joint (metres)	Rolls required Quantity
900	20 x 20 x 4	0.88	1
1050	20 x 20 x 4	1.00	1
1200	20 x 40 x 4	1.13	2
1350	20 x 40 x 4	1.25	2
1500	20 x 40 x 4	1.38	2
1800	20 x 40 x 4	1.63	2
2100	20 x 40 x 4	1.88	2
2400	20 x 40 x 4	2.13	3
2700	20 x 40 x 4	2.38	3
3000	12 x 120 x 6	1.75	2
3600	12 x 120 x 6	2.08	3
4000	12 x 120 x 6	2.33	3

Please note this is a guideline based on sealant supplied by FP McCann only.

DN4000 MANHOLE CHAMBER



The DN4000 manhole chamber sections can be used in a variety of applications such as:

- Water treatment plants
- Stormwater attenuation systems
- Storage tanks
- Catchpits

The DN4000 chamber ring is supplied with a standard tongue and groove joint, connecting bolts and butyl rubber sealant for jointing purposes. The units are designed for use with the FP McCann ladder system. Single units (half ring) are lifted using 3 no. threaded lifting loops connected into threaded lifting sockets that are cast into the units, all of which must be used. Assembled units (full ring) are then lifted using 4 threaded lifting loops.

The 4 metre chamber section comes as a two part unit, which allows for ease of transport and handling.

DN4000 CHAMBER SECTION

Nominal Size (mm)	Section Depth (mm)	Wall Thickness (mm)	Approx. weight per section (kg)	Approx. weight per section when jointed (kg)
4000	1000	200	3400	6800
4000	750	200	2550	5100

DN4000 COVER SLAB – 2 PIECE UNIT (DETAIL FOR STANDARD 600 & 675 OPENINGS)

Nominal Size (mm)	Section Depth (mm)	Overall Thickness (mm)	Overall Diameter (mm)	Approx. weight of half section (mm)	Approx. weight of combined sections (kg)
4000	300	300	4500	6450	11,700

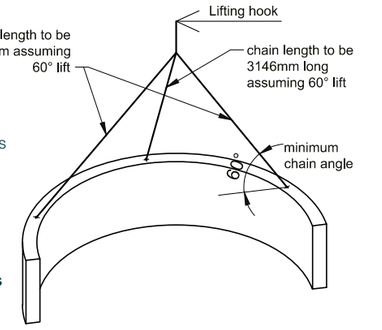
Cover slabs are manufactured in two sections, supplied with standard openings. Standard cover slabs are designed to withstand 30 units of Type HB loading, applied in accordance with BS 5911. If required, cover slabs can be designed to withstand 45 units of Type HB loading. For special opening cover slabs, an engineering drawing and steel specification may be required in order to achieve the desired loading requirement.

FP McCann will provide a technical installation sheet which must be adhered to when installing DN4000 manhole chambers. This is available online or from our sales team.

DN4000 LIFTING/HANDLING & INSTALLATION GUIDE

1. LIFTING

Single units (half ring) are lifted using 3 no. threaded lifting loops connected into threaded lifting sockets that are cast into the units, all of which must be used. The chain angle should not be less than 60 degrees to the horizontal. In order to lift without tilt, the chain lengths will differ. Refer to the diagram opposite for explanation of minimum chain angle and lengths. Alternatively, a spreader beam may be used. Complete units (full ring) are lifted using 4 threaded lifting loops attached to threaded lifting sockets cast into the units. Refer to the diagram opposite for explanation of the location of the lifting sockets to be used. The chain angle should not be less than 60 degrees to the horizontal. Alternatively, a spreader beam may be used. **Note: Using 3 chains to lift a full ring will put unnecessary stress on the concrete and may cause the concrete around the join to crack.**

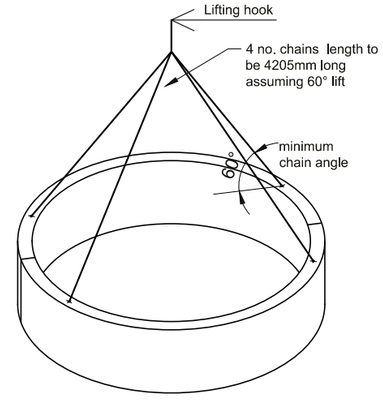


Unit weight and identification of lifting points will be marked on each casting for information.

2. HANDLING & INSTALLATION

It is recommended that the two piece chamber ring is jointed before lifting into place:

- Place the two units on a level surface, ideally on 2 skids to reduce resistance when jointing and also to maintain a clean joint
- Place both halves side by side, ensuring both are at the correct orientation i.e. with bolt holes in line with threaded sockets
- Insert the M24x200 threaded pins with the 60mm threaded side placed into the cast-in sockets
- Place a strip of bituminous sealant along the small recess of the vertical joint on both halves of the ring
- Once bolts and sealant are in position, the 2 halves of the unit must be pulled together using a ratchet system e.g. a chain block fixed to the cast-in M24 x 80 sockets on opposite ends of the units. (Do not use the wall end bolting system to pull the units together as this may crack the concrete and damage the joint)
- The completed ring can then be manoeuvred into place, as detailed above



Half-rings can be lifted into final position and the chamber can be built up, a half unit at a time.

Please note it is the end-user's responsibility to ensure safe access and lifting procedures are followed at all times.

WIDE WALL MANHOLE CHAMBER

FP McCann's precast concrete wide wall manholes have been designed with a tongue and groove dimension to accommodate the use of bituminous sealant. FP McCann's approved sealant should be used at all times. The sealant requirement for wide wall manholes is 12mm x 120mm x 6m. When placing the sealing strip into position during installation, the ends of the strips must be overlapped by a minimum of 30mm and cut at an angle of 60 degree. The cut ends must then be pressed together. Full installation guidelines can be provided upon request or obtained from our website www.fpmccann.co.uk

DN1200, 1500 AND 1800MM WIDE WALL MANHOLE CHAMBERS

A 130mm thick wide wall chamber, in combination with the Easi-Base™ unit, provides a sealed watertight manhole system. This robust design means that the requirement for a concrete surround is eliminated.

PRODUCT BENEFITS

- Quick and easy installation
- Watertight structure
- Safe anchor lifting system (spherical head lifting system)
- Greater cost savings associated with using precast concrete over a traditional system
- No concrete back fill required, in accordance with 'Sewers for Adoption' 7th edition
- More environmentally friendly than a traditional system, almost 40% less carbon omitted during the concrete casting process
- Significant reduction in health and safety risks associated with using precast concrete

Please note: Wide Wall Manhole Chambers are manufactured with 3 x 2.5T Lift Head Anchor points to facilitate the safe anchor lifting system (spherical head lifting system).

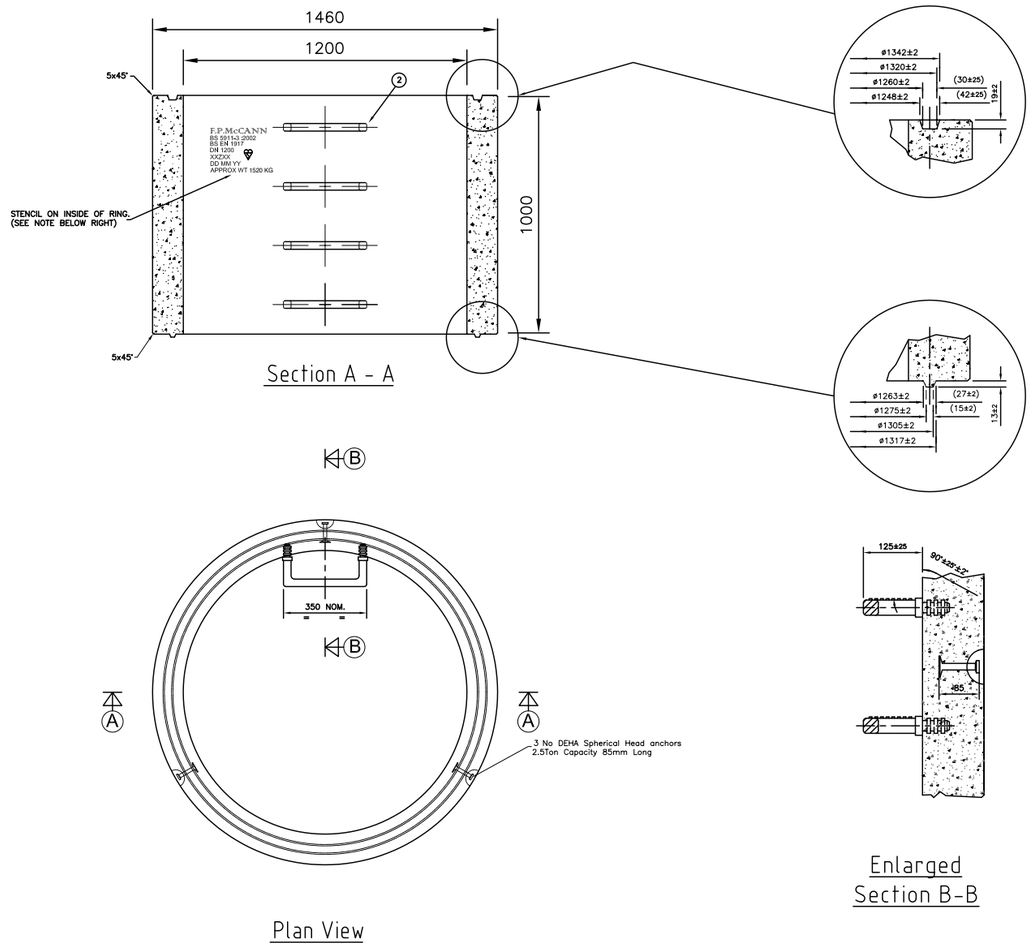






WIDE WALL MANHOLE CHAMBER DIMENSIONS





Nominal Size DN (mm)	Available Depth of Section				Wall Thickness (mm)	Barrel Diameter (mm)	Approx Weight Kg. (p/metre)	Approx. Products per load Qty. (metre)	36mm Lifting Pin 0.7t SWL	42mm Lifting Pin 3.5t SWL	3 leg lifting chain SWL 3.1t
	250mm (±25mm)	500mm (±25mm)	750mm (±50mm)	1000mm (±50mm)							
1200	✓	✓	✓	✓	130	1460	1520	16	3x 2.5T Lifting clutches. FP McCann supplies recommended and approved lifting clutches.		✓
1500	✓	✓	✓	✓	130	1760	1645	14			✓
1800	✓	✓	✓	✓	130	2060	1970	12			✓

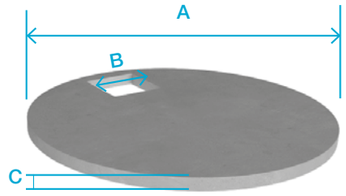
MANHOLE COVER SLABS & ACCESSORIES

STANDARD LANDING SLABS				
Chamber Section (DN)	Outside Diameter (A)	Opening Diameter (B)	Slab Thickness (C)	Approx. Weight (Kg)
1500	1730	900	200	826
1800	2050	900	200	1292
2100	2375	900	200	2030
2400	2705	900	200	2600
2700	3025	900	200	3880
3000	3330	900	200	4500

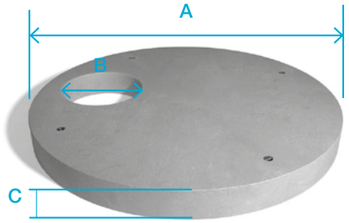
NB: All dimensions are in mm, unless stated otherwise

			STANDARD COVER SLABS			STANDARD REDUCING SLABS		
			Opening Configuration B					
Chamber DN (mm)	Outside Diameter (A) (mm)	Slab Thickness (C) (mm)	Size (mm)	Location	Approx. Weight (kg)	Opening Diameter B (mm)	Effective Depth (mm)	Approx. Weight (kg)
900	1080	150	600x600 675x675	CENTRAL	215			
1050	1240	150	600x600 675x675	ECCENTRIC	315			
1050	1450	150	750x750	CENTRAL				
1200	1450	150	600x600 675x675 750x600	ECCENTRIC	455	900	200	385
1350	1580	170	600x600 675x675 750x600	ECCENTRIC	650	1050	200	695
1350	1740	175	1200x675	CENTRAL	980	1200	200	680
1500	1740	175	600x600 675x675 750x600 1200x675	ECCENTRIC CENTRAL	980	900 1050 1200	200 200 200	981 835 680
1800	2070	175	600x600 675x675 750x600 1200x675	ECCENTRIC	1460	900 1050 1200	200 200 200	1495 1350 1220
2100	2380	200	600x600 675x675 750x600 1200x675	ECCENTRIC	2180	900 1050 1200	200 200 200	2130 2690 2540
2400	2710	200	600x600 675x675 750x600 1200x675	ECCENTRIC	2800	900 1050 1200	200 200 200	2815 2690 2540
2700	3030	230	600x600 675x675 750x600 1200x675	ECCENTRIC	3750	900 1050 1200	200 200 250	3695 3550 3410
3000	3420	200	600x600 675x675 750x600 1200x675	ECCENTRIC	4970	900 1050 1200	200 200 200	4970 4970 4970
*3600 Two Piece	4000	300	600x600 675x675 750x600 1200x675	ECCENTRIC	9250	Covers to suit Manholes greater than or equal to 1.5m deep cover level to pipe soffit.		
*4000 Two Piece	4500	300	600x600 675x675 750x600 1200x675	ECCENTRIC	11700	*3600mm and 4000mm diameter cover slabs come in a 2 piece unit		

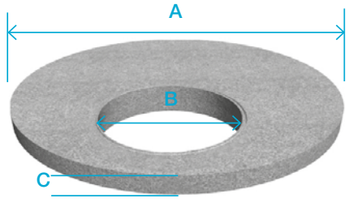
COVER SLABS



LANDING SLABS



REDUCING SLABS



Multiple access/other access sized cover slabs can be made to order

Note:
Cover Slab sizes 900-3000 are manufactured in accordance with BS 5911-3. DN3600 and 4000 cover slabs are generally designed in accordance with BS EN 1992-1-1, (for 30 units of Type HB loading, can also be designed to withstand 45 units of Type HB loading).
* Weights for DN3600 and DN4000 are estimated weights based on solid slabs.

ADJUSTING UNITS & CORBEL SLABS

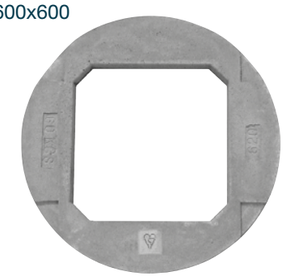
Manhole Type	Diameter (mm)	Opening Size (mm)	No. per Pack	Thickness (mm)	Weight (kg)
Type 2	1050	600 x 600	15	65	70
Type 2	1050	675 x 675	15	65	55
Type 2	1050	750 x 600	15	65	60
Type 2	1050	750 x 750	10	65	45
Type 2	1575 x 1050	1200 x 675	6	75	160
Type 1	1175 x 1025	600 x 600	10	65	125

Note: A 600 x 600 eccentric corbel slab is also available when using a ladder BS EN 1917 and BS 5911

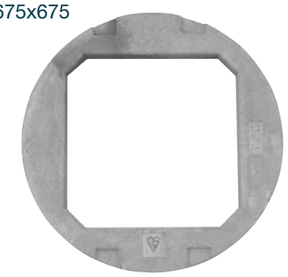
FP McCann manufactures a full range of adjusting units and corbel slabs that have the following advantages:

- Designed as seating for manhole cover
- Eliminates laying engineering bricks on-site
- Quicker to lay, ensuring reduced labour costs
- 65mm thick – similar to brickwork
- Sits on top of the manhole cover slab
- Eliminates brickwork vertical joint weakspots
- Quality product produced by vibration process
- Comprehensive strength, similar to Class B.Eng bricks

Type 2
600x600



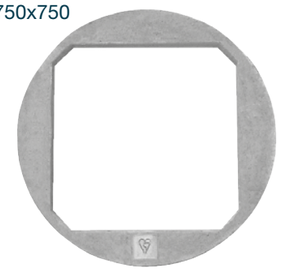
Type 2
675x675



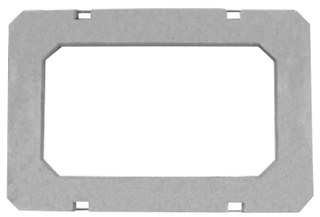
Type 2
750x600



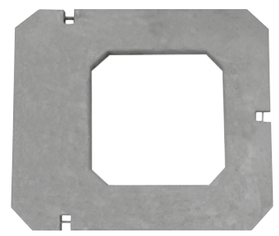
Type 2
750x750



Type 2 1200x675

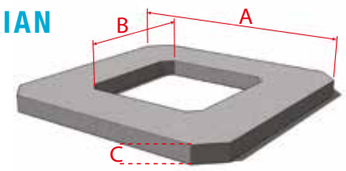


Type 1 600x600 Eccentric (Corbel)



Size (A) (mm)	Slab Thickness (C) (mm)	Openings (B) (mm)	Approx. Weight (kg)
1125x1125	75	600x600/675x675/750x600	140
1125x1125	150	600x600/675x675/750x600	290

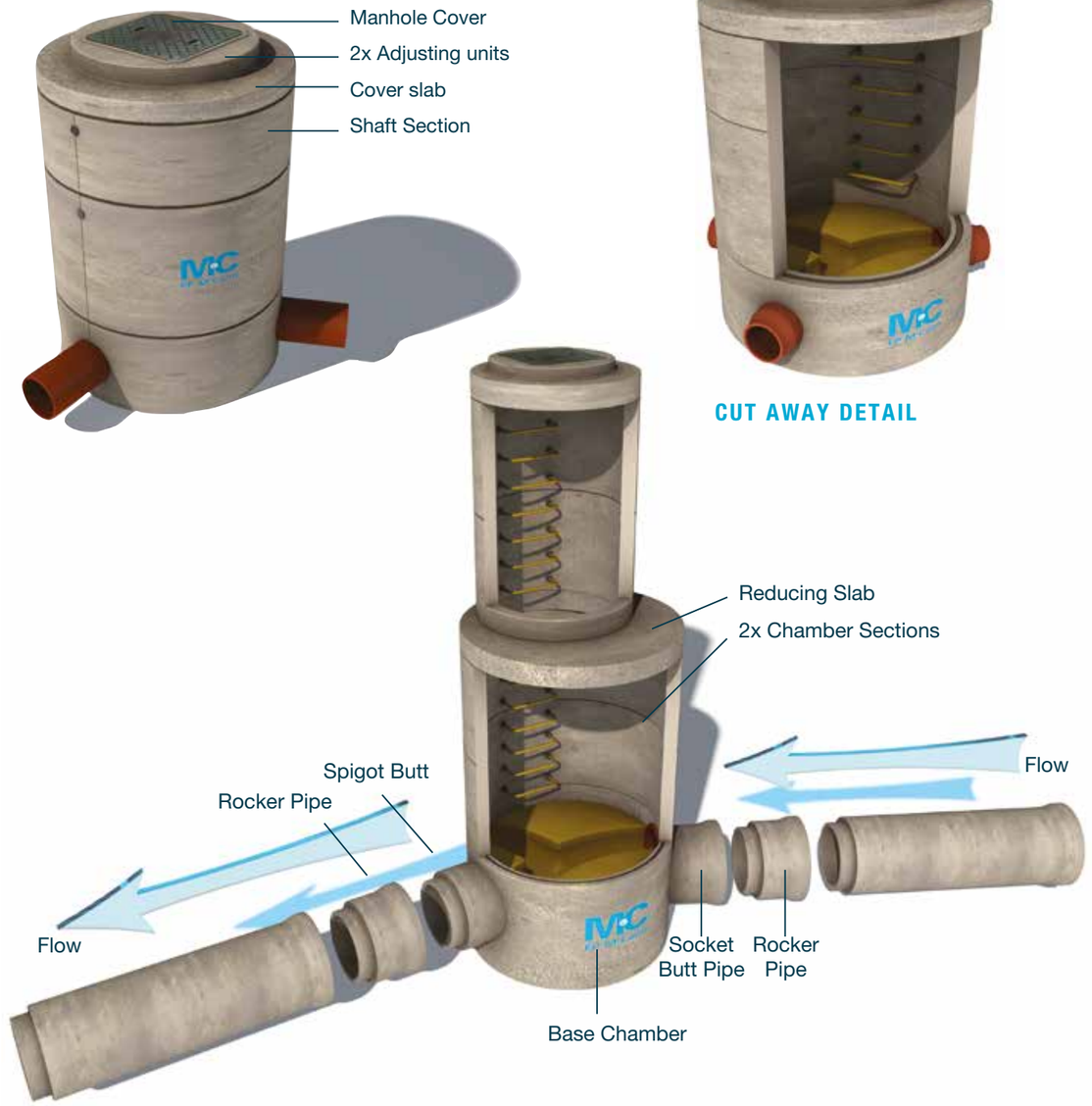
LOTHIAN SLAB



MANHOLE CONSTRUCTION



DETAIL OF MANHOLE CONSTRUCTION



CUT AWAY DETAIL

DN1200 EASI-BASE™

FP McCann's DN1200 Easi-Base™ is a prefabricated manhole base unit with integral benching, channels and connectors, that provides an immediate and long-lasting watertight solution in the management of waste water.

PRODUCT BENEFITS

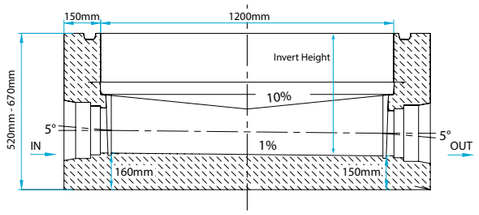
- An extremely fast, efficient and economical method of constructing manhole bases on-site
- Accepted by all UK water companies
- Significant health and safety benefits
- An immediate watertight structure, allowing other trades to instantly follow on
- Factory prefabrication provides a quality finish to channelling and benching, and enables accurate combinations and variations for entry/ exit pipes
- Connects with any type of pipe and is compatible with the DN1200 130mm thick wide wall chamber ring which eliminates the need for backfilling.
- Maintenance of channels and benches are aided by clean access for inspection
- Eliminates the risk of water pollution that is associated with traditional methods of manhole construction, such as concrete base formation integrity failures due to bad weather conditions, which results in groundwater being contaminated with polluted raw sewerage and clean groundwater infiltrating the already overloaded raw sewerage system of pipelines and treatment plants
- The 7th Edition of Sewers for adoption has now been published to include precast bases; Easi-Base™s are in full accordance with the guidance provided.
- Easi-Base™ is a kitemark product, manufactured and tested to BS EN1917
- WRc tested and approved
- An 80 year guaranteed base



The unique DN1200 Easi-Base™ utilises a polypropylene liner with prefabricated benching and channels. Pipe connection bells are pushed into the inlet and outlet points and the liner is then encased and embedded in concrete to provide its structural strength and integrity. The DN1200 Easi-Base™ is manufactured as a monolithic precast unit; it utilises the standard manhole tongue and groove joint and is ready for immediate use, in combination with either a standard 90mm thick manhole chamber or the new 130mm thick wide wall chamber ring.

The Easi-Base™ system connects with most type of pipe including Single wall uPVC, Twin wall, Concrete, Ductile Iron and Clay.

The DN1200 unit allows connection to channel diameters DN150 to DN300. FP McCann has developed a selection of adaptors to increase the range of pipe types accommodated. The type of pipe must be disclosed prior to placing the order, so that the correct adapters and seals are fitted.



DN1200 EASI-BASE™ UNITS					
Diameter	Internal Diameter	Size	Invert Level (for take off)	Depth	Weight
DN1200	150	SMALL	370	520	1.7
DN1200	150	MEDIUM	445	595	1.8
DN1200	150	LARGE	520	670	1.9
DN1200	225	SMALL	470	620	2.2
DN1200	225	MEDIUM	545	695	2.4
DN1200	225	LARGE	620	770	2.5
DN1200	300	SMALL	520	670	2.4
DN1200	300	MEDIUM	595	745	2.5
DN1200	300	LARGE	670	820	2.7

All sizes are in mm

PRODUCT FEATURES

- The DN1200 Easi-Base™ is made to an internal diameter of 1200mm with a tongue and groove joint profile to match standard DN1200 manhole chamber rings
- Wall thickness is 150mm
- The base has a 150mm floor thickness with the outlet invert at approximately 150mm from ground level
- A 1% fall exists across the channel toward the outlet (1:100)
- A gradient of 1:10 is present at the benching with the run-off toward the channel
- The height of the DN1200 Easi-Base™ unit varies in accordance with the diameter of the main channel running through the unit. (Please refer to the above table for heights)

DN1200 RANGE OF LINER ORIENTATIONS

Pipe Size (mm)	PREDL REFERENCE
150	P1, P13, P135, P13579, P14, P147, P149, P15, P157, P158, P159, P16, P169 P17, P18, P19, P2-, P2, P24, P248, P25, P258, P259, P26, P268, P27, P28, P29 P3-, P3, P35, P357, P358, P359, P36, P37, P38, P39, P4-, P4, P45, P46, P469 P47, P48, P49, P5-, P5, P5+, P56, P57, P579, P58, P59, P6, P6+, P68, P69, P7, P7+, P79, P8, P8+, P9
200 *	P1, P15, P159, P19, P2, P3, P4, P5, P59, P6, P7, P8, P9
225	P1, P14, P149, P15, P157, P158, P159, P16, P169, P17, P18, P19, P2-, P2, P248, P25, P257, P258, P259, P26, P27, P28, P29, P3-, P3, P35, P357, P358, P359, P37, P38, P39, P4-, P4, P46, P48, P49, P5-, P5, P5+, P57, P58, P59, P6, P6+, P69, P7, P7+, P8, P8+, P9
250 *	P1, P15, P159, P19, P2, P25, P3, P35, P4, P5, P57, P58, P59, P6, P7, P8, P9
300	P1, P15, P159, P17, P18, P19, P2-, P2, P25, P27, P28, P29, P3-, P3, P35, P37, P38, P39, P4-, P4, P5-, P5, P5+, P57, P58, P59, P6, P7, P7+, P8, P8+, P9

150 Pipe: PVC (EN1401), Polysewer, Marley Quantum, Twinwall, Ultra Rib, Supersleve Clay, Naylor Clay

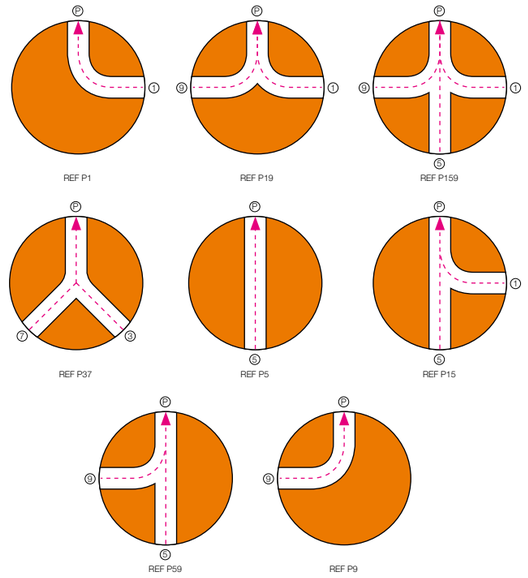
200 Pipe: PVC (EN1401)

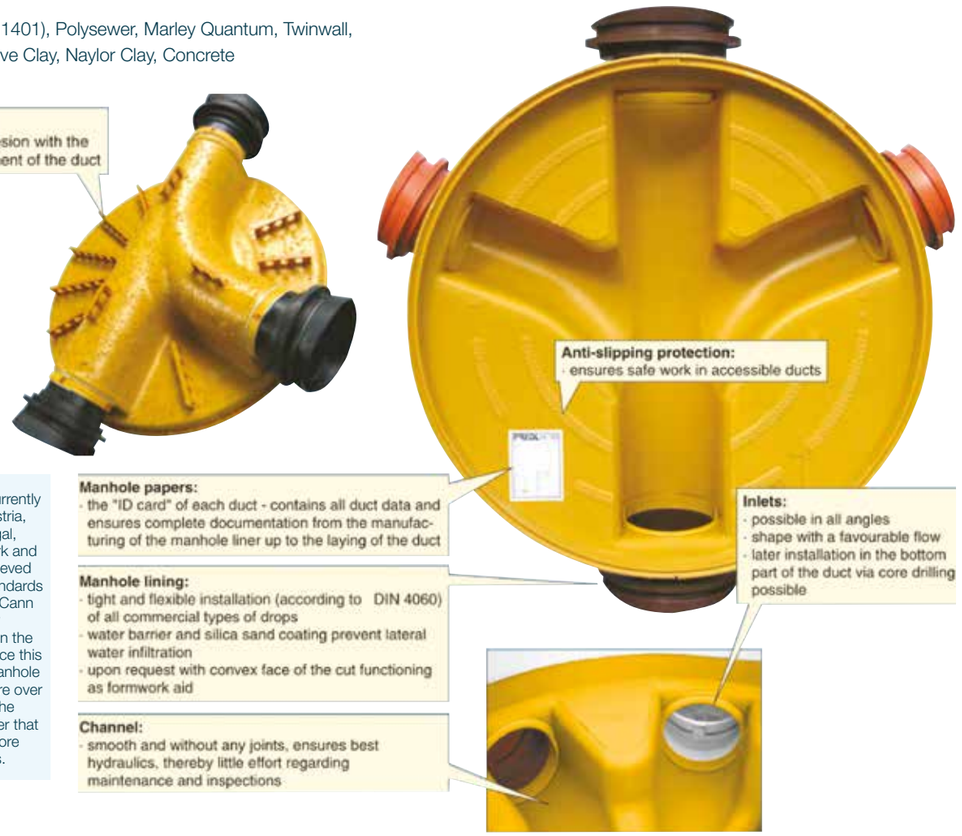
225 Pipe: Polysewer, Marley Quantum, Twinwall, Ultra Rib, Supersleve Clay, Naylor Clay

250 Pipe: PVC (EN1401)

300 Pipe: PVC (EN1401), Polysewer, Marley Quantum, Twinwall, Ultra Rib, Supersleve Clay, Naylor Clay, Concrete

EXAMPLES OF PREDL LINERS STANDARD STOCK





PREDL® liners are currently used in Germany, Austria, France, Spain, Portugal, Italy, Norway, Denmark and Poland and have achieved accredited quality standards within Europe. FP McCann with franchise partner PREDL® are the rst in the British Isles to introduce this new technology to manhole construction. There are over 1500 basic forms of the PREDL® manhole liner that can be delivered in more than 100,000 variants.

EASI-BASE™ ORDER FORM

ORDER DETAILS

Merchant:.....

Merchant Contact: .....

Contractor:.....

Contact Name:.....

Contact Tel: .....

Job Details / Address: .....

Manhole Ref:.....

Chamber Dia (mm): .....

Order your Easi-Base™ using the PREDL Clock diagram. The outlet is 'P' with inlets available in any combination from 1-9. Any angles from 90°- 270° are available in accordance with the latest sewers for adoption compliance.

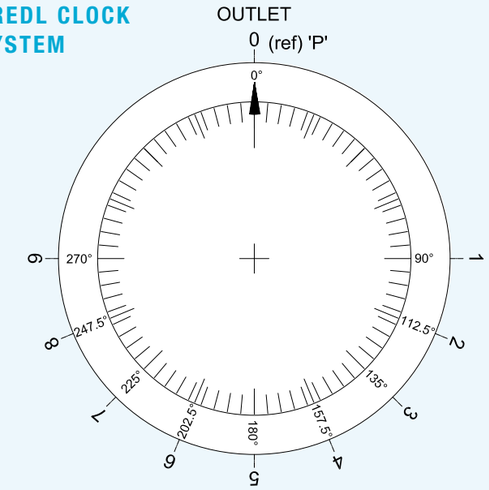
Please consider the example, and use the table below to place your order. One form is required per Easi-Base™.

We can offer a bespoke take-off service on all manholes upon placement of order.

NOTES

1. One form required per Easi-Base™.
2. It is essential the pipe type is given correctly to ensure the correct pipe seals are provided.

PREDL CLOCK SYSTEM



SPECIFYING AND ORDERING YOUR EASI-BASE UNIT

Combinations and variants in entry pipe diameters and orientations can be chosen from the PREDL Clock diagram.

When ordering, it is important to remember that the 'P' refers to the position of the outlet leading from the manhole. All other orientations are specified as a reference from the 'P' position; the next reference is then given as the main channel; each inlet is then referenced firstly by the largest diameter, then by numerical order.

Please see the examples below.

- P5 is a DN1200 Easi-Base™ with straight-through inlet at 180° from the outlet position. Note a 1% fall in the channel exists towards the outlet position 'P'.
- P59 refers to a DN1200 Easi-Base™ with the main channel inlet at 180° from the outlet 'P' position and an additional second inlet at 270°.

Using the PREDL clock reference system, FP McCann can ensure the accuracy of each channel connection.

	Outlet	Inlet 1	Inlet 2	Inlet 3	Inlet 4	Inlet 5
PREDEL Ref.	P					
Angle	0˚					
Pipe Size						
Pipe Type						
Add. Info.						
EXAMPLE - P519						
PREDEL Ref.	P	1	5	9	-	-
Angle	0˚	90˚	180˚	270˚	-	-
Pipe Size	300mm	150mm	300mm	150mm	-	-
Pipe Type	Wavin Ultrarib	Wavin Ultrarib	Wavin Ultrarib	Wavin Ultrarib	-	-
Add. Info.						

DN1500 - DN2100 EASI-BASES™



FP McCann's bespoke Easi-Bases™ from DN1500 to DN2100 complement our existing manhole ranges and are produced as monolithic units, utilising standard manhole tongue and groove joints for connection with standard manhole chambers. These units are produced wholly from concrete and provide a variety of connection orientations using the Predl Clock System. They can accommodate concrete, clay, twinwall, ductile iron and uPVC pipes from 150mm to 1200mm.

The table below gives the dimensions associated with each size, including the overall height of the unit, the invert level for each different pipe diameter and the combination of pipe diameters accommodated. All Easi-Base™s are made level to soffit, (i.e. level-benching).





DN1500 - DN2100 EASI-BASE™ UNIT SIZES				
Diameter	Pipe Size	Invert Level to top of base	Finished Height	Weight (T)
DN1500	100	470	750	3.50
DN1500	150	470	750	3.50
DN1500	200	575	760	3.50
DN1500	225	575	760	3.50
DN1500	250	575	760	3.90
DN1500	300	705	950	3.90
DN1500	375	755	1000	4.60
DN1500	450	825	1100	4.60
DN1500	525	945	1200	4.70
DN1500	600	1015	1310	4.75
DN1800	100	470	750	6.00
DN1800	150	470	750	6.00
DN1800	200	575	760	6.10
DN1800	225	575	760	6.10
DN1800	250	575	760	6.10
DN1800	300	705	950	6.10
DN1800	375	755	1000	6.50
DN1800	450	825	1100	6.70
DN1800	525	945	1200	7.00
DN1800	600	1015	1310	6.50
DN1800	675	1175	1450	8.00
DN1800	750	1195	1450	7.75
DN1800	825	1255	1500	7.50
DN1800	900	1345	1560	6.85
DN2100*	150-1200	1900	2435	10.50

* 2 part unit / max Δ per unit
† 1 unit ex Knockloughrim depot

All sizes are in mm

WEIGHTS AND LIFTING MECHANISM DETAIL

Easi-Base™ (DN)	Lifting Mechanism	Quantity of Lifters Used per unit	Safe Working Load (S.W.L) per lifter (Tonnes)	Easi-Base™ Unit Max. weight (Tonnes)
1200	M24	3	2.5	1.5 - 2.5
1500	M36	3	6.3	3.5 - 5.0
1800	M36	3	6.3	6.0 - 8.0
2100	M36	3	6.3	6.5
* 2100	Utility Anchors & M36	3 & 3	5 & 6.3	11.0

* Manufactured in NI
(Please note, weights will vary dependent upon pipe size and number of inlets/outlets.)

Our Easi-Base™ manhole systems are manufactured with cast-in lifting sockets to allow chains to be hooked on to lift the base in a safe manner, which will prevent damage during handling. It also negates the requirement to drill holes through the Easi-Base, thus ensuring absolute water tightness when installing in wet ground.



EASI-BASE™ WITH INTEGRAL SEAL



FP McCann's integral seal is a simple, reliable rubber compression connector which is embedded in the concrete when the manhole is cast. The seal is compressed between the pipe and the concrete, creating a flexible watertight seal.

FP McCann is the first precast concrete manufacturer in the UK to offer an integral seal on our Easi-Base™ DN1500 and DN1800 units. Our new integral seal system is a simple, reliable rubber compression connector which is embedded in the concrete when the manhole is cast. The seal is compressed between the pipe and the concrete, creating a flexible watertight seal.





FEATURES

- Connector is placed in the sealing position at the precast plant
- Manhole arrives at the jobsite ready to receive the pipe
- Pipe is beveled and lubricated, and then inserted through connector
- Manhole may be back filled immediately

BENEFITS

- Integrally cast into the *structure when the concrete is poured
- Requires low insertion force
- No clamps to tighten or forget
- Fast and easy installation
- Less time in the excavation
- Durable, reusable casting forms
- Reusable tooling holds connector in position during casting process.

* 1050mm and above pipe sizes require grouting using a e-proxy resin or similar approved product

SEALANT

DN1200	12mm x 120mm x 4.2m
DN1500	12mm x 120mm x 5.2m
DN1800/DN2100	12mm x 120mm x 6.0m

EASI-BASE ADAPTORS AND SEALS

Part No.	Size	Pipe O/D	Type	Description
FPM 101	225	250	Adaptor	PVC TW & Ultra Rib
FPM 102	225	N/A	Adaptor	End cap Stock
FPM 103	225	263	Adaptor	Clay (SuperSleve)
FPM 104	225/150	N/A	Adaptor	Level Invert Reducer
FPM 105	225	268	Adaptor	PE Twin Wall
FPM 106	225	N/A	Seal	Uni bell Seal
FPM 107	225	263	Seal	Clay Adaptor Seal
FPM 108	150	170	Adaptor	Ultra Rib
FPM 109	150	N/A	Adaptor	End Cap
FPM 110	150	178	Adaptor	Twin Wall PE
FPM 111	150	178	Adaptor	Clay (SuperSleve)
FPM 112	300	335	Adaptor	Ultra Rib
FPM 113	150	188	Adaptor	Naylor Densleeve
FPM 114	300	353	Adaptor	Twin Wall
FPM 115	150	160	Adaptor	Twin Wall PVC
FPM 116	225	278	Adaptor	Naylor Densleeve

Please note: all adaptors and seals are available from stock

FLEXI-FIT PIPE SEAL

Introducing the new range of sizes for FP McCanns Flexi-Fit seal.

FF150

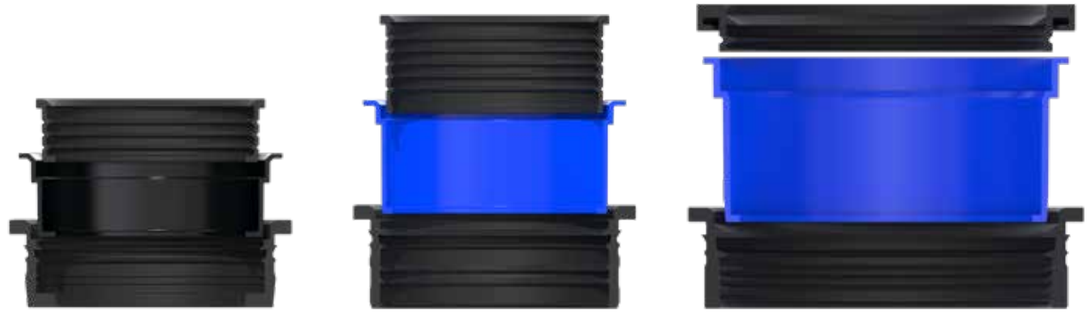
Designed to be used in junctions and large diameter pipes.

FF150 Base

Designed to be used in manhole bases and catchpits. Lateral support is required.

FF225

Designed to be used in manhole bases and catchpits. Lateral support is required.



The Flexi-Fit seal is a time and cost saving solution for fitting lateral (or branch) pipes into larger concrete pipes, manholes, junctions, catch pits or other concrete structures, at the time of casting or retro-fitting into a cored hole.

Each seal uses three component parts to adapt its internal size to suit the lateral pipe being fitted. The user can simply remove components to increase the internal diameter of the seal. All components conform to the latest standards for below ground applications. The universal nature of the Flexi-Fit range means that any lateral pipe of the same nominal diameter can be fitted. The Flexi-Fit removes the need to purchase and store multiple seals and adaptors for different pipe materials, simplifies project planning and supports specification changes.

BENEFITS

- Universal solution
- Removes the need for adaptors
- Can be installed in seconds
- Can be cast into concrete during manufacture or cored and retro-fit
- Configuration can be altered in seconds
- Watertight connection for any DN150 & DN225 Lateral
- Smooth transition and level invert through to the connecting structure
- Designed to remove the possibility of lateral intrusion
- Independently tested to 0.5 bar pressure on all adoptable laterals



FLEXI-FIT PIPE SEAL



PIPE FITTING OPTIONS

Option 1 - Full product



Product	Pipe Type
FF150 FF150 Base	**DN150:** PVC Smooth Marley Quantum Polysewer Cast Iron Ultra 3
FF225	**DN225:** PVC Smooth Cast Iron Ultra 3

Option 2 - Inner Bush removed



Product	Pipe Type
FF150 FF150 Base	**DN150:** Ultrarib
FF225	**DN225:** Marley Quantum Polysewer Ultrarib

Option 3 - Outer Body only



Product	Pipe Type
FF150 FF150 Base	**DN150:** Supersleeve Clay All Twinwall pipe types
FF225	**DN225:** Supersleeve Clay All Twinwall pipe types

Note: the pipe seal must be used in the first groove.

*Not suitable for Naylor Clay - adaptor required with FF150/225

FLEXI-FIT PIPE SEAL





Product Code	FF150 / FF150 Base / FF225
Description	DN150/DN225 Universal connector
Core Hole Size	198 +0/-1mm & 294 +0/-1mm
Material	ABS & EPDM Rubber
Pressure Rating	0.5 bar
Jetting Resistance	180 bar
Temperature Range	-50°c to 80°c constant, 100°c intermittent
Standards	BS EN 681-1:1995 WIS 4-35-01

INSTALLATION



5 EASY STEPS

- Using the correct equipment, core a 198mm or 294mm hole at the selected position into the concrete pipe, manhole or junction. Ensure the cored hole and surrounding area is clean and free from slurry/debris.
- Remove the two inner body components from the main outer body as shown in image 2.
- Press the rubber into the 198mm/294mm cored hole until fully seated, a little force will be required.
- Lubricate the outside of the casting socket using water (if required).
- Using a chock of wood and hammer (if required) drive the casting socket into the outer body evenly around the circumference.

Note: It is recommended that a diamond tipped core drill be used to core the 198mm / 294mm holes.

GENERAL INFORMATION

Flexi-Fit Seal has been certified by the British Standards Institution (BSI) as a company of assessed capability, with a quality management system which meets the requirements of BS EN ISO 9001:2015.

A materials cost calculator is available on request. For further information on FP McCann's precast drainage solutions, contact the sales team: SCOTLAND/NI: 028 7954 9026 | ENGLAND/WALES: 01530 240000

DN1050 HIGHWAYS AGENCY CATCHPIT

HIGHWAYS AGENCY COMPLIANT EPDM FLEXIBLE SEAL DN1050 CATCHPIT

With its flexible rubber pipe connector seals, precast concrete catchpits can be utilised on a single lane carriageway, replacing the requirement to cast a base sump in-situ and construct the catchpit from a standard DN1050 manhole ring.

The innovative EPDM 40 flexible rubber seal at the connection points can accommodate pipe sizes DN150, DN225 and DN300. This negates the need to saw cut openings in the concrete wall and the use of wet mortar trades to seal the pipe surround.

Catchpits are supplied with factory fitted pre-marked EPDM 40 rubber blanks. The unique rubber blank/seal has preformed cutting grooves around the three DN entry sizes indicated. This allows for accurate cutting out to pipe diameter requirement. There is no similar system available on the market. Once pipes are fitted into the seal, up to 45 degrees of pipe deflection is permitted without breaking the seal.

Significant savings in time eliminates the need for follow-up finishing gangs. Reduced safety risks because the operative time in excavation is minimal and no power tools are required to cut concrete. Indirect cost benefits arise from saving up to 26 hours of labour time, related to the curing of wet trades on a traditional build.

FP McCann's catchpit products are manufactured under BSI Kitemark approval to comply with BS EN 1917 and BS 5911, and are therefore fully compliant to HA's MCHW specification.

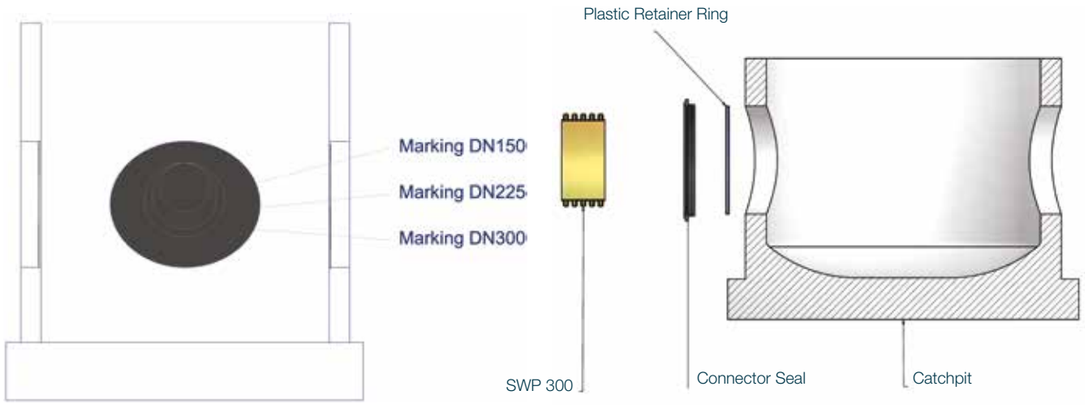




Can be used in straight through, 90° connection or straight through with a cross drain.



Once pipe is fitted to the connector, up to 45° of deflection is possible without breaking the seal.



CATCHPIT

The catchpit effectively provides a sealed sump manhole, a monolithic precast concrete unit fitted with connector seals, which can be used to connect to the following types of pipe: uPVC, twin wall, clay, ductile iron and concrete. The catchpit is designed to accommodate pipe sizes DN150 to DN1800 and is in line with highway specification.



PRODUCT BENEFITS

- Creates an immediate watertight structure
- Prefabricated off-site (minimising on-site labour and costs)
- Quick and efficient to install
- Accommodates connection to all types of pipe used in road and manhole construction
- Safety benefits gained in the construction of manholes as the pre-formed sump and connect seals eliminate on-site construction, thus greatly reducing labour activity within the manhole
- Quality is greatly increased as construction is within the factory environment and complies with BS EN 1917 and BS 5911
- Eliminates material wastage associated with current in-situ method
- Yields environmental benefits such as lower carbon footprint, less concrete used on-site and less excavated material removed from site
- Bespoke designs available



Nominal Size (dn)	Height (mm)	+ Max. Pipe Size (mm)	Chamber OD (mm)	Wall Thickness (mm)	Capacity (l)	**Approx. Weight (kg)		No.of Units per Load	Lifting Hole Qty/ da/ per unit
DN1050	* 1000	300	1210	80	650	1380		19	3no. ø45 lifting holes
DN1200	* 1000	300	1380	90	870	1600		16	3no. ø16 sockets and loops
DN1500T1	* 1400	600	1800	150	1800	4700		5	3no. utility anchors
DN1500T2	* 2400	675	1800	150	3300	7700		4	3no. utility anchors
DN1800T1	* 1500	600	2100	150	2700	^ 6300		4	3no. utility anchors
DN1800T2	* 2400	900	2100	150	5100	8300		3	3no. utility anchors
DN2100	* 2400	1500	2400	150	7000	^ 9000	11000	3	3no. utility anchors
DN2400	* 2700	1800	2700	150	10,500	^ 11700	14000	2	3no. utility anchors

* Height can be reduced to suit customers' requirements Based on 300mm sump. If a non-standard invert level is required, please specify when ordering

^ Lightweight catchpits (available on request)

** Maximum weight of a solid, full height unit with no holes

\+ Based on a standard catchpit only. If larger pipe sizes are required, please contact FP McCann

VALVE CHAMBER

FP McCann designs and manufactures a bespoke range of reinforced valve chambers capable of housing any size and type of valve/pump. Valve chambers consist of a precast concrete sealed sump manhole with factory-fitted saddles to house the pump, and are used in the management of water, oils and chemicals.

Chamber Diameter	1200 - 3000mm
Chamber Height	900mm
Stool	Bespoke to project requirements
Pipe Size	150 - 375mm
Inlets / Outlets	Will vary to accommodate pipe size
Cover Slab Thickness	Will vary in accordance with chamber diameter
Base Thickness	250mm







PRODUCT BENEFITS

- Immediate watertight structure
- Reduced installation time/costs
- Accommodates connection to all types of pipe, including concrete, metallic, HDPE and clay
- Pump is raised off the ground and sits on a preformed concrete stool
- Easy and clean access for operation and inspection



STORMBRAKE

VORTEX FLOW CONTROL SYSTEM

wrc approved PT/398/0217

A new force in vortex flow technology

Vortex Flow Controls (VFCs) are commonly used in drainage systems to regulate the storm water runoff from urban areas. Through the use of vortex flow technology, FP McCann's StormBrake™ provides the solution to a variety of stormwater management problems. These include accurately controlling storm/surface water flow, minimising upstream storage requirements and reducing the risk of blockages compared to traditional orifice plates.

WHAT IS VORTEX FLOW TECHNOLOGY?

Vortex flow technology is based on the principle of a vortex hydrodynamics, where under sufficiently high upstream water levels a vortex is induced in the flow by the device. The vortex motion results in significant energy loss, creating a pressure drop across the device and restricting the discharge leaving the outlet. The geometric properties of the device control the amount of flow restriction and can be tailored to suit the design conditions for a specific site.



Low water level in the flow control chamber

BENEFITS

- Reduces the amount of upstream storage required, minimising the cost of providing attenuation facilities
- Minimal maintenance required after installation. FP McCann's StormBrake™ is self-activating and function without any mechanical components
- Outlet clearances up to 6 times larger than an equivalent orifice plate, significantly reducing the risk of blockages and the associated maintenance costs
- Accurately designed to meet a wide range of design conditions:

  - flows up to 40l/s;

  - heads up to 2m

- Contains a bypass door which can be manually opened at ground level using a pull cable to allow easy access for inspection or blockage removal

For design conditions outside of this range, please contact FP McCann directly



STORMBRAKE™

VORTEX FLOW CONTROL SYSTEM

DESIGN

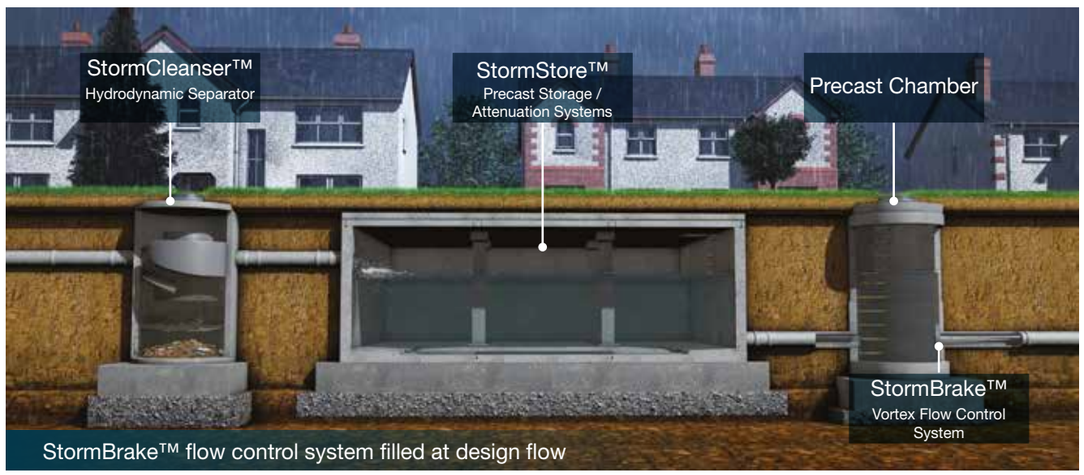
FP McCann's StormBrake™ is manufactured using grade 304L / 316L stainless steel for increased durability, strength and resistance to corrosion and chemical damage. It consists of 3 main parts: an inlet section, a vortex chamber and an outlet. Each part can be configured to provide the most efficient solution to specific site requirements.

Each StormBrake™ is fitted with a pivoting bypass door on the front face in line with the outlet pipe. A stainless steel wire cable is attached to the bypass door and extends to the top of the manhole chamber. Upon pulling the cable the bypass door rotates and moves upwards, revealing a clear straight-through channel between the manhole and the outflow pipe. In the event of the StormBrake™ becoming blocked by debris, the bypass door allows fast discharge of water out of the chamber for maintenance.





StormBrake™ flow control system at low flow



StormBrake™ flow control system filled at design flow

FLOW STAGES

The performance of FP McCann's StormBrake™ is determined by relating the upstream head to the outflow leaving the device. Its performance is characterised by a head-flow curve, which produces a unique 'S'-shape, corresponding to the following three phases of flow:

(i) Pre-vortex phase – hydrodynamics governed by orifice flow. The flow generated by the upstream head is not large enough to induce a vortex in the StormBrake™. This phase occurs until the flush-flow point is reached.

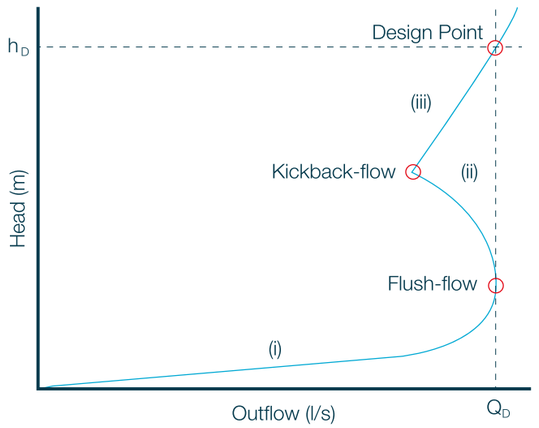
(ii) Transition phase – flow throttling initiated. Vortex continually
forms and collapses, resulting in significant energy loss and lower flow rates despite increasing upstream head. This phase is bounded by the flush-flow and kickback points.

(iii) Vortex phase – vortex fully formed with central air core. The air core imposes a quasi-physical flow restriction, reducing the available area in the pipe for outflow.



By changing the geometry of the StormBrake™, the positions of the flush-flow and kickback points can be tailored to suit the clients' needs. For example, the curve below is ideal for situations
where upstream storage capacity is limited. The flush-flow point occurs at the design flow, allowing for maximum discharge of water during the early stages of a storm, therefore minimising upstream storage requirements.

VFC HEAD-FLOW CURVE





TESTING

FP McCann's in-house development team test the StormBrake™ using a full scale test facility. The test-rig is constructed of the same components that would be used on site, increasing the accuracy and realism of the tests. The team works closely with university researchers to apply state-of-the-art experimental methods and computational fluid dynamics to the development process. To date, over 2.5 million litres of water has been used to characterise the performance of the StormBrake™. This volume is constantly increasing, due to continual development and rigorous hydrodynamic characterisation, ensuring maximum product performance to meet the requirements of each specific site.

INSTALLATION

1) Position the StormBrake™ so that the inlet is at the bottom and the outlet surround is resting on the inside of the outlet pipe. Mark the locations of the mounting points on the chamber wall;

2) Using the marked locations, drill holes to the required diameter and depth for the supplied masonry anchors. Fix the anchors to the drilled holes.

3) Attach the StormBrake™ to the anchor points, ensuring the neoprene gasket is flush with the chamber wall, and fasten the device by tightening the bolts. This will compress the neoprene gasket to provide a watertight seal between the device and the wall.

4) Fix the stainless steel wire cable from the bypass door to the underside of the manhole cover, vertically above the device. A secondary bracket is supplied and should be fitted halfway up the chamber to guide the bypass door cable in deeper chambers.

5) Adjust the length of the bypass cable accordingly, so that it reaches ground level whilst ensuring the bypass door can open if required.

STORMCLEANSER™
HYDRODYNAMIC SEPERATOR

FP McCann has designed and developed the enhanced StormCleanser™ for the treatment of urban catchment stormwater run-off.

The StormCleanser™ provides a cost-effective solution for designers, engineers and contractors involved in the provision of Sustainable Drainage Systems (SuDS). This unit has no moving parts, requires no power, and is constructed within standard precast concrete chambers.

The standard units come factory fitted in precast chambers and could also be installed on-site as required. The modular stainless steel built assembly is designed to provide installation simplicity. The separator internal assembly is fabricated out of stainless steel (304L/316L), per BSI BS EN 10088-2-2014. Stainless Steel material grade and composition, provides exceptional longevity due to high corrosion resistance. The lifespan of the internal assembly outlasts the lifespan of a typical precast concrete structure (100+ years).

The enhanced StormCleanser™ design allows for an inlet at varying angles with respect to the outlet. Moreover, the design also enables configuration with multiple inlets, at different orientations and of various sizes. The symmetric inlet design provides the freedom of clockwise or counter-wise flow direction, and allows the vortex formation with minimal hydrodynamic losses and turbulence.



Fixed flow direction separators tend to lose efficiency especially when a higher flow inlet is placed ahead of a lower flow inlet. The changeable flow direction provides drainage engineers the freedom to set the desired orientation of multiple inlets. StormCleanser™ allows for preferential flow direction of the main inlet, providing optimum performance for a wide range of configurations. StormCleanser™ is developed with state-of-the-art hydraulics technology, using Computational Fluid Dynamics (CFD) modelling and full-scale experimentation.





OPERATION

The StormCleanser™ is specifically designed to remove suspended solids, hydrocarbons, and floatable debris from the stormwater run-off. Water and pollutants enter the system via the inlet pipe, where the internal geometry enables low energy forced vortex flow patterns. This allows the floatables to gather and solids to settle to the bottom of the treatment chamber for subsequent removal.

Settled sediment is retained within the sump storage of the unit, allowing easy access for suction cleaning. Re-suspension of the solids is minimised by the provision of a baffle plate (Catch Skirt), positioned above the sediment storage sump. A central core allows for convenient suction hose entry down to the sump for cleaning and maintenance. If there is a stormwater surge in excess of maximum treatment flow rate, it overflows a weir, bypasses the treatment zone and directly discharges through the outlet pipe. This helps to minimize the effects of scour within the treatment region and prevents wash out of retained sediment downstream.

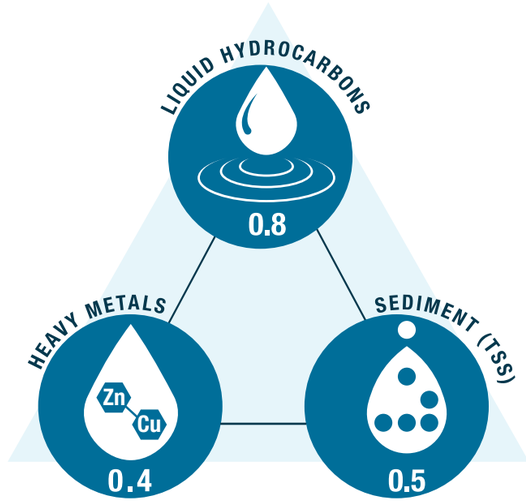
FEATURES

- Developed at inhouse high-flow Hydraulic Rig, and rigorously tested against actual rainfall inlet conditions
- High retention at most frequent rainfall events per annum
- High treatment flow rate to size ratio preventing oversized separators in the drainage design i.e. minimise footprint
- Wide range of chamber sizes (Ø1200 – Ø4000mm) and pipe sizes (Ø150 – Ø900mm)

APPLICATIONS

- SuDS based drainage networks
- Housing Developments
- Retail Parks
- Commercial Centres
- Leisure Facilities
- Industrial Developments
- Highway Drainage Products
- Car Parks, Roads, Motorways and Trafficked Areas
- Existing surface water sewer discharges

SuDS POLLUTION MITIGATION INDEX (PMI)



- Tested using extremely fine sand particles starting from 2µm
- Modular and innovative design for multiple inlet orientation
- Choice of flow direction providing optimal configuration performance
- Complies with SuDS legislation

SPECIFICATIONS

MODEL	TANK DIAMETER	MAX TREATMENT FLOW RATE	PIPE SIZE	MIN. SEDIMENT STORAGE CAPACITY	MIN. OIL STORAGE CAPACITY	MAX. HEAD LOSS AT TREATMENT FLOW RATE
	(mm)	(L/s)	(mm)	(m^3)	(L)	(mm)
PRE-SC1200	1200	43	300	0.50	320	240
PRE-SC1500	1500	67	375	0.82	630	300
PRE-SC1800	1800	96	450	1.23	1085	360
PRE-SC2100	2100	131	525	1.75	1725	420
PRE-SC2400	2400	172	600	2.38	2575	480
PRE-SC2700	2700	217	675	3.13	3670	540
PRE-SC3000	3000	268	750	4.01	5035	600
PRE-SC3600	3600	387	900	6.20	8703	720
PRE-SC4000	4000	477	900	8.00	11938	800

Notes:

- MTFR is per WRc specified Weighted Annualised Removal Efficiency of at least 50%, for a particle size distribution (PSD) with a D_{50}: 63µm and density of 2650 kg/m^3
- Customized solutions such as: oriented inlet, multiple inlets, and different pipe sizes available as required
- Sediment storage capacity could be extended as required, per the desired maintenance frequency

STORMCHANNEL™

FP McCann's StormChannel™ is a heavy duty, precast concrete slot drainage channel designed to remove surface water from many areas, including roads, motorways, car parks, industrial, commercial and residential areas. This helps to prevent flooding and run-off.

FP McCann offers two types of StormChannel™ slot drain:

1. A precast concrete bullnosed kerb drainage channel has a linear slot drain and a profiled, oblong drainage channel.
2. A standard precast concrete drainage channel with an interrupted slot and stabiliser bars for increased stability.

PRODUCT BENEFITS

- Quick installation
- Minimal maintenance
- Excellent flow rates even at zero or shallow gradients
- Modular system
- Robust product
- Economical product
- Integrated watertight seal
- No concrete surround required
- Conforms to EN 1433

SCAN THE QR CODE TO SEE OUR STORMCHANNEL™ INSTALLATION VIDEO

CAST IN GRATING



A unit with cast in grating to allow easy cleaning and maintenance

PRODUCT FEATURES

- Resilient up to class D400kN, E600kN or F900kN
- 300 and 400 Standard Stormchannel™ tested to Class E600
- 2% surface slope to the slot
- Supplied with interrupted slot only – slot width 30mm
- Spigot and socket end for correct alignment and joining

Additional connections can be provided on request to this precast slot drain solution. Junction boxes and sump units are also available in all sizes.

RANGE OF SIZES



300 Standard | 400 Standard | 400 Kerb | 500 Standard | 600 Standard

HOUSE INSPECTION CHAMBERS

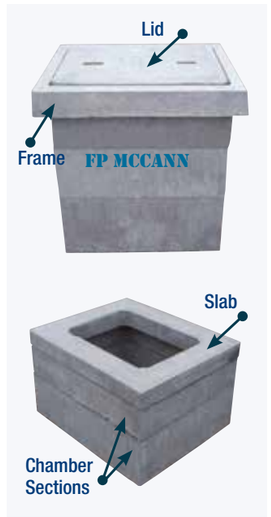


FP McCann's precast concrete inspection chambers are available in two sizes: 600 x 450 and 1200 x 750mm. Manufactured in accordance with BS EN 1917 / BS5911, each section has a tongue and groove joint and can be sealed with a sand and cement mortar or bitumen sealant, in the same fashion as a circular manhole and chamber ring.

To complete the chamber, FP McCann has a range of covers and ground level components. FP McCann's frame (also known as a surround) and lid combination is designed to sit flush with the top course, such as tarmac or concrete surfacing or in grassy areas.

The lid itself features an anti-slip chequered finish and recessed lifting points to allow removal from the frame by use of standard lifting eyes.

Chamber Size (mm)	Cover
600x450	Frame and lid places straight on top of unit
1200x750	Light or heavy duty below surface slab with 600x600 access, allowing use of standard steel access hole cover



Description Units (mm)	**Weight per unit (kg)	No. of units per pallet	Wall/ Slab thickness (mm)
600x450x150 section	40	12	40
600x450x225 section	65	8	40
600x450x300 section	85	6	40
600x450x100 frame	45	8	100
600x450x55 lid	50	16	55
1200x750x150 section	120	6	75
1200x750x250 section	200	4	75
1200x750x80 cover slab (600x600 access)	185	6	*80

* Effective thickness
** Approximate weights



NOTE: For HIC's placed in depths greater than 1.5m, we recommend the use of a concrete surround.

GULLIES & SLABS RANGE



GULLIES

Dimensions (mm)			Nominal Weight (Kg)	Approx. Capacity (litres)	No. per load
Diameter Internal	Depth	Outlet			
375	750	150	180	51	66
375	900	150	200	67	66
450	750	150	215	71	60
450	900	150	255	95	60
450	1050	150	270	118	60
450	1200	150	280	142	60

PRODUCT BENEFITS

- The seal has been cast-in, thus preventing loss or damage on-site
- An integral seal and rodding eye for universal sealing characteristics
- The rodding eye closure has been recessed into the concrete to help eliminate dislodgment
- Reduced thickness, giving reduced weight and a smaller footprint for better vehicle utilisation
- Improved system that helps prevent any discharge of oil
- The gully is fully universal, suitable for all plastic and clay drainage products from 160mm to 186mm diameter
- Does not lose shape
- Does not float (self weight inhibits flotation)

GULLY COVER SLABS

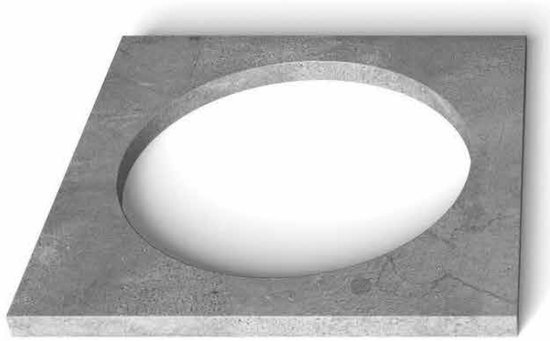
Dimensions (mm)	Standard	Horseshoe	65 Standard	65 Horseshoe
Length (mm)	750	600	750	600
Width (mm)	650	650	650	650
Thickness (mm)	100	100	65	65
Weight (kg)	70	58	51	37
Hole Size (mm)	450	450	450	450
Qty/Pack	12	12	12	12

The Gully Cover Slab is designed as seating for a gully grate

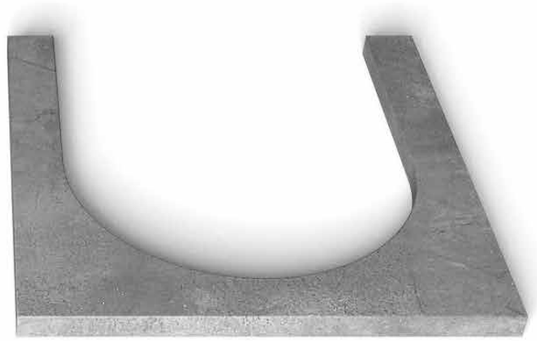
PRODUCT BENEFITS

- Quicker to lay, ensuring reduced labour costs
- Use on top of 450mm diameter gully
- Eliminates laying engineering bricks on-site
- Sits flush to kerb for enhanced stability
- 100mm and 65mm thick single piece units available
- Eliminates brickwork vertical joint 'weakspots'
- Greater stability than brickwork
- Quality product produced by vibration process
- Compressive strength similar to Class B.Eng. bricks

STANDARD GULLY COVER



HORSESHOE GULLY COVER



Note: Gullies and Gully cover slabs manufactured in accordance with BS 5911-6

FALL ARREST SYSTEM

AWARD-WINNING SAFETY SOLUTION FOR MANHOLE CONSTRUCTION

Clients, consultant engineers, contractors and suppliers all have a duty to mitigate hazards on-site, whenever reasonably practicable. One such hazard identified is the risk of operatives falling through manhole openings, particularly during the construction process and also in follow-up maintenance work.

Working with partners Severn Trent Water, engineer Grontmij and contractor to the water sector, Morgan Sindall plc, FP McCann has designed an award-winning safety solution. Our fall arrest system allows for safe working around the manhole opening prior to the fitting of the ironwork.

In the construction of a manhole, operatives often work unprotected from the opening at surface level when the final stages of completion occur. This includes the final brickwork up to the manhole frame and the mortar bedding of the frame itself.

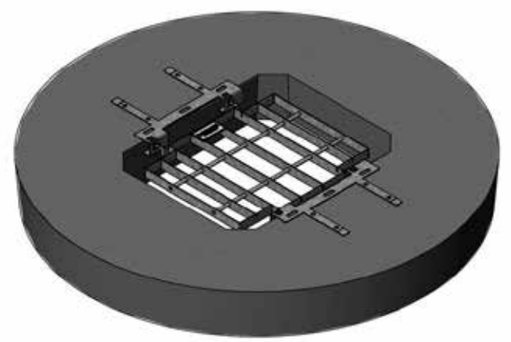
With most standard cover slabs, the access point for man entry is open and it is left to the contractor to cover on-site. In many site situations, these openings remain for a number of days while phases of work are completed. Our fall arrest system immediately addresses this problem. The future production of all standard access cover slabs will incorporate the optional protective grid, which will remain in the slab even when the final D400 steel cover and frame are set in place at surface level.

The galvanised mild steel grid is available in four standard sizes:

- 610mm x 610mm
- 675mm x 675mm
- 750mm x 600mm
- 1200mm x 675mm

The fall arrest grid is seated on load-bearing corners cast into a standard range of manhole cover slabs. If a temporary fall arrest system is required, once the construction of the manhole is complete, the grid can be removed prior to the fitting of the ironwork. Alternatively, it can be a permanent fixture, left in place beneath the manhole lid. The spacing between the bars allows for ease of inspection and jetting of the manhole base during maintenance work.





RAIN HARVESTING CHAMBERS

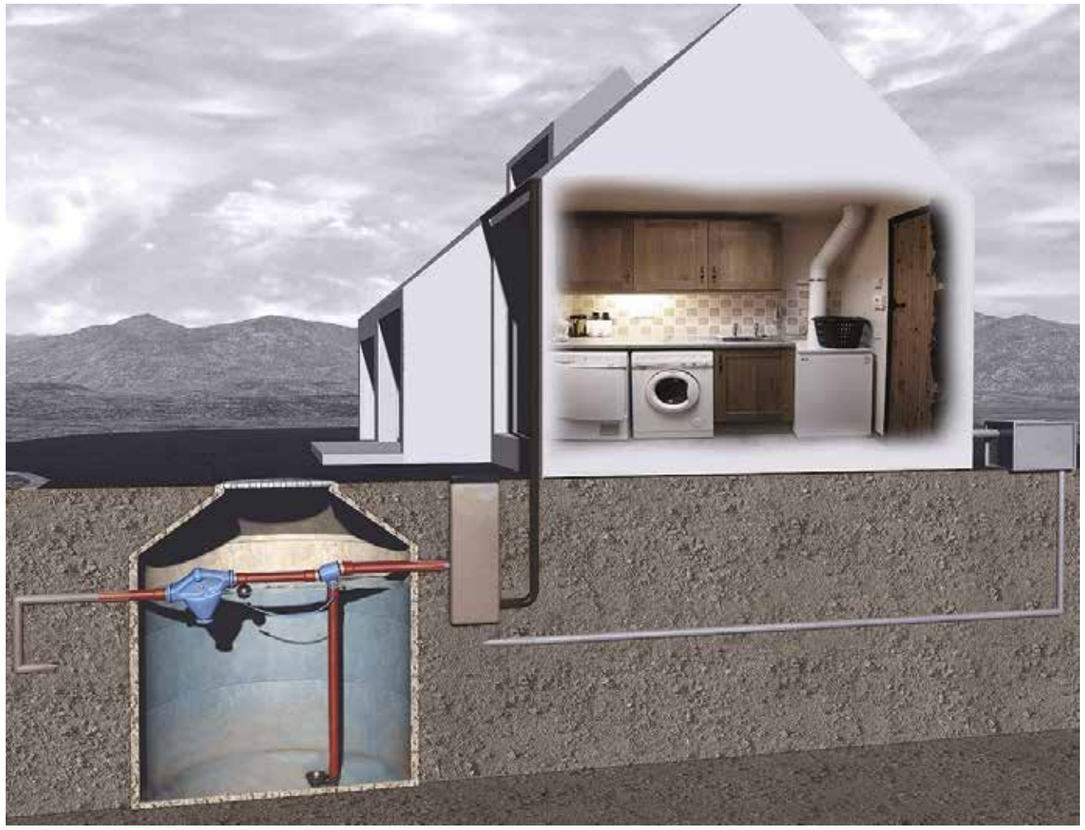
FP McCann's rain harvesting chamber is a bespoke precast water storage chamber that is compatible with water harvesting systems for residential, industrial/commercial and agricultural installations. Capturing rainwater for re-use offers significant cost savings for the user and benefits the environment by increasing water resources and further enhancing water amenity. The chamber complies with Environment Agency SuDS (Sustainable Urban Drainage System) directives.

The basic concept of harvesting rainwater is simple - rainwater is mostly collected from the roofs of buildings - it flows through gutters and downspouts and is then filtered and collected by a storage tank. From the tank, it can be recirculated or treated to produce a better quality of recycled water.



VOLUME CAPACITY OF STORAGE CHAMBERS

Internal Diameter (x1000mm)	Capacity (Litres)	Weight (kg)
DN1800	1200	1800
DN1800	1500	1900
DN2400	3000	5900
DN2400	5000	7250
DN2400	7000	8700





ADD-A-STEP®

MODULAR MANHOLE LADDER

ADD-A-STEP® modular ladders are designed to allow easy access to chambers and are approved for use in potable water, waste water, highly corrosive and general construction applications. They are a cheaper, safer and a more user-friendly alternative to traditional stainless steel ladders.

The ADD-A-STEP® modular ladder system is designed to provide a product that can be supplied off-the-shelf for next day delivery. Each module of the ADD-A-STEP® ladder consists of two stiles, one rung and two retaining clips. Each stile measures 360mm long, 80mm wide and 32mm thick maximum dimension. The ladder width outside the stiles (upright) is 435mm.

The ADD-A-STEP® ladder has 30mm diameter rungs at 300mm centre spacing and the width or foot space inside the stiles is 375mm. Two types of wall brackets are supplied as standard, one for circular and one for square chambers. The ladder can be assembled on-site using the number of modules to achieve any length and can be trimmed to length using a standard hand saw without the need for expensive cutting equipment.

ASSEMBLED IN MINUTES

STAINLESS STEEL PULL-UPS AVAILABLE TO SUIT EX STOCK

BENEFITS

The modular design allows for more economical transportation than fully assembled ladders. The ADD-A-STEP® ladder requires no maintenance other than occasional cleaning with a pressure hose, if desired. The ladder has excellent insulation properties so it can be used in applications where electrical cables are present. Constructed from polybutylene (PBT), which is UV tolerant, it is a non-corrosive and a fully recyclable material; it can easily be cut on-site with no harmful shards or dust given off.

The ADD-A-STEP® ladder helps to reduce potential health and safety risks. At approximately 5kg per linear metre, the ladder is significantly lighter than galvanized or stainless steel alternatives and its yellow colour gives it high visibility properties, making it clearly visible when the manhole cover is raised. It is also a cheaper and more user-friendly alternative to traditional stainless steel manhole ladders. The ADD-A-STEP® system is fully compliant and tested to BS EN 14396, and is the only CE marked modular ladder system in the UK.



PLASTIC ENCAPSULATED LADDERS & RUNGS

This system ladder gives the user benefits of a durable plastic encapsulated ladder without the need to specify an exact length or fit on-site. In addition, a single specification can be used for all depths of access.

PRODUCT SPECIFICATIONS

BS EN 13101 Plastic Encapsulated Steps

WIS 4-33-01: 1990 Polypropylene Encapsulated Steps

PRODUCT APPLICATIONS

Concrete manholes and inspection chambers.
Renovation of existing structures.

MATERIALS

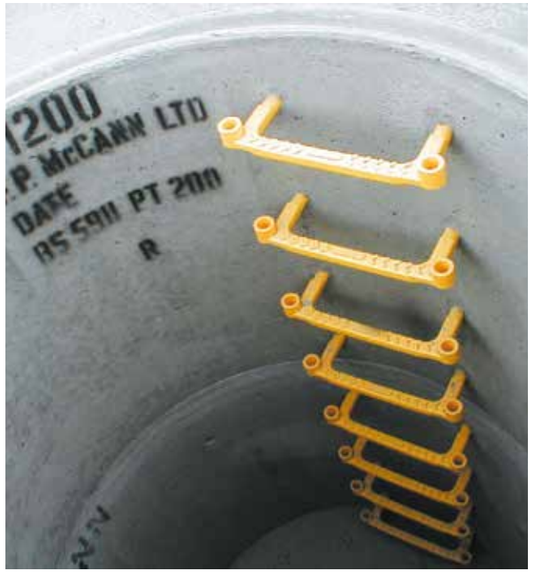
The plastic encapsulated ladder has a bright yellow coating and is made from high impact virgin polypropylene copolymer plastic. If the ladder is to be subject to prolonged exposure to daylight then black or UV stabilised material should be specified. It is reinforced with structural steel.

PERFORMANCE

Pull out load:	7.5kN minimum, when fitted in accordance with manufacturer's instructions
Deflection under load:	5mm maximum at 2.5kN
Permanent Set:	0 mm at 2.5kN
Impact:	20kg weight from 1 metre, no cracking
Chemical Resistance:	At least pH2 to 12
Integrity of plastic:	2M ohm at 500 volts DC
Thickness of plastic:	3mm minimum
Minimum cross section:	25mm diameter

PRODUCT BENEFITS

- Excellent corrosion resistance
- Visibility
- No sharp edges
- Eliminates need to specify exact length or fit on-site
- Steel reinforcement gives predictable deflection under load without causing brittle failure





HANDHOLD ENTRY POLE SYSTEM

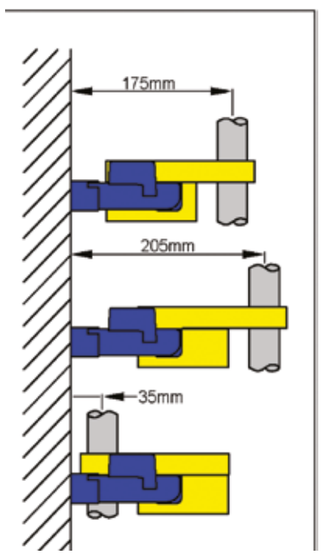
The handhold entry pole system is suitable for aiding maintenance engineers in the initial entry into a manhole from the surface level. Once fitted, the entry pole is a permanent fixture within the manhole, which is stored in the lowered position beneath the level of the cover. When required, the entry pole can be easily extended by simply hooking the easy-to-reach loop located at the top of the pole, pulling the handle upwards and twisting, locking into position. The handhold then provides a stable support to aid the entrance of the manhole, as well as a clear visual indication of the location of the manhole, when open. This helps prevent injury of other people in the area. Once the engineer has used the entry pole to aid their return to the surface, the pole is simply twisted to unlock it from the raised position and lowered back into the manhole, ready for the next time it is needed.

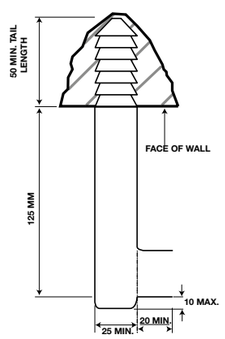


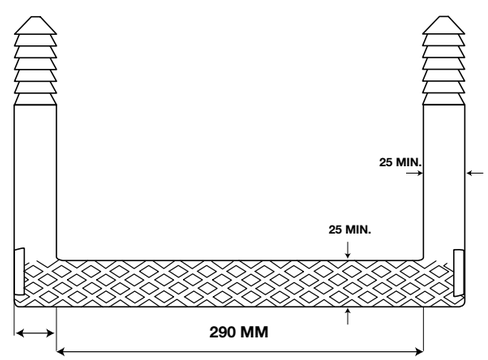


SPECIFICATION

The handhold has a pole length of 1200mm and can be assembled to give three different distances from the pole to the wall. This is designed to accommodate different cover positions.







PRODUCT BENEFITS

- Helps the user find the first step safely
- Creates visual aid to indicate location of manhole to other people in the area
- Easy to fit
- Easy to raise and lower
- High strength for ultimate safety
- Low cost
- Can be fitted to any Caswick step
- Two projections for round or flat walled manholes

HEADWALLS

FP McCann's precast concrete headwalls provide an ideal end connection point to outfall pipes into open watercourses such as rivers, culverts, collection and balancing ponds. They are a very efficient alternative to intrusive shuttering of soil embankments and costly on-site formwork with ready-mixed concrete, making them particularly suitable for use in hard-to-reach locations and in environmentally sensitive areas.

Where time constraints exist such as in tidal flow situations, concrete headwalls can be quickly positioned, secured and backfilled, providing immediate stability around the point of water discharge.

The FP McCann headwall range can accommodate pipe sizes from DN150 to DN2100 and is suitable for usage with box culverts. Additionally, accessories such as flap valves, penstocks, silt traps, handrails and safety grating can be added as part of the specification.

A front weir wall can be fabricated onto any of the standard headwall range, on request, and installation is quick and easy.



KEY SITE SAFETY BENEFITS

Safety hand rails can be used with our full range of headwalls. Health and safety risks are minimised because the construction work takes place off-site and installation is quick and easy.

Please note: Bespoke grates and handrails are available on request. Please contact FP McCann for information on correct installation



SMALL HEADWALL



MEDIUM HEADWALL



LARGE HEADWALL



XL-T4 HEADWALL



XXL-T2 HEADWALL



PRODUCT BENEFITS

- Headwalls are designed to EC2 and manufactured to BS EN 13369. (Full design calculations available to illustrate design assumptions).
- Prefabricated off-site
- Speedy and efficient to install
- Durable, long-lasting and low maintenance
- No on-site shuttering or formwork required
- Provides immediate stability and reduces soil erosion
- Valve and safety accessories available
- Cost-effective solution
- Significantly reduces the potential for floating debris to block the watercourse
- Installation with 2 or 3 lifting anchors
- Flap valves and grates available
- Reduces carbon footprint as no need to bring in lorries to site to pour in-situ
- The extended toe unit is available for all sizes making the entire headwall range compliant with Sewers for Adoption (SFA) and Sewers for Scotland
- Headwalls meet the requirements indicated in Fig. C.5 (typical details) of Sewers for Adoption

Headwall Range	Up to & including Pipe Sizes	Max Pipe O.D. mm	Approx. Weight (Kg)
HW Small 100	300	450	1100
HW Small 150	300	450	1390
HW Medium 100	450	630	1540
HW Medium 150	450	630	2020
HW Large 100	900	1080	3020
HW Large 200	900	1080	4740
HW XL-T1	1500	1800	Part A / B 4725
HW XL-T2	1050	1260	Part A / B 4095
HW XL-T3	675	885	Part A / B 3465
HW XL-T4	375	505	Part A / B 2646
HW XXL-T1	2100	2460	Part A / B 10,150
HW XXL-T2	1500	1800	Part A / B 9205
HW XXL-T3	1050	1260	Part A / B 8421
HW XXL-T4	525	675	Part A / B 6915

NB: The above dimensions are in mm.

ACCESSORIES

Please note: Bespoke grates and handrails are available on request. Please contact FP McCann for information on correct installation



TYPICAL FRONT WALL GRATE



TYPICAL BASKET GRATE



TYPICAL HANDRAIL



MECHANICAL CONCRETE PIPE LIFTER

Fit a pipe lifter to your excavator and you can lay concrete pipes in around half the time with less cost and less hassle – but with greater safety.

To buy or rent the Pipe Lifter, contact BPDA's supply partners visit: concretepipelifter.co.uk for details

Safer. No operative needed on vehicle during off-loading or in trench during pipe laying.

Easier. Simple to use. No special equipment & minimal training required.

Faster. Around 50% saving on installation time.

Cheaper. Fewer operatives plus greater productivity.

The Concrete Pipe Lifter makes light work of the installation of waste water pipelines. Within seconds, it can be attached to your excavator using a quick-hitch coupling. There are no hydraulic links or additional energy requirements.

There is no need for anyone to stand on the bed of the vehicle during off-loading (the biggest cause of accidents during pipe laying). There's no need for anyone to stand in the trench during installation and there are no slings or chains to trap hands and fingers. The whole operation is around 50% faster and you can reduce the size of your pipe laying team, so costs are lower too.

The Concrete Pipe Lifter is suitable for standard UK specification BS EN1916 concrete pipes from DN300 to DN1200.

The Manhole Lifter is a companion device that makes lifting manhole rings a safe and easy, one-man operation. It eliminates the risk of vehicle falls during off-loading. There are two versions available for precast concrete manhole rings from DN900 to DN1800 and from DN2100 to DN3000. It's capable of lifting rings from 250 mm to 1000 mm deep.



KNOW YOUR LIFTERS

All of the precast concrete drainage products manufactured by FP McCann feature a lifting system to allow safe off-loading and installation in an efficient manner. Each system is suited to each type of product.



The information below will allow you to determine what lifting attachments are required. This list is not exhaustive and may be subject to change. Please contact FP McCann's technical department if you are unsure about any aspect of lifting. Please be aware that it is the contractor's responsibility to ensure all lifts are safe and compliant with legal requirements.

If you do not have the correct lifting equipment, please contact our sales department who will be happy to assist. **Please ensure you have ordered lifting equipment to arrive on-site, ready for when your load is delivered!**

Unless otherwise stated, FP McCann will only supply the eyes or attachments. Correct chains will need to be sourced by the contractor. Unless otherwise specified, access to the trailer will be required to insert the attachments.

PRODUCT	LIFTERS REQUIRED		NOTES
900 to 1800 Standard Chamber Rings and Soak-away	3No M24 Lifting Eye Pins inserted into holes through the ring wall.		Eyes should be on the INSIDE of the ring.
2100 to 3000 Standard Chamber Rings and Soak-away	4No M30 Lifting Eye Pins inserted into holes through the ring wall.		Eyes should be on the INSIDE of the ring.
3600 Standard Chamber Rings	3No RD30 Lifting Loops screwed into the top face of the ring		Please be aware that the loops are not intended for prolonged use.
4000 Standard Chamber Rings (2 part)	4No RD36 Lifting Loops screwed into the top face of the ring		Please be aware that the loops are not intended for prolonged use. Instructions for handling are shown on the product itself.
1200 to 1800 Wide-Wall Chamber Rings	3No 5t Spherical Head Clutch		Attach to the OUTSIDE of the ring.
300 to 1200 Standard Pipes and Fittings	Pipe Grab (below) or Slings		Slings are <u>not</u> supplied by FP McCann. **DO <u>NOT</u> USE HOOKS!** These can damage the pipes and can be dangerous!
1350 to 2100 Standard Pipes and Fittings	10t Spherical Head Clutch and Chain Sling Set		Clutches and chains allow safe lift and easy installation of units.
2400 Standard Pipes and Fittings	20t Spherical Head Clutch and Chain Sling Set		12-20 tonne shackle 2 leg lifting chain only
All Diameters of Standard Cover Slabs	None		Chain Hooks can be attached directly to all of our standard slabs without further equipment required.
Small Headwalls	2 No. 24mm Lifting Loops		Please be aware that the loops are not intended for prolonged use. Instructions for handling are shown on the product itself.
Medium & Large Headwalls	3 No. 24mm Lifting Loops		

MECHANICAL GRABS - The quicker, easier and safer option for handling rings and pipes. These attachments connect to site plant and allow off-loading and installation without any need for access to the trailer bed. Mechanical grabs are available for pipe diameters DN300 to 1200 and for ring diameters of DN900 to 3000. For further information, contact your sales representative. Easi-bases, headwalls and flow-control chambers come supplied with the correct lifters ready for use. Catchpits should be handled with a mechanical grab. All lifters supplied by FP McCann come with appropriate certification and are ready for use. Lifters should be incorporated into the contractors lifting equipment inspection regime under LOLER regulations or disposed of after use.

SAFE LIFTING OF STANDARD PRECAST CHAMBER RING SECTIONS

When lifting chamber ring sections with lifting eyes, it is important that the eyes are passed from the inside of the ring and the nut is attached to the outside of the ring to secure the pin. Hooks must be attached to the eyes on the inside of the chamber and lifted in a safe and controlled manner.

Lifting with the pins installed in any other way is dangerous and should not be attempted in any circumstances.

Lifting with the eyes on the outside is NOT safe and can crush the concrete section. When using lifting eye bolts with the nut not attached, the ring can become damaged or the eyes can pull out of the concrete.

Please be aware that precast concrete rings are fragile. They have thin walls and are not reinforced, and can be easily broken when handled incorrectly.

INCORRECT



Eyes passed through from the outside with hooks connected to the outer face of the ring. Pins can come loose if nuts not applied or the self-locking mechanism has not engaged and the concrete can be crushed by the chains.

CORRECT



Eyes passed through from the inside with the plate and nut applied to the thread on the outside, or self-locking mechanism engaged. Hooks are connected to the inside of the ring to allow for a safe lift with straight chains.

For safe lifting in situations when access to the product is restricted (i.e. when stacked high or on a trailer bed, a mechanical grab should be employed). Wide wall chamber rings are lifted via a different method (see page 18).

Bespoke chamber components such as Easi-Bases™ and StormBrake™ Flow Control Chambers will feature a separate handling method. Reference should be made to appropriate drawings or handling information.

STORMSTORE™ RANGE OF TANKS & CHAMBER SYSTEMS

FP McCann's Stormstore™ range of precast tank and chamber systems is the most extensive in the UK. Products manufactured include StormTank™ bespoke precast concrete panel system, StormChamber™ bespoke precast concrete chamber system, a precast concrete storm and waste water management system called Modular Tank System and StormHold™ stormwater management system. Complementary products include StormCleanser™ hydrodynamic separator, StormBrake™ vortex flow control system and StormChannel™ heavy-duty precast concrete slotted drainage channel.

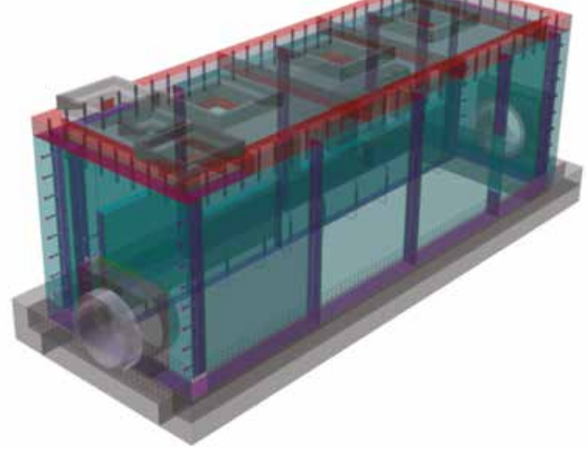
KEY ADVANTAGES OF OUR RANGE

- From receiving the specification, designs can be returned within 2 days
- Complete design package provided, including calculations and drawings
- Manufactured off-site, including factory-fitted pipework and flow control connections, ensures consistent quality, lower construction costs, faster installation and lower health and safety issues
- Design service life of 100 years
- Overall cost of the project can be estimated no matter how complicated the design
- Bespoke designs can be used for reproductions and for future alterations
- No vertical shuttering required, unless an in-situ floor is installed
- Complies with all relevant British Standards and Eurocodes



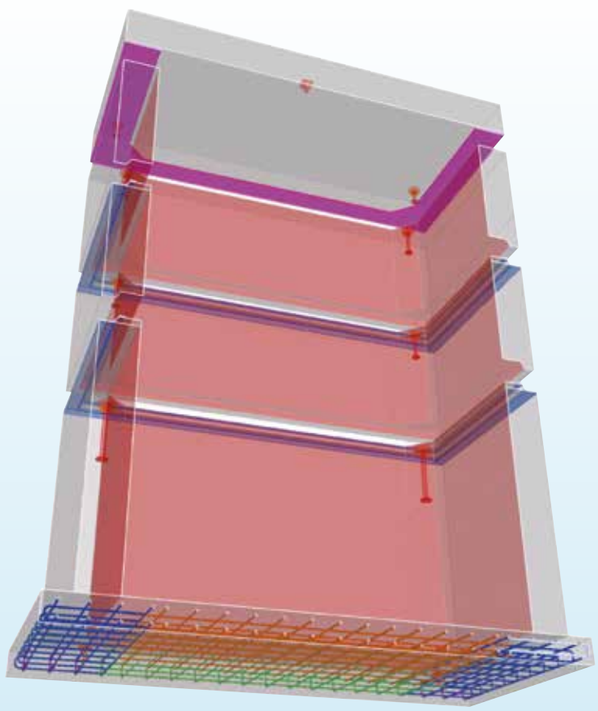
PARAMETRIC DESIGN

ONE DESIGN FOR ALL STRUCTURES



FP McCann's precast tank and chamber systems are designed using parametric 3D modelling. Specification details such as length, width, depth and loading category are entered into our in-house system by our design team; along with additional options such as pipe entries, which will instantly produce the drawings, schedules, price etc.

All multi-purpose chamber and panel systems are designed to BS EN 1992 and are CE marked.



THE DESIGN PROCESS...

DESIGN PARAMETERS ARE ENTERED ON THE SYSTEM BY FP MCCANN

↓

RUDIMENTARY DETAILS PRODUCED, INCLUDING PRICE AND DRAWING

↓

ONCE APPROVED, ADDITIONAL DESIGN DETAILS ARE ENTERED ON THE SYSTEM

↓

SYSTEM PRODUCES AUTOMATIC PRODUCTION DRAWINGS, STEEL SCHEDULES, CUSTOMER DRAWINGS AND DEDICATED CALCULATIONS

↓

APPROVAL OBTAINED FROM CLIENT BY SIGNING DRAWINGS AND CALCULATIONS

↓

PRODUCTION COMMENCES

STORMCHAMBER™

MULTIPURPOSE CHAMBER SYSTEM



FP McCann's StormChamber™ multipurpose chamber system is a single piece chamber system made up of a base unit, risers and cover slab to suit chamber depth and the specific application. A 3D dimensional drawing is available on request. This flexible modular system is suitable for most tank and chamber applications.

STORMCHAMBER™ – INTERNAL DIMENSIONS

1250 x 1250mm	2500 x 2000mm
1500 x 1500mm	2500 x 2500mm
2000 x 1500mm	3000 x 2500mm
2000 x 2000mm	3000 x 3000mm

The above size range do not generally have toe units.

Sizes above 3000x3000mm up to a maximum size of 5000x3500mm. The length and width of these chambers can be adjusted up/down in 250mm increments to suit requirements. The height of the chamber is flexible up to 6 metres, with 8 metres possible, subject to calculations.

If chamber dimensions are critical and don't fit with the above range, we can usually offer a solution.

TYPICAL CONSTRUCTION/ INSTALLATION

(Subject to specific application)

- Base unit is placed on level concrete blinding or type 1 sub base
- Riser unit/s are placed onto the base unit, if required
- Hydrophilic swell, butyl sealant and bearing strips are placed in the joint between the base unit and riser unit/s
- Internal wall is fitted at factory or at site and is connected with threaded rod, nuts and washers
- Pipework is connected and backfilling takes place
- Cover slab is bedded on with high strength mortar, contained to the inside by butyl sealant strip

You should consider the overall installed cost of the chamber when taking into account all the benefits and cost savings detailed below, not the upfront material cost.

BENEFITS

- Concrete surround is not required, saving time and money on site installation. Up to 85% reduction in on-site construction programme
- Pipe penetrations are done at the factory, avoiding the need for cutting or core drilling on site
- Weir walls, flow controls etc can be factory fitted, if required. Up to 95% reduction in site man-hours for pit construction
- Virtual elimination of on-site waste
- 55% reduction in lorry movements for deliveries
- Traffic calming/ management reduction
- Elimination of need for confined space working
- Significant reduction in site noise
- Clear openings to suit requirements
- Reduces enclosed spaces work and working at depth
- Reduction in Health and Safety and Dynamic Risk Assessment issues
- Enhanced functionality - product can be designed for future alterations
- A flexible modular system with a high quality factory finish
- Greatly reduces long term maintenance costs
- Smaller units may be adjusted using alternative increments, if required



STORMTANK™

MULTIPURPOSE PANEL SYSTEM

The StormTank™ multipurpose panel system is an underground structure consisting of wall panels, an in-situ or precast concrete base and cover slab, which are assembled on-site by the contractor or an approved installer using a range of standard jointing types. The panels can be made with cast-in pipe connections, recesses and openings and have penstocks or flap valves pre-installed. Internal weir-walls, overflows, underpasses and baffle walls can also be incorporated into the structure.

This system can be used for a variety of uses such as CSO chambers, storage tanks, large size manholes, pumping stations, valve chambers etc. The main advantage of using this system is that there is no size limitation, except for the height, which cannot exceed six metres, with a two metre overburden. A detailed installation guide is available. Please contact FP McCann for further details.

PRODUCT APPLICATIONS

- Air-infiltration chambers
- Hydro-brake chambers
- Large CSO chambers
- Water storage tanks
- Pumping stations
- Attenuation tanks
- Large manholes
- ASP structures
- Sludge tanks
- Basements
- Headwalls

wrc approved™ PT/433/0119



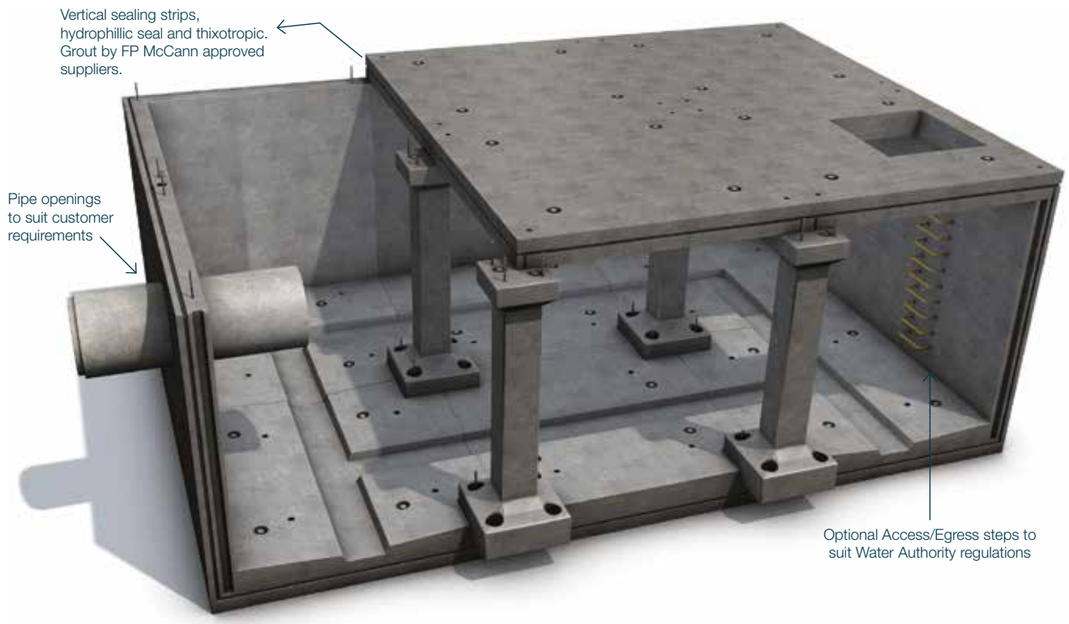




MODULAR TANK SYSTEM

wrc approved™ PT/363/0715

StormStore (storm and waste water management system) provides a multifunctional, durable solution for the detention, retention, infiltration, harvesting and treatment of water, comprising of a combination of standardised precast concrete elements, which are designed to solve your storm and waste water management needs.



DETENTION

StormStore™ provides a cost-effective solution for site applications where stormwater needs to be detained and allowed to discharge at a controlled rate.

RETENTION

StormStore™ retention systems are ideal for applications where the goal is to retain rainwater or stormwater for some type of harvest and reuse applications.

INFILTRATION

Eliminate the issues created with discharging stormwater off-site by using a StormStore™ to infiltrate stormwater into the soil for natural treatment and to replenish local aquifiers.

HARVESTING

Water harvesting is the collection, storage, cleaning and recycling of stormwater to replace or reduce the consumption of municipal potable water.

TREATMENT

Stormwater treatment options such as pre-treatment, post-treatment and oil water separators are available as stand-alone systems, as well as integration with StormStore.

BENEFITS OF MODULAR TANK SYSTEM

MANUFACTURING BENEFITS

- Manufactured locally
- Bespoke inlets and outlets
- An adoptable system which can cater for the 1 in 30 and 1 in 100 year storm event
- FP McCann uses state-of-the-art tooling to manufacture products of the highest quality
- A fully modular system encompassing inherent health and safety benefits

MAINTENANCE AND CLEANING BENEFITS

- The StormStore system excels where most other systems fail, incorporating features that provide maximum system performance and life cycles. As with all stormwater systems, inspection and maintenance of the StormStore system is vital for satisfactory performance and extended life cycle of the stormwater management system
- A self-cleansing and easy maintainable system which includes silt collection areas
- Designed to create safe walking channels during the maintenance, cleaning and inspection process
- Easily inspected visually, offering reduced inspection costs
- System provides clear lines of sight to aid health and safety during maintenance and cleaning

DESIGN BENEFITS

- Complies with BS EN 1992
- Grated inlets may also be incorporated to accommodate surface stormwater flows directly into the StormStore system, reducing the requirements for conventional site drainage components. Any grated inlets may also include pre-treatment devices for pollutant removal
- Standard units reduce design cost
- No requirement for in-situ structural topping to roof slab – offering reduced fill depths and cost savings
- Fully accessible system with the option of including step rungs or ladders
- A fully modular system that brings with it inherent health and safety benefits
- The design and performance meets CESWI 7th edition
- Standard internal heights from underside of roof slab to the channel inverts of 1500, 1800, 2100 and 2400mm. All available with either 1 in 4 or 1 in 20 benching gradients
- The system fully meets CE Marking requirements
- The system and installation is approved by WRc
- Complies with Sewers for Adoption 7th edition and Sewers for Scotland 3rd Edition 2015



- Precast elements manufactured using concrete with a DC4 design chemical class in accordance with BRE SD1
- Up to 2.5m overburden with a 10kN/m2 surcharge
- 100 year design life
- Complies with watertightness class 1 of BS EN 1992-3
- Assumed water table at roof slab level
- Suitable for use within wastewater and stormwater drainage systems

INSTALLATION BENEFITS

- Potential savings on temporary works
- Reduced disruption due to speed of installation
- No need to wait 28 days before back filling. Backfilling can follow on after installation
- No requirement for in-situ concrete topping to roof slab
- No requirement for on-site in-situ benching
- No requirement for in-situ joint-stitching



STORM-HOLD™

LARGE DIAMETER PIPE STORMWATER MANAGEMENT SYSTEM

The production of water-impermeable surfaces in construction is inevitable. This includes roof areas on buildings, car parks, loading bays and road pavements. The provision of these surfaces interrupts the natural drainage process, creating increased stormwater run-off in respect of both volume and flow rate.

In many cases, this increase in stormwater flow and volume is a problem as the local sewer or watercourse does not have the sufficient capacity to cope. This problem could be alleviated by an increase in the size of the stormwater sewer or watercourse, thus providing the capacity within the drainage system to cope with the increased surface water. This, however, may be expensive, cause major infrastructure disruption, and can often be completely unfeasible.

Legislation under Planning Policy Statement 25 and Building Regulations approved Document H3 for flood risk assessment (SuDS), has created the need for planners and developers to design and install effective stormwater management systems.

The types of systems that can be employed to overcome these issues are well documented and varied. Quite often they can be very technically demanding in their operation, maintenance and construction. The selection of a system will depend on site constraints, position, expected loading, geographical limitations and inevitably cost.

The Storm-Hold system offers a complete solution to the stormwater attenuation problem and utilises a tried, tested and approved method of stormwater storage. FP McCann can provide the complete package of design, product specification and supply of products and installation advice.

PRODUCT FEATURES

- Available in a range of sizes
- Can use and combine a number of techniques and products such as pipes, culverts, tanks, manifold systems and soakaways
- A complete solution with all connections
- Established and familiar products
- Can be laid in short lengths
- The system can be adapted to load-bearing and non-load bearing applications
- 120 year design life
- Adoptable by water companies
- Manufactured in accordance with a BSI accredited quality management system conforming to ISO 9001
- Available straight from stock





STRUCTURAL

The inherent structural strength of concrete is well documented and can be designed to meet the severest of loading criteria.

Storm-Hold systems can be tailored to suit low load situations, for example, when the tank is to be situated below verges or gardens.

BENEFITS

- System can be designed specifically to suit the application
- Quick construction using a standard joint
- No need for fabrication on-site or external specialist contractors
- Straightforward installation using known techniques, no need to retrain
- Can be installed under roads and car parks
- Can cope with construction plant loading
- Flotation is not a concern – no need for geotechnical anchors when located below the water table
- Long term solution

DESIGN

The design of the system can be tailored to suit most structural and hydraulic criteria.

RELEVANT LEGISLATION/ INFORMATION

- Planning Policy Statement 25 (PPS25) December 2009
- Department of Communities and Local Government (DCLG)
- Future Water February 2008, Department for Environment, Food and Rural Affairs (DEFRA)
- The Pitt Review, Learning Lessons from the 2007 floods by Sir Michael Pitt
- The Code for Sustainable Homes February 2008, Department for Communities and Local Government (DCLG)
- The SuDS Manual 2007, CIRIA C697
- Sustainable drainage systems - Hydraulic, structural and water quality advice 2004, CIRIA C609
- Flood and Water Management Act 2010

FP McCann's Storm-Hold systems can be designed to suit a wide range of construction projects and drainage schemes. Precast concrete attenuation components include products such as side entry manholes, stop end bends and spigot and socket end wall pipes. These products

can either be engineered into an on-line sewer pipe system or utilised off-line as single or multiple stormwater holding tanks. All FP McCann storm attenuation products comply with the requirements set out within 'Sewers for Adoption 7th Edition' and are made from Kite marked precast concrete components, which comply with the relevant Standards: BS EN 1916 / BS 5911-1 and Manholes BS EN 1917.

STORM-HOLD™

LARGE DIAMETER PIPE STORMWATER MANAGEMENT SYSTEM

EXAMPLES

Spigot and Socket Tank End Wall Pipes (Adaptor/Fitting - BS EN 1916)

- Consists of a standard 2500mm long flex pipe with a cast-in end wall. Inlet/outlet holes are generally cored into the wall

Side Entry Manholes (Junction - BS EN 1916)

- Entry shafts factory-fitted to pipes 900mm diameter and above
- Ideal for use in restrictive locations where conventional manhole build is not possible
- Can be supplied in left or right hand configuration. Access steps can be fitted, if required
- Can be used in conjunction with an end wall pipe
- Additional chamber sections or a reducing slab can be used to build height

Stop End Bends (Bend - BS EN 1916)

- Tank end access for pipes 900m diameter and above
- Access steps fitted, if required
- Drainage inlet/outlet holes cored, as requested
- Additional chamber sections or a reducing slab can be used to build height

Side Entry Manhole with Bend (Junction/Bend -BS EN 1916)

- 2500mm long Easi-Flex standard pipe with cast-in bend
- Entry shaft fitted to pipes 900mm diameter and above

Mid Entry Manholes (Junction/Bend BS EN 1916)

- Standard pipe with a sealed manhole joint, complete with fitted slab
- Manhole joint and slab factory-fitted to pipes 1200mm and above
- Access to the tank via winch or removable ladder. Reduced access via slab, available on request
- Additional chamber sections or a reducing slab can be used to build height

End Entry Manholes (Junction - BS EN 1916)

- Standard pipe with a sealed manhole joint, fitted slab and cast-in end wall
- Manhole joint and slab factory-fitted to pipes 1500mm diameter and above
- Drainage inlet/outlet holes cored, as requested
- Access steps factory-fitted, if required

PRODUCT BENEFITS

1. Flexibility of design - adaptable to meet client requirements
2. Products can be used in space restrictive on-line sewer systems, providing the required storage volume
3. Reduction in construction times
4. Quality assured and kite marked products used
5. Sustainable systems with design life in excess of 100 years
6. Site safety benefits related to reduction of man hours spent in excavation
7. Ease of access for maintenance
8. Can be linked to other SuDS related systems such as rainwater capture and re-use

Note: Concrete haunching should be used to provide local stiffening to the concrete pipes with manhole entries. Use a minimum 150mm thickness surround to the pipe, extending to a height of 300mm above the pipe, in order to support the shaft joint.



DRY WEATHER FLOW CHANNELS

Prefabricated dry weather flow channels for pipes and box culverts are available. Half round (or equivalent) channels can be cast into the floor of the units at any position, with a choice of equivalent half round diameters.



BOX CULVERTS

TYPICAL CULVERT

Units are available in internal span sizes from 1000mm to 6000mm and internal heights from 500mm to 3600mm, with unit lengths to a maximum of 2000mm, dependent on final mould configuration (please refer to internal dimensions chart opposite).



DRY WEATHER FLOW CHANNELS

Half round (or equivalent) channels can be cast into the floor of the units at any position, we offer a choice of equivalent half round diameters.



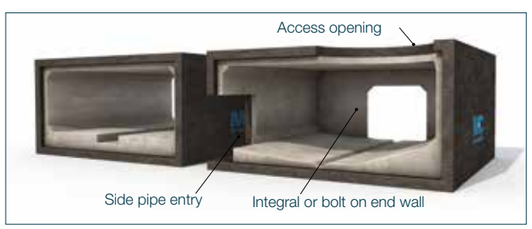
BENCHING

Combined with either a channel or cast as a “vee”, benching improves self-cleansing flow rates.



MAMMAL LEDGES

Cast-in mammal ledges allow access through the culvert to wildlife without the requirement for extra site provisions.



SPECIALS

Bespoke units accommodating a variety of features can be manufactured to our customers’ design requirements.

The proven strength and performance characteristics of precast concrete box culverts, together with their excellent service life, make them ideal for a wide variety of civil engineering and construction applications. Box culvert sections can be manufactured in a variety of internal profiles and sizes, offering exceptional versatility in the uses to which they can be applied.

In addition to the more common use for diverting water courses, box culverts have been used in an array of applications including balancing tanks, pedestrian subways, access shafts, service tunnels, sea outfalls, road crossings and many other situations where the whole life costing consideration requires strength, durability and economy to be of paramount importance.

Unlike other materials such as steel, precast concrete box culverts do not require additional treatments to prolong their life or improve performance. The concrete surface will not rust and the smooth internal finish of the box culvert ensures optimum flow of water through the concrete structure.

Precast concrete box culverts fulfil the current design life requirements for buried structures. With minimum maintenance and the ability to provide many years of service, precast concrete box culverts are the most cost-effective means of diverting water courses, especially with the ever present risk of corrosive elements in the water or soil.

Whilst the methods and procedures for the installation of precast concrete box culverts are familiar to contractors, careful attention to detail will lead to safer working, a smoother flow of operations and a higher standard of finished culvert. Box Culvert installation and jointing details can be downloaded from **www.fpmccann.co.uk/box-culverts**

This guide provides a reliable checklist for anyone engaged in the installation of box culverts. It is published to encourage good practice in the use of precast box culverts.

INSTALLATION GUIDELINES

For installation and jointing details, refer to the Box Culvert Installation Guide which can be downloaded from our website.

DESIGN CRITERIA

Design loading criteria is generally specified by the scheme engineer and ideally should include, as a minimum, the information below:

- Internal span
- Internal height
- Metres required
- Number of runs
- Minimum depth of fill over the culvert unit
- Maximum depth of fill over the culvert unit
- Culvert usage
- Surface loading conditions : green field, highway etc
- Invert type

Exposure conditions should be specified and, where available, design codes provided. Further design requirements may be required for inlet/outlet points, access holes and end walls.

PORTAL FRAMES



Portal frames either consist up of an n-shaped upper unit and two L-shaped footings per ring, or simply just an n-section. The portal frame system offers a quicker and more economical alternative to bridge beams and abutments that are cast in-situ. Units can be designed for specified loadings, and fulfill Eurocode requirements.

KEY FEATURES

- Alternative to bridge beam construction
- Ball and socket joint between wall and roof
- Designed per project requirements
- Reduced insitu works
- Used for road infrastructure
- Bitumen coating can be factory applied if required



UAN CULVERTS

UAN culverts consist of two U-shaped sections, which can then be assembled on-site. A ball and socket joint is used between the two parts of the finished section. This option can be offered for larger box culverts that are unsuitable for transport as a monolithic structure or if there are any site specific weight constraints.

The popularity of UAN culverts is growing, largely due to their immediate stability, quick installation, and the flexibility in being able to manufacture culverts for a wider range of applications. Key uses include as an underbridge for road or rail, and in other road infrastructure projects.

KEY FEATURES

- Adjustable moulds mean the product can be made to accommodate a range of projects
- Instant stability
- Mammal ledges can be added to allow wildlife to safely pass through the culvert
- The ball and socket joint is typically located mid-height.
- Used for road infrastructure
- Bitumen coating can be factory applied if required



ELLISTOWN OFFICE:
Whitehill Road
Ellistown
Leicestershire
LE67 1ET
T 01530 240000
sales@fpmccann.co.uk

MAGHERAFELT OFFICE:
16-18 Quarry Road
Knockloughrim
Magherafelt
BT45 8NR
T 028 7954 9026
sales@fpmccann.co.uk

DRAINAGE

Ellistown 01530 240000 (England/Wales) Magherafelt 028 7954 9026 (Scotland)

AGRICULTURE
Lydney 01594 847500 Grantham 01476 562277

BOX CULVERTS
Weston Underwood 01335 361269

BUILDING PRODUCTS
Cadeby 01455 290780

DOCK LEVELLER PITS
Weston Underwood 01335 361269

FENCING
Cadeby 01455 290780

FILTER BED SYSTEMS
Littleport 01353 861416

FLOORING
Weston Underwood 01335 361269 Uddingston 01698 803300

POWER & INFRASTRUCTURE
Littleport 01353 861416

PRECAST OFF-SITE BUILDING SOLUTIONS
Byley 01606 843500 Grantham 01476 562277 Littleport 01353 861416

RAIL
Littleport 01353 861416

SPECIALIST PRECAST
Littleport 01353 861416

TANKS & CHAMBERS
Littleport 01353 861416

TUNNELS & SHAFTS
Cadeby 01455 290780

WALLING
Grantham 01476 562277 Lydney 01594 847500
Uddingston 01698 803 300 (Scotland)

FPMCCANN.CO.UK

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	1.170	23.300
Flush-Flo™	0.284	23.279
Kick-Flo®	0.711	18.407
Mean Flow		19.189

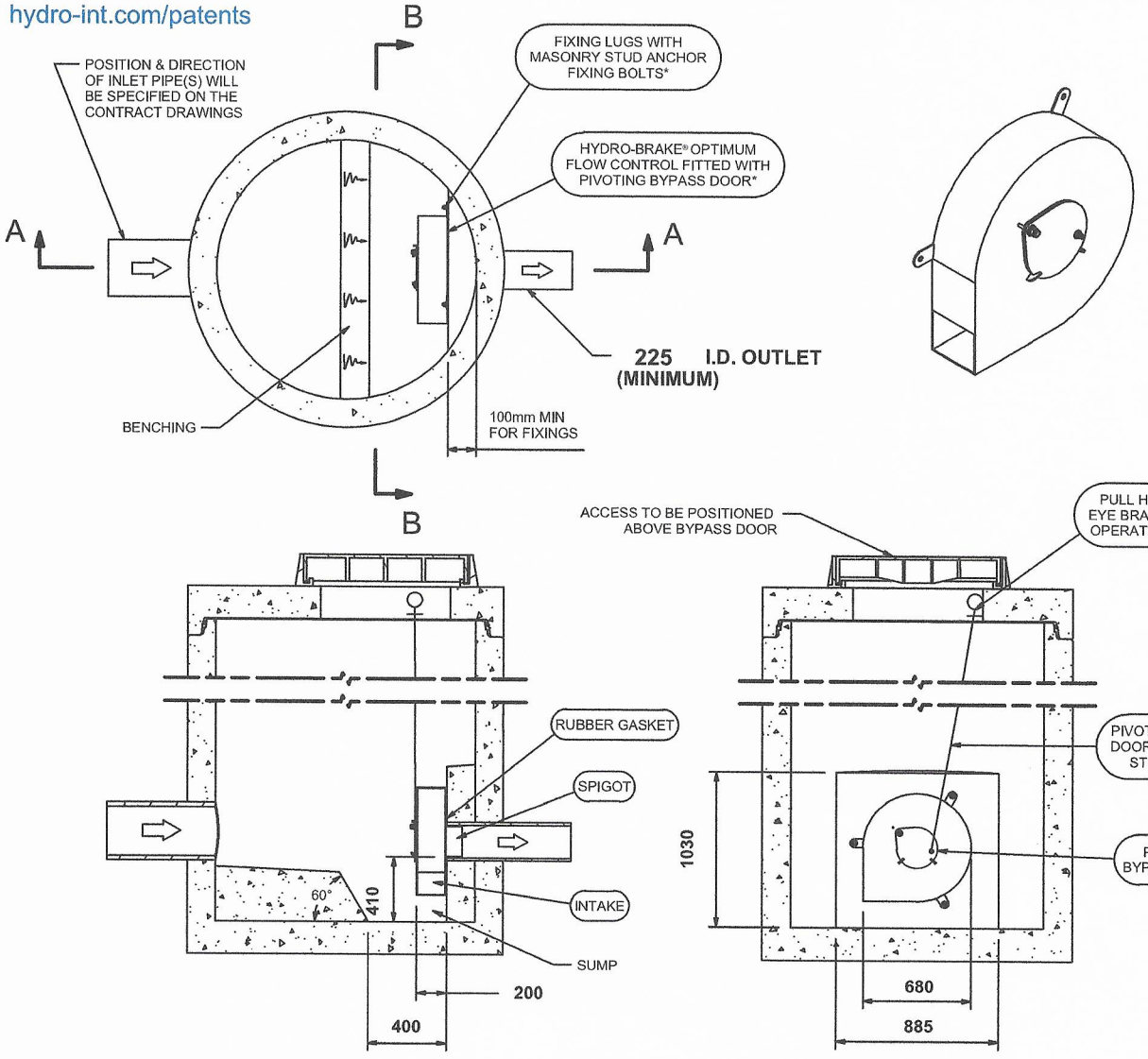
Hydro-Brake® Optimum Flow Control including:

- 3 mm grade 304L stainless steel
- Integral stainless steel pivoting by-pass door allowing clear line of sight through to outlet, c/w stainless steel operating rope
- Beed blasted finish to maximise corrosion resistance
- Stainless steel fixings
- Rubber gasket to seal outlet

BBA APPROVAL INSPECTION TESTING CERTIFICATION CERTIFICATE 08/4596

WRc Approved PT/329/0412

hydro-int.com/patents



SECTION A-A

SECTION B-B

IMPORTANT:
- LIMIT OF HYDRO INTERNATIONAL SUPPLY
- THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
- FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
- ALL CIVIL AND INSTALLATION WORK BY OTHERS
- * WHERE SUPPLIED
- HYDRO-BRAKE® FLOW CONTROL & HYDRO-BRAKE® OPTIMUM FLOW CONTROL ARE REGISTERED TRADEMARKS FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

DESIGN ADVICE

The head/flow characteristics of this SCL-0194-2330-1170-2330 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro International®

DATE	1/7/2021 3:41 PM
SITE	18_21_2991 Axis Tower, Albion Street
DESIGNER	
REF	HQT-071844

SCL-0194-2330-1170-2330
Hydro-Brake® Optimum

© 2021 Hydro International Ltd, Shearwater House, Clevedon Hall Estate, Victoria Road, Clevedon, BS21 7RD. Tel; 01275 878371 Fax; 01275 874979 Web; www.hydro-int.com Email; enquiries@hydro-int.com

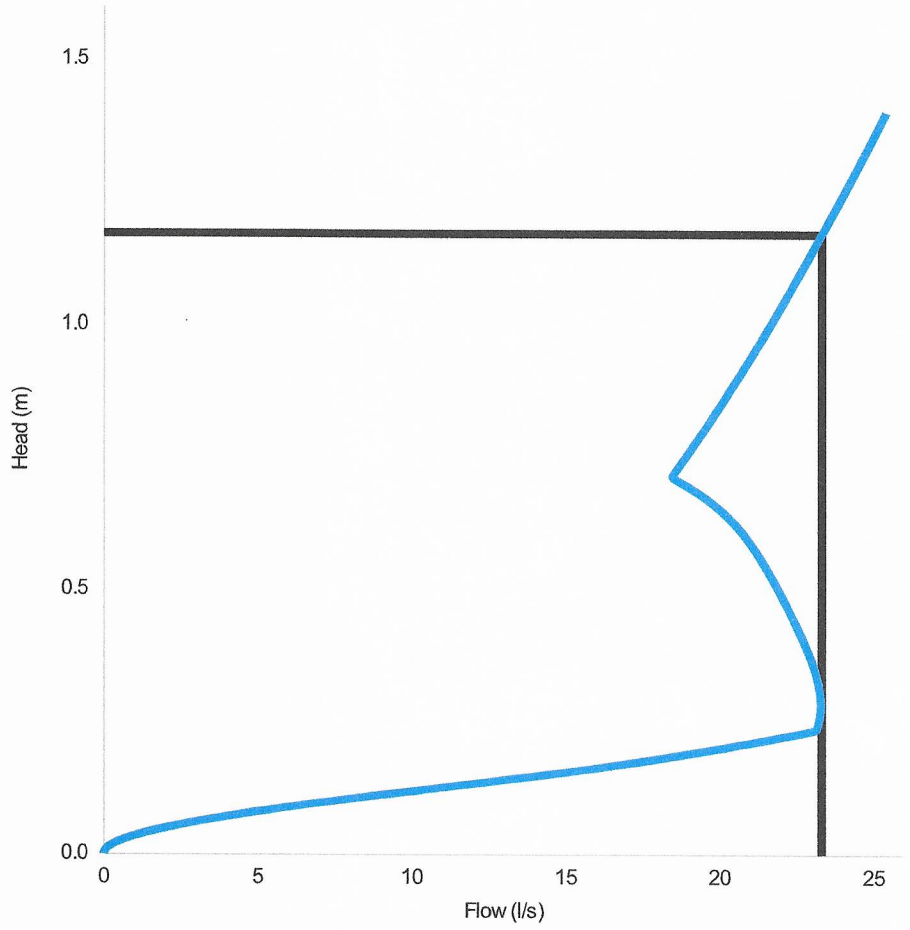
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Mean Flow		19.189

BBA APPROVAL INSPECTION TESTING CERTIFICATION
CERTIFICATE No 08/4596

WRc APPROVED
PT/329/0412

hydro-int.com/patents



Head (m)	Flow (l/s)
0.000	0.000
0.040	1.385
0.081	5.081
0.121	10.242
0.161	15.702
0.202	20.077
0.242	23.170
0.282	23.279
0.323	23.206
0.363	23.004
0.403	22.718
0.444	22.387
0.484	22.033
0.524	21.661
0.565	21.249
0.605	20.751
0.646	20.093
0.686	19.182
0.726	18.592
0.767	19.072
0.807	19.540
0.847	19.996
0.888	20.440
0.928	20.875
0.968	21.300
1.009	21.716
1.049	22.123
1.089	22.523
1.130	22.915
1.170	23.300

DESIGN ADVICE

The head/flow characteristics of this SCL-0194-2330-1170-2330 Hydro-Brake Optimum® Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.

! **The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.**

Hydro International®

DATE	07/01/2021 15:41
Site	18_21_2991 Axis Tower, Albion Street
DESIGNER	
Ref	HQT-071844

SCL-0194-2330-1170-2330

Hydro-Brake Optimum®

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MEASURIT
www.measurit.com

stop silent
light

The Backwater valve



Lasso

Lasso Technik Corp.
Basel, Switzerland
www.stopsilent.com

Measurit

Stop Silent Light at a glance

- Reliable and long-lasting backwater protection
- Airtight odour barrier
- Frog-Flap fonction against small animals
- Suitable for sewage and rainwater
- Available in the sizes: 80, 100, 110, 125, 150, 200, 250 and 300 (Larger sizes on request)
- Designed for back pressure up to 0,5 bar
- Easy and quick installation without any additional costs

Applications

The backwater valve Stop Silent Light

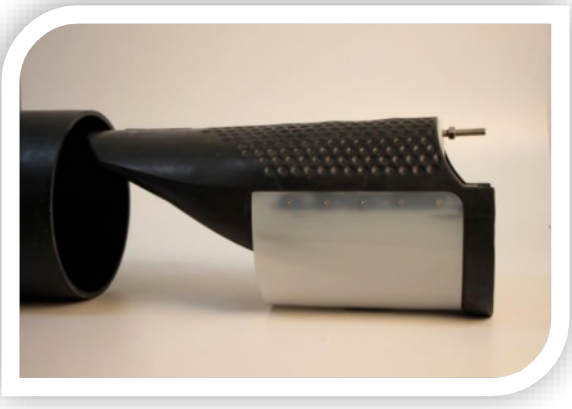
The traditional Swiss company Lasso Technik AG introduces the newly developed STOP SILENT LIGHT sewer backflow preventing valve. This backwater flap sets new standards in terms of its record-breaking fast installation, and guarantees reliable backflow prevention.

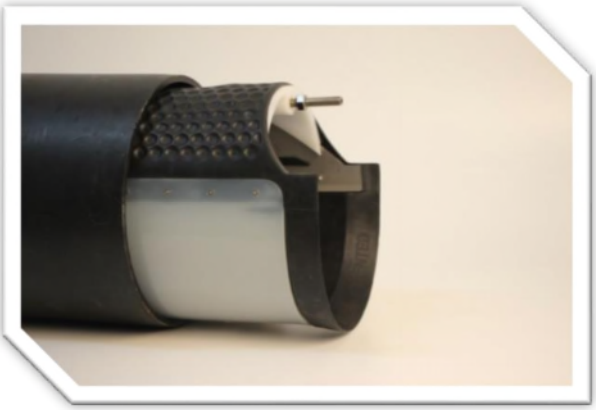
Solve a problem within minutes! The Stop Silent Light sewer backflow preventing valve can be installed into already existing sewer lines or inspection shafts: Reliable back flow prevention guaranteed! The smoothly working rubber membrane is the only moving part.

Available in different sizes, the Swiss made Stop Silent Light check valve is designed for a back pressure up to 0.5bar (7.25psi). This valve stands out through simple and time saving installation.

Besides the backflow preventing function of the valve, Stop Silent Light furthermore serves as a frog flap, preventing small animals from entering into pipe systems.

A third function that gives the valve a competitive advantage is the airtight odour trap, preventing channel gases from flowing back into premises.



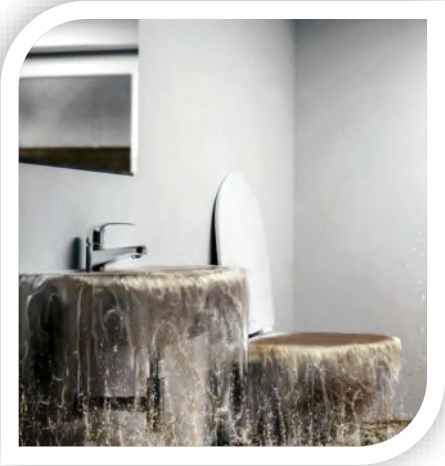


Active backwater protection

Flooded basements? Costly renovation of damaged rooms? No problem for households which are protected by a Stop Silent Light check valve.

Emotional and Financial Damage

In addition to damages done to premises and furniture, it is the emotional stress that makes a water damage a high burden.





Flooded basements in a new building

Lupsingen, Switzerland. A quaint, town on the countryside. In this town, family Hartmann decided to build their own home. However, the unfavourable location as the lowermost house of the road, caused two water penetrations in the basement floor within a short time. Alone to dry the parquet floor of their basement, the family had. Fixing the damage and dehumidifying the parquet floor alone, forced family Hartmann to run a drying machine for several weeks which caused considerable noise exposure.

Sewers at the capacity limit

Heavy rains, combined with an ever-increasing concrete surface, bring sewers to their capacity limit. If this limit is reached, the water that is looking for a way out can be pushed back into the property. That's what happened at Hartmann family's house.

A backwater automat with noise and vibration reduction

The constant humming

Water streams can cause the sewer system to vibrate. Drainage pipes absorb the movements and propagate them through vertical pipes to inhabited areas. At first, these noises may be barely perceptible. But because of their uninterrupted constancy, they strain the nerves of the inhabitants - especially during night-time hours.
The rubber membrane of Stop Silent Light absorbs these movements and effectively interrupts the propagation. In this way, resonances and pipe noises are muffled. The resulting calmness has an immediate effect on the quality of sleep of the person suffering from it.

In August 2019, a customer of Lasso Technik also encountered this kind of problem, he testifies:
"For years, we have suffered at night from vibrations and noise from sewers and waterways 70 meters away. By chance, we heard about your check valve. Since the installation of the Stop Silent Light, we sleep much better. We highly recommend this product".

How to keep vermin out of tube systems?

Small animals that invade tube systems are an annoying problem that can be reliably and permanently solved with the new and innovative Stop Silent Light backflow pre-venting valve.

Small animals and vermin that penetrate water tubes can be a problem for the water quality, and can have unpleasant consequences for affected humans. The Stop Silent Light flap gate prevents small animals from entering into tube systems, contributing to a flawless water quality.

Case Study: Bivio, Grison, Switzerland:

Bivio is a small town in the Swiss Alps, 6562 ft. above sea level. After launching a new water collector, the water supply noticed, that amphibians and insects can infiltrate the system through the overfall. In order to solve this problem as fast as possible, Lasso Technik AG installed a Stop Silent Light Flap Gate. Within few minutes the Stop Silent Light valves were installed and ready for use.







What to do when you smell the Sewers?

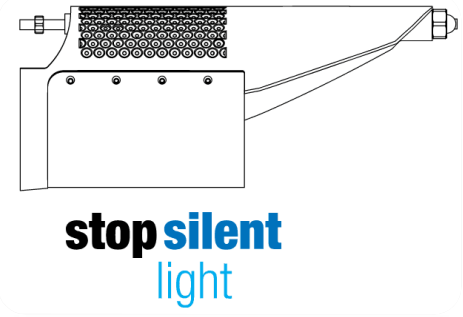
Sewer gases that pass through the canal system back into properties and causing unpleasant odour nuisances. This issue can be permanently solved with a Stop Silent Light backflow prevention valve.

Steaming gullies on cold days, a common sight during the winter season. This steam is the so-called “channel gas” generated by waste water and is the cause for unpleasant stench.

Prevent Odour Nuisance!

This negative effect of the channel gases can be prevented with a Stop Silent Light backflow preventing valve. One main function of Stop Silent Light is the odour Barrier. The odour barrier guarantees an airtight shut of the sewer pipe, avoiding the stack-effect.





Prior Installation: The Stop Silent Light Checklist

Internal diameter

In order to offer you the proper valve, we need to know the exact internal diameter of the pipe that needs to be protected.

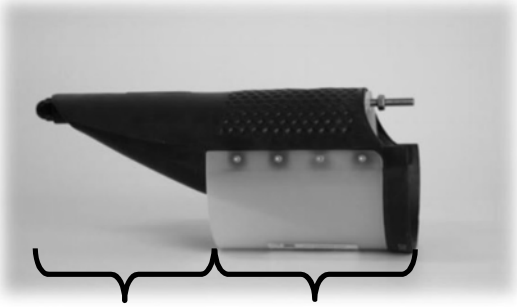
Nominal Diameter (mm) / (inch)	Clamping Range (mm) / (inch)	Total Length (mm) / (inch)	Weight (kg) / (lb)	Allen key size (metric)
DN80 / 3.15”	75-80 / 2.95-3.15	180 / 7.08	0,17 / 0,374	3
DN100 / 4”	93-101 / 3.66-3.98	215 / 8.46	0,3 / 0,661	3
DN110 / 4.3”	98-106 / 3.86-4.17	230 / 9.06	0,34 / 0,75	3
DN125 / 5”	115-125 / 4.53-4.9	270 / 10.63	0,54 / 1,19	3
DN150 / 6”	145-154 / 5.7-6.06	330 / 12.99	1,0 / 2,205	4
DN200 / 8”	183-197 / 7.20-7.76	420 / 16.54	1,75 / 3,858	4
DN250 / 9.8”	230-252 / 9.05-9.92	530 / 20.86	3,09 / 6,812	4
DN300 / 11.8”	280-298 / 11-11.73	650 / 25.59	5,37 / 11,839	6

Dimensions for bigger sizes are on request available. For intermediate diameters, we provide adapters.

1. **Access to the pipe**
   - Hand-moulded shaft bottoms can be too tight and have to be manually adjusted.

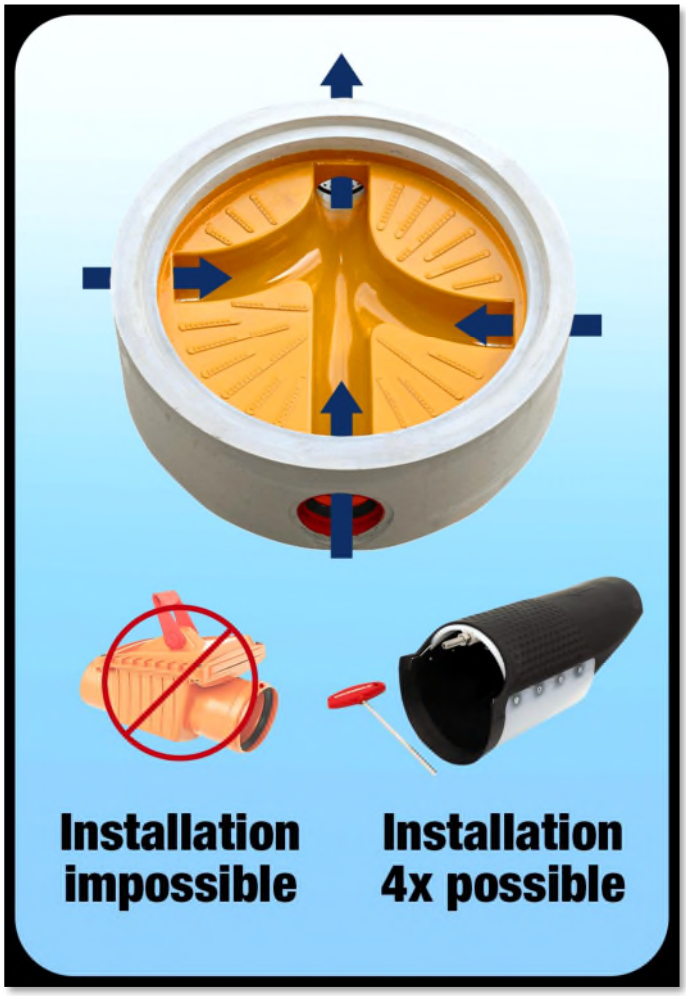
2. **Length**
   - The length of the cylindrical clamping range is approximately 1x diameter. Also, the length of the conical valve head is approximately 1x diameter.

3. **Minimum Slope to ensure smooth operation**
   - In sewage you need a constant gradient of 2% before the valve
   - In rainwater you need a constant gradient of 1% before the valve.



4. **Type of Medium?**
   - Private- or industrial drain water
   - Rain water
5. **Installation in the entrance or exit?**
   - If no Large Quantities of rainwater flow into the check shaft, the valve should be installed in the exit of the shaft. During the backwater, no more water will flow off and the shaft thus serves as a reservoir for own water.
   - If there is a large amount of rainwater, we recommend to install the valve in the pipe with the to be protected area.
6. **Problems to plug in?**
   - For small pipe diameters, soft soap/ soap water can be used to facilitate the insertion of the valve. NO FAT, NO OILS!

During long-lasting floods, the internal pipe system can absorb only a limited amount of water. Low water consumption is recommended.



Installation of the backwater flap in the inspection shaft, without structural adjustments!

Stop Silent Light can be installed quickly and without any additional costs. Our backwater automat does not include any moving mechanical parts or electronics that could fail.

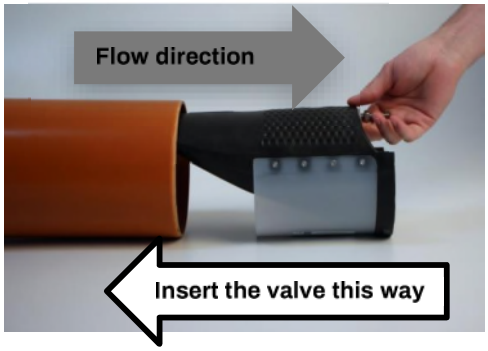
By following the link below you will find a GIF showing an expensive and complex non-return valve with defective electronics. The Stop Silent Light Backwater flap replaces this system in less than two minutes for reliable and durable protection.

https://www.stopsilent.ch/en/backwater-flaps/i-561-case-study-what-to-do-when-the-electronic-check-valve-fails

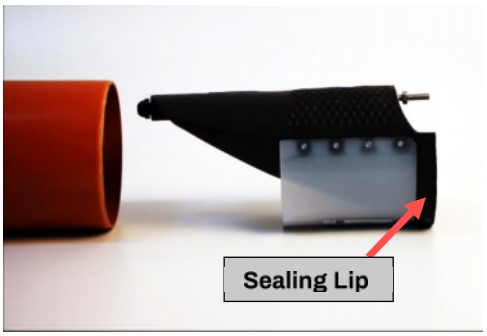
Installation Guide:

Stop Silent Light is usually installed horizontally. The slope can be very steep but it is not recommended to install it vertically, otherwise residues could accumulate and get stuck in the expansion clamp. A minimum constant incline of 2% is requested when installing Stop Silent Light. An Allen key and installation guide are delivered with the order.

1st Option: Entrance manhole



a) Before installation, completely loosen the clamping mechanism and moisten the valve surface with water. (Possibly soap water)

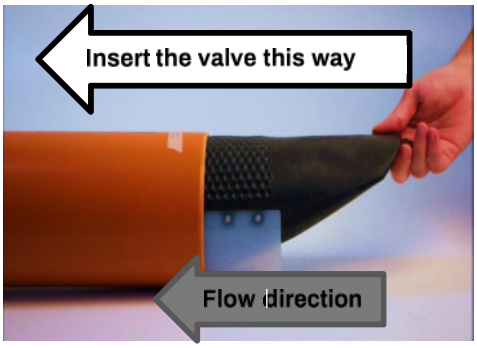


b) Insert the valve until the sealing lip is completely fitting inside the pipe. When inserted correctly, the valve should sit within the pipe as shown in picture (c).

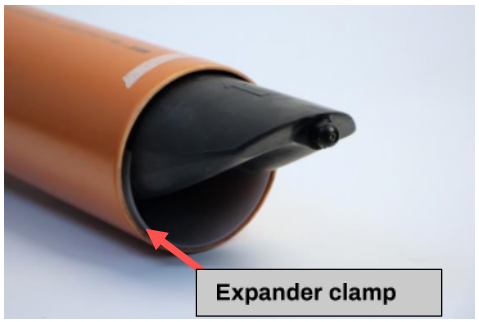


c) Tighten the screw in direction of the arrow with the original tool. To guarantee an optimal functioning the bolt has to be centred in the upper part of the pipe.

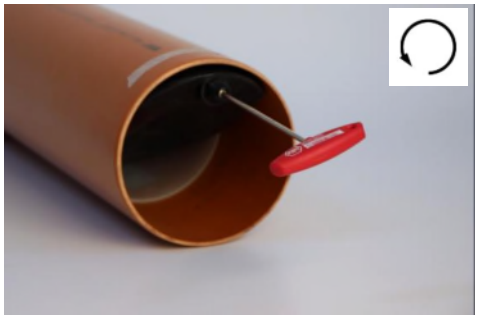
2nd Option: Exit of the manhole



a) Before installation, completely loosen the clamping mechanism and moisten the valve surface with water. (Possibly soap water)



b) Push the valve into the pipe until at least the expander clamp is completely in the pipe.



c) Tighten the screw in direction of the arrow with the original tool. To guarantee an optimal functioning the bolt has to be centred in the upper part of the pipe.

Functional check and maintenance of the valve when used with sewage water

New installed valves have to be checked for function and sedimentation after 4-6 weeks

The valve should be checked twice a year

Open the cover of the inspection shaft and descend. Flush the toilet several times while flushing down toilet paper. Observe whether flushed water including paper passes the valve. Check the membrane for brittleness or flexibility. If necessary, clean the membrane with clean water (You must not use a high-pressure cleaning device)

Functional check and maintenance of the valve when used with rainwater:

The valve should be checked once a year.

The procedure is the same as with sewage water.

Guarantee:

The guarantee period is two (2) years from the date of purchase. Warranty claims can only be made if the product has been used under standard operating conditions* and in according with Lasso Technik AG's recommendations. The guarantee does not cover damage or defects to the product caused by external mechanical forces due by persons, animals or machines. Furthermore, the guarantee is not valid if the Stop Silent Light valve has been modified in any way after being manufactured or if the product has been exposed to high concentrations of chemical substances. The warranty is void if the valve is damaged due to pressure surges and/or vacuum inside the valve. Unless otherwise agreed, the warranty will be void if the flow velocity exceeds 1.5m/s (.5ft/s) through the valve.

In the event of a complaint, clients should contact their Stop Silent Light distributor within 5 working days after the damage has been detected. The liability of Lasso Technik AG is limited to the replacement or repair of defective products. Lasso Technik AG does not reimburse any costs for the removal of defective products or for a later installation of substitute products.

Lasso Technik AG does not assume any transport costs for damaged products or for replacement products. This warranty voids all other explicit or implicit warranties to the entire extent permitted by law. Lasso Technik AG is not liable for any subsequent damages. No employee, agent or representative of Lasso Technik AG is entitled to extend the warranty conditions listed here.

*Normal operating conditions: Normal use of toilets, showers and other drains in the building. No disposal of waste Chemicals Edible oil etc. in accordance with the recommendations of the Cantonal Building Department of the Canton Aargau.

Measurit

Lasso

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PLUVIAL CUBE MODULE – DATA SHEET

Pluvial Cube Module Dimensions* (mm)	Module Configuration	Units per m^3	Module Volume (m^3)	Storage Volume (m^3)
500 (L) x 500 (W) x 550 (D)	Single	7.27	0.1375	0.132
500 (L) x 500 (W) x 1075 (D)	Double	3.72	0.2688	0.258
500 (L) x 500 (W) x 1600 (D)	Triple	2.5	0.4	0.384

* Bespoke modules with different configuration available



Single Module



Double Module



Triple Module

Product Data	Heavy Duty Pluvial Cube Module	Pluvial Cube Module
Application	Stormwater Management	Stormwater Management
Average Weight (kg) – single module	8	7
Compressive Strength* (kN/m^2)	400	320
Lateral Strength* (kN/m^2)	225	200
Long Term Creep Testing** (kN/m^2)	200	200
Void Ratio (%)	96	96
Surface Void Ratio (%)	Greater than 90	Greater than 90
Minimum Backfill Cover Landscaped areas#(mm)	450	450
Material	Polypropylene	Polypropylene
Chemical resistance	Good	Good
Bacterial Resistance	Good	Good
UV Resistance	Good	Good

Note: Other Modules with Compressive Strength more than 1500 kN/m^2 available

* Modules tested using UKAS calibrated test machine, range 0 – 60 Tons, UDL, loading rate 0.2 kN/m^2

** Modules tested for long term creep testing for 90, 180 and 208 days / 5000 hours = 50 years design life.

Any cover less than 450 mm and for Min. backfill cover for trafficked areas – contact ESS design department

Maximum depth to invert based on soil type dense sand and gravel for different soil type–contact ESS design department

Note: All Alderburgh products are manufactured to the highest quality, being subjected to rigid quality control. However the company cannot control conditions of application and use of its products, thus any warranty, written or implied, is given in good faith for materials only. Alderburgh Ltd will not accept any responsibility for damage or injury arising from storage handling, misapplication or misuse of its products. All transactions are subject to our standard condition of sales, copies of which are available on request. Product design and specification are subject to change without further notice

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Email: sales@alderburgh.com

ENVIRONMENTAL SUSTAINABLE SOLUTIONS LTD

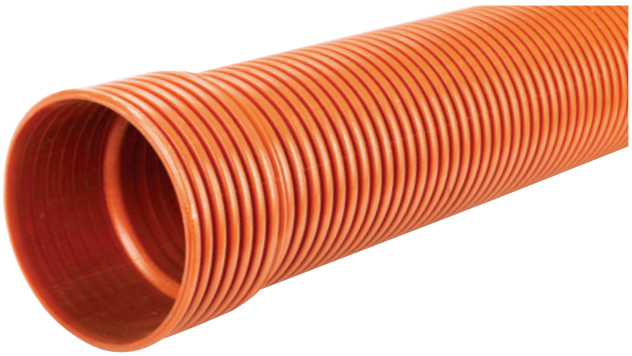
Polysewer

Data Sheet

PRODUCT INFORMATION **P1** **ISSUE 2 - APR 2017**

Polysewer is a range of PVCu structured wall gravity sewer pipes and fittings available in diameters from 150-300mm. The complete system includes a range of couplings, seals, bends, junctions and accessories.

The system is manufactured in accordance to BS EN 13476-1 and WIS 4-35-01 v2, and has adequate resistance to the type and quantities of chemicals likely to be found in domestic sewerage.



Applications

Polysewer provides robust, chemical and sewer gas resistant sewer pipes for new and replacement gravity sewer systems.

Performance

Polysewer has a design life in excess of 100 years.

Key benefits

- Fully compliant with BS EN 13476-1 and WIS 4-35-01 v2
- BSI Kitemarked and BBA approved
- Adoptable by water companies
- Manufactured to stiffness classification 8
- Lighter in weight for increased Health and Safety benefits
- Durable, long life PVCu
- Structured wall pipe for high ring stiffness and strength
- Integral sockets for quicker installation and greater leak tightness
- Strong, flexible pipe wall withstands ground movement and differential settlement
- Chemical, impact and abrasion resistant
- Resistant to sulphate attack and corrosion by sewer gas
- Saddle connectors are available
- Meets WRc Code of Practice for high pressure water jetting tolerance

KM55698 KM582885

POLYSEWER INTEGRALLY SOCKETED PIPE

NOMINAL SIZE (mm)	ID (mm)	OD (mm)	CODE	LENGTH (m)	PACK QTY
150	146	160	PS632	3	46
225	229	250	PS1032	3	23
300	301	330	PS1232	3	8

6m lengths available, subject to minimum order quantity and lead times.

JOINTING

NOMINAL SIZE (mm)	COUPLING CODE	SEAL CODE
150	PS601	PSSP1
225	PS1001	PSSP2
300	PS1201	PSSP3

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Polypipe

SVP & RWP SETTING OUT

SVP AND RWP LOCATIONS ARE INDICATIVE FOR DETAILED SETTING OUT REFER TO ARCHITECTS/ BUILDING SERVICES ENGINEERS DRAWINGS. ALL CAPILLARY DRAINAGE IS IN ABEYANCE UNTIL SETTING OUT OF ALL SVPs, STACKS AND RWPs IS CONFIRMED BY THE ARCHITECT AND BUILDING SERVICES ENGINEER

ALL CONNECTIONS BETWEEN ABOVE GROUND DRAINAGE AND BELOW GROUND DRAINAGE TO BE SIZED TO SUIT ABOVE GROUND DRAINAGE.

EXTERNAL WORKS SETTING OUT

FOR PROPOSED SITE LEVELS REFER TO LANDSCAPE DRAWINGS. CHANNELS/ GULLY LOCATIONS TO LANDSCAPE ARCHITECT SPECIFICATION UNLESS NOTES OTHER WISE.

BEDDING/ SURROUND REQUIREMENTS

ALL DRAINAGE TO BE CONCRETE ENCASED (CLASS Z BEDDING). EXCAVATIONS FORMED USING MINIMUM DIG TECHNIQUES SUCH AS TRENCH BOXING TO MINIMISE EXCAVATIONS TO ARCH STRUCTURE BALLAST.

COVER LEVELS

LANDSCAPE ARCHITECT TO VALIDATE COVER LEVESL IN ALL EXTERNAL AREAS. ARCHITECT TO VALIDATE COVER LEVELS IN ALL INTERNAL AREAS.

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RENAISSANCE, ARCHITECTS, LANDSCAPE ARCHITECTS AND BUILDING SERVICES ENGINEERS DRAWINGS.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE BELOW GROUND DRAINAGE SPECIFICATION SP-C-00050, MANHOLE SCHEDULE ON DRAWING C-01301 AND DETAILS SHOWN ON DRAWING SERIES C-03301 & C-03311 TO C-03312.
3. REFER TO DRAWING VIA-REN-00-00-DR-C-01100 FOR BELOW GROUND FLOOR DRAINAGE GROUND LEVEL PLAN.
4. FOR ALL ABOVE GROUND DRAINAGE AND ASSOCIATED PUMPS REFER TO BUILDING SERVICES AND ARCHITECT'S DRAWINGS.
5. ALL BELOW GROUND DRAINAGE WORKS TO BE IN ACCORDANCE WITH RELEVANT BUILDING REGULATIONS AND SEWER SECTOR GUIDANCE APPENDIX C- DESIGN AND CONSTRUCTION GUIDANCE. IF DISCREPANCIES ARE NOTED BETWEEN SSG AND DRAWINGS THESE SHOULD BE BROUGHT TO THE ATTENTION OF RENAISSANCE FOR REVIEW.
6. RWPs, SVPs, SSs AND FLOOR GULLEYS TO BE TRAPPED.
7. THE CONTRACTOR IS TO UNDERTAKE A FULL CCTV SURVEY AT COMPLETION OF THE PROJECT TO DEMONSTRATE THAT THE DRAINAGE IS CLEAN. ANY DEFECTS ARE TO BE CORRECTED BY THE CONTRACTOR PRIOR TO HANDOVER OF THE SYSTEM TO THE CLIENT.
8. THE CONTRACTOR IS TO KEEP A RECORD SET OF THE AS INSTALLED DRAINAGE ON SITE AND PROVIDE THIS TO RENAISSANCE UPON COMPLETION OF THE WORKS TO ALLOW FOR PRODUCTION OF A 'FINAL CONSTRUCTION' ISSUE DRAWING.
9. DURING THE WORKS ALTERATIONS TO THE DRAINAGE LAYOUT ARE TO BE MARKED UP BY THE CONTRACTOR AND AGREED WITH RENAISSANCE IN WRITING.
10. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED AN INCREMENT TO ACCOMMODATE THE CONNECTIONS AND BENDS.
11. MANHOLE COVERS ARE TO BE ACCORDANCE WITH BS EN 124 FOR THE RATING INDICATED IN THE MANHOLE SCHEDULE. THE CONTRACTOR IS TO SUBMIT DETAILS FOR THE PROPOSED MANHOLE COVERS TO THE ENGINEER AND LANDSCAPE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION.
12. COVER SLABS MUST CARRY THE BSI KITEMARK. WHERE THE CLEAR OPENING OF THE KITEMARKED PRODUCT IS DIFFERENT TO THAT OF THE COVER AND FRAME, A LOAD BEARING REDUCING SLAB SHOULD BE FITTED ABOVE THE COVER SLAB TO BRING THE SIZE DOWN TO REQUIRED SIZE.
13. ALL SEWERS TO BE BSI KITEMARK (CERTIFIED TO WIS 4-35-01)
14. ALL CONCRETE PIPES TO BE TO ES EN 1916 CLASS 120 (54kN/m).
15. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2)
16. IF PLASTIC PIPES ARE TO BE USED THEN THE FOLLOWING MUST APPLY:
    A. BSI KITEMARK (CERTIFIED TO BS EN 13476-1 AND WIS 4-35-01)
    B. PIPES LESS THAN OR EQUAL TO 500mm DIA
    C. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2)
17. THE MINIMUM CRUSHING STRENGTH FOR CLAY PIPES SHOULD BE AS FOLLOWS: 100mm DIA. 40kN/m, 150mm DIA. 40kN/m, 225mm DIA. 45kN/m AND 300mm DIA. 72kN/m.
18. THE MINIMUM CRUSHING STRENGTH FOR CONCRETE PIPES SHOULD BE - (CLASS 120 TO EN 1916/BS5911-1 2002). PLASTIC PIPES SHOULD CONFORM TO WIS 4-35-01 AND BS EN13476.
19. SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVIDING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
20. SEWER PIPES TO BE LAID IN MAXIMUM 3.METER LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER PIPES, AND THIS IS AGREED BY THE CONTRACTOR WITH THE PIPE MANUFACTURER.

DRAWING LEGEND

- PLANNING BOUNDARY
- OWNERSHIP BOUNDARY
- PHASE 1 BOUNDARY
- SURFACE WATER DRAINAGE
- FOUL WATER DRAINAGE
- EXISTING DRAINAGE TO BE RETAINED
- EXISTING DRAINAGE TO BE REMOVED
- G — GULLY
- CHANNEL DRAIN TO LANDSCAPE ARCHITECTS SPECIFICATION UNO
- RAINWATER PIPE/ SOIL VENT PIPE

Rev:	Description:	Date:	By:	Chkd:
C01	CONSTRUCTION	29.09.21	HW	PC

renaissance
Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project:

VIADUX, MANCHESTER

Drawing Title:

BELOW GROUND DRAINAGE LEVEL 01 PLAN (SHEET 01)

Status:

CONSTRUCTION

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	SEP'21	HW	HW	PC

Scale:	Project No:
1:150	1910-12

Project: Originator: Volume: Level: Type: Role: Category/Number: Rev:

VIA - REN - 0 - 01 - DR - C - 01101 - C01

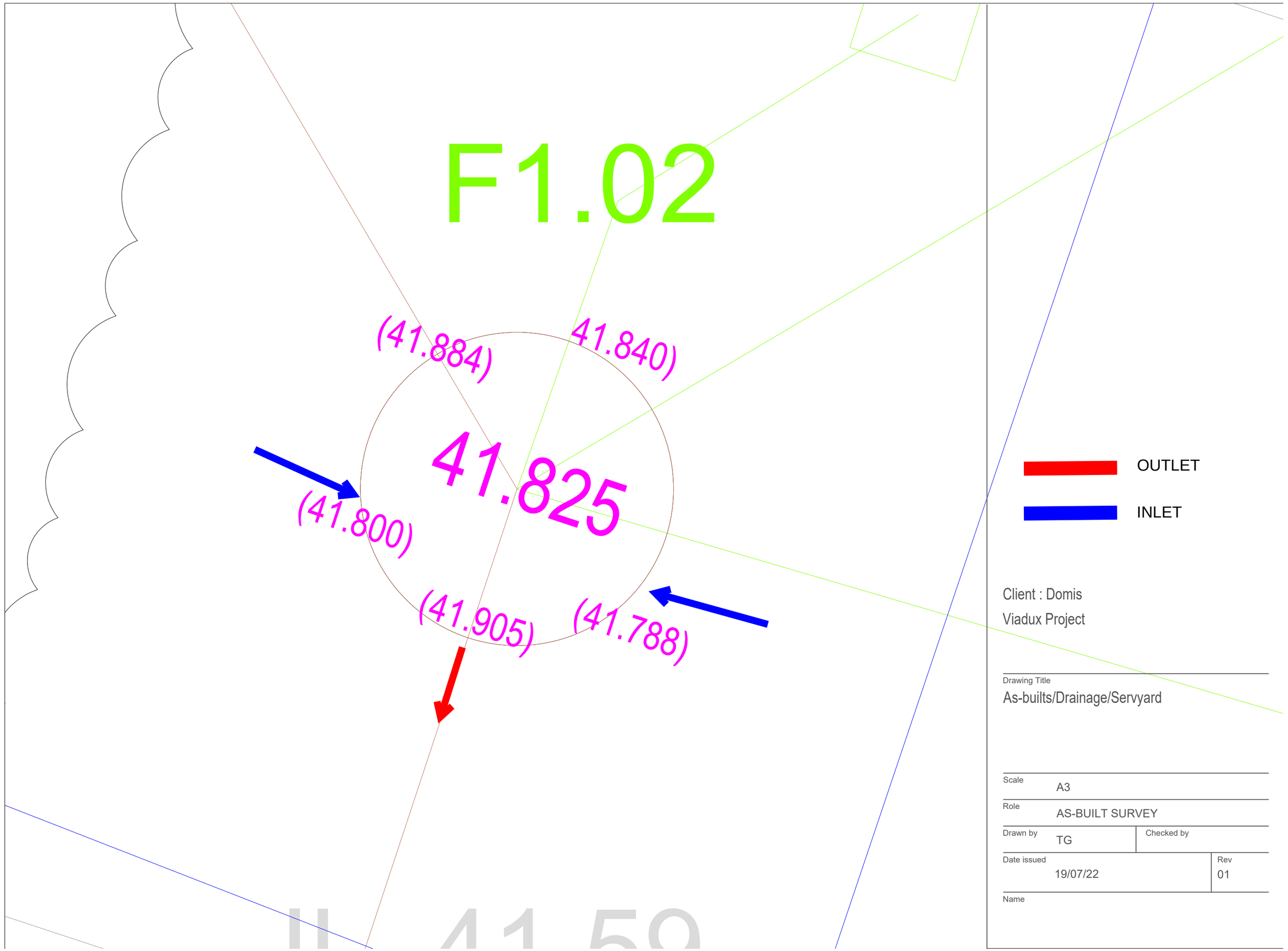
This drawing has been prepared for the sole benefit, use and information of the client for the purpose set out in the instructions commissioning it. The liability of renaissance in the respect of the information contained in this drawing will not extend to any third party. This document should not be used in whole or part by any third parties without the express written permission of renaissance

S11 INVERT LEVEL 41.682

INVERT LEVEL 41.825

OVERPUMP GRUBBED OUT
LINE CLASHING WITH
COLUMN PENETRATION 9

F1.02



OUTLET

INLET

Client : Domis

Viadux Project

Drawing Title

As-builts/Drainage/Servyard

Scale	A3
Role	AS-BUILT SURVEY
Drawn by	TG
Checked by	
Date issued	19/07/22
Rev	01
Name	

ER TO TYPICAL SLAB
EP DETAIL
m THK RC WALL FOR
CLE RESTRAINT
IJ
mh
SRMJ
Pop up
205
3203
S02
IL 42.00
G01
203
3203
F-SVP 1
IL 41.884
dp
G

1.817

G

G23

1.872

0.726

0.434

G

2.034

RWP FOR TOWER
ATTENUATION BY
BLUE ROOF.
DISCHAR

150Ø @

S5.00

1.05m

CL: +43

IL: +42.6

Drawing Title
As-builts/Drainage/servyard

Scale
A3

Role
AS-BUILT SURVEY

Drawn by
TG

Checked by

Date issued
F1.02

Rev
01

Name

(41.884)

41.840)

41.8

100

BA

BB

BC

225DIA @ 1:150 (S1.000)

BD
IL: +33.523

Combined water

225DIA
@ 1:100

225DIA @ 1:150 (S2.003)

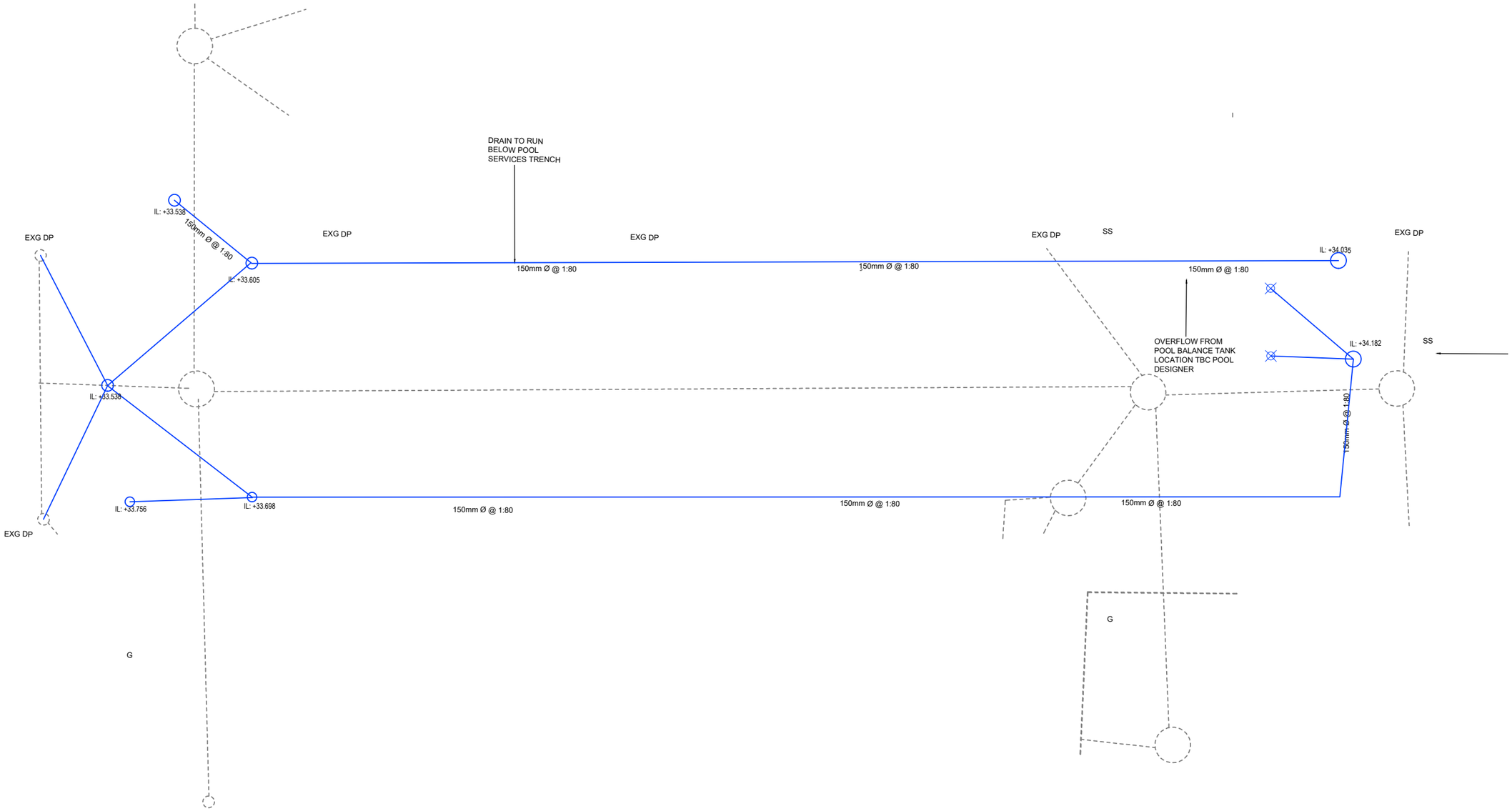
225DIA @ 1:150 (S3.000)

225DIA @ 1:100.0

EXG DP

300DIA

Viadux- Service yard- Surface runs


DRAIN TO RUN
BELOW POOL
SERVICES TRENCH
EXG DP
EXG DP
EXG DP
EXG DP
SS
EXG DP
IL: +33.538
150mm Ø @ 1:80
IL: +33.605
150mm Ø @ 1:80
150mm Ø @ 1:80
IL: +34.035
150mm Ø @ 1:80
OVERFLOW FROM
POOL BALANCE TANK
LOCATION TBC POOL
DESIGNER
IL: +34.182
SS
IL: +33.538
150mm Ø @ 1:80
IL: +33.756
IL: +33.698
150mm Ø @ 1:80
150mm Ø @ 1:80
150mm Ø @ 1:80
EXG DP
G
G

VIA-REN-00-XX-RP-00005

Drainage Maintenance Strategy

Project: Viadux, Manchester

Project No: 1910-12

Revision	Description	Issued By	Date	Checked
P01	First Issue	S Ahmad	23.02.2024	P Clayton
P02	Updated to suit comments	J Bullough	28.02.2024	P Clayton

1.0. ABSTRACT

This drainage maintenance strategy has been produced to support the Viadux, Manchester development. It provides supplementary information in relation to the drainage maintenance generally and specifically the Sustainable Drainage Systems (SuDS) utilised on-site. It is to be read in conjunction with the manufacturer's recommendations and the project's drainage drawings and reports.

2.0. THE SITE

2.1. Site Location

The site is located between Trafford Street, Albion Street and Great Bridgewater Street within Manchester City Centre and is split over two levels. The lower deck at ground level comprises an undercover car park featuring a series of Grade II listed Victorian arches, whereas the upper deck is used as a service yard for the Manchester Central Convention Centre.

The site location is described below:

- Post Code M1 5LH
- OS X (Easting) 383550
- OS Y (Northing) 397630
- Nat. Grid SJ835976



Imagery ©2020 Google, Imagery ©2021 Infoterra Ltd & Bluesky

Figure 2.1: Site Location

2.2. Proposed Development

The Viadux development in Manchester comprises the construction of a 40-storey tower over the service yard on the existing Grade II listed masonry viaduct. The 40 storey tower will comprise residential apartments with two retail/leisure units at ground level.

3.0. PROPOSED DRAINAGE NETWORK

The existing onsite networks have previously been assessed and proposed discharge rates discussed and agreed with United Utilities and the LLFA. Details of the proposed drainage networks for each of the blocks and external areas can be found within the renaissance Drainage Strategy Report – VIA-REN-00-XX-RP-C-00100 and the following drawings attached in Appendix A.

VIA-REN-00-00-DR-C-01100 – Below Ground Drainage, Ground Level Plan

VIA-REN-00-00-DR-C-01101 – Ground Floor Drainage, Plan Sheet 02

VIA-REN-00-01-DR-C-01101 – Below Ground Drainage, Level 01 Plan. Sheet 01

Surface water run-off associated with the development is collected by a dedicated surface water below ground drainage network which provides stormwater attenuation. The network includes a vortex flow control which restricts the surface water discharge rates before discharging into the public combined sewer network. No discharge is provided to the adjacent canal, either via a direct connection or via groundwater infiltration and as such there is no impact to the canal.

Foul water associated with the development is collected by a dedicated foul water network which discharges into the public combined sewer network.

4.0. FUTURE MANAGEMENT & MAINTENANCE

The proposed drainage solution uses SuDS techniques in accordance with the CIRIA SUDS Manual C753.

The SuDS following will be maintained by a Building Management company that will be selected by the client:

- Blue roofs to the tower and podium
- Geocellular attenuation tanks beneath the Residential Refuse Store.

The following components have been included within the drainage strategy for the proposed development:

- Inspection chambers, manholes and catchpits.
- Pipes.
- Drainage channels and gullies.
- Vortex flow control device.
- Cellular attenuation tank.
- Blue roofs.

A suitable maintenance strategy should be adopted to ensure the drainage network is cleaned regularly and the routine maintenance and cleansing regime should be documented.

The Main Contractor delivering the development is to update the general requirements to reflect the product specific requirements of the as installed proprietary SuDS and incorporate these into the Operation & Maintenance manual for the building.

It should be noted that the Main Contractor should provide a Verification Report, including photographic evidence, to demonstrate that the drainage has been constructed as per the design drawings. As-built drawings should be supplied by the Main Contractor where the construction of the drainage varies from the construction drawings.

As such, the maintenance of the specified SuDS should be included within the developments Operation and Maintenance Manual and should be detailed in accordance with the CIRIA SuDS Manual C753, as per the operation and maintenance guidance outlined below.

4.1. General Maintenance & Inspection Requirements

No work shall be carried out on the drainage system without permission from a nominated person, who has access to information/a working knowledge of the system.

Maintenance/inspection work shall be carried out in a safe/planned manner.

All work is to be carried out by competent persons suitably trained and equipped in accordance with current statutory safe working policies.

Entry into confined spaces shall be kept to a minimum and be restricted to suitably qualified/equipped personnel working in accordance with current statutory safe working policies.

Drainage systems shall be inspected on a regular basis or when any problems arise. Any debris/defects discovered shall be recorded and a programme of cleaning/ repair initiated. Urgent repairs/cleaning shall be actioned as soon as practicable.

It is recommended that the drainage system is inspected a minimum of twice a year, with the system also being inspected after all major storm events.

Clearing of the drainage system can be achieved by a number of methods depending on the nature of the work;

- Rodding – Manual/Mechanical with flexible rods.
- Jetting – High pressure water jetting.
- Plunging.

4.2. Inspection Chambers, Manholes and Catchpits

The appropriate health and safety equipment must be used when accessing manholes/catchpits. Confined space certificates must be held by any personnel entering a manhole and the appropriate permits should be obtained from the Maintenance Manager prior to any access. The following operations should be carried out annually:

- Covers of inspection chambers and manholes shall be removed and the sides, benching and channels cleared.
- Deposits of silt in inspection chambers, catchpits and manholes shall be removed. Any traps shall then be plunged and thoroughly flushed out with clean water. This should be completed in Autumn, after leaf fall has halted.
- Main and branch drains shall be cleared as required and afterwards be flushed with clean water. Any obstructions found shall be removed and not flushed down the system.
- Covers of inspection chambers, manholes and catchpits shall be replaced, bedded in suitable sealing material as required and bolted/locked down as appropriate. Missing bolts and broken items shall be replaced in accordance with the manufacturer's details.

4.3. Pipes

Regular inspection and maintenance are important to identify areas which may have become obstructed/clogged and may not be draining correctly, failure to do so would expose the development to flood risk.

Pipes are proprietary products and therefore the materials used can vary across the site. As such, the manufacturer's recommendations should be followed. Access for maintenance of the pipes is provided through inspection chambers and manholes. The below table sets out the maintenance schedule for the pipe components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect for evidence of poor operation via water levels. If required, take remedial action.	Monthly for 3 months, then six monthly intervals. Also, 48 hours after large storms.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.

Remedial Actions	Rod through poorly performing runs as initial remediation.	As required.
	If continued poor performance jet and CCTV survey poorly performing runs.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial inspection should be provided as post construction CCTV survey.	N/A
	Inspect/check all inlets, outlets and overflows to ensure they are in good condition and operating as designed.	Monthly for 3 months, then six monthly intervals. Also, 48 hours after large storms.

4.4. Drainage Channels and Gullies

Channels and gullies should be inspected and cleaned in accordance with the manufacturer's details. Channel units can be cleaned through the use of a high-pressure hose; this can be fed into the channel system through access units strategically placed along the channel run. The throat section of channel units should be kept clear at all times to ensure uninterrupted flow of surface water into the drainage channel and any debris within the throat should be removed.

Locking bolts should be replaced and sufficiently tightened, taking care that the bolt heads do not stand above the top surface of the cover or grate. If covers are allowed to move within their frame, this may cause damage to the frame or seating. The below table sets out the maintenance schedule for the drainage channel and gullys components of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Litter and debris removal.	Monthly or as required.
	Check and remove large debris and/or vegetation growth near pipe runs.	Monthly or as required.
	Inspect for evidence of poor operation and/or weed growth. If required, take remedial action. Inspect silt accumulation rates and establish appropriate brushing frequencies.	Monthly for 3 months, then six monthly intervals. Also, 48 hours after large storms.
Remedial Actions	Inspect access/outlet boxes and rod through poorly performing channels and outlets as initial remediation.	As required.
	Seek advice as to remediation techniques suitable for the type of performance issue.	As required, if above actions do not improve performance.
Monitoring	Initial inspection including channel outlet boxes and gully sumps.	Monthly for 3 months, then six monthly intervals. Also, 48 hours after large storms.

4.5. Vortex Flow Control Device

Regular inspection and maintenance is important, to identify if the vortex flow control device has become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a risk of flooding.

Vortex flow control devices are proprietary products and therefore can vary from manufacturer to manufacturer. As such, the manufacturer's recommendations should be followed. Normally, little maintenance is required as a vortex flow control device has no moving parts.

If blockages occur they tend to do so at the intake of the vortex flow control device.

Vortex flow control devices are generally fitted with a pivoting by-pass door, which allows the manhole chamber to be drained down should blockages occur.

The smaller type conical units, below the minimum recommended size, are also supplied with rodding facilities or vortex suppressor pipes as standard.

Following installation of the vortex flow control device it is vitally important that any building materials etc. are removed from the unit and the chamber.

After the system is made fully functional, it is recommended that each unit be inspected monthly for three months and thereafter at six monthly intervals with hose down if required. Units should also be inspected within 48 hours after large storms.

4.6. Cellular Attenuation Tank

Regular inspection and maintenance is important to identify if the inlets/outlets have become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

The maintenance requirements for cellular attenuation tanks are outlined within Table 21.3 of the CIRIA SUDS Manual C753. A copy of that table is replicated below to set out the maintenance schedule for the cellular attenuation tank component of the proposed drainage systems.

Maintenance Schedule	Required Action	Typical Frequency
Regular Maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action.	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary	Annually
	Remove sediment from pre-treatment structures and/ or internal forebays	Annually, or as required
Remedial Actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Note: The above is to be undertaken in accordance with the manufacturers specification and details.

4.7. Blue Roofs

Regular inspection and maintenance is important to identify if the inlets, outlets and overflows have become obstructed/clogged and may not be functioning correctly, as failure to do so would expose the development to a greater level of flood risk.

The below table sets out the maintenance schedule for the blue roof components of the proposed drainage system.

Maintenance Schedule	Required Action	Typical Frequency
Regular inspection	Inspect all outlets, checking the flow restrictor has not been tampered with, damaged or removed.	Quarterly and after severe storms
	Check and replace pebble margin (if required) around the inspection chamber (this helps filter the water entering the outlet).	Quarterly and after severe storms

	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Quarterly and after severe storms
	Inspect all overflows to ensure the overflow will discharge freely. Check for any signs of discharge, discharge of water via the overflow indicates that the roof is not functioning correctly and a more thorough investigation may be required	Quarterly and after severe storms
	Check that the surface finishes of the blue roof (green or hard landscaping) are still correctly installed and in good condition. That there has been no movement to the finished surface during investigations or activities by other trades.	Quarterly and after severe storms
	Check that the filter fleece is still in place on vertical edges around outlets. Ensure there is no openings that might allow leaves and debris into the blue roof system.	Quarterly and after severe storms
	Access ladders and man-safe system inspected, and date tagged as required so that the blue roof can always be accessed.	Quarterly and after severe storms
	Inspect underside of roof for evidence of leakage	Quarterly and after severe storms
Regular Maintenance	Remove debris, litter and fallen leaves to prevent clogging of the system	Quarterly and after severe storms
	Remove any debris from inlets, outlets and overflows.	Quarterly and after severe storms
	Remove fallen leaves and debris from deciduous plant foliage	Quarterly and after severe storms
	Remove nuisance and invasive vegetation, including weeds	Quarterly and after severe storms
Remedial actions	If drain inlets, outlets or overflows have settled, cracked or moved, investigate and repair as appropriate	As required
	Repair ladders and man-safe systems to maintain safe access	As required

Note: The above is to be undertaken in accordance with the manufacturers specification and details.

APPENDIX A

Below Ground Drainage General Arrangements

TRAFFORD STREET

600DIA

REUSE EXISTING CONNECTION INTO UNITED UTILITIES PUBLIC SEWER SUBJECT TO S106 AGREEMENT REF EC5169. CONTRACTOR TO APPLY FOR S106 PART 2 APPLICATION BEFORE COMMENCING ANY WORK ON THE PUBLIC SEWER

UU MH
CL: 34.90
IL 31.01
d = 3.89m

525DIA UTT

300DIA

RAINWATER PIPE TO BE COORDINATED WITH ARCHITECT AND ABOVE GROUND DRAINAGE DESIGNER TO AVOID CLASH RODDING EYE.

EXISTING RUN ASSUMED TO SERVE VIADUCT PIERS AND IS TO BE MAINTAINED. DETAILS TBC ON SITE BACKDROP TO BE CONFIRMED ONCE EXISTING DRAIN HAS BEEN SURVEYED.

PROVIDE CLASS Z SURROUND FOR DRAINAGE BELOW PILECAP

CHANNEL DRAIN TO SUIT ARCHITECT AND BUILDING SERVICES ENGINEER

SW1- FLOW CONTROL
1.5m DIA PCC
CL: +34.965
IL: +32.552
HYDROBRAKE OPTIMUM (BY HYDROBRAKE INTERNATIONAL) SCL-0194-2330-1170-2330
DESIGN FLOW: 23.3 l/s DESIGN HEAD: 1.170m

FW8
1.2m DIA PCC
CL: +35.110
IL : +31.710

Future connection to slot site

REFER TO SLOT SITE DRAWING PACKAGE FOR WORKS

REFER TO DRAWING: VIA-REN-00-00-DR-C-01105 FOR PROPOSED SURFACE WATER DRAINAGE TO SLOT SITE

EXTERNAL LEVELS TO FALL AWAY FROM BUILDING THRESHOLD MIN 1:60

Staff Welfare

Residential Entrance Lobby

Parcel Store

Library

Games

Cardboard Store

Plant

Substation

Landlord LV Switchroom

Gate switch location - TBC

FOR DETAILED CORE WALL GENERAL ARRANGEMENT REFER TO DRAWING VIA-REN-B-XX-DR-S-01201

GREAT BRIDGEWATER STREET

CHANNEL DRAIN TO SUIT ARCHITECT AND BUILDING SERVICES ENGINEER

CW1
1350mm DIA PCC
CL: +34.902
IL: +31.116

WASTOP SS225mm INLINE NON RETURN VALUE BY ALTHON TO PREVENT BACK UP OF CONTAMINATED FLOWS INTO THE SURFACE WATER NETWORK

ALL FOUL DRAINAGE AND SVPs FROM LEVEL 01 AND ABOVE TO BE COLLECTED AT SERVICE YARD LEVEL AND DROPPED AT ONE LOCATION. FURTHER COORDINATION REQUIRED WITH BUILDING SERVICES ENGINEER.

FOUL SYSTEM TO BE VENTED A THIS LOCATION.

DIRECTION OF FLOW REVERSES WHEN THE OUTFALL IS RESTRICTED BY THE FLOW CONTROL TO UTILISE THE OFFLINE ATTENUATION TANK

PROVIDE CLASS Z SURROUND FOR DRAINAGE BELOW SUBSTATION

WASTOP SS150mm INLINE NON RETURN VALUE BY ALTHON TO PREVENT ODOURS FROM BACKING UP INTO SYSTEM

WASTOP SS150mm INLINE NON RETURN VALUE BY ALTHON TO PREVENT ODOURS FROM BACKING UP INTO SYSTEM

BAY 'C' BELOW GROUND DRAINAGE TO HAVE MINIMUM 1m COVER TO AVOID CLASH WITH SWIMMING POOL BURIED INFRASTRUCTURE

BAY 'D' DRAINAGE POINT OF CONNECTION. REFER TO VIA-REN-00-00-DR-C-1101 FOR CONTINUATION

FW9
1.2m DIA PCC
CL: +35.085
IL: +31.507

FW6
1.2m DIA PCC
CL: +35.085
IL: +31.390

SW2
600mm DIA PPIC
CL: +35.077
IL: +32.576

SW5
600mm DIA PPIC
CL: +34.965
IL: +33.529

FW5
600mm DIA PPIC
CL: +35.110
IL: +33.335

FW4
600mm DIA PPIC
CL: +35.110
IL: +33.400

FW3
600mm DIA PPIC
CL: +35.110
IL: +33.465

FW10
600mm DIA PPIC
CL: +35.110
IL: +33.538

SW3
600mm DIA PPIC
CL: +35.110
IL: +32.700

SW4 - CATCHPIT
600mm DIA PPIC
CL: +35.110
IL: +32.733
IL: +32.433 (SUMP)

GEOCELLULAR ATTENUATION TANK
9.6 (W) x 10.0 (L) x 1.075m (D)
MIN 30.96m3 STORAGE
CL: +33.8 (TANK)
IL: +32.725

ALLOW FOR REPLACEMENT OF EXISTING DOWNPIPES AND GULLEY WITHIN ARCH BACKING TO SUIT HERITAGE ARCHITECT REQUIREMENTS. PROVIDE FLEXIBLE COUPLER CONNECTION BY POLYPIPE OR EQUAL APPROVED TO NEW BELOW GROUND DRAINS TO ALLOW FOR DIFFERENTIAL MOVEMENT BETWEEN VIADUCT AND NEW FOUNDATIONS.

DRAIN TO RUN BELOW M.U.T.

BALANCE TANK DRAIN IN ABEYANCE. TBC BY POOL DESIGNER

PROPOSED BURIED INFRASTRUCTURE CORRIDOR WITHIN ARCH BAY - REFER TO M&E ENGINEER DRAWINGS. TO BE COORDIANTED WITH PROPOSED BELOW GROUND DRAINAGE

INFRASTRUCTURE CORRIDOR TO BE REALIGNED TO AVOID CLASH TOWER CRANE. INDICATIVE REALIGNMENT SHOWN.

SEE LEVEL 00-SERIES-00 GROUND FLOOR EXTENTS

FOR CONTINUATION TO SHEET VIA-REN-00-00-DR-C-1101

FOR DRAINAGE REFER TO NEXT SHEET

NOTES:

1. FOR CURRENT PLANS, LEVELS AND STACK LOCATIONS REFER TO LATEST ARCHITECT LANDSCAPE ARCHITECT AND BUILDING SERVICES DRAWINGS.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE BELOW GROUND DRAINAGE SPECIFICATION SP-C-00050, MANHOLE SCHEDULE ON DRAWING C-01300 AND DETAILS SHOWN ON DRAWING SERIES C-03301 & C-03311 TO C-03312.
3. THE FINAL CONNECTION TO THE SEWER IS SUBJECT TO UNITED UTILITIES APPROVAL AND IS TO BE IN ACCORDANCE WITH THEIR AGREED DETAILS.
4. FOR ALL ABOVE GROUND DRAINAGE AND ASSOCIATED PUMPS REFER TO BUILDING SERVICES AND ARCHITECT'S DRAWINGS.
5. ALL BELOW GROUND DRAINAGE WORKS TO BE IN ACCORDANCE WITH RELEVANT BUILDING REGULATIONS AND SEWER SECTOR GUIDANCE APPENDIX C- DESIGN AND CONSTRUCTION GUIDANCE. IF DISCREPANCIES ARE NOTED BETWEEN SSG AND DRAWINGS THESE SHOULD BE BROUGHT TO THE ATTENTION OF RENAISSANCE FOR REVIEW.
6. ALL FOUL AND SURFACE WATER DRAINAGE TO BE 150DIA PLASTIC TWIN WALL UNLESS NOTED OTHERWISE.
7. THE ATTENUATION TANK, FLOW CONTROL AND NON-RETURN VALUES ARE TO BE TO SUPPLIERS DESIGN AND DETAILS. INSTALLATION IS TO BE IN ACCORDANCE WITH THE SUPPLIER REQUIREMENTS.
8. ROCKER PIPE DETAIL TO BE PROVIDED AT ALL ENTRY AND EXIT POINTS FOR DRAINS CAST INTO CONCRETE FOUNDATIONS UNLESS NOTED OTHERWISE.
9. UNLESS NOTIFIED OTHERWISE CHANNEL DRAINS TO BE ACO M150D 0.0 OR SIMILAR APPROVED
10. FLOOR GULLEYS AND RWPS TO BE TRAPPED.
11. THE CONTRACTOR IS TO UNDERTAKE A FULL CCTV SURVEY AT COMPLETION OF THE PROJECT TO DEMONSTRATE THAT THE DRAINAGE IS CLEAN. ANY DEFECTS ARE TO BE CORRECTED BY THE CONTRACTOR PRIOR TO HANDOVER OF THE SYSTEM TO THE CLIENT.
12. THE CONTRACTOR IS TO KEEP A RECORD SET OF THE AS INSTALLED DRAINAGE ON SITE AND PROVIDE THIS TO RENAISSANCE UPON COMPLETION OF THE WORKS TO ALLOW FOR PRODUCTION OF A 'FINAL CONSTRUCTION' ISSUE DRAWING.
13. DURING THE WORKS ALTERATIONS TO THE DRAINAGE LAYOUT ARE TO BE MARKED UP BY THE CONTRACTOR AND AGREED WITH RENAISSANCE IN WRITING.
14. MANHOLE COVERS ARE TO BE ACCORDANCE WITH BS EN 124 FOR THE RATING INDICATED IN THE MANHOLE SCHEDULE. THE CONTRACTOR IS TO SUBMIT DETAILS FOR THE PROPOSED MANHOLE COVERS TO THE ENGINEER AND LANDSCAPE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION.
15. ALL CONCRETE PIPES TO BE TO ES EN 1916 CLASS 120 (54kN/m).
16. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2).
17. IF PLASTIC PIPES ARE TO BE USED THEN THE FOLLOWING MUST APPLY:
    A. BSI KITEMARK (CERTIFIED TO BS EN 13476-1 AND WIS 4-35-01)
    B. PIPES LESS THAN OR EQUAL TO 500mm DIA
    C. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2)
18. SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVIDING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
19. SEWER PIPES TO BE LAID IN MAXIMUM 3 METER LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER PIPES, AND THIS IS AGREED BY THE CONTRACTOR WITH THE PIPE MANUFACTURER.

DRAWING LEGEND

- SITE BOUNDARY
- SURFACE WATER DRAINAGE
- FOUL WATER DRAINAGE
- COMBINED WATER DRAINAGE
- EXISTING PRIVATE DRAINAGE TO BE RETAINED IN PHASE 1 WORKS
- EXISTING PRIVATE DRAINAGE TO BE REMOVED IN PHASE 1 WORKS
- EXISTING UNITED UTILITIES COMBINED SEWER
- G GULLY
- CHANNEL DRAIN
- RAINWATER PIPE/ SOIL VENT PIPE
- RE RODDING EYE
- IN-LINE NON-RETURN VALUE

Rev:	Description:	Date:	By:	Chkd:
C03	AMENITY CHANGE UPDATE	16.03.22	SS	PC
C02	UPDATED FOR DESIGN TEAM COMMENTS	03.11.20	SS	PC
C01	STAGE 5	02.10.20	SS	PC

renaissance
Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project:
VIADUX, MANCHESTER

Drawing Title:
BELOW GROUND DRAINAGE GROUND LEVEL PLAN

Status:
STAGE 5

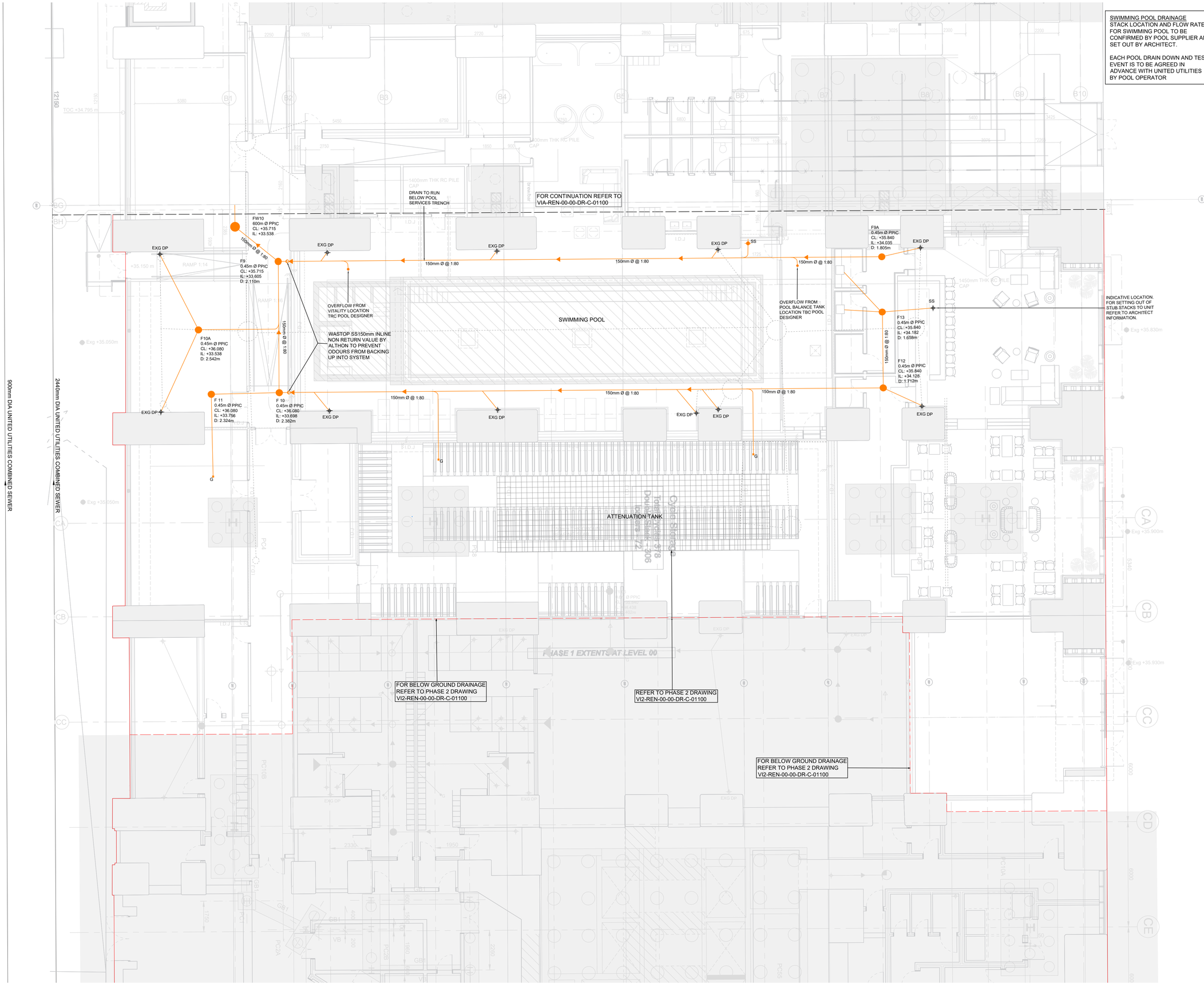
Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	OCT 20	MR	JB	PC

Scale: 1:100 | Project No: 1910-12

Project: | Originator: | Volume: | Level: | Type: | Role: | Category/Number: | Rev:

VIA - REN - 00 - 00 - DR - C - 01100 - C03

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NOTES:

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3. THE FINAL CONNECTION TO THE SEWER IS SUBJECT TO UNITED UTILITIES APPROVAL AND IS TO BE IN ACCORDANCE WITH THEIR AGREED DETAILS.
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6. ALL FOUL AND SURFACE WATER DRAINAGE TO BE 150DIA PLASTIC TWIN WALL UNLESS NOTED OTHERWISE.
7. THE ATTENUATION TANK, FLOW CONTROL AND NON-RETURN VALUES ARE TO BE TO SUPPLIERS DESIGN AND DETAILS. INSTALLATION IS TO BE IN ACCORDANCE WITH THE SUPPLIER REQUIREMENTS.
8. ROCKER PIPE DETAIL TO BE PROVIDED AT ALL ENTRY AND EXIT POINTS FOR DRAINS CAST INTO CONCRETE FOUNDATIONS UNLESS NOTED OTHERWISE.
9. UNLESS NOTIFIED OTHERWISE CHANNEL DRAINS TO BE ACO M150D 0.0 OR SIMILAR APPROVED
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11. THE CONTRACTOR IS TO UNDERTAKE A FULL CCTV SURVEY AT COMPLETION OF THE PROJECT TO DEMONSTRATE THAT THE DRAINAGE IS CLEAN. ANY DEFECTS ARE TO BE CORRECTED BY THE CONTRACTOR PRIOR TO HANDOVER OF THE SYSTEM TO THE CLIENT.
12. THE CONTRACTOR IS TO KEEP A RECORD SET OF THE AS INSTALLED DRAINAGE ON SITE AND PROVIDE THIS TO RENAISSANCE UPON COMPLETION OF THE WORKS TO ALLOW FOR PRODUCTION OF A 'FINAL CONSTRUCTION' ISSUE DRAWING.
13. DURING THE WORKS ALTERATIONS TO THE DRAINAGE LAYOUT ARE TO BE MARKED UP BY THE CONTRACTOR AND AGREED WITH RENAISSANCE IN WRITING.
14. MANHOLE COVERS ARE TO BE ACCORDANCE WITH BS EN 124 FOR THE RATING INDICATED IN THE MANHOLE SCHEDULE. THE CONTRACTOR IS TO SUBMIT DETAILS FOR THE PROPOSED MANHOLE COVERS TO THE ENGINEER AND LANDSCAPE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION.
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    A. BSI KITEMARK (CERTIFIED TO BS EN 13476-1 AND WIS 4-35-01)
    B. PIPES LESS THAN OR EQUAL TO 500mm DIA
    C. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2)
18. SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVIDING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
19. SEWER PIPES TO BE LAID IN MAXIMUM 3 METER LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER PIPES, AND THIS IS AGREED BY THE CONTRACTOR WITH THE PIPE MANUFACTURER.
20. ALL MAMHOLES COVER RATINGS TO BE CLASS B125 UNLESS NOTED OTHERWISE.

DRAWING LEGEND

- SITE BOUNDARY
- SURFACE WATER DRAINAGE
- FOUL WATER DRAINAGE
- COMBINED WATER DRAINAGE
- EXISTING PRIVATE DRAINAGE TO BE RETAINED IN PHASE 1 WORKS
- EXISTING PRIVATE DRAINAGE TO BE REMOVED IN PHASE 1 WORKS
- EXISTING UNITED UTILITIES COMBINED SEWER
- G — GULLY
- CHANNEL DRAIN
- RAINWATER PIPE/ SOIL VENT PIPE
- RE — RODDING EYE
- IN-LINE NON-RETURN VALUE

Rev:	Description:	Date:	By:	Chkd:
C01	STAGE 5	20.05.22	SS	PC

renaissance
Renaissance Associates Ltd
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Manchester
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Project:
VIADUX, MANCHESTER

Drawing Title:
GROUND FLOOR DRAINAGE PLAN SHEET 2

Status:
STAGE 5

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	MAY'22	PH	JB	PC

Scale: 1:100 | Project No: 1910-12

Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:
VIA	REN	00	00	DR	C	01101	C01

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STREET

NOTE IF EXISTING DRAINAGE LEVELS PERMIT GRAVITY CONNECTION TO NEW SW NETWORK, RETAIN EXISTING, ALLOW FOR REPLACEMENT AS SHOWN.

INDICATES PHASE 2 DRAINAGE, REFER TO VI2-REN-00-01-DR-C-01110 FOR DETAILS

ACCESSIBLE

B125 ACO MULTIDRAIN M100PPD NO 0.0J 1%

S1,02
600mm Ø PPIC
CL: +43.285
IL: +42.593

S1,00
450mm Ø PPIC
CL: +43.300
IL: +42.737

S1,03
600mm Ø PPIC
CL: +43.285
IL: +42.538

150Ø @ 1:100 (S1.000)

RWP FROM ABOVE CANOPY

225Ø @ 1:100 (S1.002)

225Ø @ 1:100 (S1.001)

S1,01
600mm Ø PPIC
CL: +43.285
IL: +42.650

225Ø @ 1:100 (S1.003)

S1.04
600mm Ø PPIC
CL: +43.190
IL: +42.472

225Ø @ 1:100 (S1.004)

F1,00
1.2m Ø PCC
CL: +43.300
IL: +42.431

F1,01
1.2m Ø PCC
CL: +43.300
IL: +42.389

225Ø @ 1:100 (F1.001)

225Ø @ 1:100 (F1.000)

G

G

225Ø

RWP FOR TOWER ATTENUATION BY BLUE ROOF. DISCHARGE RATE 1,15 l/s

SVP B

F1,02
1.2m Ø PCC
CL: +43.190
IL: +41.990

S5,00
1,05m Ø PCC
CL: +43.210
IL: +42.565

S1.05
600mm Ø PPIC
CL: +43.260
IL: +42.407

225Ø @ 1:100 (S1.005)

S1.06
600mm Ø PPIC
CL: +43.430
IL: +42.331

225Ø @ 1:100 (S1.006)

E600 ACO S200 1% CHANNEL DRAIN

225Ø @ 1:100 (F1.002)

150Ø @ 1:100 (S5.000)

RWP FOR TOWER ATTENUATION BY BLUE ROOF. DISCHARGE RATE 1,15 l/s

S5,01
1.05m Ø PCC
CL: +43.194
IL: +42.470

RWP (BLUE ROOF)

G07

G06

G07

225Ø @ 1:80 (P0.000)

F1,03
1.2m Ø PCC
CL: +43.280
IL: +41.655

F3.00
1.2m ØPCC
CL:+43.280
IL: TBC ON SITE

F1,04
1.2m Ø PCC
CL: +43.244
IL: +41.580

150Ø @ 1:100 (S5.001)

E600 ACO S200 1% CHANNEL DRAIN

225Ø @ 1:100 (F1.003)

S5,02
1.05m Ø PCC
CL: +43.253
IL: +42.407

F2,00
1.2m Ø PCC
CL: +43.300
IL: +42.176

225Ø @ 1:16 (F2.000)

G

225Ø

F1,05
1.2m Ø PCC
CL: +43.220
IL: +41.525

225Ø @ 1:100 (F1.004)

RWP (BLUE ROOF)

150Ø @ 1:100 (S5.002)

SVP A

G

F-SVP 1
IL 41.884

225Ø @ 1:80 (F3.000)

S1,11
1.2m Ø PCC w/ SILT TRAP
CL: +43.275
IL: +41.385

150Ø @ 1:100 (S3.001)

S4,00
450mm Ø PPIC
w/ SILT TRAP
CL: +43.270
IL: +41.410

225Ø @ 1:100 (F1.007)

225Ø @ 1:100 (F1.006)

225Ø @ 1:100 (F1.005)

F4.00
1.2m ØPCC
CL:+43.200
IL: TBC ON SITE

150Ø @ 1:100 (S5.003)

S5,03
1.05m Ø PCC
CL: +43.273
IL: +42.355

S1,07
600mm Ø PPIC
CL: +43.200
IL: +42.215

INDICATIVE POSITION OF RETAINING WALL

225Ø @ 1:100 (S1.007)

CONNECTION TO PLANTERS TO LANDSCAPE ARCHITECTS DETAIL

S1,08
600mm Ø PPIC
CL: +42.970
IL: +42.126

S1.09
600mm Ø PPIC
CL: +42.770
IL: +42.066

225Ø @ 1:100 (S1.008)

225Ø @ 1:100 (S1.009)

WASTOP SS150mm INLINE NON RETURN VALVE BY ALTHON

150Ø @ 1:100 (S2.000)

S3,00
450mm Ø PPIC
CL: +43.290
IL: +42.076

S3,01
450mm Ø PPIC
CL: +43.290
IL: +41.982

150Ø @ 1:100 (S3.000)

EXISTING CHANNEL DRAIN MODIFIED / REPLACED TO SUIT ROAD REALIGNMENT WORKS

E600 ACO S200 1% CHANNEL DRAIN

225Ø @ 1:169 (S1.010)

225Ø @ 1:170 (S1.011& S1.012)

225Ø @ 1:35(S4.000)

S1.10
1.2m Ø PCC
CL: +42.772
IL: +42.045

S2.00
450mm Ø PPIC
CL: +42.750
IL: +42.139

S-RWP 1
IL 41.871
MAX DISCHARGE RATE 54,3 l/s
TOTAL IMPERMEABLE AREA 0,133 HA

S-RWP 2
IL 42.258
MAX DISCHARGE RATE 6,9 l/s

F1,07
1.2m Ø PCC
CL: +43.286
IL: +41.400

F1,06
1.2m Ø PCC
CL: +43.286
IL: +41.495

S5.00A
1.05m Ø PCC
CL: +43.210
IL: +42.675

150Ø @ 1:100 (S5.001A)

S5.00B
1.05m Ø PCC
CL: +43.200
IL: +42.620

150Ø @ 1:100 (S5.001C)

S5.00C
1.05m Ø PCC
CL: +43.200
IL: +42.680

RWP (BLUE ROOF)

150Ø @ 1:100 (S5.000C)

INDICATIVE TOWER CRANE LOCATION. EXISTING DRAINAGE TO BE DIVERTED OR ABANDONED SUBJECT TO SURVEY FINDINGS.

G20?

G21?

G21?

HEAD OF EXISTING DRAINAGE RUN AT EASTERN END OF SERVICE YARD

FOR HILTON SLOT SITE DRAINAGE DETAILS REFER TO HSS-REN-00-00-DR-C-01100

NOTE BLUE ROOF TO PODIUM LEVEL 02 DECK TO HAVE MAX 4.6 l/s PEAK DISCHARGE RATE

PROVIDE NEW GULLIES WITHIN SERVICE YARD. CONNECT TO LOCATIONS OF EXISTING REMOVED GULLIES

NOTE LEVEL OF BRICKWORK ARCH BELOW ASSUMED AT +41.295m IN THIS LOCATION. TBC ON SITE TO CHECK FOR CLASH WITH DRAINAGE

OFFSITE RESURFACING WORKS TO BE DETAILED TO REUSE EXISTING DRAINAGE

2 NEW RWP DROP POINTS PENETRATING THROUGH THE VIADUCT. VERTICAL DRAINAGE TO BE DESIGNED AND DETAILED BY ABOVE GROUND DRAINAGE DESIGNER

NEW SVP DROP POINT PENETRATING THROUGH THE VIADUCT. VERTICAL DRAINAGE TO BE DESIGNED AND DETAILED BY ABOVE GROUND DRAINAGE DESIGNER

PHASE I EXTENTS OF PODIUM

SVP & RWP SETTING OUT

SVP AND RWP LOCATIONS ARE INDICATIVE FOR DETAILED SETTING OUT REFER TO ARCHITECTS/ BUILDING SERVICES ENGINEERS DRAWINGS. ALL CAPILLARY DRAINAGE IS IN ABEYANCE UNTIL SETTING OUT OF ALL SVPs, STACKS AND RWPs IS CONFIRMED BY THE ARCHITECT AND BUILDING SERVICES ENGINEER

ALL CONNECTIONS BETWEEN ABOVE GROUND DRAINAGE AND BELOW GROUND DRAINAGE TO BE SIZED TO SUIT ABOVE GROUND DRAINAGE.

EXTERNAL WORKS SETTING OUT

FOR PROPOSED SITE LEVELS REFER TO LANDSCAPE DRAWINGS. CHANNELS/ GULLY LOCATIONS TO LANDSCAPE ARCHITECT SPECIFICATION UNLESS NOTES OTHER WISE.

BEDDING/ SURROUND REQUIREMENTS

ALL DRAINAGE TO BE CONCRETE ENCASED (CLASS Z BEDDING), EXCAVATIONS FORMED USING MINIMUM DIG TECHNIQUES SUCH AS TRENCH BOXING TO MINIMISE EXCAVATIONS TO ARCH STRUCTURE BALLAST.

COVER LEVELS

LANDSCAPE ARCHITECT TO VALIDATE COVER LEVESL IN ALL EXTERNAL AREAS, ARCHITECT TO VALIDATE COVER LEVELS IN ALL INTERNAL AREAS.

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RENAISSANCE, ARCHITECTS, LANDSCAPE ARCHITECTS AND BUILDING SERVICES ENGINEERS DRAWINGS.
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3. REFER TO DRAWING VIA-REN-00-00-DR-C-01100 FOR BELOW GROUND FLOOR DRAINAGE GROUND LEVEL PLAN.
4. FOR ALL ABOVE GROUND DRAINAGE AND ASSOCIATED PUMPS REFER TO BUILDING SERVICES AND ARCHITECT'S DRAWINGS.
5. ALL BELOW GROUND DRAINAGE WORKS TO BE IN ACCORDANCE WITH RELEVANT BUILDING REGULATIONS AND SEWER SECTOR GUIDANCE APPENDIX C- DESIGN AND CONSTRUCTION GUIDANCE. IF DISCREPANCIES ARE NOTED BETWEEN SSG AND DRAWINGS THESE SHOULD BE BROUGHT TO THE ATTENTION OF RENAISSANCE FOR REVIEW.
6. RWPs, SVPs, SSs AND FLOOR GULLEYS TO BE TRAPPED.
7. THE CONTRACTOR IS TO UNDERTAKE A FULL CCTV SURVEY AT COMPLETION OF THE PROJECT TO DEMONSTRATE THAT THE DRAINAGE IS CLEAN. ANY DEFECTS ARE TO BE CORRECTED BY THE CONTRACTOR PRIOR TO HANDOVER OF THE SYSTEM TO THE CLIENT.
8. THE CONTRACTOR IS TO KEEP A RECORD SET OF THE AS INSTALLED DRAINAGE ON SITE AND PROVIDE THIS TO RENAISSANCE UPON COMPLETION OF THE WORKS TO ALLOW FOR PRODUCTION OF A 'FINAL CONSTRUCTION' ISSUE DRAWING.
9. DURING THE WORKS ALTERATIONS TO THE DRAINAGE LAYOUT ARE TO BE MARKED UP BY THE CONTRACTOR AND AGREED WITH RENAISSANCE IN WRITING.
10. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED AN INCREMENT TO ACCOMMODATE THE CONNECTIONS AND BENDS.
11. MANHOLE COVERS ARE TO BE ACCORDANCE WITH BS EN 124 FOR THE RATING INDICATED IN THE MANHOLE SCHEDULE. THE CONTRACTOR IS TO SUBMIT DETAILS FOR THE PROPOSED MANHOLE COVERS TO THE ENGINEER AND LANDSCAPE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION.
12. COVER SLABS MUST CARRY THE BSI KITEMARK. WHERE THE CLEAR OPENING OF THE KITEMARKED PRODUCT IS DIFFERENT TO THAT OF THE COVER AND FRAME, A LOAD BEARING REDUCING SLAB SHOULD BE FITTED ABOVE THE COVER SLAB TO BRING THE SIZE DOWN TO REQUIRED SIZE.
13. ALL SEWERS TO BE BSI KITEMARK (CERTIFIED TO WIS 4-35-01)
14. ALL CONCRETE PIPES TO BE TO ES EN 1916 CLASS 120 (54kN/m),
15. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2).
16. IF PLASTIC PIPES ARE TO BE USED THEN THE FOLLOWING MUST APPLY:
    A. BSI KITEMARK (CERTIFIED TO BS EN 13476-1 AND WIS 4-35-01)
    B. PIPES LESS THAN OR EQUAL TO 500mm DIA
    C. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2)
17. THE MINIMUM CRUSHING STRENGTH FOR CLAY PIPES SHOULD BE AS FOLLOWS: 100mm DIA. 40kN/m, 150mm DIA. 40kN/m, 225mm DIA. 45kN/m AND 300mm DIA. 72kN/m.
18. THE MINIMUM CRUSHING STRENGTH FOR CONCRETE PIPES SHOULD BE - (CLASS 120 TO EN 1916/BS5911-1 2002). PLASTIC PIPES SHOULD CONFORM TO WIS 4-35-01 AND BS EN13476.
19. SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVIDING THAT SUCH PRECAUTIONS ARE NOT NECESSARY,
20. SEWER PIPES TO BE LAID IN MAXIMUM 3 METER LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER PIPES, AND THIS IS AGREED BY THE CONTRACTOR WITH THE PIPE MANUFACTURER.

DRAWING LEGEND

- PLANNING BOUNDARY
- OWNERSHIP BOUNDARY
- PHASE 1 BOUNDARY
- SURFACE WATER DRAINAGE
- FOUL WATER DRAINAGE
- EXISTING DRAINAGE TO BE RETAINED
- EXISTING DRAINAGE TO BE REMOVED
- PHASE 2 DRAINAGE
- G — GULLY
- CHANNEL DRAIN TO LANDSCAPE ARCHITECTS SPECIFICATION UNO
- RAINWATER PIPE/ SOIL VENT PIPE

Rev:	Description:	Date:	By:	Chkd:
C03	CHANNEL DRAINS CO-ORDINATED	04.11.22	AM	PC
C02	RECEIPT OF SITE SURVEY INFORMATION	26.11.21	HW	PC
C01	CONSTRUCTION	29.09.21	HW	PC

renaissance

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Carvers Warehouse
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Manchester
M1 2HG

Project:

VIADUX, MANCHESTER

Drawing Title:

BELOW GROUND DRAINAGE LEVEL 01 PLAN (SHEET 01)

Status:

CONSTRUCTION

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	NOV'21	HW	HW	PC

Scale:	Project No:
1:150	1910-12

Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:
VIA	REN	0	01	DR	C	01101	C03

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SVP & RWP SETTING OUT

SVP AND RWP LOCATIONS ARE INDICATIVE FOR DETAILED SETTING OUT REFER TO ARCHITECTS/ BUILDING SERVICES ENGINEERS DRAWINGS. ALL CAPILLARY DRAINAGE IS IN ABEYANCE UNTIL SETTING OUT OF ALL SVPs, STACKS AND RWPs IS CONFIRMED BY THE ARCHITECT AND BUILDING SERVICES ENGINEER

ALL CONNECTIONS BETWEEN ABOVE GROUND DRAINAGE AND BELOW GROUND DRAINAGE TO BE SIZED TO SUIT ABOVE GROUND DRAINAGE.

EXTERNAL WORKS SETTING OUT

FOR PROPOSED SITE LEVELS REFER TO LANDSCAPE DRAWINGS. CHANNELS/ GULLY LOCATIONS TO LANDSCAPE ARCHITECT SPECIFICATION UNLESS NOTES OTHER WISE.

BEDDING/ SURROUND REQUIREMENTS

ALL DRAINAGE TO BE CONCRETE ENCASED (CLASS Z BEDDING). EXCAVATIONS FORMED USING MINIMUM DIG TECHNIQUES SUCH AS TRENCH BOXING TO MINIMISE EXCAVATIONS TO ARCH STRUCTURE BALLAST.

COVER LEVELS

LANDSCAPE ARCHITECT TO VALIDATE COVER LEVELS IN ALL EXTERNAL AREAS. ARCHITECT TO VALIDATE COVER LEVELS IN ALL INTERNAL AREAS.

NOTES:

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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE BELOW GROUND DRAINAGE SPECIFICATION SP-C-00050, MANHOLE SCHEDULE ON DRAWING C-01301 AND DETAILS SHOWN ON DRAWING SERIES C-03301 & C-03311 TO C-03312.
3. REFER TO DRAWING VIA-REN-00-00-DR-C-01100 FOR BELOW GROUND FLOOR DRAINAGE GROUND LEVEL PLAN.
4. FOR ALL ABOVE GROUND DRAINAGE AND ASSOCIATED PUMPS REFER TO BUILDING SERVICES AND ARCHITECT'S DRAWINGS.
5. ALL BELOW GROUND DRAINAGE WORKS TO BE IN ACCORDANCE WITH RELEVANT BUILDING REGULATIONS AND SEWER SECTOR GUIDANCE APPENDIX C- DESIGN AND CONSTRUCTION GUIDANCE. IF DISCREPANCIES ARE NOTED BETWEEN SSG AND DRAWINGS THESE SHOULD BE BROUGHT TO THE ATTENTION OF RENAISSANCE FOR REVIEW.
6. RWPs, SVPs, SSs AND FLOOR GULLEYS TO BE TRAPPED.
7. THE CONTRACTOR IS TO UNDERTAKE A FULL CCTV SURVEY AT COMPLETION OF THE PROJECT TO DEMONSTRATE THAT THE DRAINAGE IS CLEAN. ANY DEFECTS ARE TO BE CORRECTED BY THE CONTRACTOR PRIOR TO HANDOVER OF THE SYSTEM TO THE CLIENT.
8. THE CONTRACTOR IS TO KEEP A RECORD SET OF THE AS INSTALLED DRAINAGE ON SITE AND PROVIDE THIS TO RENAISSANCE UPON COMPLETION OF THE WORKS TO ALLOW FOR PRODUCTION OF A 'FINAL CONSTRUCTION' ISSUE DRAWING.
9. DURING THE WORKS ALTERATIONS TO THE DRAINAGE LAYOUT ARE TO BE MARKED UP BY THE CONTRACTOR AND AGREED WITH RENAISSANCE IN WRITING.
10. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED AN INCREMENT TO ACCOMMODATE THE CONNECTIONS AND BENDS.
11. MANHOLE COVERS ARE TO BE ACCORDANCE WITH BS EN 124 FOR THE RATING INDICATED IN THE MANHOLE SCHEDULE. THE CONTRACTOR IS TO SUBMIT DETAILS FOR THE PROPOSED MANHOLE COVERS TO THE ENGINEER AND LANDSCAPE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION.
12. COVER SLABS MUST CARRY THE BSI KITEMARK. WHERE THE CLEAR OPENING OF THE KITEMARKED PRODUCT IS DIFFERENT TO THAT OF THE COVER AND FRAME, A LOAD BEARING REDUCING SLAB SHOULD BE FITTED ABOVE THE COVER SLAB TO BRING THE SIZE DOWN TO REQUIRED SIZE.
13. ALL SEWERS TO BE BSI KITEMARK (CERTIFIED TO WIS 4-35-01)
14. ALL CONCRETE PIPES TO BE TO ES EN 1916 CLASS 120 (54kN/m).
15. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2).
16. IF PLASTIC PIPES ARE TO BE USED THEN THE FOLLOWING MUST APPLY:
    A.BSI KITEMARK (CERTIFIED TO BS EN 13476-1 AND WIS 4-35-01)
    B. PIPES LESS THAN OR EQUAL TO 500mm DIA
    C.BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENTS OF THE WATER INDUSTRY SPECIFICATION 4-08092 (TABLE A2)
17. THE MINIMUM CRUSHING STRENGTH FOR CLAY PIPES SHOULD BE AS FOLLOWS: 100mm DIA. 40kN/m, 150mm DIA. 40kN/m, 225mm DIA. 45kN/m AND 300mm DIA. 72kN/m.
18. THE MINIMUM CRUSHING STRENGTH FOR CONCRETE PIPES SHOULD BE - (CLASS 120 TO EN 1916/BS5911-1 2002). PLASTIC PIPES SHOULD CONFORM TO WIS 4-35-01 AND BS EN13476.
19. SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVIDING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
20. SEWER PIPES TO BE LAID IN MAXIMUM 3 METER LENGTHS UNLESS THERE IS A SPECIFIC OPERATIONAL NEED TO LAY LONGER PIPES, AND THIS IS AGREED BY THE CONTRACTOR WITH THE PIPE MANUFACTURER.

DRAWING LEGEND

- PLANNING BOUNDARY
- OWNERSHIP BOUNDARY
- PHASE 1 BOUNDARY
- SURFACE WATER DRAINAGE
- FOUL WATER DRAINAGE
- EXISTING DRAINAGE TO BE RETAINED
- EXISTING DRAINAGE TO BE REMOVED
- PHASE 2 DRAINAGE
- G GULLY
- CHANNEL DRAIN TO LANDSCAPE ARCHITECTS SPECIFICATION UNO
- RAINWATER PIPE/ SOIL VENT PIPE

Rev:	Description:	Date:	By:	Chkd:
C03	CHANNEL DRAINS CO-ORDINATED	04.11.22	AM	PC
C02	RECEIPT OF SITE SURVEY INFORMATION	26.11.21	HW	PC
C01	CONSTRUCTION	29.09.21	HW	PC

renaissance
Renaissance Associates Ltd
Carvers Warehouse
77 Dale Street
Manchester
M1 2HG

Project:
VIADUX,
MANCHESTER

Drawing Title:
BELOW GROUND DRAINAGE LEVEL 01 PLAN (SHEET 01)

Status:
CONSTRUCTION

Size	Date:	Drawn by:	Designed by:	Checked by:
A1	NOV'21	HW	HW	PC

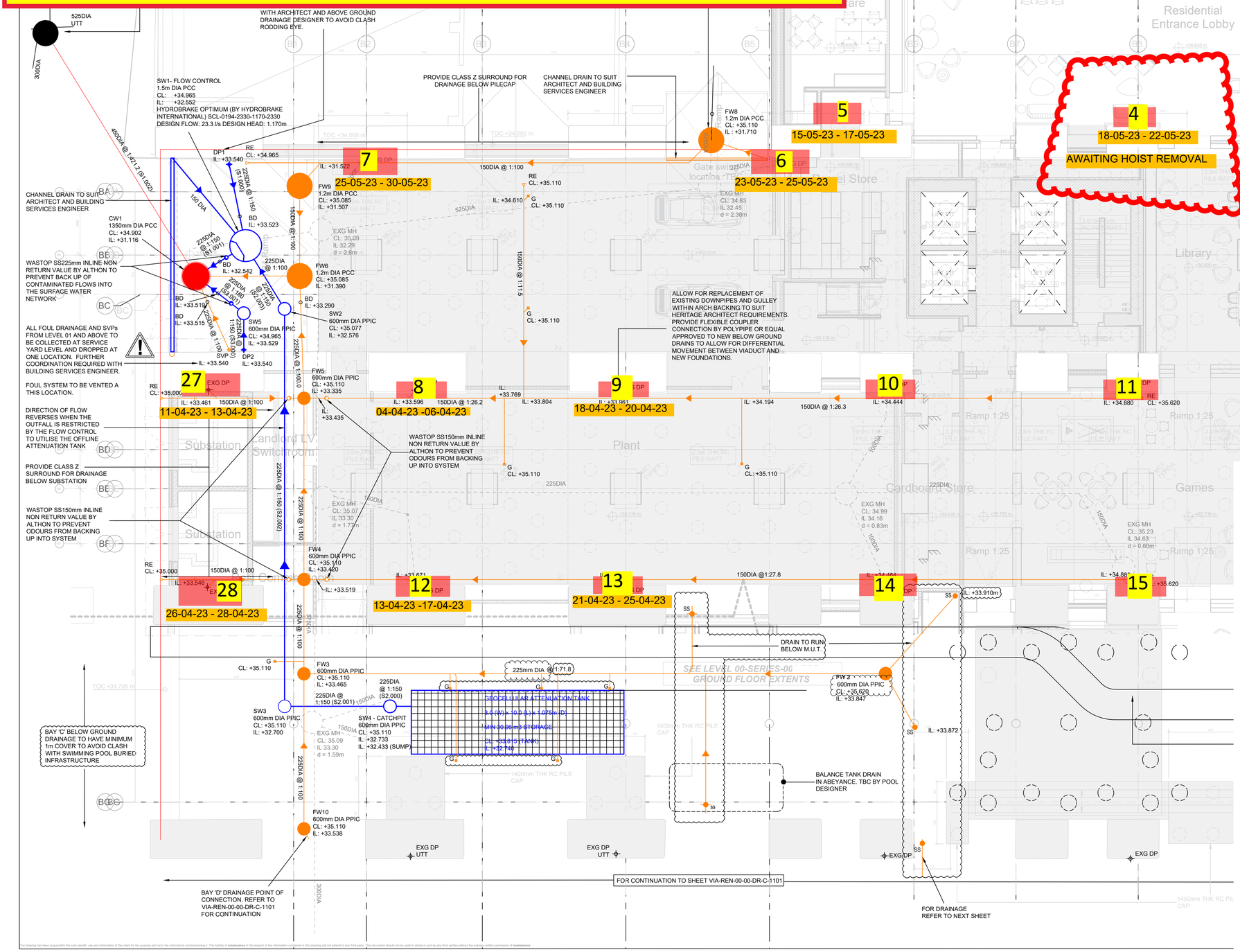
Scale: 1:150 Project No: 1910-12

Project: Originator: Volume: Level: Type: Role: Category/Number: Rev:
VIA-REN-0-01-DR-C-01101-C03

Existing drainage lines to service yard, surveyed, lined and re-surveyed highlighted in green

: GULLIES NOT YET DONE — UNDER REVIEW

SAW CUT AND EXCAVATE HOLE 2.5M X 2.5M X 2.0M DEEP
CART ARISINGS TO STOCKPILE AT GROUND LEVEL TO BE COLLECTED BY DOMIS GRAB WAGON
1-5 INCLUSIVE ALLOW FOR BREAKING THROUGH EXISTING CONCRETE APPROX 600MM THICK BED 2NO 1M PERFORATED PCC MH RINGS 1200MM DIA & BISCUIT
CAST IN GULLEY SUPPLIES BY DOMIS USING WATERPROOF GROUT
BACKFILL EXCAVATION WITH 75MM CLEAN STONE 20TONNES PER EXCAVATION
REINSTATE EITHER BLINDING, TARMAC OR PAVING AS INDICATED.
NOTE:
1-7 INCLUSIVE PAVING
8-15 INCLUSIVE BLINDING
16-26 INCLUSIVE TARMAC



NOTES:

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3. THE FINAL CONNECTION TO THE SEWER IS SUBJECT TO UNITED UTILITIES APPROVAL AND IS TO BE IN ACCORDANCE WITH THEIR AGREED DETAILS.
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6. ALL FOUL AND SURFACE WATER DRAINAGE TO BE 150DIA PLASTIC TWIN WALL UNLESS NOTED OTHERWISE.
7. THE ATTENUATION TANK, FLOW CONTROL AND NON-RETURN VALUES ARE TO BE TO SUPPLIERS DESIGN AND DETAILS. INSTALLATION IS TO BE IN ACCORDANCE WITH THE SUPPLIER REQUIREMENTS.
8. ROCKER PIPE DETAIL TO BE PROVIDED AT ALL ENTRY AND EXIT POINTS FOR DRAINS CAST INTO CONCRETE FOUNDATIONS UNLESS NOTED OTHERWISE.
9. UNLESS NOTIFIED OTHERWISE CHANNEL DRAINS TO BE ACO M150D 0.0 OR SIMILAR APPROVED
10. FLOOR GULLEYS AND RWPS TO BE TRAPPED.
11. THE CONTRACTOR IS TO UNDERTAKE A FULL CCTV SURVEY AT COMPLETION OF THE PROJECT TO DEMONSTRATE THAT THE DRAINAGE IS CLEAN. ANY DEFECTS ARE TO BE CORRECTED BY THE CONTRACTOR PRIOR TO HANDOVER OF THE SYSTEM TO THE CLIENT.
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DRAWING LEGEND

- SITE BOUNDARY
- SURFACE WATER DRAINAGE
- FOUL WATER DRAINAGE
- COMBINED WATER DRAINAGE
- EXISTING PRIVATE DRAINAGE TO BE RETAINED IN PHASE 1 WORKS
- EXISTING PRIVATE DRAINAGE TO BE REMOVED IN PHASE 1 WORKS

3000	●	●	●	175	3 x 45	3950	6

= Plugs are available to seal the lifting holes in manhole rings.

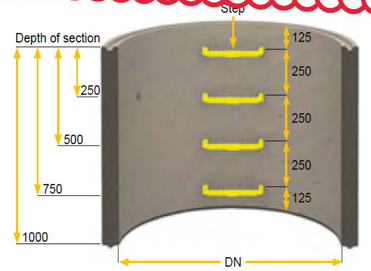
= Manhole and soakaway depths are nominal, actual depths may vary. Where the height of construction is critical, units should be measured prior to construction.

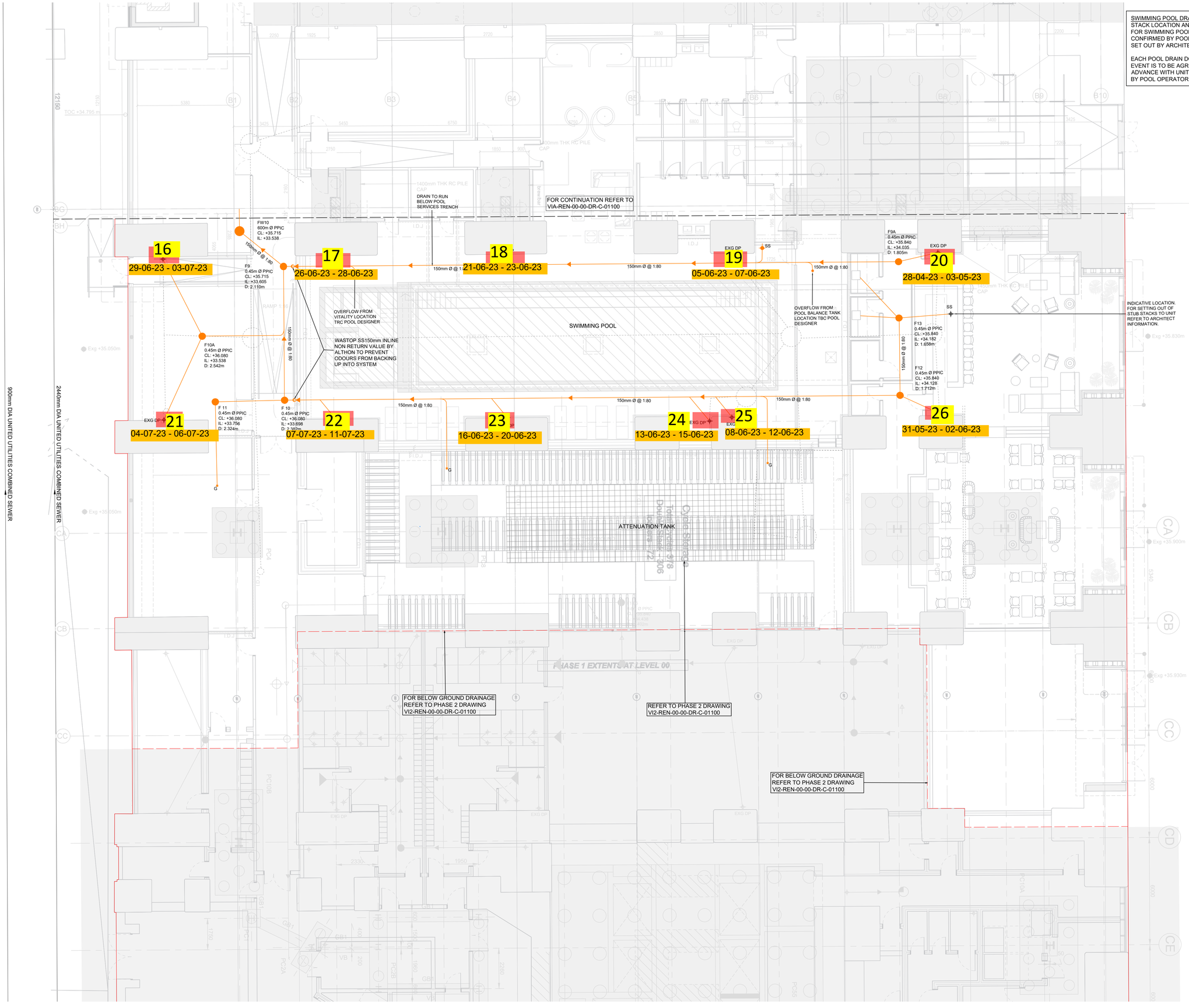




Soakaway Ring Data:

RING	Perforations per section (75mm Ø)		
	500mm deep	750mm deep	1000mm deep
DN	Perfs per product	Perfs per product	Perfs per product
900	6	9	12
1050	6	9	12
1200	8	12	16
1350	8	12	16
1500	10	15	20
1800	12	18	24
2100	12	18	24
2400	14	21	28
2700	16	24	32
3000	18	27	36





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20. ALL MAMHOLES COVER RATINGS TO BE CLASS B125 UNLESS NOTED OTHERWISE.

DRAWING LEGEND

- SITE BOUNDARY
- SURFACE WATER DRAINAGE
- FOUL WATER DRAINAGE
- COMBINED WATER DRAINAGE
- EXISTING PRIVATE DRAINAGE TO BE RETAINED IN PHASE 1 WORKS
- EXISTING PRIVATE DRAINAGE TO BE REMOVED IN PHASE 1 WORKS
- EXISTING UNITED UTILITIES COMBINED SEWER
- G — GULLY
- CHANNEL DRAIN
- RAINWATER PIPE/ SOIL VENT PIPE
- RE — RODDING EYE
- IN-LINE NON-RETURN VALUE

Rev:	Description:	Date:	By:	Chkd:
C01	STAGE 5	20.05.22	SS	PC

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Renaissance Associates Ltd
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77 Dale Street
Manchester
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Project:
VIADUX,
MANCHESTER

Drawing Title:
GROUND FLOOR DRAINAGE PLAN SHEET 2

Status:
STAGE 5

Size:	Date:	Drawn by:	Designed by:	Checked by:
A1	MAY'22	PH	JB	PC

Scale: 1:100 | Project No: 1910-12

Project:	Originator:	Volume:	Level:	Type:	Role:	Category/Number:	Rev:
VIA	REN	00	00	DR	C	01101	C01

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Floor gullies and access covers



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1	**Introduction**
2	**Design considerations**
3	**Installation guidelines**
4	**Stainless steel gullies**
4B	Body assemblies
4G	Gratings
	See also section 5; pages 5Bntss, 5Btss, 5Gss and 5Vss
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5A	Assemblies with typical installations
5B	Bodies
5C	Membrane clamping collars
5G	Gratings
5V	Access covers
5X	Accessories and adaptors
6	**Direct connection**
6G	Gratings
6V	Access covers
7	**Uni-Level**
	Gullies for asphalt/composition finished floors
8	**Multi-Level**
	Gullies for unfinished floors
9	**Side inlets**
10	**Adaptors**
11	**Specialised applications**
11L	Large gullies – hopper, trench and pit drains
11M	Non-spark gunmetal gullies for use in metal decks
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11P	Drainage of planting areas and roof gardens
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11SF 1	Double-sealed access cover for man-entry
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11V	General purpose access covers
WP	Non-freeze water points
Appendix i	**Materials care and maintenance**
Appendix ii	**Glossary**
Code index	**Spec. Code index**
Wade	**I.T. and Warranty**

Introduction

A UK company with more than fifty years' experience in the industry, Wade is established as a leading manufacturer of quality drainage products. Much of the success of the business is attributable to an on-going commitment to put technology to practical use, to generate fresh ideas, and to guarantee quality assured production.

This technical manual presents illustrations and data from a comprehensive range of products in which choices of material, size and style enable the specifier/user to select gullies that will meet his/her requirements.



Floral style gratings

Aesthetic yet practicable, equally suitable for inside or outside applications, nickel bronze complements a wide variety of floor finishes including terrazzo, stone paviors, marble and flexible sheet flooring.



Drainage of security areas

K29, K35 and K36 series are designed to deter unauthorised removal of gratings and unauthorised access to a gully.



Custom-made products

Products can be designed to suit particular applications. Please contact our Technical Services Department for details.



A.E.L.T.C.C. Wimbledon

Certification of compliance with BS EN ISO 9001 underlies our commitment to quality and service



Drainage in block paving

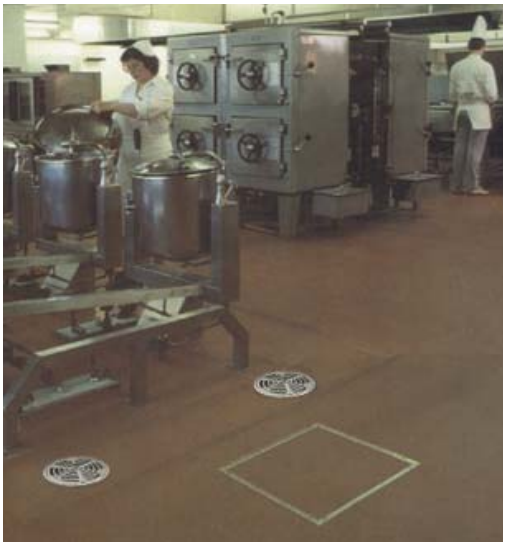
Cast nickel bronze is particularly suited to the mixed traffic conditions encountered in pedestrian areas such as at shopping centres.



Drainage in a resin floor

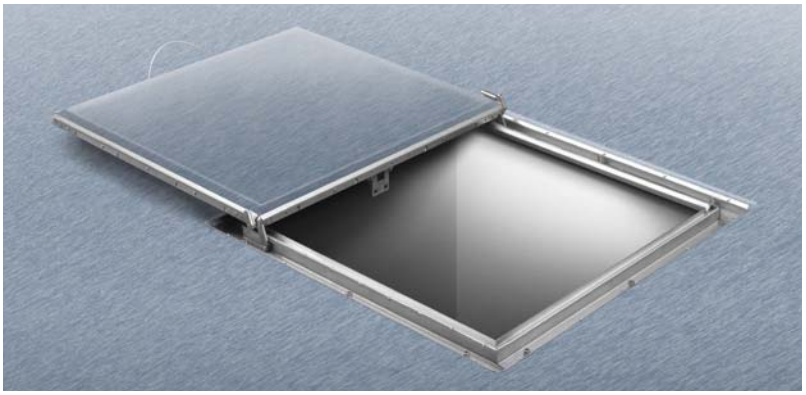
K2107 gratings of stainless steel ensure watertight connections.





Drainage and service access in a kitchen with vinyl flooring

K2307 gratings of stainless steel and RS213 access cover of stainless steel ensure watertight connections.



Sliding access cover on a vinyl covered floor (patent pending).

Tel: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

Design considerations

Selection of gullies is usually the responsibility of the specifying engineer conversant with the floor construction, flooring finish, drainage system and the operations or functions designated for the particular building area. Some of the factors that should be considered when selecting gullies are given below.

Building regulations/standards

Local regulations must be complied with in matters concerning sanitary pipework and drainage.

A trapped gully may be used where a water seal is required to prevent foul air from entering a building; different versions are available – Bell, Bottle, 'P', 'Q', and 'S'. In other cases a non-trapped gully may be used with a trap installed in the drain line.

Load rating

It is essential that gullies withstand expected loads. This catalogue shows the load rating class for each grating, cover or gully assembly, based on BS EN 1253, as follows:

K3 Areas without vehicular traffic, such as bathrooms, shower areas, retirement homes, hotels, schools, swimming baths, leisure centres, balconies, terraces and roof gardens.

L15 Areas with light vehicular traffic such as cycleways and domestic drives.

M125 Areas with vehicular traffic, such as car parks, factories and workshops – not including light commercial vehicles or heavy wheel loads.

P400 Heavy duty applications including food processing areas or process plants, where gullies are subjected to forklift trucks and/or heavy vehicles are manoeuvring.

The load rating of certain gratings is also shown in N/mm^2. All such ratings are based on static loads.

Flow rate

Flow rate is the maximum amount of water (litres/sec) which a gully will drain, and is influenced by several factors: grating free area, sump capacity, body free area, design of the gully, outlet size, and features and accessories such as filter buckets and traps.

Experience shows that at low heads of water the flow rate of a gully is mainly governed by the grating free area; at heads of water above 50mm flow rate is governed by the body free area, or by the grating free area, whichever is smaller. This catalogue shows free area (cm^2) for gratings and bodies.

Floor and flooring

The depth of the structural slab and available space will influence the selection of gullies, while the use of an extension may be necessary to bring the grating or cover up to finished floor level.

Installations with a damp-proof membrane will require the use of gullies with a membrane clamping collar.

Different kinds of floor finishes such as ceramic tiles, resin or sheet floor covering, such as vinyl, will influence the type of grating or cover to be used.

Pipework

The type and size of pipework in a given installation is fundamental to the selection of gullies. Wade gullies can be connected to all pipework in general use; certain bodies are for direct connection to pipework, others require the use of threaded pipework adaptors and/or couplings.

Appearance

Gullies with attractive gratings or covers made of nickel bronze or stainless steel are for use in finished floor areas where the gratings or covers contribute to the aesthetic appeal of the area.

Sherardized cast iron gratings whilst of pleasing appearance are best suited in unfinished floors in plant rooms etc. and also for restoration or refurbishment projects to match period architecture.

Accessories and variations

Standard optional items are readily available, such as filter buckets to intercept debris, internal backwater valves to prevent backflow, and side inlets and tappings to receive ancillary pipework.

Custom made products can be manufactured for non-standard applications.

Materials and finishes

Strength, corrosion resistance and appearance are important considerations when selecting gullies.

Information on materials and finish of Wade floor gullies is given in Appendix i.

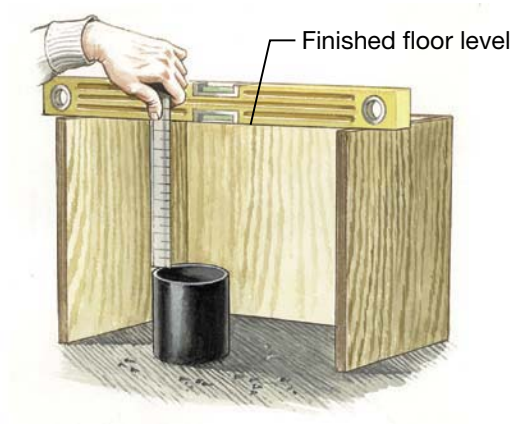
Installation guidelines

General installation guidelines are provided for gully components in a tiled finished floor with a damp proof membrane. Page 3SF gives additional guidelines for installing gratings designed for use with flexible sheet flooring such as vinyl.

See also wadeint.co.uk/installation

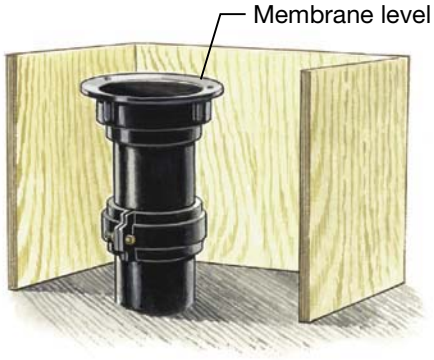


1. Where applicable, screw threaded pipework adaptor into the body outlet using a suitable sealant to ensure the joint is watertight.



2. Measure the distance between the top of the connecting pipework and finished floor level.
3. Check that this distance will enable the complete gully (with extensions, if applicable) to be installed with the top face of the grating or cover flush and level with the finished floor.

Note
Where a damp-proof membrane is used, the body must be installed with the top of the flange at or below membrane level.



4. Connect body (with threaded pipework adaptor if applicable) to pipework.
5. Infill as required.



6. Where applicable, dress the membrane over the flange and into the sump of the body, ensuring that the membrane does not restrict the outlet; bolt the membrane clamping collar to the body – certain collars are reversible to increase height adjustability.

Note
In some cases the membrane clamping collar serves to connect the grating or cover to the body, so it must be fitted even where a membrane is not used. In installations without a below-floor membrane and/or using flexible sheet flooring such as vinyl, the membrane clamping collar should be sealed to the body using the supplied gasket and, where supplied, fibre washers beneath the screw heads.



7. Fit grating, cover, or funnel with extensions, frame or collar as applicable; set top face flush and level with the finished floor using height adjustability features. Use a suitable, good quality sealant on all threaded joints to ensure a watertight assembly.

   All joints need to be sealed to ensure that leaks do not occur in the event of water backing up in the gully, e.g. if a downstream pipe blockage occurs. The exception is gully assemblies specified with weepholes, which are designed to provide supplementary drainage from above the membrane; these weepholes should not generally be sealed.



8. Infill or lay floor screed and apply final floor finish (e.g. tiles, marble, paviors, terrazzo) around the grating or cover.

Note
Installation of gratings and covers for use with flexible sheet flooring such as vinyl, is illustrated on page 3SF.

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Installation guidelines

Gratings and access covers for use with flexible sheet flooring such as vinyl

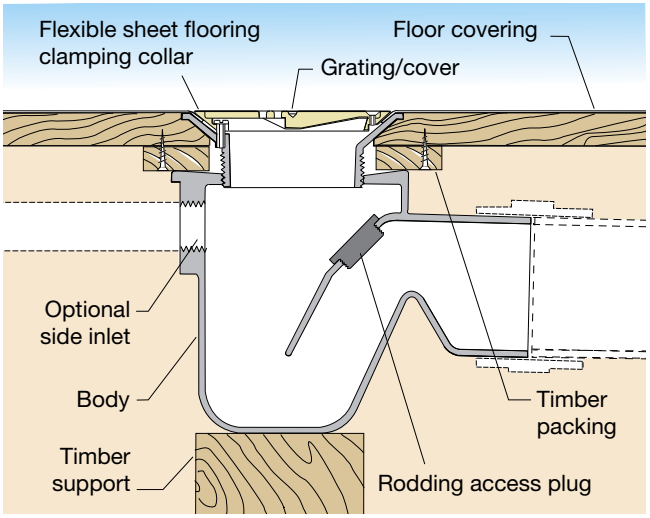
Worldwide demand for higher standards of hygiene and safety in buildings is reflected in the increasing use of modern slip-resistant flooring. In keeping with its position at the forefront in the design and manufacture of gullies, Wade has developed a range of superbly finished products specifically for use with flexible sheet flooring such as vinyl. Where a clamping collar is fitted a watertight seal is obtained, yet gratings and covers are removable for access to pipework without disturbing the flooring material. See also wadeint.co.uk/installation

G202

Cast iron body with K2302 nickel bronze grating.



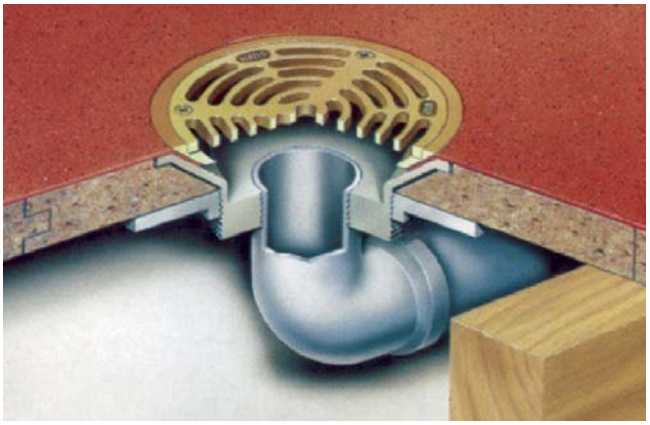
Typical installation in a wooden floor.



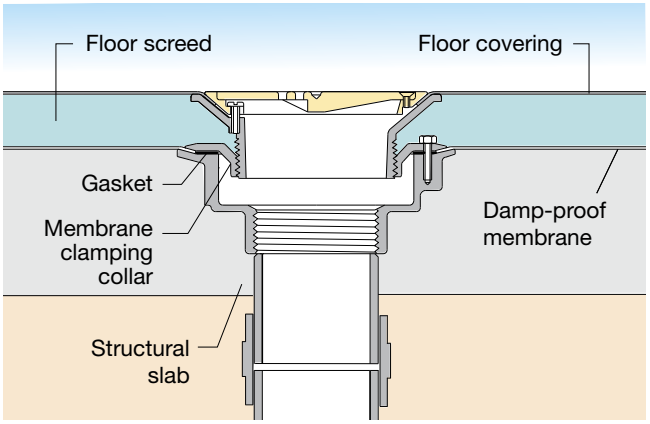
N213

Nickel bronze grating, with cast iron backnut, connected directly to 40mm plastic pipework.

Watertight drainage in a vinyl covered timber floor.



Typical installation with damp-proof membrane.



To achieve a watertight joint, installation must be in accordance with instructions which accompany the gratings/covers.

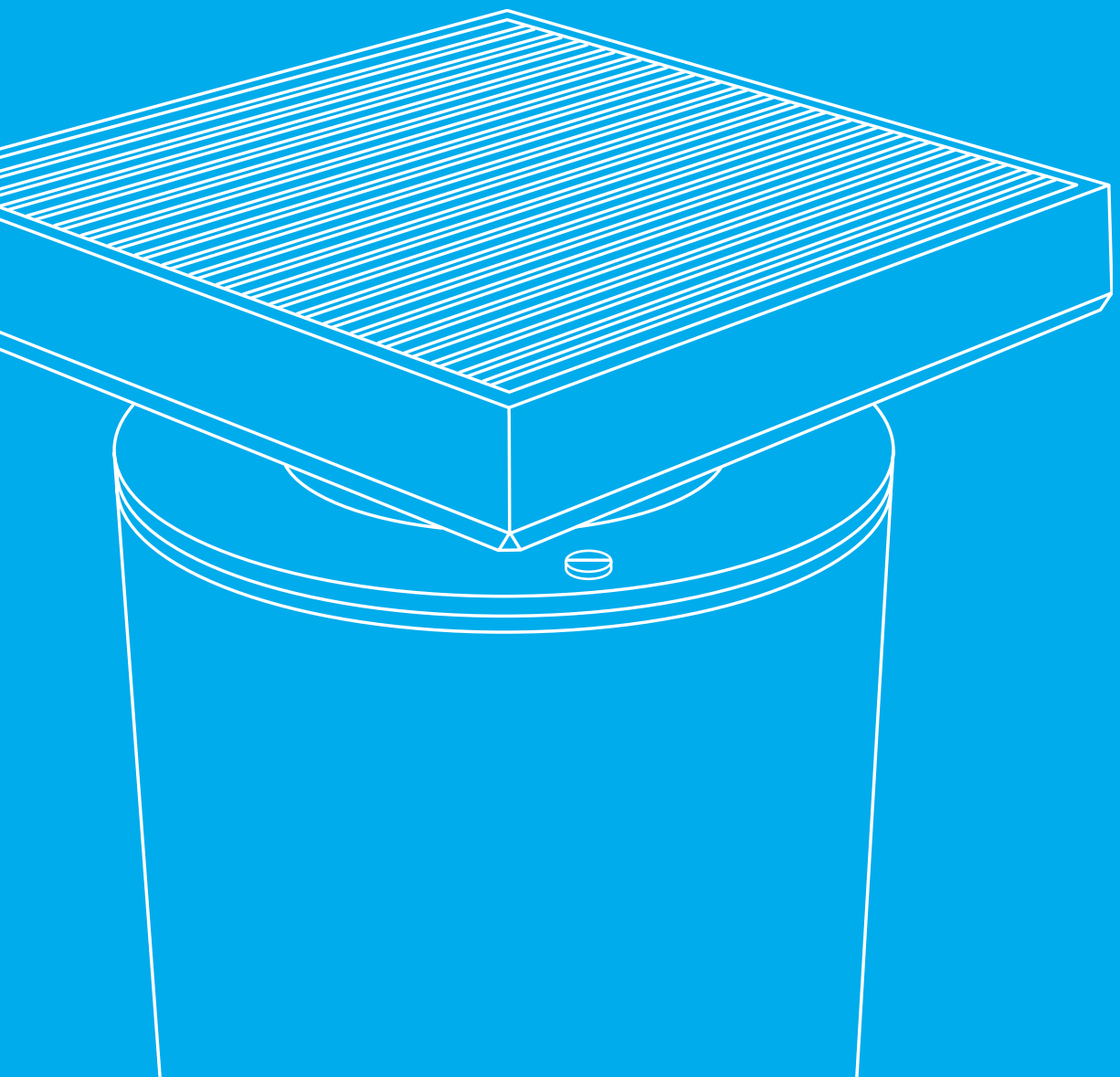








Stainless steel gullies



4

Stainless steel gullies

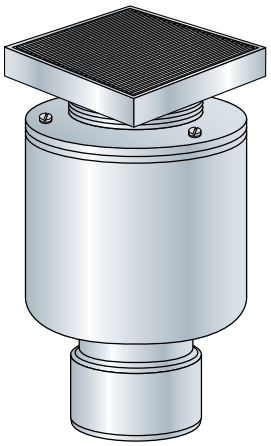
A range of stainless steel gully assemblies is available for use, particularly in areas associated with food production, processing or preparation where corrosion resistance or minimum maintenance is a requirement.

Assemblies and typical installations

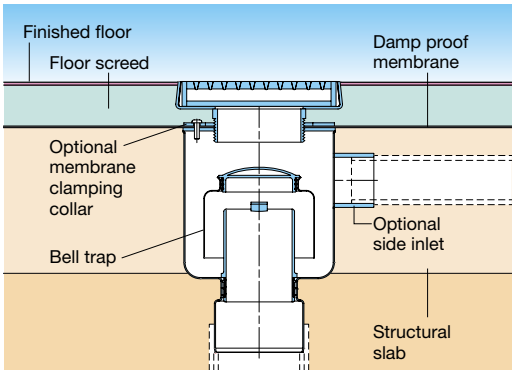
Trapped gullies, 200mm square at FFL

Select gully body assemblies from page 4B1, and 192mm square gratings from page 4G

Q2434 height adjustable gully body assembly with optional membrane clamping collar (option 'C') and **Q9233** Streamline grating.



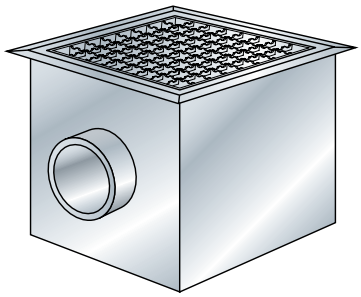
Typical installation



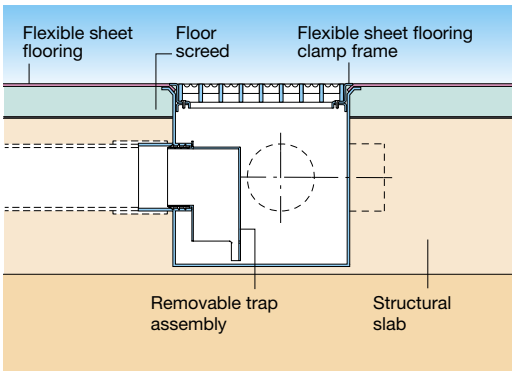
Trapped gullies, *300mm square at FFL

Select gully body assemblies from page 4B2, and 293mm square gratings from page 4G

Q1234 gully body assembly with optional flexible sheet flooring clamp (option 'V') and **Q4332** anti-slip mesh grating.



Typical installation



Features

Stainless steel body assemblies are shown on pages 4B1 and 4B2; gratings are on page 4G.

Trapped – all Wade stainless steel body assemblies are trapped. Some versions can be supplied as non-trapped by specifying option 'N'.
Full-bore rodding access is provided on all body assemblies except Q2334 (38mm) and Q2434 (90mm).
Side inlets (optional) are fully trapped.
Filter buckets (optional) to intercept debris.
Choice of gratings including perforated, anti-slip mesh, plain mesh, bar and Streamline.

Notes

1. Optional flexible sheet flooring clamp increases size of gully body, so **Q1234V illustrated on this page is 325mm square (visible dimension at F.F.L.).*
2. Optional flexible sheet flooring clamp is also available on 200mm square gully body assemblies, increasing their visible dimension at F.F.L. to 225mm.

Stainless steel body assemblies – 200mm sq.

Stainless steel grade 304, trapped – 60mm seal

For use in high specification applications including food preparation, showers and areas where high corrosion resistance is a requirement. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request.

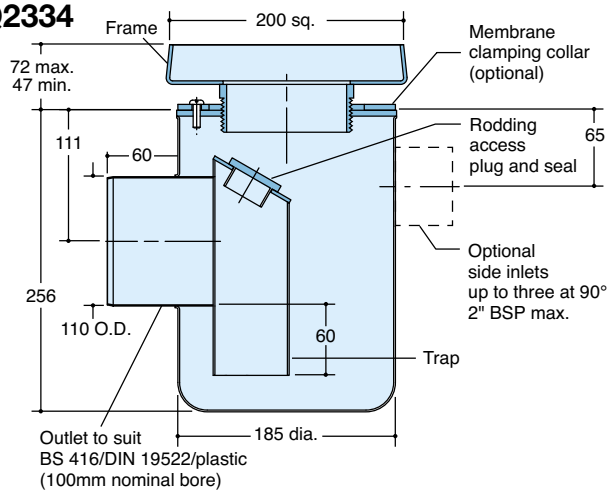
Connections

For use with 192mm square stainless steel gratings shown on page 4G.

Bodies are for direct connection to cast iron BS 416/DIN 19522 and PVC pipework; they can be connected to other pipework systems by means of adaptors shown in Section 10.

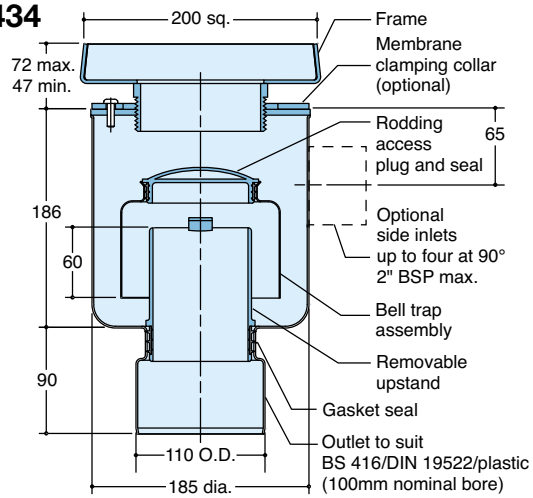
Height adjustable – with a fine thread

Q2334



Gratings – Select from page 4G, 192mm square (not Q7235).
Options – **A B C I M W V**

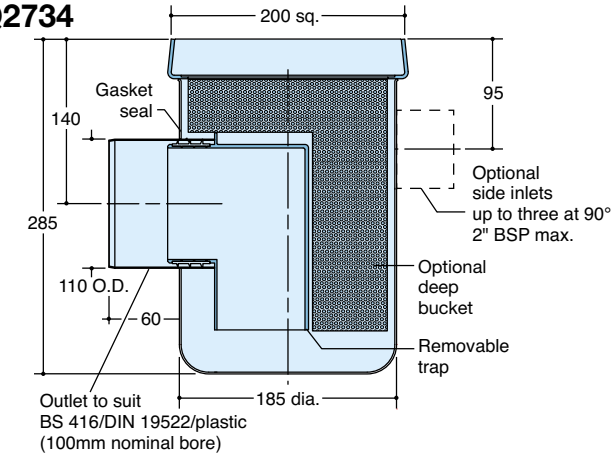
Q2434



Gratings – Select from page 4G, 192mm square (not Q7235).
Options – **A B C I M W V**

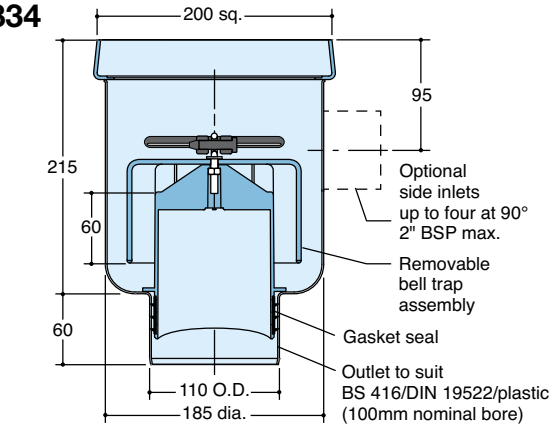
Non-height adjustable

Q2734



Gratings – Select from page 4G, 192mm square.
Options – **B I M V**

Q2834



Gratings – Select from page 4G, 192mm square.
Options – **B I M N V**

Spec. Code	Outlet size mm	Free area cm²	Trap type	kg
Q2334	100	60	P	4.9
Q2434	100	51	Bell	4.2
Q2734	100	70	P	3.9
Q2834	100	65	Bell	3.8

To specify/order
Quote the Spec. Codes for the selected body assembly, body option suffix and grating. Gratings are illustrated on page 4G.

Note
See pages 5Bntss, 5Btss, 5Gss and 5Vss for Vari-Level stainless steel gullies. Pages 6Gss and 6Vss show direct connection gratings and access covers of stainless steel.

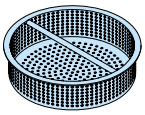
Options/Features

Bolt-on funnel



Stainless steel (U511)

Filter bucket (Standard depth add suffix 'B' Deep bucket (Q27 only), add suffix 'BD')



Stainless steel (Q27 or Q28)



Nylon (Q23 or Q24)

Asphalt flange – suffix 'A' (factory fitted)
Membrane clamping collar – suffix 'C' (factory fitted)
Side inlets – suffix 'I' maximum 2" BSP (select from section 9)
Grade 316 – suffix 'M'
Non-trapped body – suffix 'N' (Q2834 only)
Weepholes – suffix 'W' (Q23 and Q24 only), to provide supplementary drainage at membrane level
For use with flexible sheet flooring up to 3.5mm – suffix 'V'
Note FFL size of flexible sheet flooring clamp frame is 225mm square; overall height increase is 18mm (height adjustable) or 23mm (non-height adjustable).

Stainless steel body assemblies – 300mm sq.

Stainless steel grade 304, trapped – 60mm seal

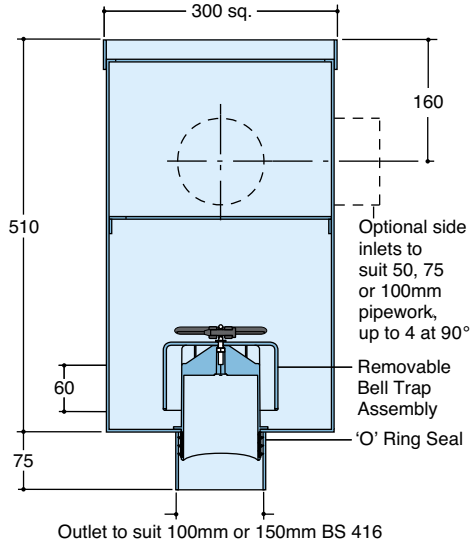
For use in high specification applications including food preparation, showers and areas where high corrosion resistance is a requirement. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request.

Connections

For use with 293mm square stainless steel gratings shown on page 4G.

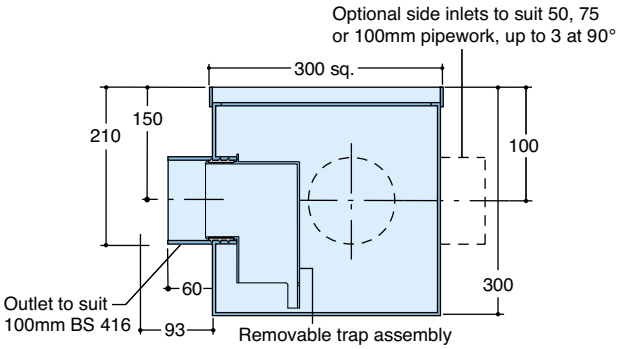
Bodies are for direct connection to cast iron BS 416/DIN 19522 and PVC pipework; they can be connected to other pipework systems by means of adaptors shown in Section 10.

Q10 Series bell trapped



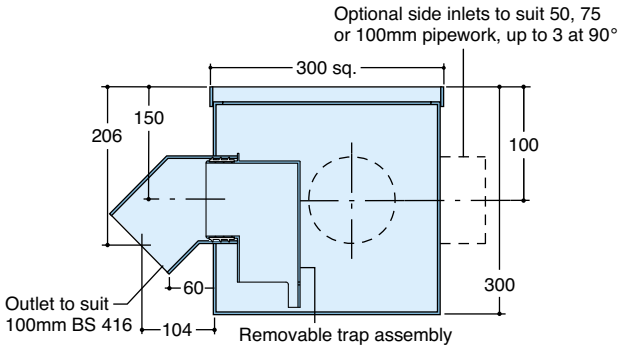
Gratings – Select from page 4G, 293mm square.
Options – **B I M N V**

Q1234 'P' trapped



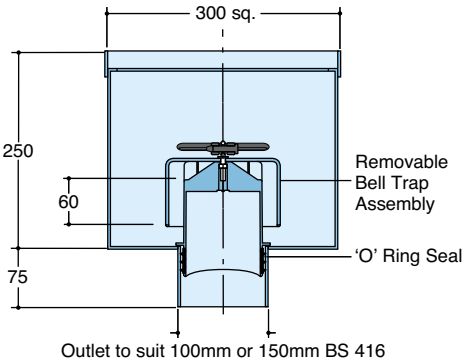
Gratings – Select from page 4G, 293mm square.
Options – **B I M V**

Q1334 'Q' trapped



Gratings – Select from page 4G, 293mm square.
Options – **B I M V**

Q14 Series bell trapped



Gratings – Select from page 4G, 293mm square.
Options – **B I M N V**

Spec. Code	Outlet size mm	Free area cm²	Trap type	kg
Q1034	100	53	Bell	16
Q1036	150	176	Bell	16
Q1234	100	78	P	8
Q1334	100	78	Q	8
Q1434	100	53	Bell	6.5
Q1436	150	176	Bell	6.2

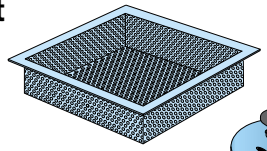
To specify/order
Quote the Spec. Codes for the selected body assembly, body option suffix and grating. Gratings are illustrated on page 4G.

Note
See pages 5Bntss, 5Btss, 5Gss and 5Vss for Vari-Level stainless steel gullies. Pages 6Gss and 6Vss show direct connection gratings and access covers of stainless steel.

Options/Features

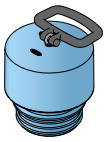
Filter bucket

Stainless steel (Suffix 'B')



Bolt-on funnel (U511)





Removable bell trap assembly (U1704)

Side inlets – suffix 'I' maximum 100mm (select from section 9)
Grade 316 – suffix 'M'
Non-trapped body assembly – suffix 'N'
For use with flexible sheet flooring up to 3.5mm – suffix 'V'
Note FFL size of flexible sheet flooring clamp frame is 325mm square

April 2018 **Tel**: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

Stainless steel gratings

Stainless steel grade 304, satin finish

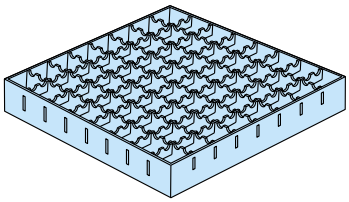
For use in high specification applications including food preparation, showers and areas where high corrosion resistance is a requirement. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request.

Connections

For use with stainless steel body assemblies shown in section 4B.

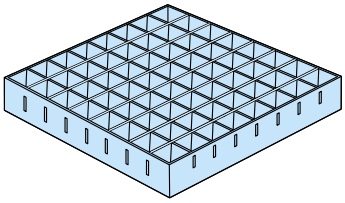
Q42, Q43 series

Anti-slip mesh. Double notched bars make this grating suited for wet or greasy floors



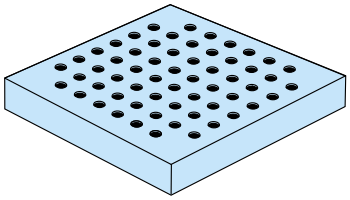
Q52, Q53 series

Plain mesh. Established design with good loading characteristics and generous free area



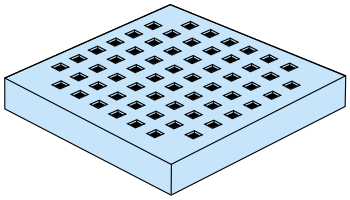
Q6230

Smooth perforated (circular apertures). Suited for bathrooms, shower areas etc.



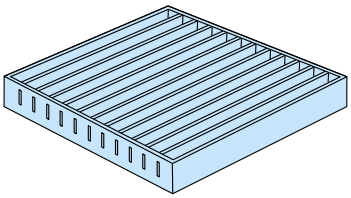
Q6430

Smooth perforated (square apertures). Suited for bathrooms, shower areas etc.



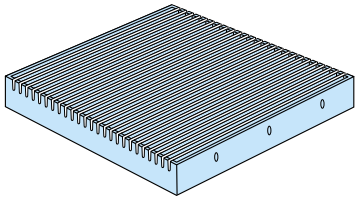
Q72, Q73 series

Bar grating



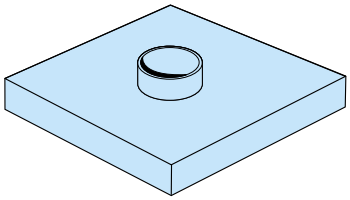
Q92, Q93 series

Streamline. Heel-proof reverse wedge profile. Also suited for barefoot zones



U5232

192 square stainless steel Q series gully funnel.



192mm square

To fit 200mm square body assemblies shown on page 4B1

Spec. Code	Length mm	Width mm	Depth mm	Max apperture width mm	Free area cm²	Load rating class	kg
Q4232	192	192	30	23x23	290	L15	1.2
Q5232	192	192	30	23x23	290	L15	1.3
Q6230	192	192	30	8 dia.	61	K3	1.1
Q6430	192	192	30	8x8	77	K3	1.1
Q7235*	192	192	30	10	209	M125	3.5
Q9233	192	192	30	5	216	L15	1.2
U5232	192	192	30	55 dia.	95	K3	0.8

**Q7235 is for use with Q2734 and Q2834 gullies only.*

293mm square

To fit 300mm square body assemblies shown on page 4B2

Spec. Code	Length mm	Width mm	Depth mm	Max apperture width mm	Free area cm²	Load rating class	kg
Q4332	293	293	30	23x23	670	L15	2.5
Q5332	293	293	30	23x23	670	L15	2.8
Q7335	293	293	30	10	550	M125	7.3
Q9333	293	293	30	5	405	L15	2.5

Note

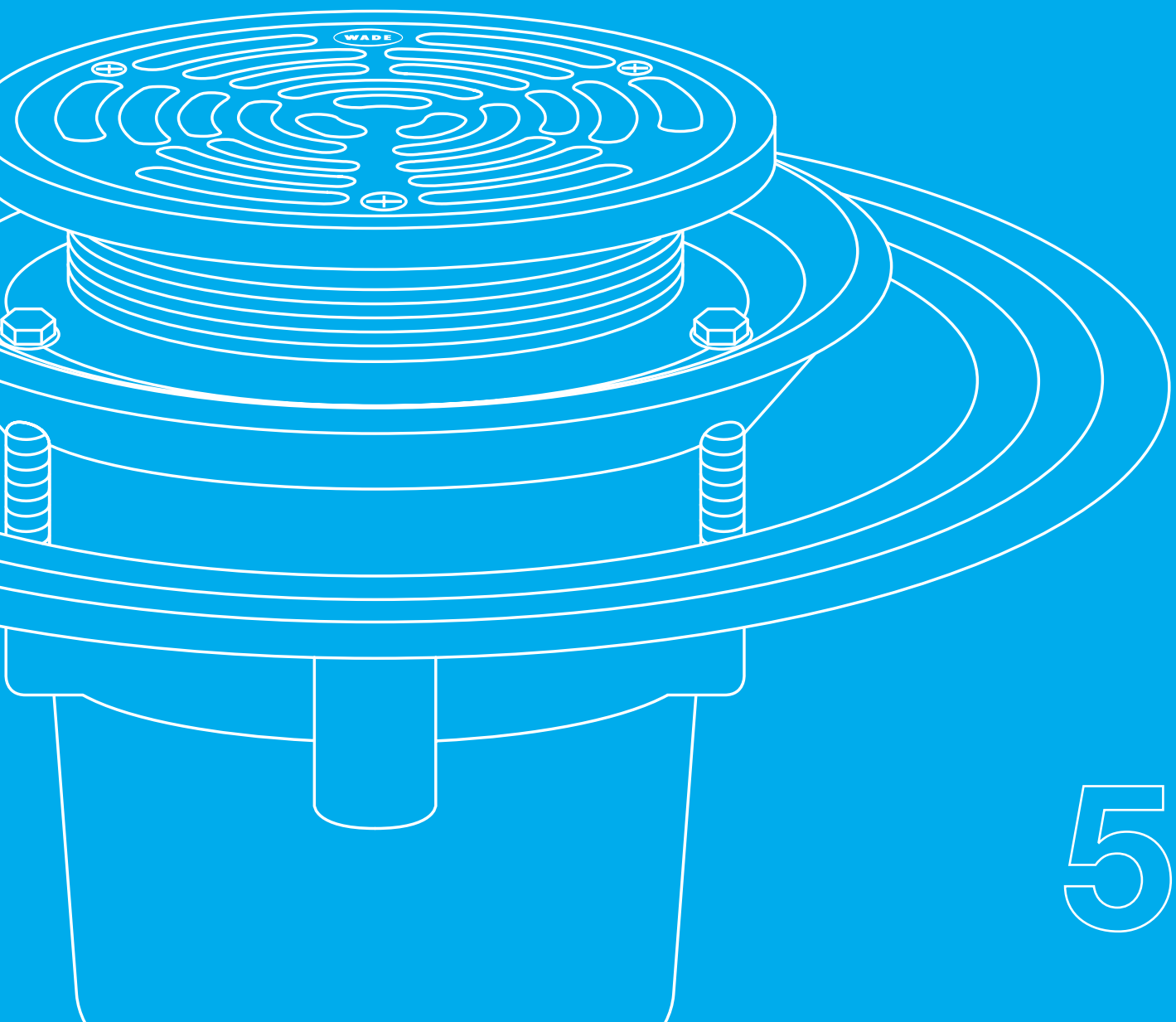
Please ensure that size of the selected style of grating matches the selected body assembly.

See pages 5Bntss, 5Btss, 5Gss and 5Vss for Vari-Level stainless steel gullies.

Options

M – Made of grade 316 stainless steel.

Vari-Level



5

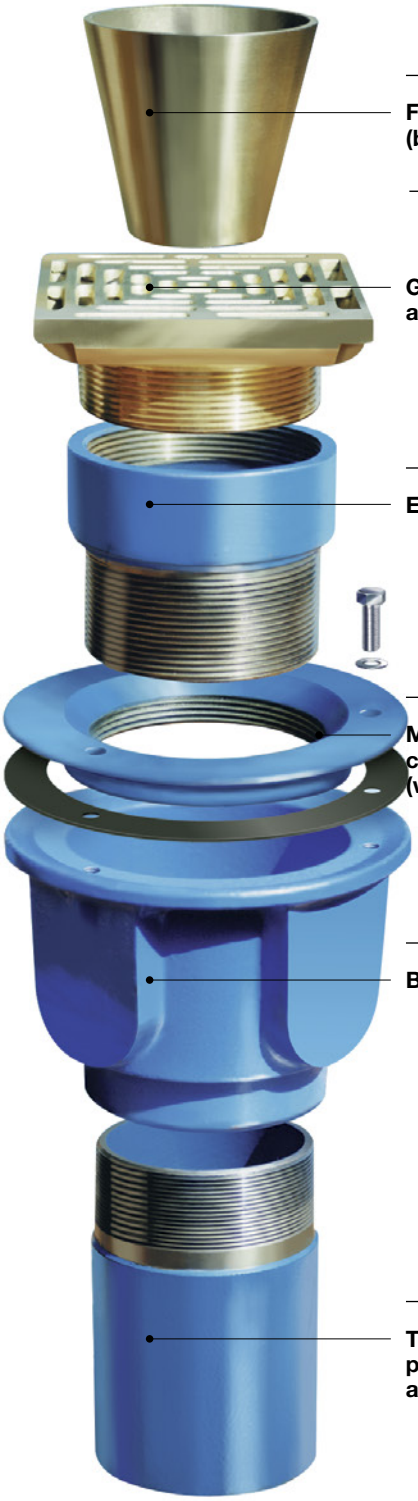
Vari-Level

The term Vari-Level refers to the fine adjustability of the height of a grating or access cover above a body; this feature enables installation exactly at finished floor level by rotating the grating or access cover.

A Vari-Level gully comprises, as a minimum, a **Vari-Level body** and a **Vari-Level grating**; in some versions these items fit together directly, but, mostly, connection is by means of an inter-connecting, dual-purpose part – a membrane clamping collar.

To address a myriad of applications, different versions of Vari-Level bodies are available for use with a wide range of Vari-Level gratings, Vari-Level access covers and Vari-Level accessories, as illustrated in this section.

Representation of a Vari-Level gully assembly with accessories and threaded pipework adaptor



			Catalogue page	
Funnel (bolt-on)	Accepts indirect discharge from waste pipes (optional)		**5X**	
Grating or access cover			Gratings	Access covers
	Cast iron		**5G ci**	**5V ci**
	Nickel bronze		**5G nb**	**5V nb**
	Stainless steel		**5G ss**	**5V ss**
Extension	Provides additional height for gratings and access covers (optional)		**5X**	
Membrane clamping collar (with gasket)	Also serves to connect the grating or access cover to the body on most series; optional facility on others		**5C**	
Body	Non-trapped, cast iron		**5B ntci**	
	For use with bituminous membrane		**5B ntcibm**	
	For use with cavity membrane		**5B ntcis**	
	Non-trapped, stainless steel		**5B ntss**	
	Trapped, stainless steel		**5B tss**	
	Trapped, cast iron		**5B tci**	
	Trapped, plastic		**5B tp**	
Threaded pipework adaptor	Enables effective connection to all sizes and types of pipework in general use		**10**	

Vari-Level

Assemblies and typical installations

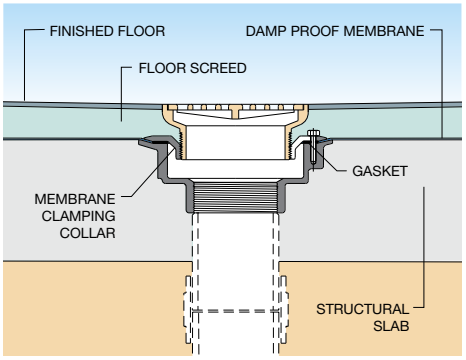
These typical installation drawings serve to illustrate the general principle of how such assemblies are used. These are not intended to imply that they must be used in this way. There are many variations of floor build up and it is for the end user to determine suitability of a drain assembly in a particular application.

Cast iron Non-trapped bodies

(See pages 5B ntci for product information)

C504 body with **C.C** membrane clamping collar and **L2103** nickel bronze grating



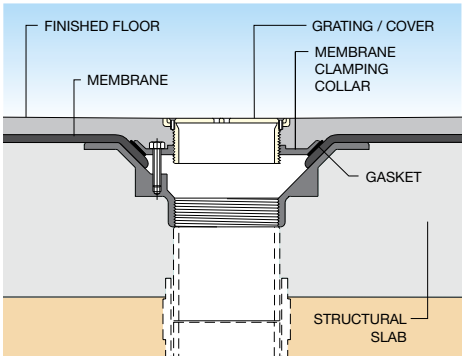


Cast iron Non-trapped bodies – for use with bituminous membrane

(See page 5B ntcibm for product information)

D1109 body with **C.D10** membrane clamping collar and **K2103** nickel bronze grating



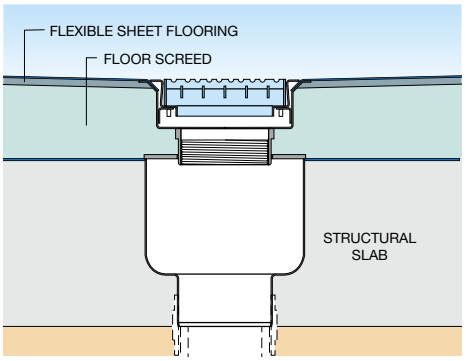


Stainless steel Non-trapped body assemblies

(See pages 5B ntss for product information)

QB114 body assembly with **L3601** stainless steel grating



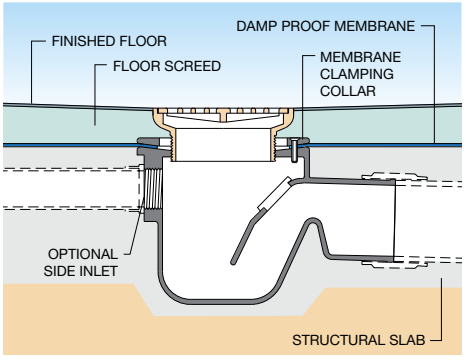


Cast iron Trapped bodies

(See pages 5B tci for product information)

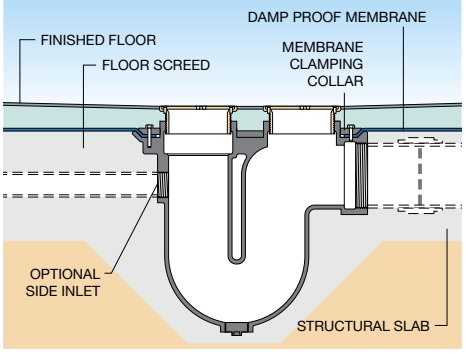
G303C body with membrane clamping collar, side inlets and **L2103** nickel bronze grating





J204 body with **C.J2** membrane clamping collar, **K2302** nickel bronze grating and **K5601** "SuperSeal" nickel bronze access cover





Vari-Level

Assemblies and typical installations

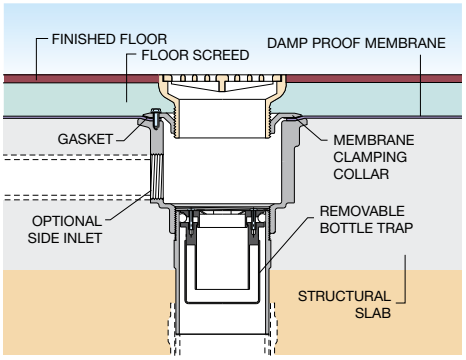
These typical installation drawings serve to illustrate the general principle of how such assemblies are used. These are not intended to imply that they must be used in this way. There are many variations of floor build up and it is for the end user to determine suitability of a drain assembly in a particular application.

Cast iron Trapped body assemblies

(See pages 5B tci for product information)

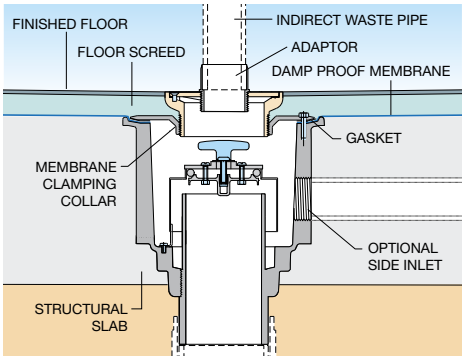
GC144 body assembly with **C.C** membrane clamping collar and **L2501** nickel bronze grating





GD144 body assembly with **C.D** membrane clamping collar, 1A x 2" side inlet and **K5203** nickel bronze access cover



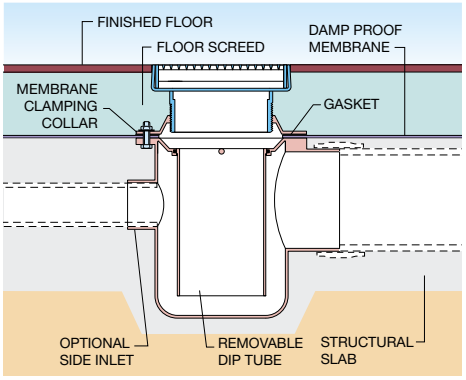


Plastic Trapped body assemblies

(See page 5B tp for product information)

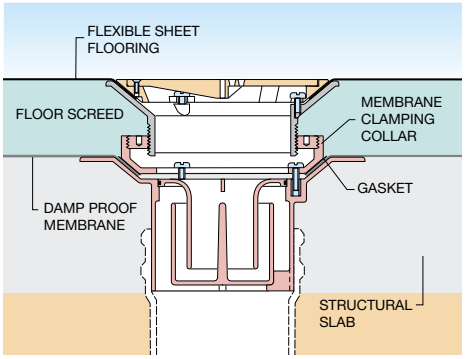
GP1104 body assembly with **L2901** stainless steel grating





GP614 body assembly with **K2302** nickel bronze grating

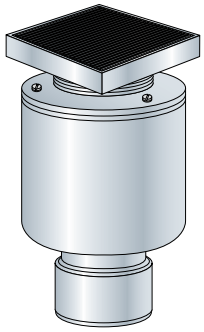


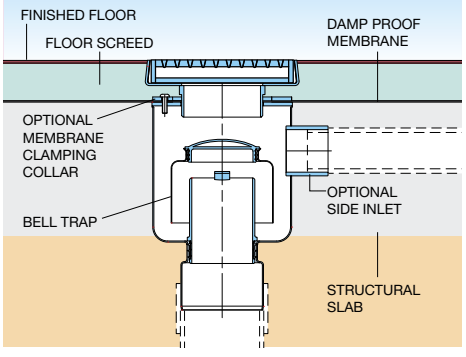


Stainless steel Trapped body assemblies

(See pages 5B tss for product information)

QG114C body assembly with membrane clamping collar and **L2902** stainless steel grating





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Vari-Level bodies

Cast iron, non-trapped

Connections

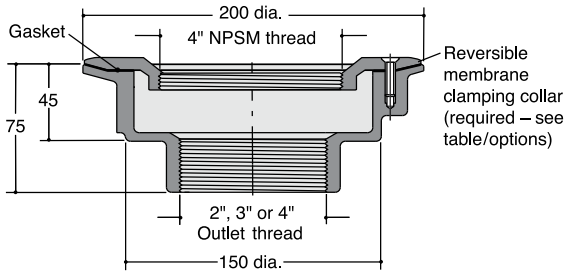
For use with gratings and access covers shown in sections 5G and 5V and accessories shown in section 5X.

Bodies with spigot outlet are for direct connection to pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in section 10.

Typical installation – see page 5A1

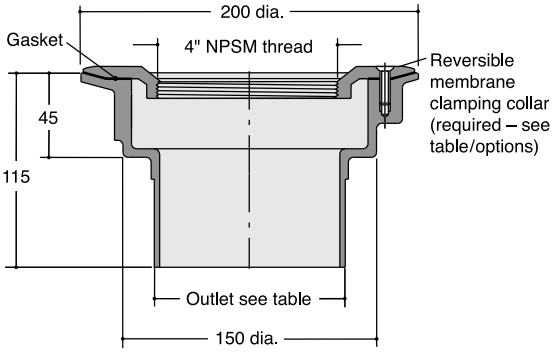
C2 series

Vertical outlet (threaded) – shallow sump



C3 series

Vertical outlet (threaded) – shallow sump



Spec. Code Body	Collar	Outlet size	Pipework system	Free area cm²	kg
C202	C.C	2" BSP	–	19	2.8
C203	C.C	3" BSP	–	44	2.9
C204	C.C	4" BSP	–	78	2.8
C343	C.C	82mm	Plastic	44	3.1
C344	C.C	110mm	Plastic	78	3.3
C363	C.C	75mm	BS 437	44	3.4
C364	C.C	100mm	BS 437	78	3.7
C393	C.C	75mm	BS 416	44	3.3
C344	C.C	100mm	BS 416/DIN 19522	78	3.3

To specify/order

Specify *Body* and *Collar* Spec. Code from the table above; see page 5C2 for alternative membrane clamping collars.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select from Section 5V.
Gratings – select from Section 5G.
Membrane clamping collar
Required for C series (membrane clamping collar also connects the grating/cover to the body) – see table for standard 4" throat collar Spec. Code or refer to page 5C2 for alternatives.
Height adjustability – distance between body flange and top of grating/cover;
Maximum – height of grating/cover plus 15mm.
Minimum – height of grating/cover minus 30mm.
Extra height can be obtained by means of an extension, see page 5X2.
Accessories – select from Section 5X.
Weepholes – see page 5C2.
(to provide supplementary drainage at membrane level).
Linear drainage – select membrane clamping collar C.CL to accept Wade 4" channel outlet – see page 5C2.

Vari-Level bodies

Cast iron, non-trapped

Connections

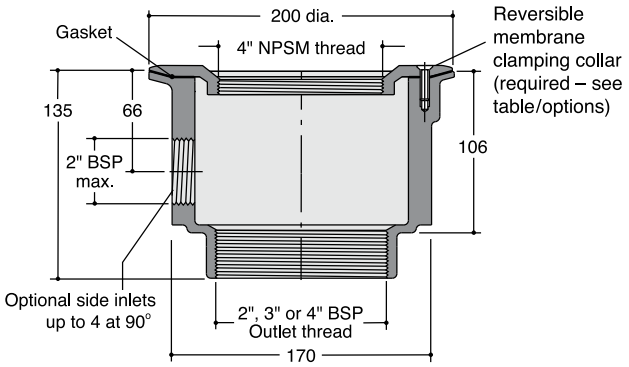
For use with gratings and access covers shown in sections 5G and 5V and accessories shown in section 5X.

Bodies have BSP threaded outlet and are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in section 10.

Typical installation – see page 5A1

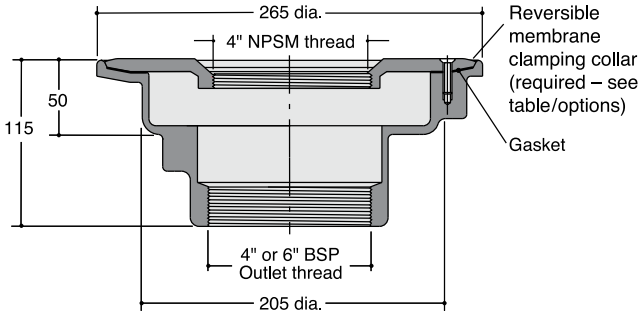
C5 series

Vertical threaded outlet – deep sump plus optional side inlet



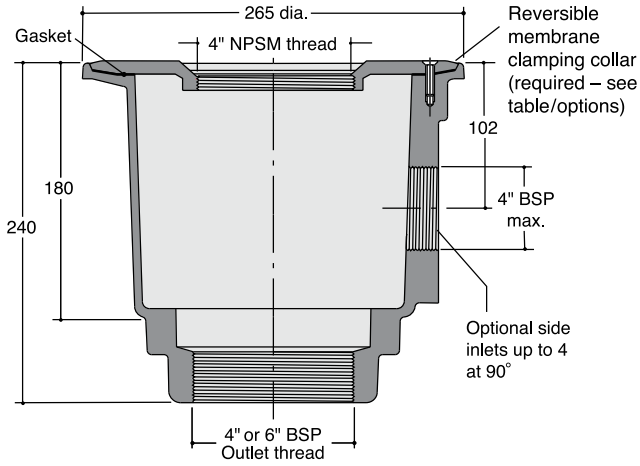
D2 series

Vertical threaded outlet – shallow sump



D4 series

Vertical threaded outlet – deep sump plus optional side inlet



Spec. Code Body	Collar	Outlet size	Free area cm²	kg
C502	C.C	2" BSP	19	7.6
C503	C.C	3" BSP	44	6.9
C504	C.C	4" BSP	78	7.8
D204	C.D	4" BSP	78	7.2
D206	C.D	6" BSP	176	6.9
D404	C.D	4" BSP	78	11.6
D406	C.D	6" BSP	176	19.8

To specify/order

Specify *Body* and *Collar* Spec. Code from the table above; see page 5C2 for alternative membrane clamping collars.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select from Section 5V.
Gratings – select from Section 5G.
Membrane clamping collar
Required for C and D series (membrane clamping collar also connects the grating/cover to the body) – see table for standard 4" throat collar Spec. Code or refer to page 5C2 for alternatives.
Height adjustability – distance between body flange and top of grating/cover;
C series
Maximum – height of grating/cover plus 15mm.
Minimum – overall height of grating/cover minus 30mm.
D series
Maximum – height of grating/cover plus 10mm.
Minimum – height of grating/cover minus 30mm.
Extra height can be obtained by means of an extension, see page 5X2.
Accessories – select from Section 5X.
Side inlets – select from Section 9 (C5 series and D4 series only).
Weepholes – see page 5C2.
(to provide supplementary drainage at membrane level).
Linear drainage – select membrane clamping collar C.CL (C5 series) or C.DL, (D2 and D4 series) to accept Wade 4" channel outlet – see page 5C2.

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Vari-Level bodies

Cast iron, non-trapped

Connections

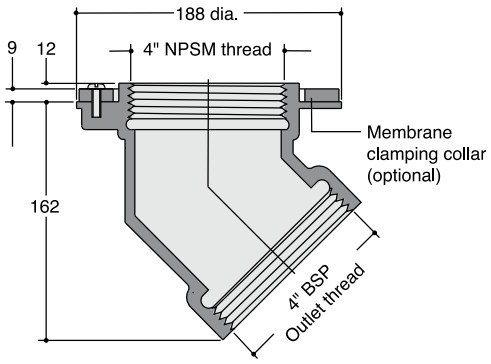
For use with gratings and access covers shown in sections 5G and 5V and accessories shown in section 5X.

Bodies have BSP threaded outlet and are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in section 10.

Typical installation – see page 5A1

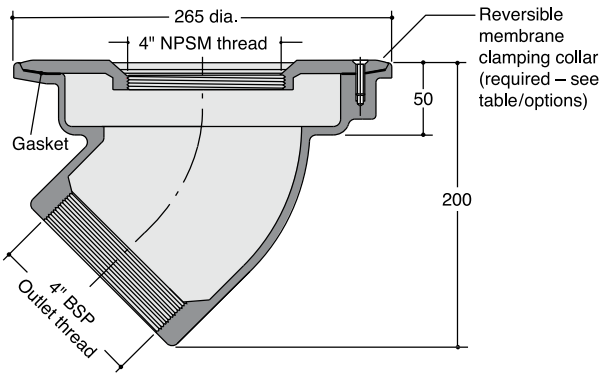
B504

45° Threaded outlet



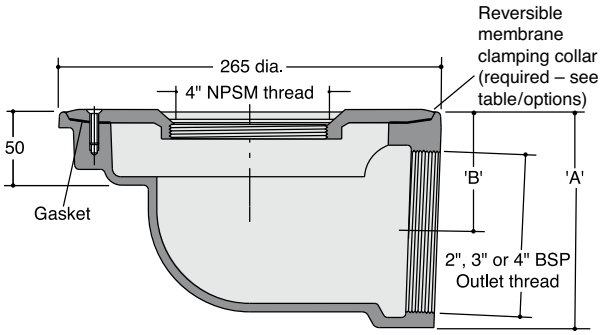
D604

45° Threaded outlet



D7 series

Horizontal threaded outlet – shallow sump



Spec. Code Body	Collar	Outlet size	A	B	Free area cm²	kg
B504	C.B	4" BSP	–	–	78	3.5
D604	C.D	4" BSP	–	–	78	10.7
D702	C.D	2" BSP	127	86	19	7.0
D703	C.D	3" BSP	127	73	44	6.5
D704	C.D	4" BSP	150	83	78	10.0

To specify/order

Specify *Body* and *Collar* Spec. Code from the table above; see page 5C2 for alternative membrane clamping collars.

Note: *Membrane clamping collar is optional for B504.*

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select from Section 5V.

Gratings – select from Section 5G.

Membrane clamping collar

Optional for B504 – see table for collar Spec. Code

Required for D series (membrane clamping collar also connects the grating/cover to the body) – see table for standard 4" throat collar Spec. Code or refer to page 5C2 for alternatives.

Height adjustability – distance between body flange and top of grating/cover;

B504

Maximum – height of grating/cover plus 5mm.
Minimum – height of grating/cover minus 15mm.

D series

Maximum – height of grating/cover plus 10mm.
Minimum – height of grating/cover minus 30mm.
Extra height can be obtained by means of an extension, see page 5X2.

Accessories – select from Section 5X.

Weepholes – see page 5C2 (D series only).
(to provide supplementary drainage at membrane level).

Linear drainage – select membrane clamping collar C.DL to accept Wade 4" channel outlet – see page 5C2 (D604 and D7 series only).

Vari-Level bodies

Cast iron, non-trapped (for use with bituminous membrane)

Connections

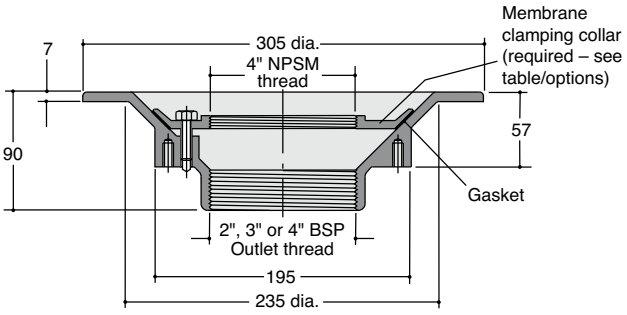
For use with gratings and access covers shown in sections 5G and 5V and accessories shown in section 5X.

Bodies with spigot outlet are for direct connection to BS 416 pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in section 10.

Typical installation – see page 5A1

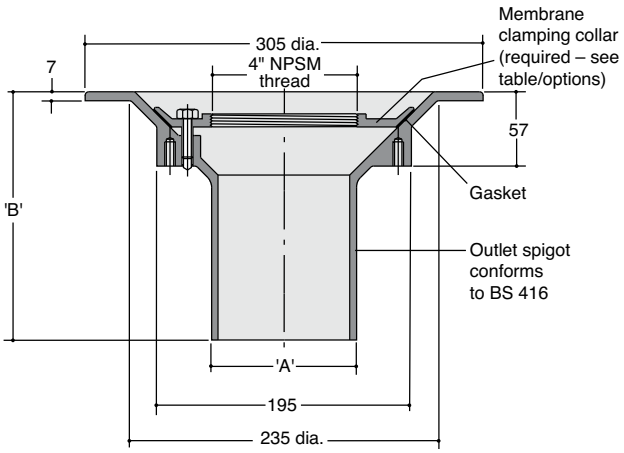
D10 series

Vertical threaded outlet



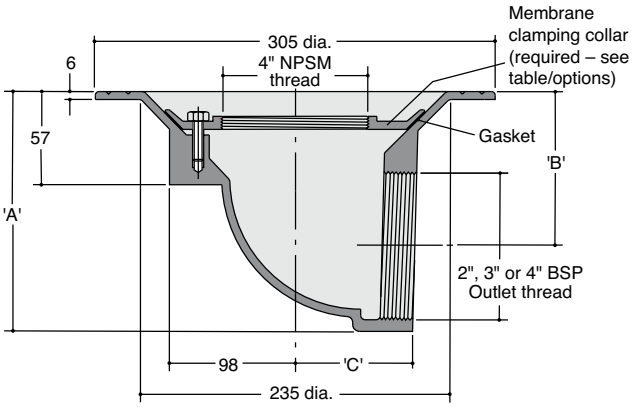
D11 series

BS 416 spigot outlet



D12 series

Horizontal threaded outlet



Spec. Code Body	Collar	Outlet size	A	B	C	Free area cm²	kg
D1002	C.D10	2" BSP	–	–	–	19	5.0
D1003	C.D10	3" BSP	–	–	–	44	4.3
D1004	C.D10	4" BSP	–	–	–	78	3.3
D1107	C.D10	50mm	61	238	–	19	4.2
D1108	C.D10	75mm	87	165	–	44	3.7
D1109	C.D10	100mm	112	190	–	78	8.7
D1207	C.D10	2" BSP	119	80.5	143	19	6.5
D1208	C.D10	3" BSP	119	67.5	143	44	6.7
D1209	C.D10	4" BSP	183	117	91	78	6.5

To specify/order

Specify *Body* and *Collar* Spec. Code from the table above; see page 5C2 for alternative membrane clamping collars.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select from Section 5V.

Gratings – select from Section 5G.

Membrane clamping collar

Required for D10-D12 series (membrane clamping collar also connects the grating/cover to the body) – see table for standard 4" throat collar Spec. Code or refer to page 5C2 for alternatives.

Height adjustability – distance between body flange and top of grating/cover (based on 20mm membrane);
Maximum – height of grating/cover minus zero.
Minimum – height of grating/cover minus 20mm.
Extra height can be obtained by means of an extension, see page 5X2.

Accessories – select from Section 5X.

Weepholes – see page 5C2.
(to provide supplementary drainage at membrane level).

Linear drainage – select membrane clamping collar C.D10LW to accept Wade 4" channel outlet – see page 5C2.

Notes

1. *WB3 and WB5 gullies shown in Section 7 and K2501A and K2591A gratings shown in Sections 5G ci and 6G ci are for use in asphalt/composition finished floors.*
2. *Versions of G series trapped gullies shown on pages 5B tci 1 and 2 are also available for use where asphalt is dressed below the finished floor.*

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Vari-Level bodies

Cast iron, non-trapped (for sub-surface drainage such as with cavity membranes, where membrane is below insulation)

Connections

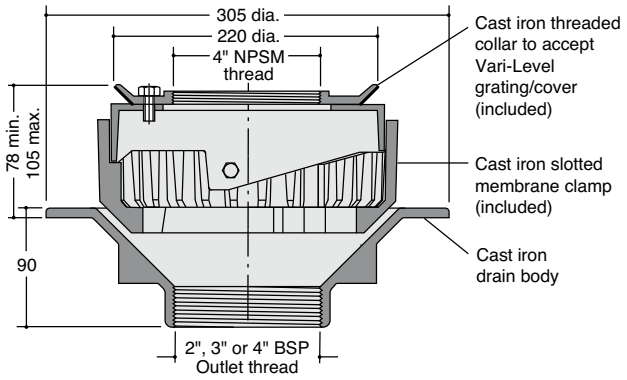
For use with gratings and access covers shown in sections 5G and 5V and accessories shown in section 5X.

Bodies with spigot outlet are for direct connection to BS 416 pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in section 10.

Typical installation – see wadeint.co.uk/installation

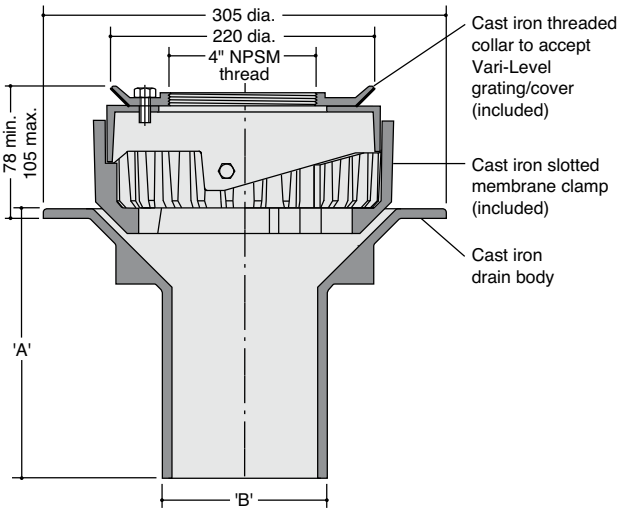
SD102, SD103, SD104

Threaded outlet



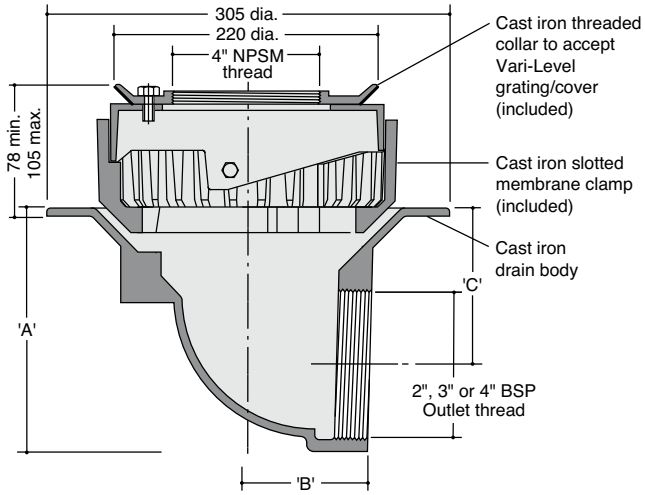
SD202, SD203, SD204

Spigot outlet



SD302, SD303, SD304

Horizontal outlet



Spec. Code	Outlet size	A	B	C	Free area cm²	kg
SD102	2"BSP	–	–	–	–	11.8
SD103	3"BSP	–	–	–	–	10.8
SD104	4"BSP	–	–	–	–	10.2
SD202	50mm	238	–	–	–	–
SD203	75mm	165	87	–	–	11.6
SD204	100mm	190	111	–	–	11.4
SD302	2"BSP	119	145	80	–	12.9
SD303	3"BSP	119	145	67	–	12.3
SD304	4"BSP	183	90	117	–	14.1

To specify/order

Specify Spec. Code from the table above.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select from Section 5V.
Gratings – select from Section 5G.
Height adjustability – distance between body flange and top of grating/cover (based on 20mm membrane);
Maximum – height of grating/cover minus 10mm.
Minimum – height of grating/cover minus 30mm.
Extra height can be obtained by means of an extension, see page 5X2.
Accessories – select from Section 5X.

Vari-Level bodies

Cast iron, non-trapped (for sub-surface drainage such as with cavity membranes, where membrane is above insulation)

Connections

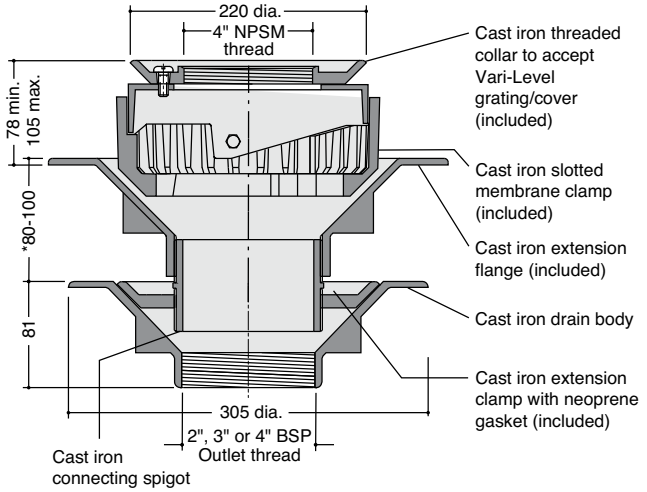
For use with gratings and access covers shown in sections 5G and 5V and accessories shown in section 5X.

Bodies with spigot outlet are for direct connection to BS 416 pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in section 10.

Typical installation – see wadeint.co.uk/installation

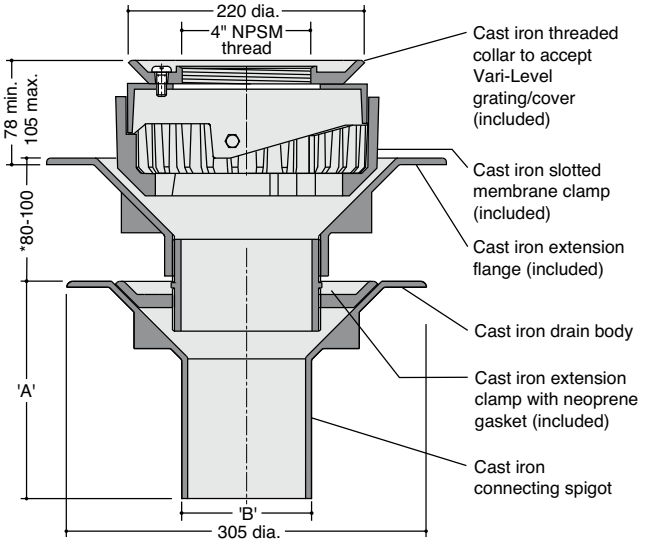
SD402, SD403, SD404

Threaded outlet



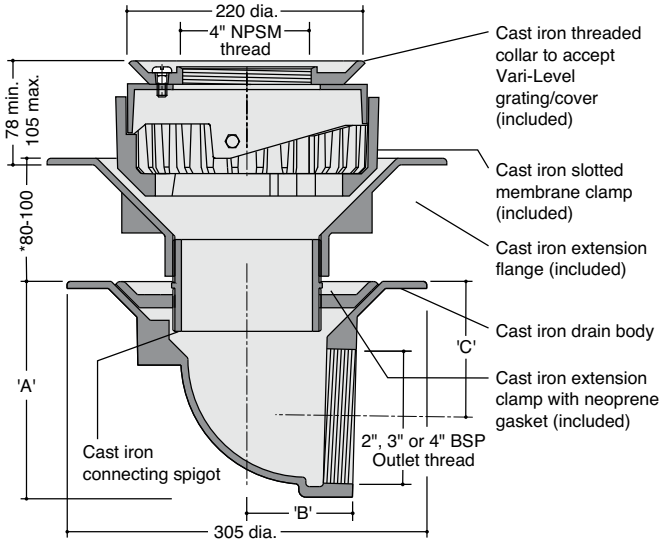
SD502, SD503, SD504

Spigot outlet



SD602, SD603, SD604

Horizontal outlet



Spec. Code	Outlet size	A	B	C	Free area cm²	kg
SD402	2"BSP	–	–	–	–	17.6
SD403	3"BSP	–	–	–	–	16.6
SD404	4"BSP	–	–	–	–	16.0
SD502	50mm	238	60	–	–	17.0
SD503	75mm	165	87	–	–	17.4
SD504	100mm	190	111	–	–	17.2
SD602	2"BSP	119	145	80	–	18.7
SD603	3"BSP	119	145	67	–	18.1
SD604	4"BSP	183	90	117	–	19.9

To specify/order

Specify Spec. Code from the table above.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select from Section 5V.

Gratings – select from Section 5G.

Height adjustability – distance between body flange and top of grating/cover (based on 20mm membrane);
Maximum – height of grating/cover minus 10mm.
Minimum – height of grating/cover minus 30mm.
Extra height can be obtained by means of an extension, see page 5X2.

Accessories – select from Section 5X.

Notes

** Items shown are for use with insulation thicknesses between 80mm and 100mm. Greater thicknesses can be accommodated by use of a longer connecting spigot. To specify, state the Spec. Code and insulation thickness.*

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Vari-Level bodies

Stainless steel grade 304, non-trapped

For use in high specification applications including food preparation, showers and areas where high corrosion resistance is a requirement. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request.

Connections

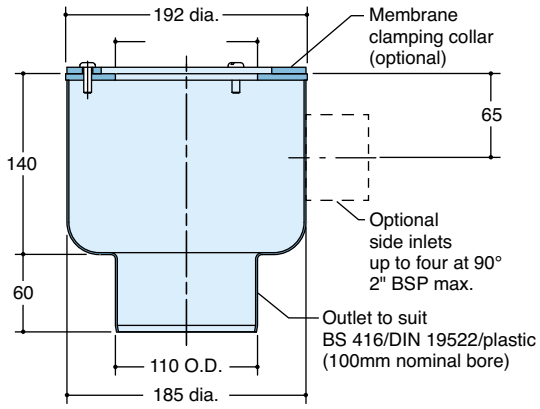
For use with gratings and access covers shown in sections 5G and 5V and accessories shown in section 5X.

Bodies are for direct connection to cast iron BS 416/DIN 19522 and PVC pipework; they can be connected to other pipework systems by means of adaptors shown in Section 10.

Typical installation – see page 5A1

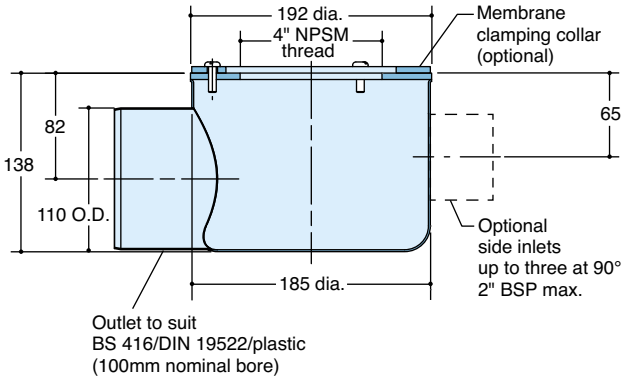
QB114

Vertical outlet (BS 416) – deep sump



QB214

Horizontal outlet (BS 416) – deep sump



Spec. Code	Outlet size mm	Free area cm^2	kg
QB114	100	78	2.3
QB214	100	78	2.1

To specify/order

Specify Spec. Codes from the table above. Add suffix 'C' if optional membrane clamping collar is required.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select from Section 5V.
Gratings – select from Section 5G.
Membrane clamping collar
Optional – add suffix 'C'
Height adjustability – distance between body flange and top of grating/cover;
Maximum – height of grating/cover minus 10mm.
Minimum – height of grating/cover minus 30mm.
Extra height can be obtained by means of an extension, *see page 5X2.*
Accessories – select from Section 5X.
Asphalt membrane flange – add suffix 'A'
(for use where asphalt is dressed below the finished floor).
Side inlets – select from Section 9.
Weepholes – add suffix 'W'.
(to provide supplementary drainage at membrane level)
Linear drainage – with inlet modified to accept Wade 4" channel outlet – add suffix 'LD'
Grade 316 – made of grade 316, add suffix 'M'.

Note

See section 4 for additional stainless steel gullies.

Vari-Level bodies

Cast iron, 'P' trapped – 50mm seal

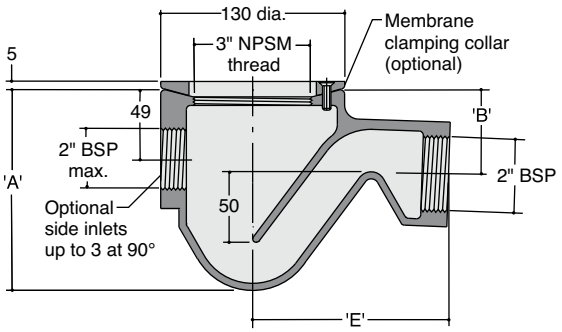
Connections

For use with gratings and access covers shown in sections 5G and 5V and accessories shown in section 5X.

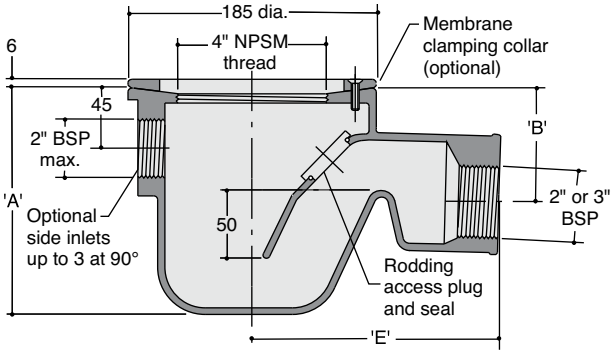
Bodies with spigot outlet are for direct connection to pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in section 10.

Typical installation – see page 5A1

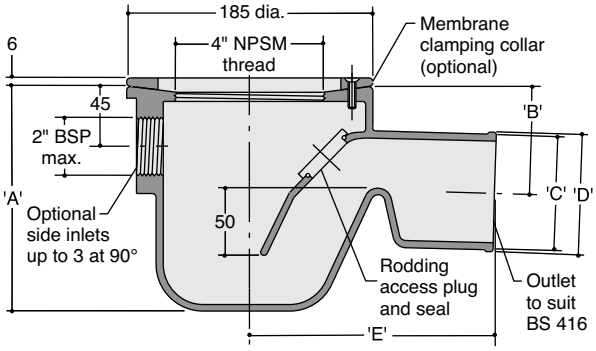
G102



G2 series



G3 series



Spec. Code	Outlet size	A	B	C	D	E	Free area cm²	kg
G102	2" BSP	142	60	–	–	140	19	5.5
G202	2" BSP	170	85	–	–	185	19	8.3
G203	3" BSP	205	95	–	–	190	44	9.9
G303	75mm	170	80	87	89	185	44	7.8
G304	100mm	205	92	112	no bead	190	78	9.6

To specify/order

Specify Spec. Code from the table above. Add suffix 'C' if optional membrane clamping collar is required.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select from Section 5V.
(with G102 select only 3" throat versions).
Gratings – select from Section 5G.
(with G102 select only 3" throat versions).
Membrane clamping collar
Optional – add suffix 'C'.
Height adjustability – distance between body flange and top of grating/cover;
Maximum – height of grating/cover minus 10mm.
Minimum – height of grating/cover minus 30mm.
Extra height can be obtained by means of an extension, see page 5X2. **Caution**: Extensions may be stacked to obtain extra height, but access to trap/plug will be restricted.
Accessories – select from Section 5X.
Asphalt membrane flange – add suffix 'A' – see page 5X3.
(for use where asphalt is dressed below the finished floor; not available with G102).
Side inlets – select from Section 9 (inlets are trapped).
Weepholes – add suffix 'W'.
(to provide supplementary drainage at membrane level).
Linear drainage – with inlet modified to accept Wade 4" channel outlet (not G102) – add suffix 'LD'.

Vari-Level bodies

Cast iron, 'S' trapped – 50mm seal

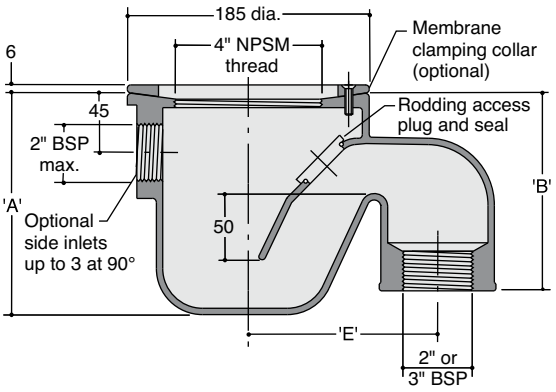
Connections

For use with gratings and access covers shown in sections 5G and 5V and accessories shown in section 5X.

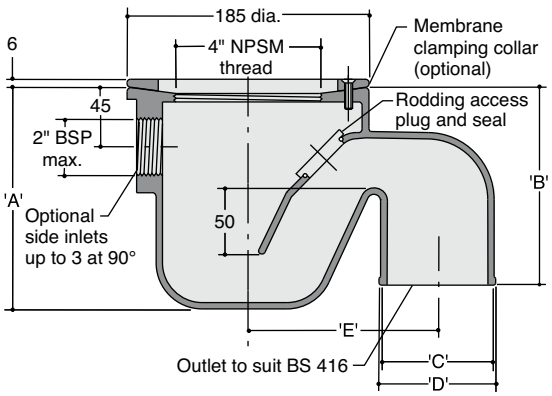
Bodies with spigot outlet are for direct connection to pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in section 10.

Typical installation – see page 5A1

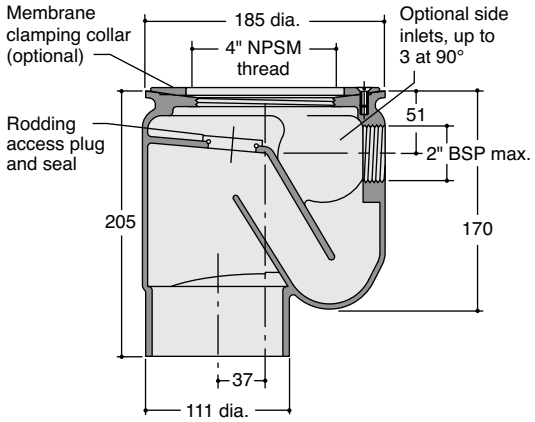
G5 series



G6 series



G1014



Spec. Code	Outlet size	A	B	C	D	E	Free area cm²	kg
G502	2" BSP	170	150	–	–	145	19	8.8
G503	3" BSP	205	165	–	–	156	44	10.6
G603	75mm	170	150	87	89	145	44	8.5
G604	100mm	205	165	112	no bead	155	78	11.0
G1014	100mm	–	–	–	–	–	64	9.0

To specify/order

Specify Spec. Code from the table above. Add suffix 'C' if optional membrane clamping collar is required.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select from Section 5V.
Gratings – select from Section 5G.
Membrane clamping collar
Optional – add suffix 'C'.
Height adjustability – distance between body flange and top of grating/cover;
Maximum – height of grating/cover minus 10mm.
Minimum – height of grating/cover minus 30mm.
Extra height can be obtained by means of an extension, see page 5X2. **Caution**: Extensions may be stacked to obtain extra height, but access to trap/plug will be restricted.
Accessories – select from Section 5X.
Asphalt membrane flange – add suffix 'A' – see page 5X3. (for use where asphalt is dressed below the finished floor).
Side inlets – select from Section 9 (inlets are trapped).
Weepholes – add suffix 'W'.
(to provide supplementary drainage at membrane level)
Linear drainage – with inlet modified to accept Wade 4" channel outlet (not G102) – add suffix 'LD'.

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Vari-Level bodies

Cast iron, 'P' trapped – 100mm seal

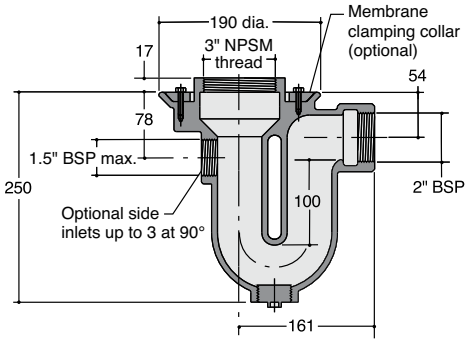
Connections

For use with gratings and access covers shown in sections 5G and 5V and accessories shown in section 5X.

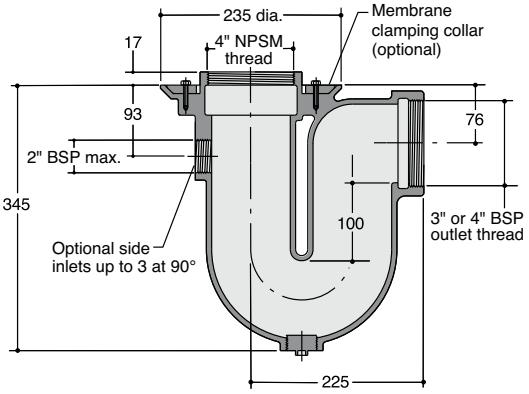
Bodies have BSP threaded outlet and are for connection to pipework by means of a threaded pipework. Details of adaptors for connecting to different types and sizes of pipework are shown in section 10.

Typical installation – see page 5A1

H102

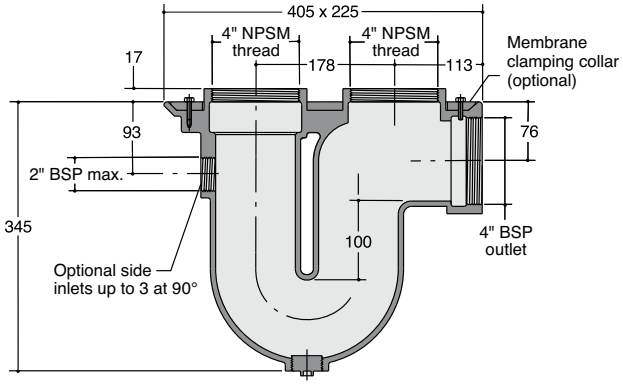


H2 series



J204

With rodding access



Notes

1. *The close proximity of grating and access cover prevents the adjacent use of the widest versions.*
2. *The inlet closest to the outlet is not trapped; select sealed access covers only and ensure that the access cover is installed closest to the outlet.*

Spec. Code Body	Collar	Outlet size	Free area cm²	kg
H102	C.H1	2" BSP	19	7.6
H203	C.H2	3" BSP	44	17.4
H204	C.H2	4" BSP	78	16.4
J204	C.J2	4" BSP	78	19.7

To specify/order

Specify *Body* Spec. Code from the table above and add *Collar* Spec. Code if optional membrane clamping collar is required.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select from Section 5V.
(with H102 select only 3" throat versions).
Gratings – select with 4" throat from Section 5G.
(with H102 select only 3" throat versions).
Membrane clamping collar
Optional – see table for collar Spec. Code.
Height adjustability – distance between body flange and top of grating/cover.
Maximum – height of grating/cover plus 10mm.
Minimum – height of grating/cover minus 10mm.
Extra height can be obtained by means of an extension, see page 5X2.
Accessories – select from Section 5X.
Side inlets – select from Section 9 (inlets are trapped).
Weepholes – add suffix 'W'.
(to provide supplementary drainage at membrane level).

Vari-Level body assembly

Cast iron body with plastic bottle trap – 50mm seal (with full bore access to pipework) Maximum flow rate of 1 l/s

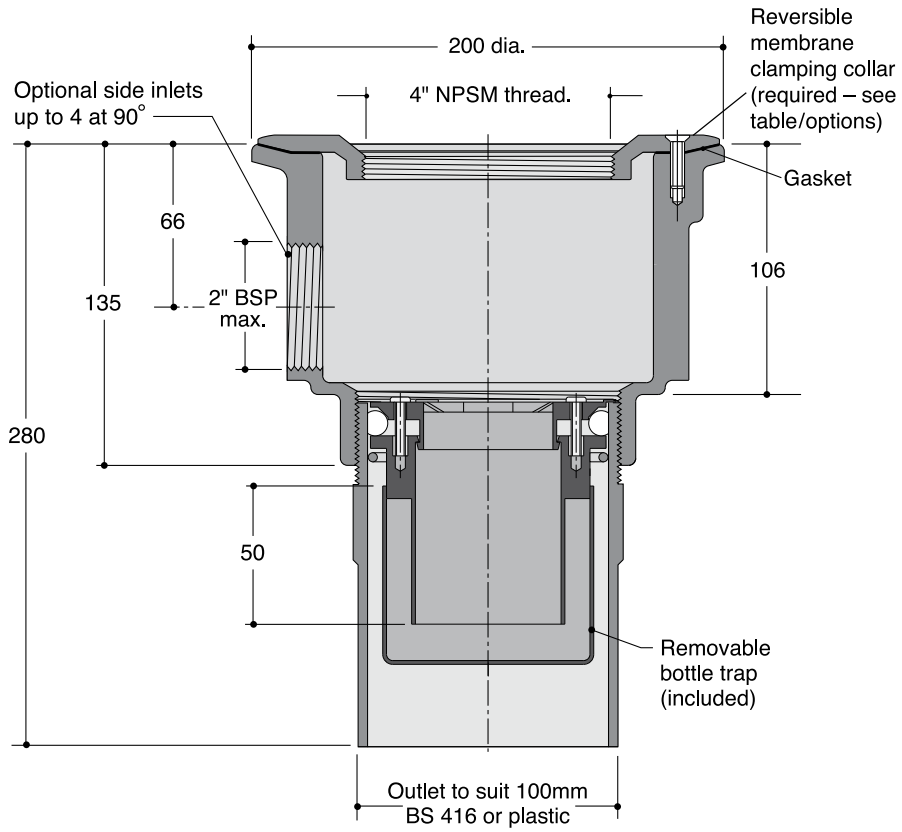
Connections

For use with gratings and access covers shown in sections 5G and 5V (4" throat versions only) and accessories shown in section 5X.

The body has a spigot outlet for direct connection to pipework. Details of adaptors for connecting to other pipework are shown in section 10.

Typical installation – see page 5A2

GC144



Rodding access to pipework is via a removable, plastic bottle trap.

Spec. Code Body	Collar	Outlet size	Pipework system	Free area cm²	kg
GC144	C.C	100	BS 416/DIN19522 (100mm) /Plastic (110mm)	20	11.1

To specify/order

Specify *Body* and *Collar* Spec. Code from the table above; see page 5C2 for alternative membrane clamping collars.

For information on flow rates please contact our Technical Services Department.

Notes

1. *This body assembly is designed for low volume drainage applications (max. flow rate of 1 l/s).*
2. *Frequent cleaning of the bottle trap will be necessary in applications where very high amounts of hair and other waste materials are present.*

Options

Access covers – select with 4" throat from Section 5V.
Gratings – select with 4" throat from Section 5G.
Membrane clamping collar
Required (membrane clamping collar also connects the grating/cover to the body) – see table for standard 4" throat collar Spec. Code or refer to page 5C2 for alternatives.
Height adjustability – distance between body flange and top of grating/cover;
Maximum – height of grating/cover plus 15mm.
Minimum – height of grating/cover minus 30mm.
Extra height can be obtained by means of an extension, see page 5X2. **Caution**: Extensions may be stacked to obtain extra height, but access to trap will be restricted.
Accessories – select from Section 5X.
Side inlets – select from Section 9 (inlets are trapped).
Weepholes – see page 5C2.
(to provide supplementary drainage at membrane level).

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Vari-Level body assemblies

Cast iron body with stainless steel bell trap – 50mm seal (with full bore access to pipework)

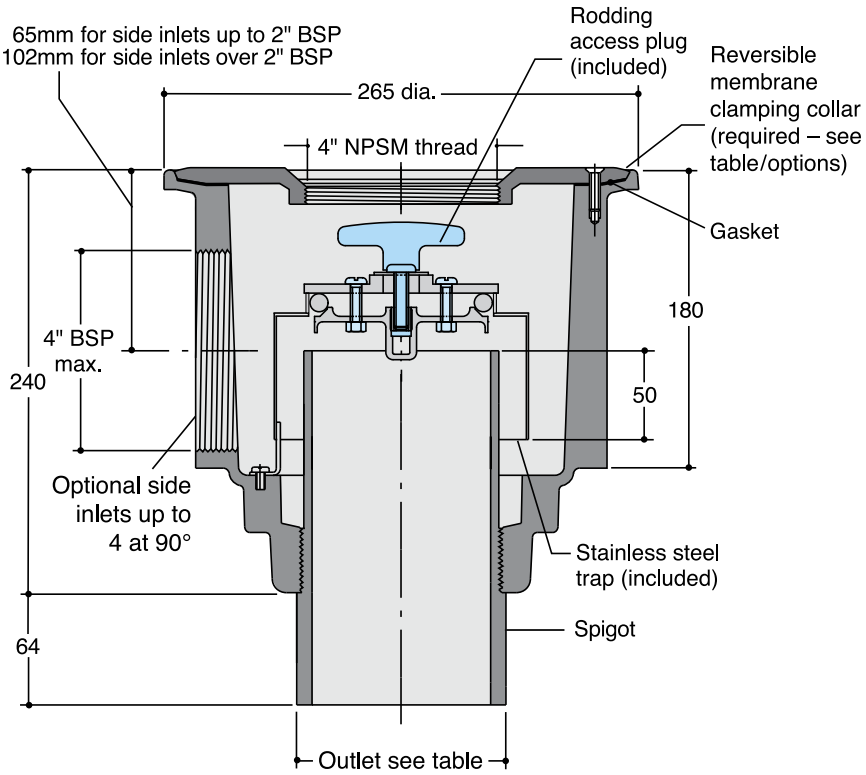
Connections

For use with gratings and access covers shown in sections 5G and 5V (4" throat versions only) and accessories shown in section 5X.

Bodies have a spigot outlet for direct connection to pipework. Details of adaptors for connecting to other pipework are shown in section 10.

Typical installation – see page 5A2

GD series



Rodding access to pipework is via a removable, expanding plug which is fitted to the secured stainless steel trap.

Spec. Code Body	Collar	Outlet size	Pipework system	Free area cm²	kg
GD144	C.D	100	BS 416/DIN 19522 (100mm)/Plastic (110mm)	78	17.3
GD164	C.D	100	BS 437	78	17.3

To specify/order

Specify *Body* and *Collar* Spec. Code from the table above; see page 5C2 for alternative membrane clamping collars.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select with 4" throat from Section 5V.
Gratings – select with 4" throat from Section 5G.
Membrane clamping collar
Required (membrane clamping collar also connects the grating/cover to the body) – see table for standard 4" throat collar Spec. Code or refer to page 5C2 for alternatives.
Height adjustability – distance between body flange and top of grating/cover;
Maximum – height of grating/cover plus 10mm.
Minimum – height of grating/cover minus 30mm (or minus 8mm if UP701 filter bucket is fitted to grating).
Extra height can be obtained by means of an extension, see page 5X2. **Caution**: Extensions may be stacked to obtain extra height, but access to trap/plug will be restricted.
Accessories – select from Section 5X.
Side inlets – select from Section 9.
(up to 2" are completely above the water level over 2" are partially below).
Weepholes – see page 5C2.
(to provide supplementary drainage at membrane level).

Vari-Level body assemblies

ABS plastic, trapped – 50mm seal comprising body and membrane clamping collar

Connections

For use with gratings and access covers shown in sections 5G and 5V (4" throat versions only) and accessories shown in section 5X.

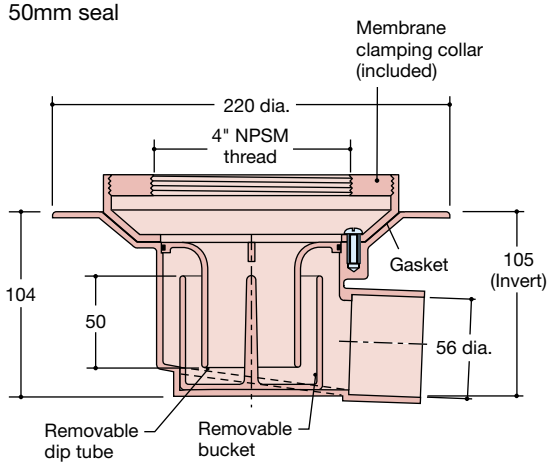
GP312 body has a 50mm socket outlet for solvent-weld connection to 50mm plastic pipework.

GP614 body has a 110mm spigot outlet for solvent-weld or ring-seal connection to 110mm plastic pipework and is supplied with a solvent-weld reducer for optional connection to 50mm plastic pipework.

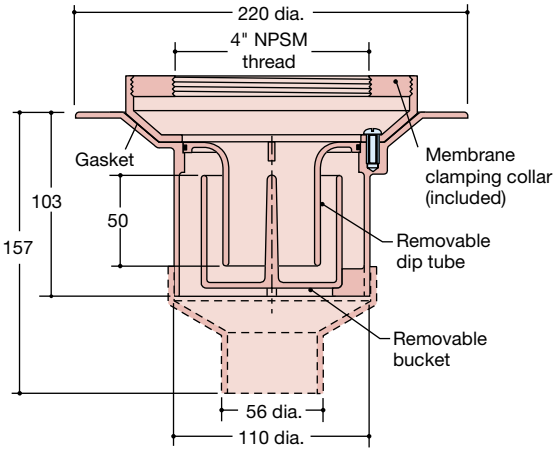
GP1104 body has a 110mm spigot outlet for solvent-weld or ring-seal connection to 110mm plastic pipework.

Typical installation – see page 5A2

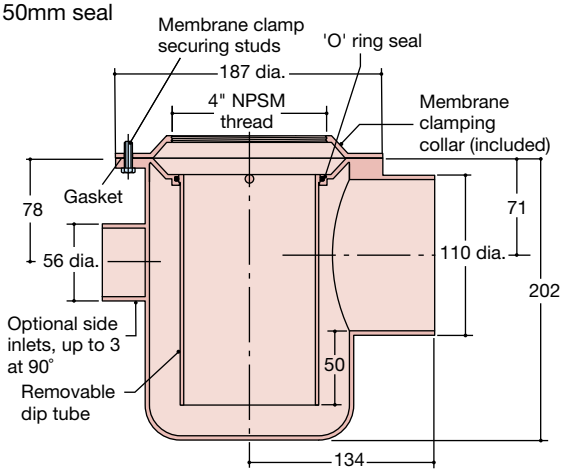
GP312
50mm seal



GP614
50mm seal



GP1104
50mm seal



Spec. Code	Outlet size mm	Pipework system	Free area cm²	kg
GP312	50	Plastic	14	0.6
GP614	110/50	Plastic	14	0.6
GP1104	110	BS 416/Plastic	67	0.6

To specify/order
Select Spec. Code from the table above (membrane clamping collar is included).

For information on flow rates please contact our Technical Services Department.

Notes
1. *The membrane clamping collar serves a dual purpose by also connecting the grating/cover to the body; a version with 4" throat is supplied to suit.*
2. *A gasket is supplied to ensure a watertight joint between membrane (or body if no membrane is being used) and membrane clamping collar.*
3. *GP312/GP614 are designed for low volume drainage applications (max. flow rate of 1 l/s). Frequent cleaning will be necessary in applications where very high amounts of hair and other waste materials are present.*
4. *Maximum continuous operating temperature of 75°C.*

Options

Access covers – select with 4" throat from Section 5V.
Gratings – select with 4" throat from Section 5G.
Height adjustability – distance between body flange and top of grating/cover;
GP312/GP614 series
Maximum – height of grating/cover plus 10mm.
Minimum – height of grating/cover minus 5mm.
GP1104 series
Maximum – height of grating/cover plus 10mm.
Minimum – height of grating/cover minus zero.
Extra height can be obtained by means of a UP104 extension see page 5X2. **Caution**: Extensions may be stacked to obtain extra height, but access to trap dip tube/bucket will be restricted.
Cast iron extensions are not suitable for use with GP Series bodies.
Accessories – select from Section 5X.
Side inlets (untrapped) – (GP1104 only).
3 solvent-weld spigots to connect to 50mm plastic pipework are enabled by knockouts. ***Note:*** *Side inlets are not trapped in the GP1104.*
Weepholes – add suffix 'W'.

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Vari-Level body assemblies

Stainless steel grade 304, trapped – 60mm seal

For use in high specification applications including food preparation, showers and areas where high corrosion resistance is a requirement. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request.

Connections

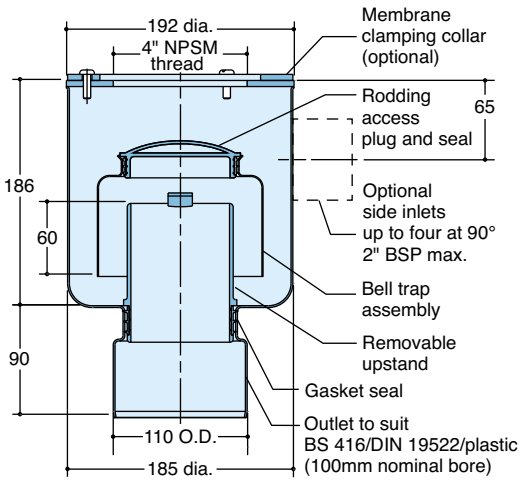
For use with gratings and access covers shown in sections 5G and 5V (4" throat versions only) and accessories shown in section 5X.

Bodies are for direct connection to cast iron BS 416/DIN 19522 and PVC pipework; they can be connected to other pipework systems by means of adaptors shown in Section 10.

Typical installation – see page 5A2

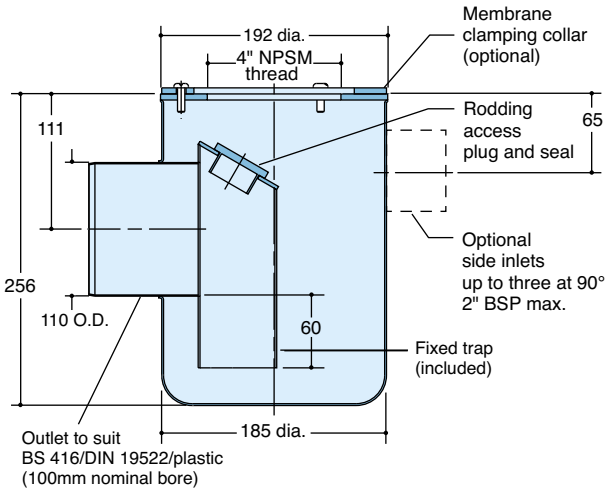
QG114

Vertical outlet (BS 416) – bell trapped



QG214

Horizontal outlet (BS 416) – 'P' trapped



Spec. Code	Outlet size mm	Free area cm²	Trap type	kg
QG114	100	51	Bell	2.8
QG214	100	60	P	3.5

To specify/order

Specify Spec. Codes from the table above. Add suffix 'C' if optional membrane clamping collar is required.

For information on flow rates please contact our Technical Services Department.

Options

Access covers – select with 4" throat from Section 5V.
Gratings – select with 4" throat from Section 5G.
Membrane clamping collar
Optional – add suffix 'C'
Height adjustability – distance between body flange and top of grating/cover;
Maximum – height of grating/cover minus 10mm.
Minimum – height of grating/cover minus 30mm.
Extra height can be obtained by means of an extension, *see page 5X2.* **Caution**: Extensions may be stacked to obtain extra height, but access to trap/plug will be restricted.
Accessories – select from Section 5X.
Asphalt membrane flange – add suffix 'A'
(for use where asphalt is dressed below the finished floor).
Side inlets – select from Section 9 (inlets are trapped).
Weepholes – add suffix 'W'.
(to provide supplementary drainage at membrane level)
Linear drainage – with inlet modified to accept Wade 4" channel outlet – add suffix 'LD'.
Grade 316 – made of grade 316 stainless steel, add suffix 'M'.

Note

See section 4 for additional stainless steel gullies.

Vari-Level membrane clamping collars

These typical installation drawings serve to illustrate the general principle of how such assemblies are used. These are not intended to imply that they must be used in this way. There are many variations of floor build up and it is for the end user to determine suitability of a drain assembly in a particular application.

Membrane clamping collars are components used to secure a damp proof membrane to a gully body. Wade manufactures a range of Vari-Level gully bodies, and each has a membrane clamping collar to suit.

Two different types of membrane clamping collar are available:

(i) Membrane clamping collar (figures 1 and 2)
Vari-Level gully bodies without a threaded inlet require a membrane clamping collar which serves the dual purpose of clamping the membrane and connecting the grating/cover to the body. The appropriate membrane clamping collar must be specified to go with the required gully body and grating/cover. Unless specified otherwise, a gasket is supplied to ensure a watertight joint between membrane (or body if no membrane is being used) and membrane clamping collar.

(ii) Optional membrane clamping collar (figure 3)
For Vari-Level gully bodies with a threaded inlet for connecting the grating/cover, the membrane clamping collar is an optional extra, to be specified if the application includes a damp-proof membrane.

To specify

Page 5C2 lists membrane clamping collar Spec. Codes by gully body series and provides details of collars suitable for use with both 4" and 3" throat gratings/covers. Select the appropriate membrane clamping collar from the table to fit the gully body and grating/cover assembly required.

Options

Membrane clamping collars are machined to produce variations to suit particular installations such as:

W– with weepholes to provide supplementary drainage at membrane level

L – with throat machined to suit a standard Wade 4" channel outlet

Note

Some membrane clamping collars are reversible (figure 1), thereby increasing the height adjustability of grating/cover above the body. Height adjustability dimensions shown on gully body pages in section 5B allow for the full range of adjustability using reversible collars either way up as necessary.

All membrane clamping collars include stainless steel fasteners to connect to the gully body.

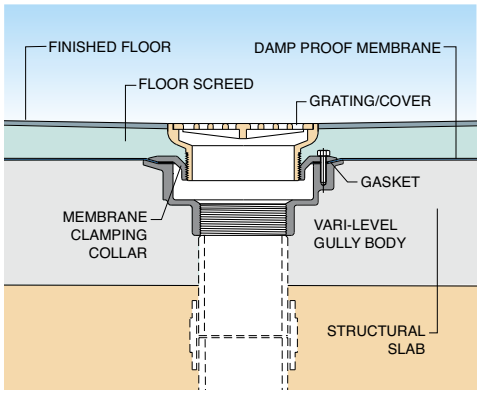


Figure 1: **C** series body with **C.C** membrane clamping collar

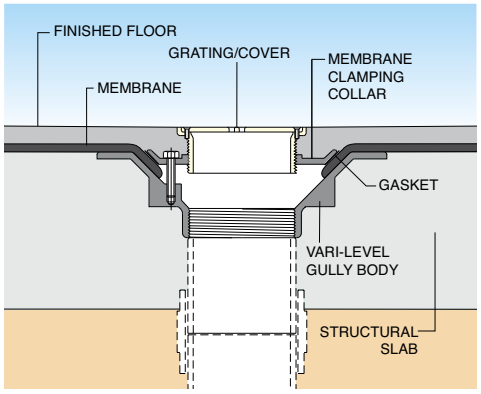


Figure 2: **D10** series body with **C.D10** membrane clamping collar

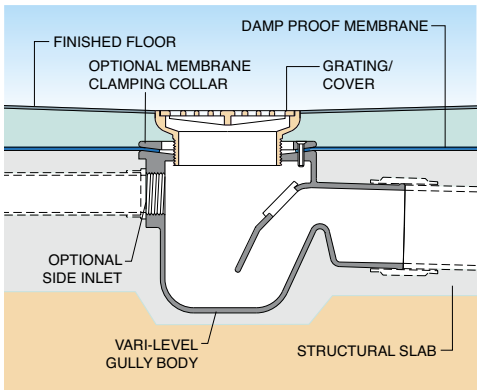


Figure 3: **G304C** body and optional, standard 4" membrane clamping collar

Vari-Level membrane clamping collars

Application chart

Membrane clamping collar Spec. Codes

Body series	For use with 4" throat Vari-Level grating/cover	For use with 3" throat Vari-Level grating/cover
B504	**C.B** (optional)	**C.B** (optional) and **U1101***
C series	**C.C** – standard 4" throat version (gasketed) **C.CW** – includes weepholes (not sealed) **C.CL** – accepts Wade 114 dia. channel outlet (not sealed)	**C.C3** – standard 3" throat version (gasketed) **C.CW3** – includes weepholes, 3" throat (not sealed)
D2-D7 series	**C.D** – standard 4" throat version (gasketed) **C.DW** – includes weepholes (not sealed) **C.DL** – accepts Wade 114 dia. channel outlet (not sealed)	**C.D** and **U1101*** – standard version (gasketed) **C.DW** and **U1101*** – includes weepholes (not sealed)
D10-D12 series	**C.D10** – standard 4" throat version (gasketed) **C.D10W** – includes weepholes (not sealed) **C.D10LW** – accepts Wade 114 dia. channel outlet (not sealed)	**C.D10** and **U1101*** – standard version (gasketed) **C.D10W** and **U1101*** – includes weepholes (not sealed)
G1 series	add suffix '**C**' to body Spec. Code (optional), and U201†	Add suffix '**C**' to body Spec. Code (optional)
G2-G10 series	add suffix '**C**' to body Spec. Code (optional)	*Not applicable* *(3" throat gratings/covers are not recommended for use with this body series)*
GC144	**C.C** – standard 4" throat version (gasketed) **C.CW** – includes weepholes (not sealed)	*Not applicable* *(3" throat gratings/covers cannot be used with this body series)*
GD series	**C.D** – standard 4" throat version (gasketed) **C.DW** – includes weepholes (not sealed)	*Not applicable* *(3" throat gratings/covers cannot be used with this body series)*
GP series	*This series is supplied as an assembly which includes a body, membrane clamping collar and gasket*	*Not applicable* *(3" throat gratings/covers cannot be used with this body series)*
H102	**C.H1** (optional) and **U201**†	**C.H1** (optional)
H2 series	**C.H2** (optional)	**C.H2** (optional) and **U1101***
J204	**C.J2** (optional)	**C.J2** (optional) and **U1101***
QB series	Add suffix '**C**' to body Spec. Code (optional)	Add suffix '**C**' to body Spec. Code and **U1101***
QG series	Add suffix '**C**' to body Spec. Code (optional)	*Not applicable* *(3" throat gratings/covers are not recommended for use with this body series)*

***U1101** reducing bush enables 3" throat gratings/covers to be used in Vari-Level bodies/adaptors with 4" inlet (see page 5X2).*

*†**U201** 4" NPSM to 3" NPSM extension is required if a 4" throat Vari-Level grating/cover is used with a G1 or H1 series body (see page 5X2).*

Note
Versions with weepholes (W) or for use with Wade channel (L) are not supplied with a gasket.

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Vari-Level gratings

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories in section 5X

Wade offers a comprehensive range of high quality gratings which complement floor finishes.

Vari-Level threaded gratings are height adjustable with a fine thread to enable accurate installation at floor level.

Please refer to the product information for the selected body to ensure compatibility and to obtain height adjustability dimensions.

Vari-Level gratings may also be connected to pipework and proprietary gullies by means of adaptors shown in Section 5X.

This section of the catalogue comprises separate pages for different materials as follows:

5G ci **Cast iron** – for use in unfinished floors such as in plant rooms and car parks; also for restoration or refurbishment projects to match period architecture.

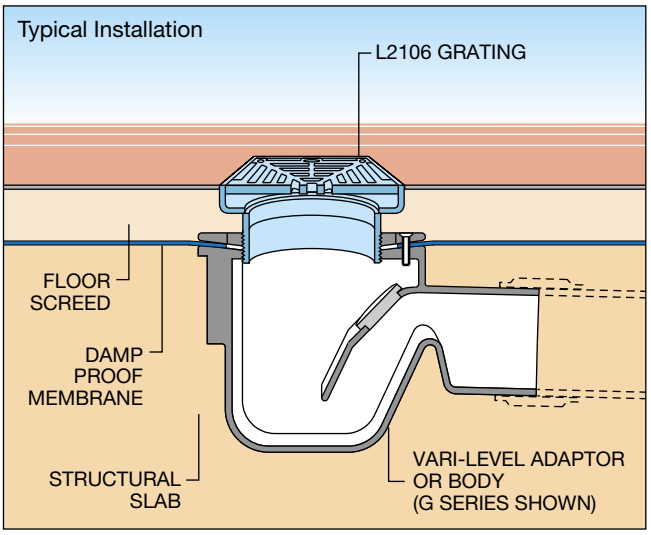
5G nb **Nickel bronze** – for use in pedestrian areas; versions are available to suit a variety of floor finishes including ceramic or vinyl tiles, marble, paviors, terrazzo, resin, carpet or wood; K23 series is for use with flexible sheet flooring such as vinyl; K2401 is for use with trowel applied composition flooring.

5G ss **Stainless steel** – for use in high specification applications including food preparation, prison cells, showers and areas where high corrosion resistance is a requirement.

Note
Direct connection gratings, shown in Section 6G, are for use where a gully body is not required; they look identical to Vari-Level gratings when installed, but are machined to enable direct connection to pipework using proprietary couplings.

L2106
Stainless steel grating





Vari-Level gratings

Cast iron – BS EN 1561

Sherardized, matt finish

For use in **unfinished** floors such as in service and parking areas and plant rooms; also for restoration or refurbishment projects to match period architecture.

Connections

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories shown in section 5X.

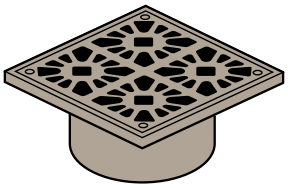
K2103 CI
Standard circular grating



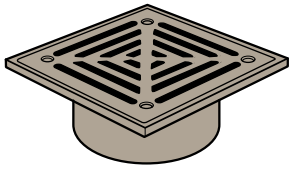
K2501
Light vehicular traffic areas



L2501 CI
Decorative floral pattern



L2601
Light vehicular traffic areas



Spec. Code	Overall dia./width mm	Overall length mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
K2103 CI	155	–	54	4	58	7	K3	1.7
K2501	176	–	60	4	85	11	L15	1.8
L2501 CI	150	150	57	4	60	14	K3	2.3
L2601	150	150	57	4	55	7	L15	1.7

For information on flow rates please contact our Technical Services Department.

Options

Suffix

A Asphalt membrane clamp (stainless steel) (for use in asphalt/composition finished floors – K2501 only).

H Fitted with Pin Torx screws for security applications.

See section 5X for a range of accessories including filter buckets, removable bottle trap and height extensions.

April 2018 **Tel**: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

Vari-Level gratings

Nickel bronze – BS EN 1982

Satin finish

Durable, superbly finished and particularly suited to areas with high volume of pedestrian traffic (K23 and K34 series have sherardized cast iron frame).

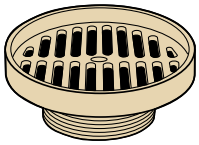
Connections

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories shown in section 5X.

K21 series
For use with tiled or epoxy resin floors



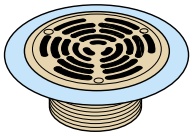
K2201
Indirect waste connector (grating not secured)



K23 series
For use with flexible sheet flooring such as vinyl



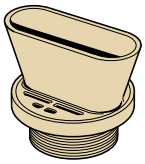
K2401
For use with trowel applied composition flooring. 4mm flange depth



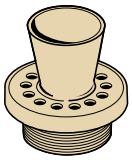
K3101
Reduces risk of blockages in channels. Removable dome protrudes 30mm



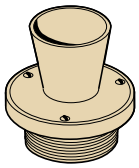
K2601
To take multiple indirect waste pipes; with peripheral grating (funnel not secured)



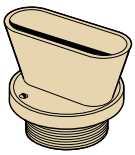
K2701
To take single indirect waste pipe; with peripheral grating (funnel not secured)



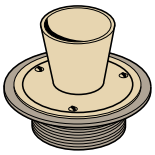
K3301
To take single indirect waste pipe; with peripheral cover and vermin guard



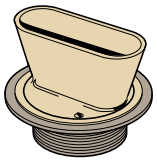
K3302
To take multiple indirect waste pipes; with peripheral cover and vermin guard



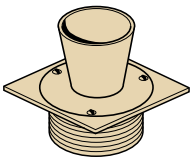
K3401
For use with flexible sheet flooring such as vinyl; with peripheral cover and vermin guard



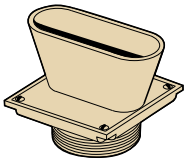
K3402
For use with flexible sheet flooring such as vinyl; with peripheral cover and vermin guard



L2801
To take single indirect waste pipe; with peripheral cover and vermin guard



L2803
To take multiple indirect waste pipes; with peripheral cover and vermin guard



Spec. Code	Overall size mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
K2101	135	48	4	40	6	K3	1.0
K2102	135	55	3	40	6	K3	1.0
K2103	152	53	4	58	6	L15	1.5
K2201	176	72	4	73	7	L15	2.5
K2301	142	54	3	32	7	L15	1.2
K2302	176	60	4	48	6	L15	2.0
K2303	250	58	4	106	6	L15	4.1
K2401	152	53	4	58	6	L15	1.9
K3101	135	78 inc. dome	4	45	16	L15	1.0

Spec. Code	Overall size at FFL mm	Overall size above FFL mm	Depth below FFL mm	Free area cm²	kg
K2601	176 dia	222L x 82W x 96H	72	42	4.1
K2701	176 dia	108 dia x 96H	72	48	3.2
K3301	150 dia	101 dia x 101H	53	23	2.7
K3302	150 dia	222L x 82W x 96H	53	42	3.7
K3401	176 dia	101 dia x 101H	60	12	3.3
K3402	176 dia	222L x 82W x 96H	60	21	4.2
L2801	150 sq	101 dia x 101H	48	12	3.4
L2803	150 sq	222L x 82W x 96H	57	21	4.4

For information on flow rates please contact our Technical Services Department.

Options

H Fitted with Pin Torx screws for security applications (not K2201, K2601 or K2701).

I Tapped to provide a direct connection for waste pipes – specify size BSP, 1" or 2" (applies to K2103, K2401; K2101, K2102 and K2303 may be tapped 1" only; K2301 may be tapped 1" or 1.5"; K2302 may be tapped 2" or 3"; K2103 may also be tapped 3").

See section 5X for a range of accessories including filter buckets, removable bottle trap and height extensions.

Vari-Level gratings

Nickel bronze – BS EN 1982

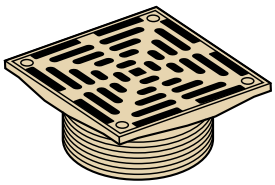
Satin finish

Durable, superbly finished and particularly suited to areas with high volume of pedestrian traffic.

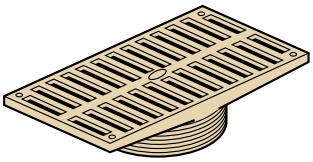
Connections

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories shown in section 5X.

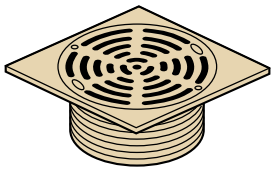
L21 series
For use with tiled or epoxy resin floors



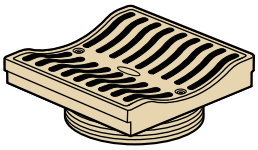
L22 series
Rectangular



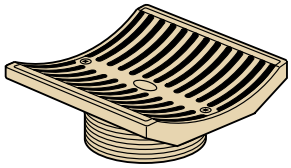
L2301
Square framed



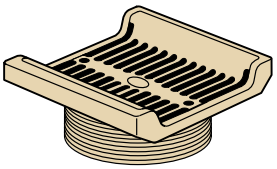
L2402
Contoured to match Johnson 4200 ceramic tile



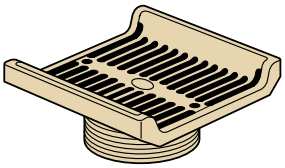
L2404
Contoured to match Pilkington/ Wooliscroft 2302 / Gail 4420 ceramic tile



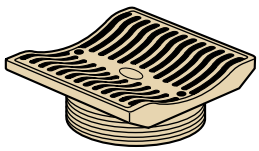
L2406
Contoured to match Platt 2300 ceramic tile



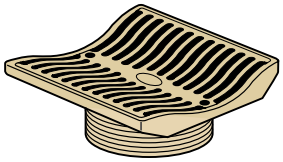
L2407
Contoured to match Ruabon ceramic tile



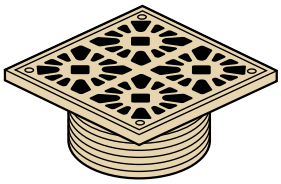
L2408
Contoured to match Keramic ceramic tile



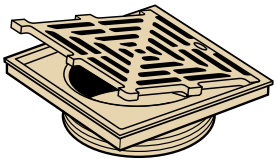
L2409
Contoured to match Strata Buchtal 4420/54420 ceramic tile



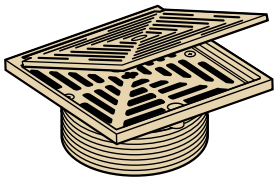
L2501
Decorative floral pattern



L3001
Hinged



L5301/L5401
Grating concealed by solid hinged cover. L5401 version has sealed cover



Spec. Code	Overall width mm	Overall length mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
L2101	101	101	45	3	30	6	K3	0.9
L2102	135	135	53	4	60	6	L15	1.7
L2103	150	150	57	4	82	8	L15	1.9
L2104	201	201	70	4	156	8	L15	3.9
L2201	102	204	57	3	66	8	L15	1.8
L2202	125	430	70	4	155	6	L15	5.6
L2301	150	150	48	4	40	6	L15	1.3
L2402	115	115	58	3	32	6	L15	1.5
L2404	150	150	70	3	90	6	L15	1.9
L2406	150	150	75	4	90	6	L15	2.0
L2407	150	150	73	3	92	6	L15	2.0
L2408	150	150	71	4	81	6	L15	2.3
L2409	150	150	70	3	90	6	L15	2.0
L2501	150	150	57	4	60	13	L15	2.1
L3001	161	161	60	4	92	7	L15	2.3
L5301	150	150	55	4	44	4	L15	2.6
L5401	150	150	55	4	44	4	L15	2.6

Options

H Fitted with Pin Torx screws for security applications (not L3001).

I Tapped to provide a direct connection for waste pipes (L2301 only – 1" BSP size available).

See section 5X for a range of accessories including filter buckets, removable bottle trap and height extensions.

April 2018

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Vari-Level gratings

Stainless steel – Grade 304

Satin finish

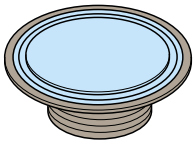
For use in high specification applications including food preparation, showers and areas where high corrosion resistance is a requirement. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request (K18, K23 and K34 series have sherardized cast iron frame).

Connections

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories shown in section 5X.

K1807

With peripheral slot, for use with flexible sheet flooring such as vinyl



K2107

For use with tiled or epoxy resin floors



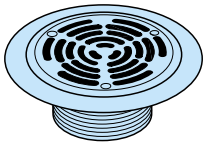
K2307

For use with flexible sheet flooring such as vinyl



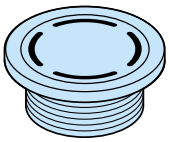
K2407

For use with trowel applied composition flooring. 6mm flange depth



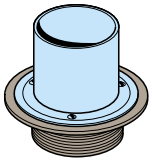
K2801

Flanged with peripheral slot. Self securing (see Note 1)



K3407

Condensate funnel (polished) with vermin guard, for use with flexible sheet flooring such as vinyl



Spec. Code	Overall size mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
K1807	176	60	4	26	6	K3	2.0
K2107	150	53	4	58	6	L15	1.0
K2307	176	60	4	48	6	L15	2.0
K2407	150	53	4	58	6	L15	2.5
K2801	140	50	4	13	7	L15	1.4

Spec. Code	Overall size at FFL mm	Overall size above FFL mm	Depth below FFL mm	Throat dia. inches	Free area cm²	kg
K3407	176 dia	101 dia x 100H	60	4	35	2.3

Options

H Fitted with Pin Torx* screws for security applications (except K1807 and K2801).
**Pin Hex screws if grade 316 specified.*

I Tapped to provide a direct connection for waste pipes – specify size BSP, 1" or 2" (applies to K2107, K2307 and K2407 only).

M Made of grade 316 stainless steel (not K1807; K23 and K34 series have sherardized cast iron frame).

P Polished (K3407 is polished as standard).

See section 5X for a range of accessories including filter buckets, removable bottle trap and height extensions.

Note
K2801 cannot be used with GC, GD or GP series bodies.

Vari-Level gratings

Stainless steel – Grade 304

Satin finish

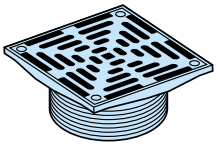
For use in high specification applications including showers and areas where high corrosion resistance is a requirement. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request.

Connections

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories shown in section 5X.

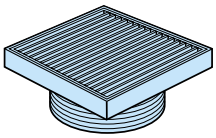
L21 series

For use with tiled or epoxy resin floors



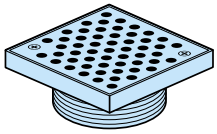
L29 series

Streamline heel-proof reverse wedge profile grating is secured with Pin Hex screws



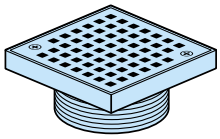
L31 series

Square perforated grating (circular apertures)



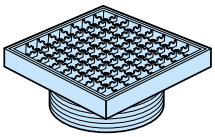
L32 series

Square perforated grating (square apertures)



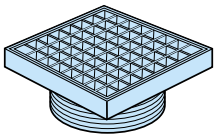
L33 series

Anti-slip mesh (grating not secured)



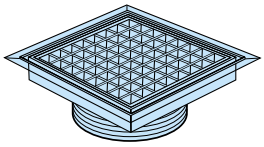
L34 series

Plain mesh (grating not secured)



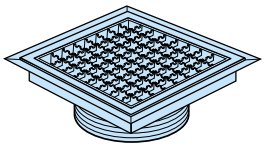
L35 series

Plain mesh (grating not secured), for use with flexible sheet flooring such as vinyl



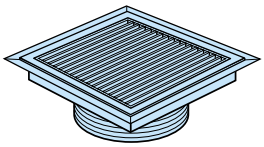
L36 series

Anti-slip mesh (grating not secured), for use with flexible sheet flooring such as vinyl



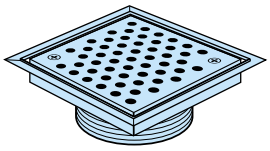
L37 series

For use with flexible sheet flooring such as vinyl. Streamline heel-proof reverse wedge profile grating is secured with pin hex screws



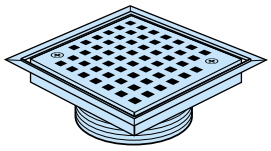
L38 series

Perforated grating (circular apertures) for use with flexible sheet flooring such as vinyl



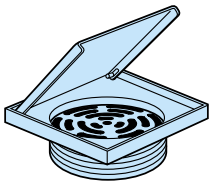
L39 series

Perforated grating (square apertures) for use with flexible sheet flooring such as vinyl



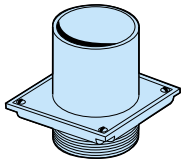
L53 series

Hinged cover with a circular non-secured grating inside. To open press centre of side furthest from Wade logo



L2701

Condensate funnel with vermin guard (polished)



Spec. Code	Overall width mm	Overall length mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
L2105	101	101	43	3	30	5	K3	0.7
L2106	147	147	57	4	82	8	L15	1.4
L2901	150	150	75	4	105	5	L15	1.6
L2902	200	200	75	4	216	5	L15	2.5
L3101	150	150	75	4	34	8	K3	1.6
L3102	200	200	75	4	75	8	K3	2.5
L3201	150	150	75	4	38	8	K3	1.6
L3202	200	200	75	4	74	8	K3	2.5
L3301	150	150	75	4	150	23	L15	1.8
L3302	200	200	75	4	290	23	L15	2.8
L3401	150	150	75	4	150	23	L15	1.8
L3402	200	200	75	4	290	23	L15	2.8
L3501	173	173	98	4	150	23	L15	2.8
L3502	223	223	98	4	290	23	L15	3.8
L3601	173	173	98	4	150	23	L15	2.8
L3602	223	223	98	4	290	23	L15	3.8
L3701	173	173	98	4	105	5	L15	2.7
L3702	223	223	98	4	216	5	L15	3.6
L3801	173	173	98	4	34	8	K3	2.6
L3802	223	223	98	4	75	8	K3	3.5
L3901	173	173	98	4	38	8	K3	2.6
L3902	223	223	98	4	74	8	K3	3.5

Spec. Code	Overall width mm	Overall length mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
L5305	135	135	55	4	31	6	K3	1.1
L5308	147	147	55	4	31	6	K3	1.3

Spec. Code	Overall size at FFL mm	Overall size above FFL mm	Depth below FFL mm	Throat dia. inches	Free area cm²	kg
L2701	150 sq	101 dia x 100H	57	4	35	2.2

Options

H Fitted with Pin Torx* screws for security applications (except L29, L33, L34, L35, L36, L37 and L53 series).
**Pin Hex screws if grade 316 specified.*

M Made of grade 316 stainless steel.

P Polished (L2701 is polished as standard – not L33, L34, L35 or L36 series).

See section 5X for a range of accessories including filter buckets, removable bottle trap and height extensions.

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Vari-Level security gratings

Stainless steel – Grade 304

Satin finish

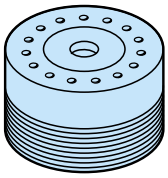
For use in high specification applications including prison cells, showers and areas where high corrosion resistance is a requirement. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request. (K36 series have sherardized cast iron frame).

Connections

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories shown in section 5X.

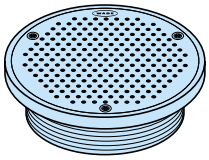
K2901

Security area drainage (see Note 2)



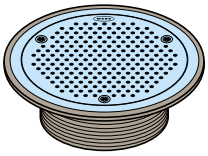
K3504

Security area drainage (4mm apertures) with Pin Torx* screws



K3604

Security area drainage for use with flexible sheet flooring such as vinyl (4mm apertures) with Pin Torx* screws



Spec. Code	Overall dia. mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
K2901	114	50	4	30 plug out 2 plug in	62 plug out 4 plug in	L15	1.4
K3504	150	54	4	20	4	K3	1.3
K3604	176	60	4	20	4	K3	1.8

Options

M Made of grade 316 stainless steel (K36 series have sherardized cast iron frame).
**Pin Hex screws if grade 316 specified.*

P Polished.

See section 5X for a range of accessories including filter buckets, removable bottle trap and height extensions.

Notes

1. *K2901 cannot be used with GC, GD or GP series bodies.*
2. *Many other Vari-Level gratings and access covers have optional facility to add Pin Torx security screws by specifying option 'H' (see other grating and access cover pages in Sections 5G and 5V).*
3. *K35 and K36 series can be manufactured with 3mm apertures but the drainage performance is unlikely to be adequate, so such versions are not offered as a standard product.*

Vari-Level access covers

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories in section 5X

Wade offers a comprehensive range of high quality access covers, sometimes referred to as cleanouts or rodding eyes, which complement wall and floor finishes.

Vari-Level threaded access covers are height adjustable with a fine thread to enable accurate installation at floor level.

Please refer to the product information for the selected body to ensure compatibility and to obtain height adjustability dimensions.

Most covers are sealed; 'SuperSeal' covers have additional benefits of being quick release and double sealed as illustrated opposite.

Vari-Level covers may also be connected to pipework and proprietary gullies by means of adaptors shown in Section 5X.

This section of the catalogue comprises separate pages for different materials as follows:

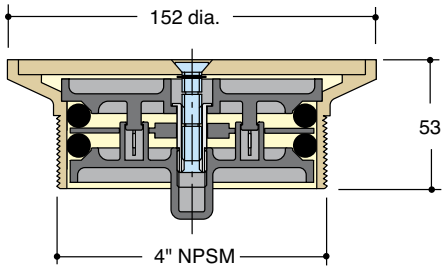
5V ci **Ductile iron** – for use in unfinished floors such as in plant rooms and car parks; also for restoration or refurbishment projects to match period architecture.

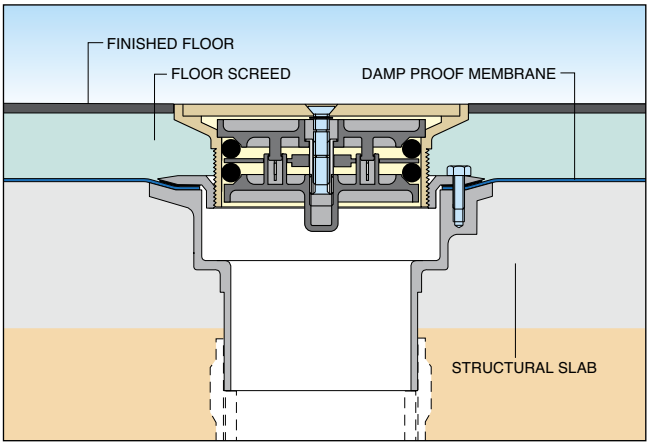
5V nb **Nickel bronze** – for use in pedestrian areas; versions are available to suit a variety of floor finishes including ceramic or vinyl tiles, marble, paviors, terrazzo, resin, carpet or wood; K51 series is for use with flexible sheet flooring such as vinyl; K5301 is for use with trowel applied composition flooring.

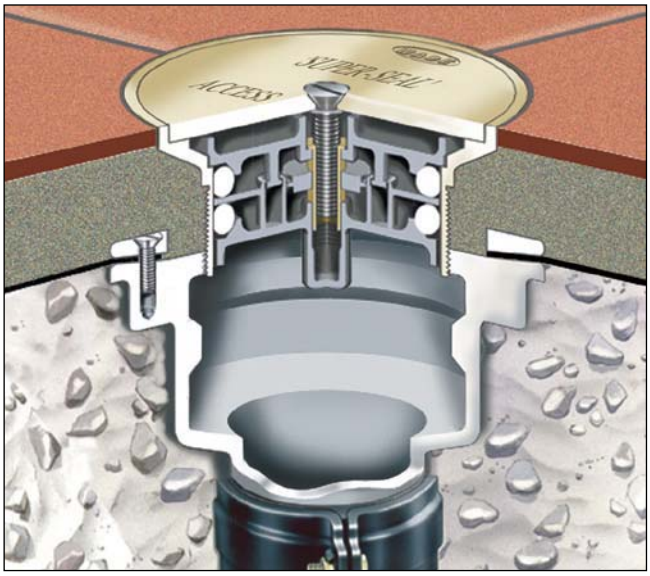
5V ss **Stainless steel** – for use in high specification applications including food preparation, prison cells, and areas where high corrosion resistance is a requirement.

K5501 'Superseal'









Notes

1. *Direct connection access covers, shown in Section 6V, are for use where a gully body is not required; they look identical to Vari-Level access covers when installed, but are machined to enable direct connection to pipework.*
2. *Double-sealed access covers for man entry and general purpose access covers are shown in Section 11.*

Vari-Level access covers

Ductile iron – BS EN 1563 + 1564

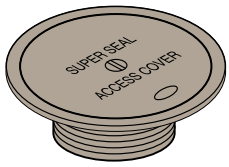
Sherardized, matt finish (with cast iron frame)

For use in **unfinished** floors such as in service and parking areas and plant rooms; also for restoration or refurbishment projects to match period architecture.

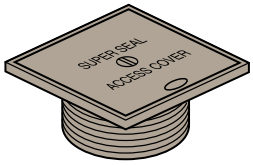
Connections

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories shown in section 5X.

K5801
'SuperSeal' (double sealed)



L5701
'SuperSeal' (double sealed)



Spec. Code	Overall dia./width mm	Overall length mm	Overall height mm	Throat dia. inches	Load rating class	kg
K5801	176	–	60	4	M125	2.7
L5701	150	150	57	4	L15	3.6

Options

H Fitted with Pin Torx screws for security applications.

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Vari-Level access covers

Nickel bronze – BS EN 1982

Satin finish

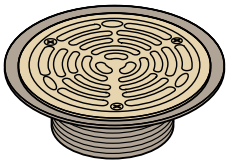
Durable, superbly finished and particularly suited to areas with high volume of pedestrian traffic. (K51 and K56 series have sherardized cast iron frame).

Connections

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories shown in section 5X.

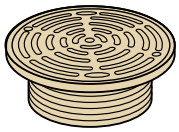
K51 series

Gasketed – for use with flexible sheet flooring such as vinyl



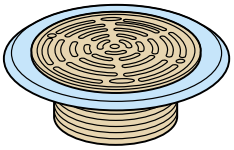
K52 series

Gasketed – for use with tiled or epoxy resin floors



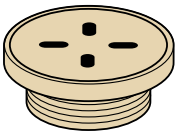
K5301

Gasketed – for use with trowel applied composition flooring. 4mm flange depth



K5401

Plug with 'O' ring seal for use in plunge and foot baths



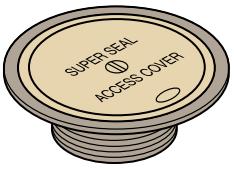
K5501

'SuperSeal' (double sealed) – for use with tiled or epoxy resin floors



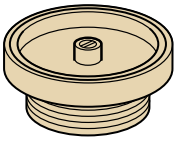
K5601

'SuperSeal' (double sealed) – for use with flexible sheet flooring such as vinyl



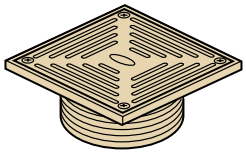
K5701

'SuperSeal' (double sealed). Recessed (19mm depth) for flooring material



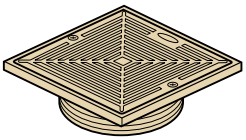
L5101

Gasketed – for use with tiled or epoxy resin floors



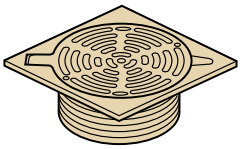
L5103

Gasketed – for use with tiled or epoxy resin floors



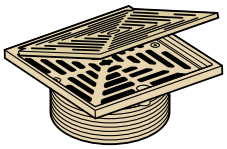
L5201

Hinged cover in square frame (unsealed)



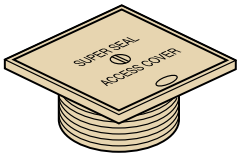
L5301/L5401

Hinged cover with grating inside. L54 version has sealed cover, (L53 unsealed)



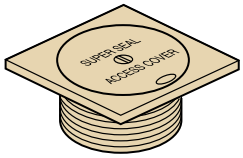
L5501

'SuperSeal' (double sealed)



L5601

'SuperSeal' (double sealed)



Spec. Code	Overall dia./width mm	Overall length mm	Overall height mm	Throat dia. inches	Load rating class	kg
K5101	142	–	54	3	L15	1.2
K5102	176	–	60	4	L15	2.5
K5103	250	–	58	4	L15	4.5
K5201	135	–	55	3	L15	1.2
K5202	135	–	48	4	L15	1.3
K5203	150	–	48	4	L15	2.0
K5301	152	–	53	4	L15	2.1
K5401	155	–	54	4	L15	2.3
K5501	152	–	53	4	L15	1.8
K5601	176	–	60	4	L15	2.3
K5701	152	–	65	4	L15	2.4
L5101	135	135	42	4	L15	1.5
L5103	160	160	60	4	L15	2.7
L5201*	150	150	48	4	L15	1.5
L5301*	150	150	55	4	L15	2.6
L5401	150	150	55	4	L15	2.6
L5501	150	150	57	4	L15	2.6
L5601	150	150	48	4	L15	1.7

**Unsealed versions.*

Options

H Fitted with Pin Torx screws for security applications (not K5401).

I Tapped to provide a direct connection for waste pipes – specify size BSP – 1¼", 1½", or 2" (applies to K51 series, K52 series, L51 series and K5301; K5103 and L5103 may also be tapped 3" or 4" BSP; K5102 may also be tapped 3" BSP).

See section 5X for a range of accessories including filter buckets, removable bottle trap and height extensions.

Vari-Level access covers

Stainless steel – Grade 304

Satin finish

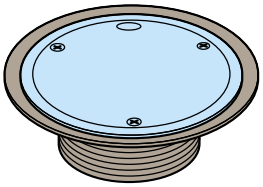
For use in high specification applications including prison cells, showers and areas where high corrosion resistance is a requirement. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request (K51 and K56 series have sherardized cast iron frame).

Connections

For use with bodies shown in section 5B, membrane clamping collars shown in section 5C and accessories shown in section 5X.

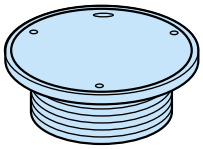
K5107

For use with flexible sheet flooring such as vinyl (unsealed)



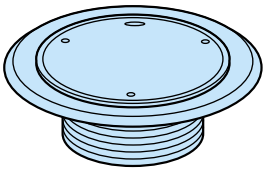
K5207

Gasketed – for use with tiled or epoxy resin floors



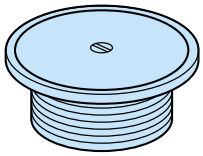
K5307

Gasketed – for use with trowel applied composition flooring. 6mm flange depth



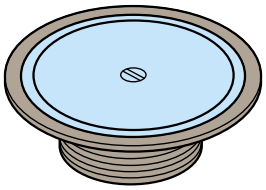
K5507

'SuperSeal' (double sealed) – for use with tiled or epoxy resin floors



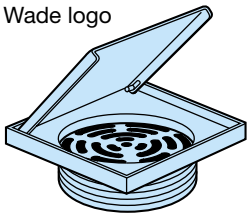
K5607

'SuperSeal' (double sealed) – for use with flexible sheet flooring such as vinyl



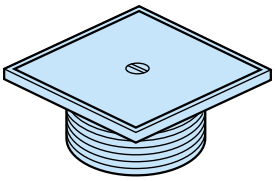
L53 series

Hinged cover with a circular non-secured grating inside. (unsealed). To open press centre of side furthest from Wade logo



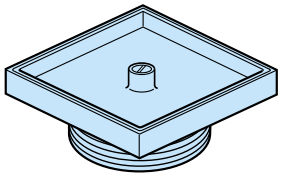
L5507

'SuperSeal' (double sealed) – for use with tiled or epoxy resin floors



L5807

'SuperSeal' (double sealed). Recessed for flooring material (22mm recess depth)



Spec. Code	Overall dia./width mm	Overall length mm	Overall height mm	Throat dia. inches	Load rating class	kg
K5107*	176	–	60	4	L15	1.9
K5207	150	–	53	4	L15	1.2
K5307	150	–	53	4	L15	1.8
K5507	150	–	53	4	L15	1.4
K5607	176	–	60	4	L15	2.4
L5305*	135	135	55	4	K3	1.1
L5308*	150	150	60	4	K3	1.3
L5507	147	147	57	4	L15	1.9
L5807	150	150	75	4	L15	2.0

**Unsealed versions.*

Options

H Fitted with Pin Torx* screws for security applications (not L53 series).
**Pin Hex screws if grade 316 specified.*

I Tapped to provide a direct connection for waste pipes – specify size BSP – 1¼", 1½", or 2" (applies to K5107, K5207 and K5307 only).

M Made of grade 316 stainless steel (K51 and K56 series have sherardized cast iron frame).

P Polished.

See section 5X for a range of accessories including filter buckets, removable bottle trap and height extensions.

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Vari-Level accessories

For use with Vari-Level gratings and access covers

Bolt-on funnels

For use with any Vari-Level grating, shown in section 5G, or Multi-Level grating shown in section 8, for applications where provision is required for indirect waste or condensate drainage in addition to floor drainage.

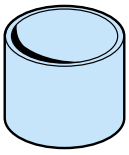
U501

To take single indirect waste pipe



U502/U511

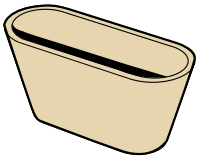
To take single indirect waste pipe



Spec. Code	Overall width mm	Overall length mm	Overall height mm	Free area cm²	Material	kg
U501	101	101	101	23	Nickel bronze	1.0
U502	101	101	101	23	Cast iron (sherardized)	1.2
U511	101	101	100	92	Stainless steel (polished)	0.9
U601	82	222	96	42	Nickel bronze	2.0
U602	85	225	96	42	Cast iron (sherardized)	2.2

U601/U602

To take multiple indirect waste pipes; (for use with gratings. min. 150mm dia/sq)

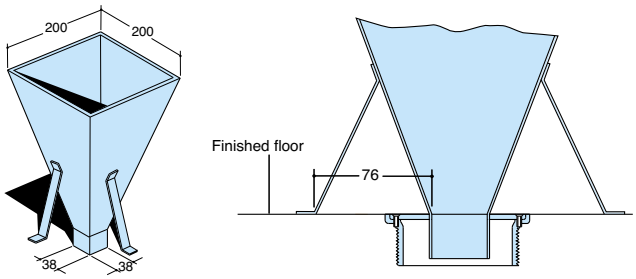


Portable funnel

To accept discharge from boiling pans etc; for use with any grating modified to suit. Please specify grating.

Spec. Code	Overall height mm	Free area cm²	Material	kg
U1202	250	12	Stainless steel	1.6
U1203*	250	12	Stainless steel	1.6

**U1203 is version without a spout.*



Filter bucket – nylon 6

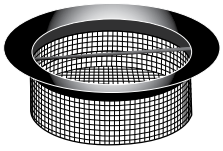
Used to intercept debris, valuables etc.

UP701

For use with gratings with 4" throat (†not K18, K28, K29 or K3211) (0.1 kg).

UP702

Deep version for use with Vari-Level gratings (not†) with bodies C5 and D4 adaptors T702, T901 and extensions U1 series (0.1 kg).

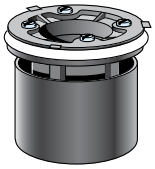


Note *A filter bucket cannot be fitted if a backwater valve or removable bottle trap is used.*

Removable bottle trap – plastic

U1404

50mm seal. To fit inside a grating or body, with 4" throat/outlet. Max. flow rate of 1 l/s.



Notes

1. *U1404 cannot be used with K18, K28 or K29.*
2. *U1404 is incompatible with 'SuperSeal' access covers.*
3. *A Vari-Level extension is required to accommodate the U1404 with the following bodies: *C2, *C3, D10, D11, G1-G10 series. (*4" outlet versions do not require an extension)*
4. *Frequent cleaning will be necessary in applications where very high amounts of hair and other waste materials are present.*
5. *When used with direct connection gratings/access covers shown in section 6, connecting pipe must be vertical for min. distance of 100mm below the grating/access cover.*

Backwater valve – brass (U703) or stainless steel (U704) and neoprene

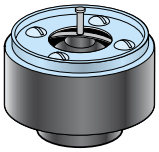
For installation in vertical orientation where protection from backflow is required. Maximum flow rate of 0.3 l/s.

U703

For use with grating/cover with 3" throat.

U704

For use with grating/cover with 4" throat.



If fitting into a Vari-Level grating/cover, a minimum of a U102 or UP104 extension will be required to prevent the backwater valve fouling on the Vari-Level body, unless body is C or D series with minimum 3" outlet.

(Not K28 or K29 gratings) (0.2 kg).

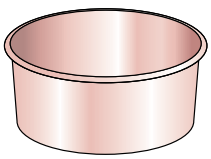
Note

A filter bucket or U1404 cannot be fitted if a backwater valve is used.

Outlet plug – plastic

UX9901

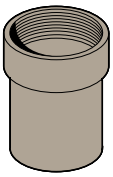
Tapered to temporarily plug 100mm inlet or outlet during installation



Vari-Level accessories and adaptors

For use with Vari-Level gratings and access covers

Adaptors to pipework



Vari-Level gratings, shown in section 5G and access covers shown in section 5V, when used without a body, may be connected to pipework by means of a cast iron adaptor, as shown in the following tables:

3" throat – Adaptors for use with Vari-Level gratings and access covers with 3" throat.

3" Throat Spec. Code	Pipework system	Max. O.D. mm	Overall length mm	kg
T701	Plastic 82mm O.D.	106	127	1.2
T714	Plastic 75mm O.D.	130	130	2.4
T712	Plastic 110mm O.D.	130	115	2.5
T801	Cast iron BS 416 75mm	106	127	1.9
T712	Cast iron BS 416 100mm	130	115	2.5
T701	Cast iron DIN 19522 SMU 75mm	106	127	1.2
T712	Cast iron DIN 19522 100mm	130	115	2.5
T911	Clay Supersleve 100mm	122	145	3.5

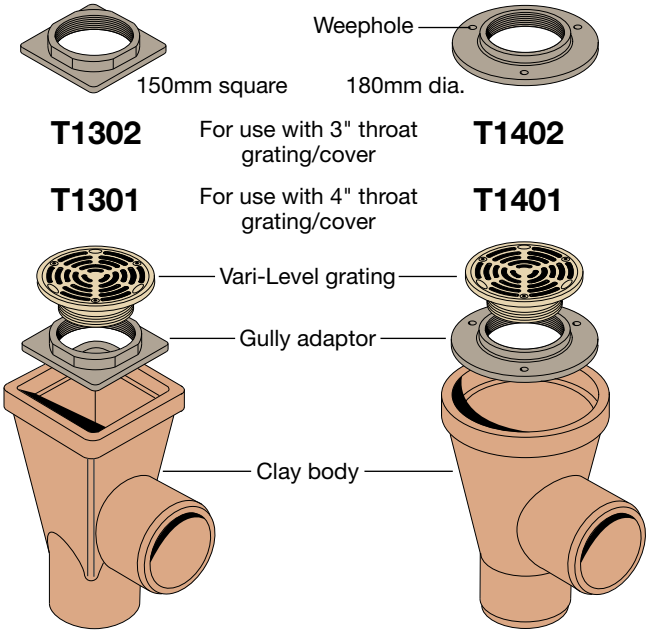
4" throat – Adaptors for use with Vari-Level gratings and access covers with 4" throat.

4" Throat Spec. Code	Pipework system	Max. O.D. mm	Overall length mm	kg
T703	Plastic 82mm O.D.	130	115	1.4
T704	Plastic 75mm O.D.	130	115	1.7
TP702*	Plastic 110mm O.D.	120	152	0.4
T792	Cast iron BS 416 50mm	130	180	3.3
T803	Cast iron BS 416 75mm	130	115	1.7
T702	Cast iron BS 416 100mm	130	100	1.5
T792	Cast iron DIN 19522 50mm	130	180	3.3
T703	Cast iron DIN 19522 SMU 75mm	130	115	1.4
T702	Cast iron DIN 19522 100mm	130	100	1.5
T901	Clay Supersleve 100mm	122	130	2.6
T742	2" BSP (T742 has 2" BSP male thread)	130	220	3.3

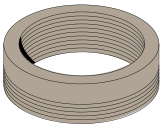
**Plastic (ABS) version.*

Gully adaptors – cast iron

Vari-Level gratings, shown in section 5G, may be connected to proprietary clay or PVC gully bodies by means of a gully adaptor. Increased range of height adjustability is obtainable by reversing the adaptor.



Reducing bush – cast iron

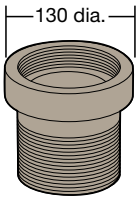


U1101 To enable 3" throat gratings/covers to be used in Vari-Level bodies/adaptors with 4" inlet.

Note

Height of grating/cover will be increased by 15mm min./27mm maximum

Extensions – cast iron



Used to increase the height between the top of a body and finished floor level.

Note

Extensions may be stacked to obtain extra height, but access to trap/plug will be restricted when used with G/GC/GD/GP/QG series trapped bodies.

U101 For use with Vari-Level gratings/covers with 3" throat and bodies with 3" inlet.

U102/U103/U104/UP104 For use with Vari-Level gratings/funnels/covers with 4" throat and bodies with 4" inlet.

U201 For use with Vari-Level gratings/funnels/covers with 4" throat and bodies with 3" inlet.

U208 For use with Vari-Level gratings/covers with 4" throat and bodies series G2-G10 to provide height increase of only 25mm. ***Notes:*** *1.When retro-fitting to G2-G10 series bodies, 3 no. M6 tapped holes must be drilled on site. To order U208 as a factory fitted option with pre-drilled holes, add suffix 'E' to the body Spec. Code; 2. This bolt-on extension cannot be stacked.*

Spec. Code	Thread size NPSM Female	Thread size NPSM Male	Overall height mm	Height gained Min.	Height gained Max.	Max O.D. mm	kg
U101	3"	3"	127	42	120	106	1.6
U102	4"	4"	60	37	55	130	1.1
U103	4"	4"	100	40	95	130	1.6
U104	4"	4"	152	85	145	130	2.5
U201	4"	3"	115	40	110	130	1.5
U208	4"	–	25	25	25	188	0.9
UP104*	4"	4"	152	36	145	120	0.4

**Plastic (ABS) version for use with GP series bodies*

Note

Additional height dimensions given in the table should be added to the maximum and minimum dimensions given in the 'height adjustability' section for the selected body. The figures shown for minimum height gained cannot be obtained with some body types unless the extension is cut in length. See our web site for details.

April 2018 **Tel**: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

Vari-Level accessories and adaptors

For use with Vari-Level bodies, gratings and access covers

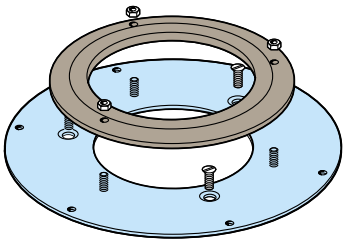
Installation adaptors

For use with G2-G10 series trapped bodies.

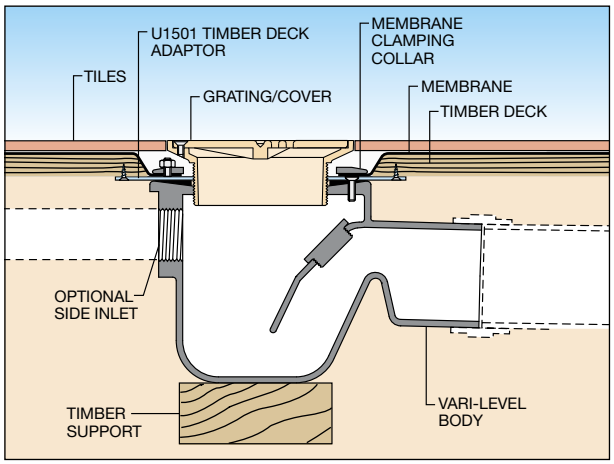
U15

Stainless steel support plate and cast iron membrane clamp to adapt G2-G10 series bodies for installation in a timber deck with tile floor finish.

To specify/order – add suffix 'D' to the body Spec. Code.



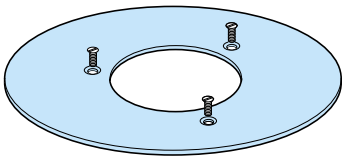
245mm dia.



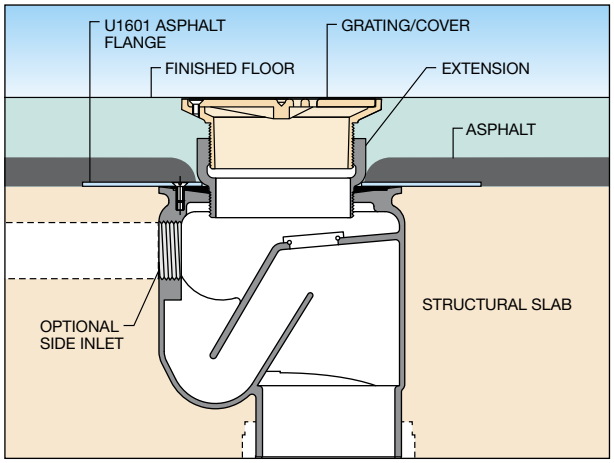
U16

Stainless steel asphalt flange for use with G2-G10 series bodies.

To specify/order – add suffix 'A' to the body Spec. Code.



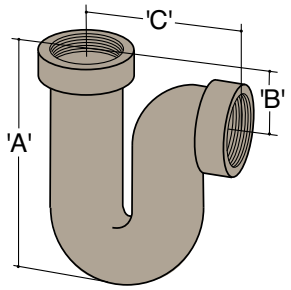
300mm dia.



Deep seal 'P' trap – cast iron

U902, U903, U904

Malleable iron 90° swept bend 2" BSP male to 2" BSP female connection.

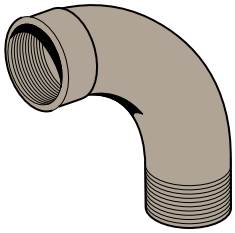


Spec. Code	Pipe size mm	Inlet & outlet thread size	Water seal mm	A	B	C	kg
U902	50	2" BSP	102	234	50	162	4.9
U903	75	3" BSP	125	318	70	210	11.0
U904	100	4" BSP	132	379	90	250	15.2

90° Swept bend

U1301

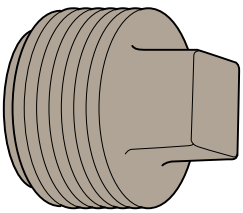
Malleable iron 90° swept bend 2" BSP male to 2" BSP female connection.



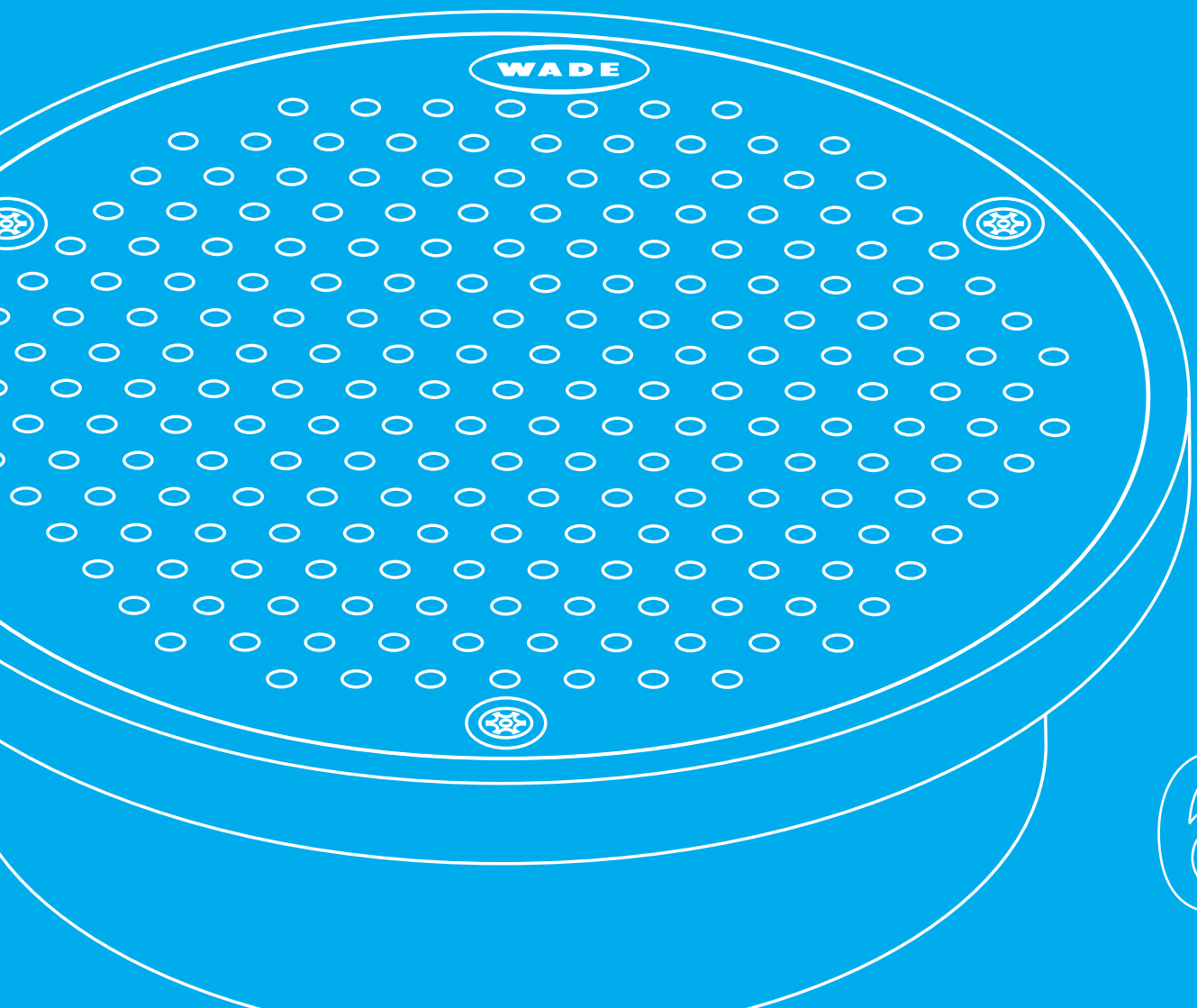
Male hollow plug

U1802

Malleable iron 2" BSP male hollow plug. Used to block a side inlet; must be sealed.



Direct connection



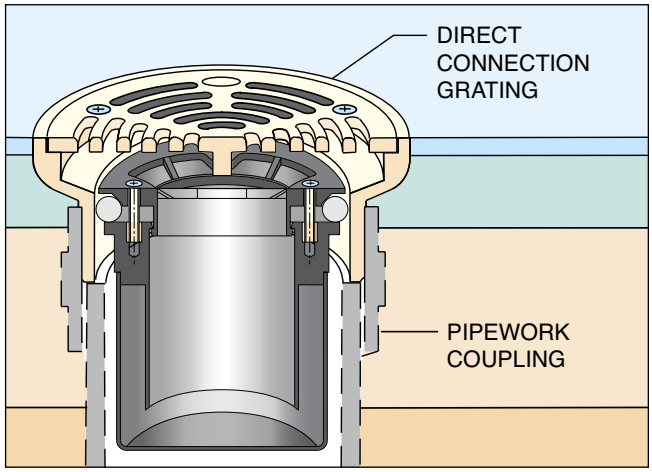
Direct connection

For applications where a gully body is not required, Wade offers a comprehensive range of high quality gratings and access covers which complement floor finishes.



K2193
Nickel bronze grating with U1404 removable push-in bottle trap

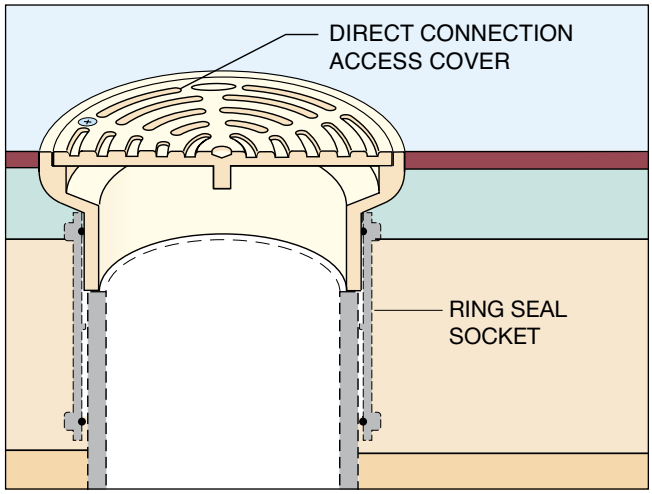
Typical installation





K5293
Nickel bronze access cover

Typical installation



Direct connection versions look identical to Vari-Level versions when installed, but are machined to enable direct connection to pipework by means of proprietary couplings or ring seal sockets.

Mostly, one version of grating or access cover is suitable for all pipework of the same size, but tolerances of castings and pipework are such that in some cases different versions of the same style and size of grating or access cover are required for different pipework – this is made clear by the Spec. Codes in the tables on the following pages.

This section of the technical manual comprises separate sub-sections for gratings (6G) and access covers (6V) which are divided into separate pages for different materials as follows:

6G ci
6V ci **Cast iron** – for use in unfinished floors such as in plant rooms and car parks and also for restoration or refurbishment projects where there is a requirement to match period architecture.

6G nb
6V nb **Nickel bronze** – for use in pedestrian areas; versions are available to suit a variety of floor finishes including ceramic or vinyl tiles, marble, paviors, terrazzo, resin, carpet or wood; flexible sheet flooring such as vinyl and trowel applied composition flooring.

6G ss
6V ss **Stainless steel** – for use in high specification applications including food preparation, prison cells, showers and areas where high corrosion resistance is a requirement.

Direct connection gratings

Cast iron BS EN 1561

Sherardized, matt finish

For use in **unfinished** floors such as service and parking areas and plant rooms; also for restoration or refurbishment projects where there is a requirement to match period architecture.

Connections

To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

Gratings can also be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

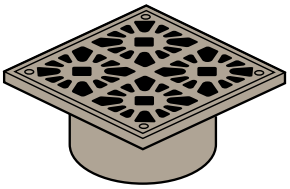
K2193 CI
Standard circular grating



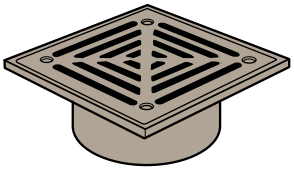
K2591
Light vehicular traffic areas



L2591 CI
Decorative floral pattern



L2691
Light vehicular traffic areas



Spec. Code	Pipework System	Pipework Nom. dia.	Overall dia/width mm	Overall length mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
K2193 CI	C.I. + P*	100	155	–	54	4	58	7	K3	1.7
K2591	C.I. + P*	100	176	–	60	4	85	11	L15	1.8
L2591 CI	C.I. + P*	100	150	150	57	4	60	14	K3	2.3
L2691	C.I. + P*	100	150	150	57	4	55	7	L15	1.7

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*
Gratings have a spigot length of 25mm minimum.

Options

Suffix

A Asphalt membrane clamp (stainless steel) (for use in asphalt/composition finished floors – K2591 only).

H Fitted with Pin Torx screw(s) for security applications.

See section 5X for a range of accessories including filter buckets and removable bottle trap.

Direct connection gratings

Nickel bronze BS EN 1982

Satin finish

Durable, superbly finished and particularly suited to areas with high volume of pedestrian traffic.

Connections

To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

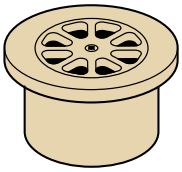
Gratings with 4" throat can also be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

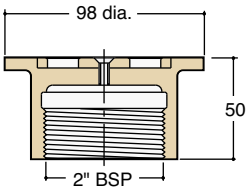
Gratings with 3" throat can also be connected to 75mm DIN 19522 Ensign cast iron pipe using adaptor T1603 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

K1941

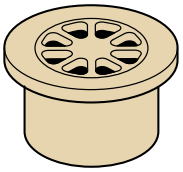
With central securing screw

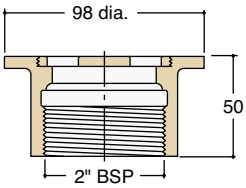




K2041

Self securing





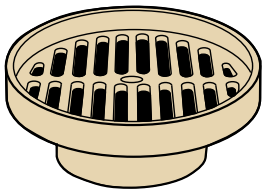
K21 series

For use with tiled or epoxy resin floor



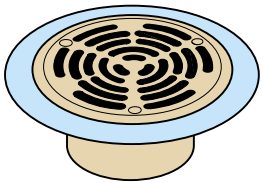
K2291

Indirect waste connector (grating not secured)



K2491

For use with trowel applied composition flooring. 4mm flange depth



K3191

Reduces risk of blockages in channels. Removable dome protrudes 30mm



Spec. Code	Pipework System	Pipework Nom. dia.	Overall dia/width mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
K1941	C.I. + P*	50	98	50	2" BSP female	11	14	K3	0.9
K2041	C.I. + P*	50	98	50	2" BSP female	11	14	K3	0.9
K2142	Plastic	75	135	55	3	40	6	K3	1.0
K2191	C.I. + P*	100	135	48	4	40	6	K3	1.0
K2193	C.I. + P*	100	155	54	4	58	6	L15	1.5
K2291	C.I. + P*	100	176	72	4	73	7	L15	2.5
K2491	C.I. + P*	100	150	48	4	58	6	L15	1.9
K3191	C.I. + P*	100	135	78 (inc. dome)	4	45	16	L15	1.0

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*

Gratings have a spigot length of 25mm minimum.

Versions for use with flexible sheet flooring such as vinyl are shown on page 6G nb sf.

Options

Suffix

H Fitted with Pin Torx screw(s) for security applications (not K2041 or K2291).

I Tapped to provide a direct connection for waste pipes – specify size BSP, 1" or 2" (applies to K2193, K2591; K2142 and K2191 may be tapped 1" only; K2193 may also be tapped 3").

See section 5X for a range of accessories including filter buckets and removable bottle trap.

April 2018

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Direct connection gratings

Nickel bronze BS EN 1982

Satin finish

Durable, superbly finished and particularly suited to areas with high volume of pedestrian traffic.

Connections

To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

Gratings can also be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

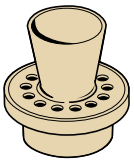
K2691

To take multiple indirect waste pipes; with peripheral grating (Funnel not secured)



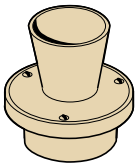
K2791

To take single indirect waste pipe; with peripheral grating (Funnel not secured)



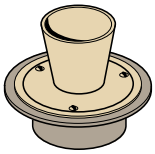
K3391

To take single indirect waste pipe; with peripheral cover and vermin guard



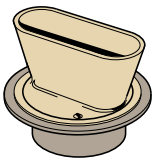
K3491

For use with flexible sheet flooring such as vinyl; with peripheral cover and vermin guard



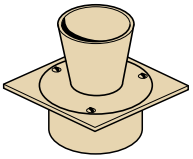
K3492

For use with flexible sheet flooring such as vinyl; with peripheral cover and vermin guard



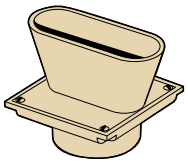
L2891

To take single indirect waste pipe; with peripheral cover and vermin guard



L2893

To take multiple indirect waste pipes; with peripheral cover and vermin guard



Spec. Code	Pipework System	Pipework Nom. dia.	Overall size at FFL mm	Overall size above FFL mm	Depth below FFL mm	Throat dia. inches	Free area cm²	kg
K2691	C.I. + P*	100	176 dia.	224L x 85W x 99H	72	4	55	4.1
K2791	C.I. + P*	100	176 dia.	108 dia. x 96H	72	4	48	3.2
K3391	C.I. + P*	100	150 dia.	101 dia. x 101H	48	4	23	2.7
K3491	C.I. + P*	100	176 dia.	101 dia. x 101H	60	4	12	3.3
K3492	C.I. + P*	100	176 dia.	224L x 85W x 99H	60	4	21	4.2
L2891	C.I. + P*	100	150 sq.	101 dia. x 101H	48	4	12	3.4
L2893	C.I. + P*	100	150 sq.	225L x 85W x 96 H	57	4	21	4.4

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*

Gratings have a spigot length of 25mm minimum.

For information on flow rates please contact our Technical Services Department.

Options

Suffix

H Fitted with Pin Torx screw(s) for security applications (not K2691 or K2791).

See section 5X for a range of accessories including filter buckets and removable bottle trap.

Direct connection gratings

Nickel bronze BS EN 1982

Satin finish

Durable, superbly finished and particularly suited to areas with high volume of pedestrian traffic.

Connections

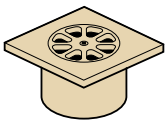
To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

Gratings with 4" throat can also be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

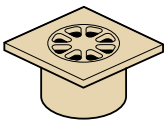
Gratings with 3" throat can also be connected to 75mm DIN 19522 Ensign cast iron pipe using adaptor T1603 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

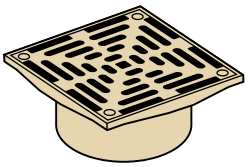
L1941
Securing screw – with 2" BSP female outlet



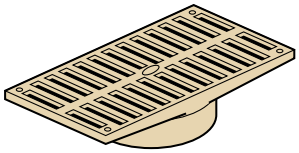
L2041
Self securing – with 2" BSP female outlet



L21 series
For use with tiled or epoxy resin floor



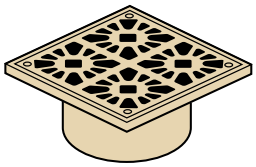
L22 series
Rectangular



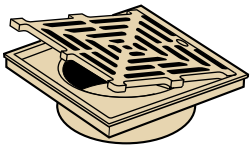
L2391
Square framed grating



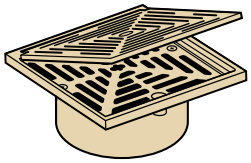
L2591
Decorative floral pattern



L3091
Hinged grating



L5391/L5491
Grating concealed by solid hinged cover. L5491 version has sealed cover



Spec. Code	Pipework System	Pipework Nom. dia.	Overall width mm	Overall length mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
L1941	C.I. + P*	50	100	100	50	2" BSP female	11	14	K3	0.9
L2041	C.I. + P*	50	100	100	50	2" BSP female	11	14	K3	0.9
L2141	Plastic	82	101	101	45	3	30	6	K3	0.9
L2191	Cast iron BS 416	75	101	101	45	3	30	6	K3	0.9
L2192	C.I. + P*	100	135	135	53	4	60	6	L15	1.7
L2193	C.I. + P*	100	150	150	57	4	82	8	L15	1.9
L2194	C.I. + P*	100	201	201	70	4	156	8	L15	3.9
L2241	Plastic	82	102	204	57	3	66	8	L15	1.8
L2291	Cast iron BS 416	75	102	204	57	3	66	8	L15	1.8
L2292	C.I. + P*	100	125	430	70	4	155	6	L15	5.6
L2391	C.I. + P*	100	150	150	48	4	40	6	L15	1.3
L2591	C.I. + P*	100	150	150	57	4	60	13	L15	2.1
L3091	C.I. + P*	100	161	161	60	4	92	7	L15	2.3
L5391	C.I. + P*	100	150	150	55	4	44	4	L15	2.6
L5491	C.I. + P*	100	150	150	55	4	44	4	L15	2.6

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*

Gratings have a spigot length of 25mm minimum.

Versions for use with flexible sheet flooring such as vinyl are shown on page 6G nb sf.

Options

Suffix

H Fitted with Pin Torx screw(s) for security applications (Not L2041).

I Tapped to provide a direct connection for waste pipes – (L2391 only – 1" BSP size available).

See section 5X for a range of accessories including filter buckets and removable bottle trap.

April 2018 **Tel**: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

Direct connection gratings

Nickel bronze BS EN 1982

Satin finish

Durable, superbly finished gratings to provide drainage in a run of tile channel. Six styles of grating are available to match the contour of ceramic tiles in general use.

Connections

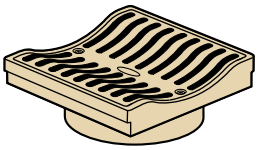
To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

Gratings with 4" throat can also be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

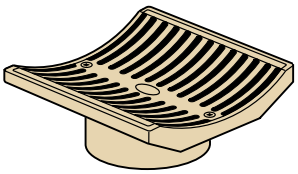
Gratings with 3" throat can also be connected to 75mm DIN 19522 Ensign cast iron pipe using adaptor T1603 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

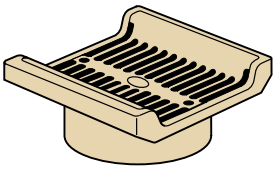
L2442/L2492
Johnson 4200



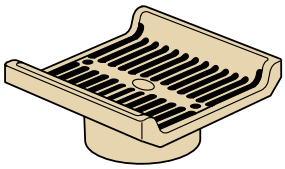
L2444/L2494
Pilkington/Wooliscroft 2302/
Gail 4420



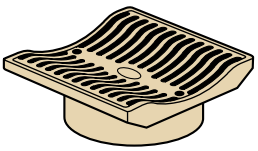
L2496
Platt 2300



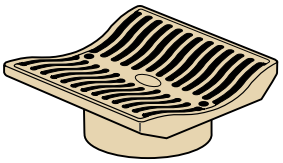
L2447/L2497
Ruabon



L2498
Keramic



L2449/L2499
Strata Buchtal 4420/54420



Spec. Code	Pipework System	Pipework Nom. dia.	Overall width mm	Overall length mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
L2442	Plastic	82	115	115	58	3	32	6	L15	1.5
L2492	Cast iron BS 416	75	115	115	58	3	32	6	L15	1.5
L2444	Plastic	82	150	150	70	3	90	6	L15	1.9
L2494	Cast iron BS 416	75	150	150	70	3	90	6	L15	1.9
L2496	C.I. + P*	100	150	150	75	4	90	6	L15	2.0
L2447	Plastic	82	150	150	73	3	92	6	L15	2.0
L2497	Cast iron BS 416	75	150	150	73	3	92	6	L15	2.0
L2498	C.I. + P*	100	150	150	71	4	81	6	L15	2.3
L2449	Plastic	82	150	150	70	3	90	6	L15	2.0
L2499	Cast iron BS 416	75	150	150	70	3	90	6	L15	2.0

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*

Gratings have a spigot length of 25mm minimum.

Versions for use with flexible sheet flooring such as vinyl are shown on page 6G nb sf.

Options

Suffix

H Fitted with Pin Torx screw(s) for security applications.

See section 5X for a range of accessories including filter buckets and removable bottle trap.

Direct connection gratings

Nickel bronze BS EN 1982

Satin finish

For use with flexible sheet flooring such as vinyl

Durable superbly finished and particularly suited to areas with high volume of pedestrian traffic (with sherardized cast iron frame).

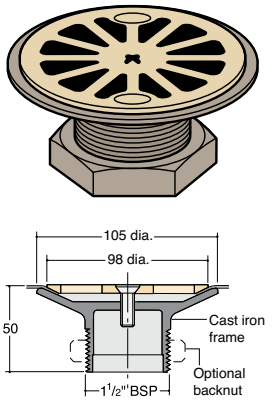
Connections

To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

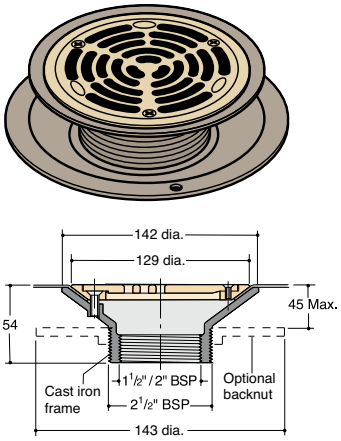
N1 series

For 40mm pipework



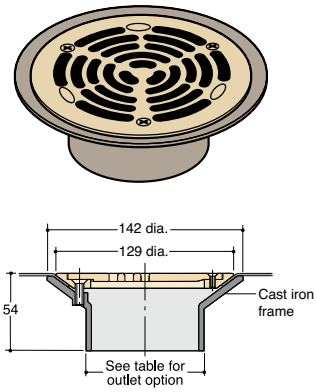
N2 series

For 40mm/50mm pipework



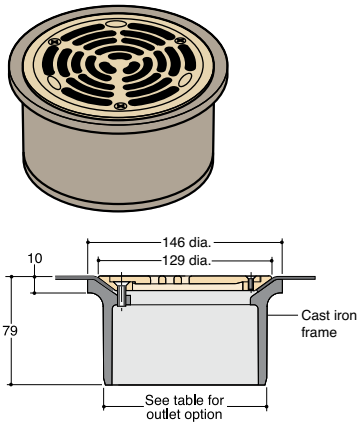
N3 series

For 75mm pipework



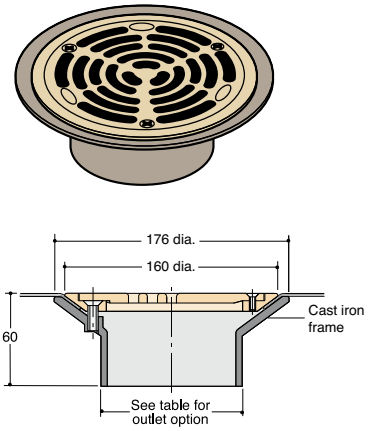
N4 series

For 100mm pipework



K2392

For 100mm pipework



Spec. Code	Pipework System	Nom. dia.	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
N111	Plastic	40	1½" BSP	32	14	K3	0.6
N112**	Plastic	40	1½" BSP	32	14	K3	0.7
N211	Plastic	40	1½" BSP female	32	7	L15	1.4
N213**	Plastic	40	1½" BSP female	32	7	L15	2.1
N215	Plastic	50	2" BSP female	32	7	L15	1.2
N217**	Plastic	50	2" BSP female	32	7	L15	1.9
N301	Cast iron BS 416	75	3"	32	7	L15	1.3
N303	Plastic	82	3"	32	7	L15	1.2
N305	Plastic DIN	75	3"	32	7	L15	1.3
N405	Cast iron BS 437	100	4"	32	7	L15	2.2
N410	Clay supersleve	100	4"	32	7	L15	2.2
K2392	C.I. + P*	100	4"	48	6	L15	2.0

* *C.I. + P means cast iron BS 416/DIN 19522 and plastic.*
***Versions with cast iron backnut for use in timber floors.*

Gratings have a spigot length of 25mm minimum.

Options

Suffix

H Fitted with Pin Torx screw(s) for security applications.

I Tapped to provide a direct connection for waste pipes – specify size BSP (N2, N3 and N4 series may be tapped 1" or 1.5"; K2392 may be tapped 2" or 3").

See section 5X for a range of accessories including filter buckets and removable bottle trap.

April 2018

Tel: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

Direct connection gratings

Stainless steel Grade 304

Satin finish

For use in high specification applications including food preparation, prison cells, showers and areas where high corrosion resistance is a requirement.

In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request (K18, K23 and K34 series have sherardized cast iron frame).

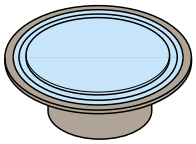
Connections

To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

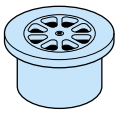
Gratings can also be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

K1897
With peripheral slot, for use with flexible sheet flooring such as vinyl



K1947
Securing screw – with 2" BSP female outlet



K2197
For use in tiled or epoxy resin floors



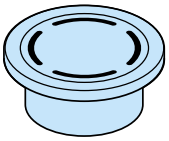
K2397
For use with flexible sheet flooring such as vinyl



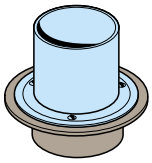
K2497
For use with trowel applied composition flooring. 6mm flange depth



K2891
Flanged with peripheral slot. Self securing



K3497
Condensate funnel with vermin guard, for use with flexible sheet flooring such as vinyl, polished



Spec. Code	Pipework System	Pipework Nom. dia.	Overall dia/width mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
K1897	C.I. + P*	100	176	60	4	26	6	K3	2.0
K1947	C.I. + P*	50	98	50	2" BSP female	11	14	K3	0.9
K2197	C.I. + P*	100	150	53	4	58	6	L15	1.0
K2397	C.I. + P*	100	176	60	4	48	6	L15	2.0
K2497	C.I. + P*	100	150	53	4	58	6	L15	2.5
K2891	C.I. + P*	100	140	50	4	13	7	L15	1.4

Spec. Code	Pipework System	Pipework Nom. dia.	Overall size at FFL mm	Overall size above FFL mm	Depth below FFL mm	Throat dia. inches	Free area cm²	kg
K3497	C.I. + P*	100	176 dia.	101 dia. x 101H	60	4	35	2.3

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*

Gratings have a spigot length of 25mm minimum.

Options

Suffix

H Fitted with Pin Torx* screw(s) for security applications (not K1897 or K2891).
**Pin Hex screws if grade 316 specified.*

I Tapped to provide a direct connection for waste pipes – specify size BSP, 1" or 2" (applies to K2197, K2397 and K2497 only).

M Made of grade 316 stainless steel (Not K1897; K23 and K34 series have sherardized cast iron frame).

P Polished (K3497 is polished as standard).

See section 5X for a range of accessories including filter buckets and removable bottle trap.

Direct connection gratings

Stainless steel Grade 304

Satin finish

For use in high specification applications including food preparation, showers and areas where high corrosion resistance is a requirement.

In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request.

Connections

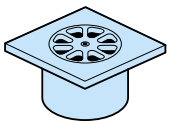
To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

Gratings can also be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

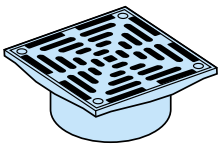
L1947

Securing screw – with 2" BSP female outlet



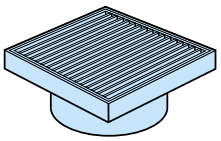
L2196

For use in tiled or epoxy resin floors



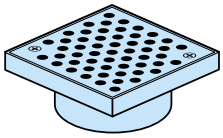
L29 series

Streamline heel-proof reverse wedge profile grating is secured with pin hex screws



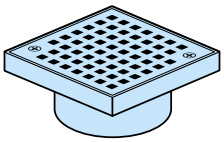
L31 series

Square perforated grating (circular apertures)



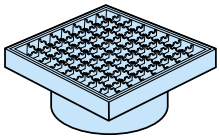
L32 series

Square perforated grating (square apertures)



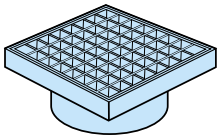
L33 series

Anti-slip mesh (grating not secured)



L34 series

Plain mesh (grating not secured)



Spec. Code	Pipework System	Pipework Nom. dia.	Overall width mm	Overall length mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
L1947	C.I. + P*	50	100	100	50	2" BSP female	11	14	K3	0.9
L2196	C.I. + P*	100	147	147	57	4	82	8	L15	1.4
L2991	C.I. + P*	100	150	150	75	4	105	5	L15	1.6
L2992	C.I. + P*	100	200	200	75	4	216	5	L15	2.5
L3191	C.I. + P*	100	150	150	75	4	34	8	K3	1.6
L3192	C.I. + P*	100	200	200	75	4	75	8	K3	2.5
L3291	C.I. + P*	100	150	150	75	4	38	8	K3	1.6
L3292	C.I. + P*	100	200	200	75	4	74	8	K3	2.5
L3391	C.I. + P*	100	150	150	75	4	150	23	L15	1.8
L3392	C.I. + P*	100	200	200	75	4	290	23	L15	2.8
L3491	C.I. + P*	100	150	150	75	4	150	23	L15	1.8
L3492	C.I. + P*	100	200	200	75	4	290	23	L15	2.8

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*

Gratings have a spigot length of 25mm minimum.

Options

H Fitted with Pin Torx* screws for security applications (except L29 series).
**Pin Hex screws if grade 316 specified.*

M Made of grade 316 stainless steel.

P Polished (not L33 or L34 series).

See section 5X for a range of accessories including filter buckets and removable bottle trap.

April 2018 **Tel**: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

Direct connection gratings

Stainless steel Grade 304

Satin finish

For use in high specification applications including food preparation, showers and areas where high corrosion resistance is a requirement.

In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request.

Connections

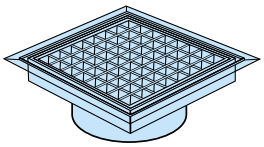
To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

Gratings can also be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

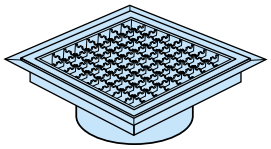
L35 series

Plain mesh (grating not secured), for use with flexible sheet flooring such as vinyl



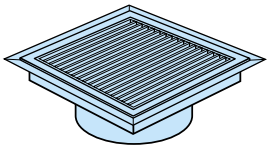
L36 series

Anti-slip mesh (grating not secured), for use with flexible sheet flooring such as vinyl



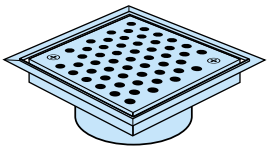
L37 series

For use with flexible sheet flooring such as vinyl. Streamline heel-proof reverse wedge profile grating is secured with Pin Hex screws



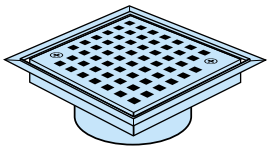
L38 series

Perforated grating (circular apertures) for use with flexible sheet flooring such as vinyl



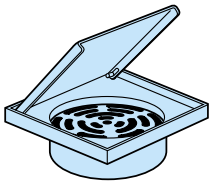
L39 series

Perforated grating (square apertures) for use with flexible sheet flooring such as vinyl



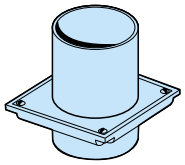
L53 series

Hinged cover with a circular non-secured grating inside



L2791

Condensate funnel with vermin guard, polished



Spec. Code	Pipework System	Pipework Nom. dia.	Overall width mm	Overall length mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
L3591	C.I. + P*	100	173	173	98	4	150	23	L15	2.8
L3592	C.I. + P*	100	223	223	98	4	290	23	L15	3.8
L3691	C.I. + P*	100	175	175	98	4	150	23	L15	2.8
L3692	C.I. + P*	100	225	225	98	4	290	23	L15	3.8
L3791	C.I. + P*	100	175	175	98	4	105	5	L15	2.7
L3792	C.I. + P*	100	225	225	98	4	216	5	L15	3.6
L3891	C.I. + P*	100	173	173	98	4	34	8	K3	2.6
L3892	C.I. + P*	100	223	223	98	4	75	8	K3	3.5
L3991	C.I. + P*	100	173	173	98	4	38	8	K3	2.6
L3992	C.I. + P*	100	223	223	98	4	74	8	K3	3.5
L5395	C.I. + P*	100	135	135	55	4	31	6	K3	1.1
L5398	C.I. + P*	100	150	150	57	4	31	6	K3	1.3

Spec. Code	Pipework System	Pipework Nom. dia.	Overall size at FFL mm	Overall size above FFL mm	Depth below FFL mm	Throat dia. inches	Free area cm²	kg
L2791	C.I. + P*	100	150 sq.	114 dia. x 100H	57	4	46	2.2

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*

Gratings have a spigot length of 25mm minimum.

Options

H Fitted with Pin Torx* screws for security applications (except L35, L36, L37 and L53 series).
**Pin Hex screws if grade 316 specified.*

M Made of grade 316 stainless steel.

P Polished (L2791 is polished as standard – not L35 or L36 series).

See section 5X for a range of accessories including filter buckets and removable bottle trap.

Direct connection security gratings

Stainless steel Grade 304

Satin finish

For use in high specification applications including food preparation, prison cells, showers and areas where high corrosion resistance is a requirement.

In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request (K36 series have sherardized cast iron frame).

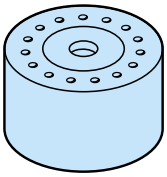
Connections

To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

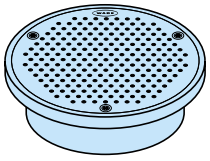
Gratings can also be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

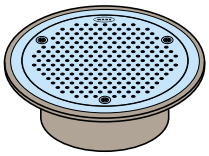
K29 series
Security area drainage



K3594
Security area drainage (4mm apertures) with Pin Torx* screws



K3694
Security area drainage for use with flexible sheet flooring such as vinyl (4mm apertures) with Pin Torx* screws



Spec. Code	Pipework System	Pipework Nom. dia.	Overall dia. mm	Overall height mm	Throat dia. inches	Free area cm²	Max. aperture width mm	Load rating class	kg
K2941	Plastic	110	114	50	4	30 plug out 2 plug in	62 plug out 4 plug in	L15	1.4
K2991	Cast iron BS 416	100	114	50	4	30 plug out 2 plug in	62 plug out 4 plug in	L15	1.4
K3594	C.I. + P*	100	150	54	4	20	4	K3	1.0
K3694	C.I. + P*	100	176	60	4	20	4	K3	1.8

* *C.I. + P means cast iron BS 416/DIN 19522 and plastic.*

Gratings have a spigot length of 25mm minimum.

Options

Suffix

M Made of grade 316 stainless steel (K36 series have sherardized cast iron frame).
**Pin Hex screws if grade 316 specified.*

P Polished.

See section 5X for a range of accessories including filter buckets and removable bottle trap.

Note

1. *Many other direct connection gratings and access covers have optional facility to add Pin Torx security screws by specifying option 'H'. (See other grating and access cover pages in sections 6G and 6V).*
2. *K35 and K36 series can be manufactured with 3mm apertures but the drainage performance is unlikely to be adequate, so such versions are not offered as a standard product.*

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Direct connection access covers

Ductile iron BS EN 1563 + 1564

Sherardized, matt finish (cast iron frame)

For use in **unfinished** floors such as in service and parking areas and plant rooms; also for restoration or refurbishment projects where there is a requirement to match period architecture (K18, K23 and K34 series have sherardized cast iron frame).

Connections

To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

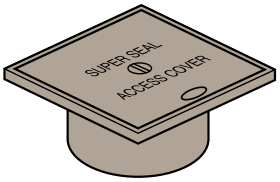
Covers can be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

K5891
'SuperSeal' (double sealed)



L5791
'SuperSeal' (double sealed)



Spec. Code	Pipework System	Pipework Nom. dia.	Overall dia. mm	Overall length mm	Overall height mm	Throat dia. inches	Load rating class	kg
K5891	C.I. + P*	100	176	–	60	4	M125	2.7
L5791	C.I. + P*	100	150	150	57	4	L15	3.6

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*

Covers have a spigot length of 25mm minimum.

Options

Suffix

H Fitted with Pin Torx screw for security applications.

Direct connection access covers

Nickel bronze BS EN 1982

Satin finish

Durable, superbly finished and particularly suited to areas with high volume of pedestrian traffic.

Connections

To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

Covers with 4" throat can also be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

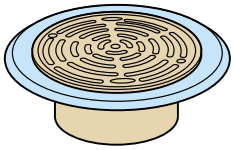
Covers with 3" throat can also be connected to 75mm DIN 19522 Ensign cast iron pipe using adaptor T1603 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

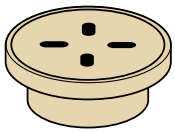
K52 series
Gasketed



K5391
Gasketed – for use with trowel applied composition flooring. 4mm flange depth



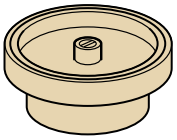
K5491
Plug with 'O' ring seal for use in plunge and foot baths



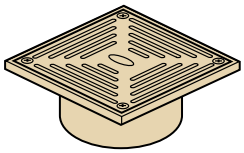
K5591
'SuperSeal' (double sealed)



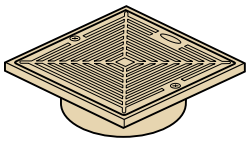
K5791
'SuperSeal' (double sealed). Recessed (19mm depth) for flooring material



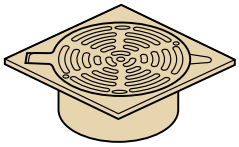
L5191
Gasketed



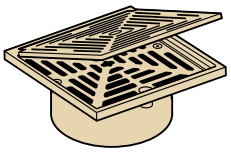
L5193
Gasketed



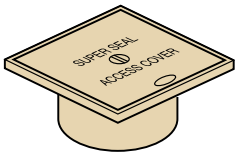
L5291
Hinged cover in square frame (unsealed)



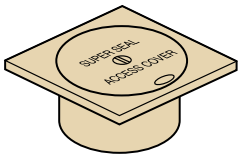
L5391/L5491
Hinged cover with grating inside. L54 has sealed cover. (L53 unsealed)



L5591
'SuperSeal' (double sealed)



L5691
'SuperSeal' (double sealed)



Spec. Code	Pipework System	Pipework Nom. dia.	Overall dia./width mm	Overall length mm	Overall height mm	Throat dia. inches	Load rating class	kg
K5241	Plastic	75	135	–	55	3	L15	1.2
K5292	C.I. + P*	100	135	–	48	4	L15	1.3
K5293	C.I. + P*	100	150	–	48	4	L15	2.0
K5391	C.I. + P*	100	152	–	53	4	L15	2.1
K5491	C.I. + P*	100	155	–	54	4	L15	2.2
K5591	C.I. + P*	100	152	–	53	4	L15	1.8
K5791	C.I. + P*	100	152	–	65	4	L15	2.4
L5191	C.I. + P*	100	135	135	42	4	L15	1.5
L5193	C.I. + P*	100	160	160	60	4	L15	2.7
L5291**	C.I. + P*	100	150	150	48	4	L15	1.5
L5391**	C.I. + P*	100	150	150	55	4	L15	2.5
L5491	C.I. + P*	100	150	150	55	4	L15	2.5
L5591	C.I. + P*	100	150	150	57	4	L15	2.5
L5691	C.I. + P*	100	150	150	48	4	L15	1.7

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*
*** Unsealed versions.*

Covers have a spigot length of 25mm minimum.

Versions for use with flexible sheet flooring such as vinyl are shown on page 6V nb sf.

Options

Suffix

H Fitted with Pin Torx screw(s) for security applications (not K5491).

I Tapped to provide a direct connection for waste pipes – specify size BSP 1¼", 1½", or 2" (applies to K52 series, K5391 and L51 series; L5193 may also be tapped 3" or 4" BSP).

See section 5X for a range of accessories including filter buckets and removable bottle trap.

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Direct connection access covers

Nickel bronze BS EN 1982

Satin finish

For use with flexible sheet flooring such as vinyl only

Durable, superbly finished and particularly suited to areas with high volume of pedestrian traffic (with sherardized cast iron frame).

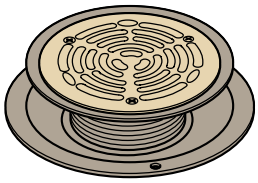
Connections

To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

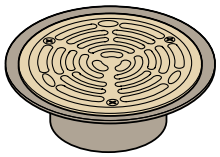
N2 series

Gasketed – for 40/50mm pipework



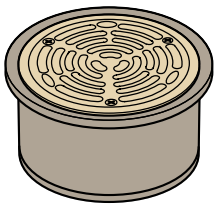
N3 series

Gasketed – for 75mm pipework



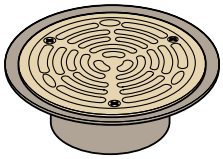
N4 series

Gasketed – for 100mm pipework



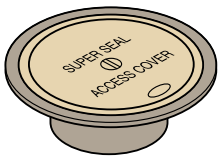
K5192

Gasketed – for 100mm pipework



K5691

'SuperSeal' (double sealed) – for 100mm pipework



Spec. Code	Pipework System	Pipework Nom. dia.	Overall dia. mm	Overall height mm	Throat dia. inches	Load rating class	kg
N212	Plastic	40	142	54	1/1½" BSP female	L15	1.5
N214**	Plastic	40	142	54	1/1½" BSP female	L15	2.0
N216	Plastic	50	142	54	2" BSP female	L15	1.4
N218**	Plastic	50	142	54	2" BSP female	L15	2.0
N302	Cast iron BS 416	75	142	54	3"	L15	1.3
N304	Plastic	82	142	54	3"	L15	1.2
N306	Plastic DIN	75	142	54	3"	L15	1.4
N404	Cast iron BS 437	100	146	79	4"	L15	2.2
N409	Clay supersleve	100	146	79	4"	L15	2.2
K5192	C.I. + P*	100	176	60	4"	L15	2.5
K5691	C.I. + P*	100	176	60	4"	L15	2.3

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*
***Versions with cast iron backnut for use in timber floors.*

Covers have a spigot length of 25mm minimum.

Options

Suffix

H Fitted with Pin Torx screw(s) for security applications.

I Tapped to provide a direct connection for waste pipes – specify size BSP, 1¼", 1½" or 2" (applies to N2, N3 and N4 series and K5192).

See section 5X for a range of accessories including filter buckets and removable bottle trap.

Direct connection access covers

Stainless steel Grade 304

Satin finish

For use in high specification applications including food preparation, prison cells, showers and areas where high corrosion resistance is a requirement.

In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request (K51 and K56 series have sherardized cast iron frame).

Connections

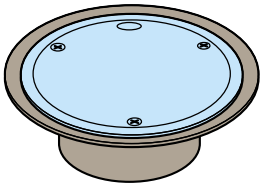
To complete the connection a coupling or ring seal socket is required, as illustrated on page 6.

Covers can be connected to 100mm Supersleve clay pipe using adaptor T1103 shown in Section 10.

For connection to other pipework systems, couplings are generally available from the pipework supplier.

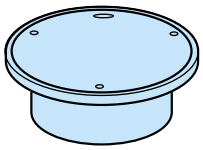
K5197

For use with flexible sheet flooring such as vinyl (unsealed)



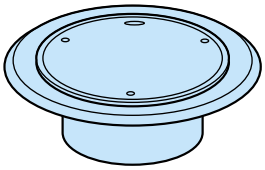
K5297

Gasketed – for use with tiled or epoxy resin floor



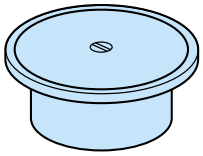
K5397

Gasketed – for use with trowel applied composition flooring. 6mm flange depth



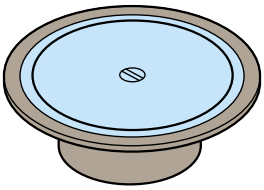
K5597

'SuperSeal' (double sealed) – for use with tiled or epoxy resin floor



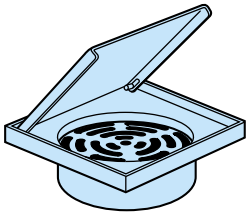
K5697

'SuperSeal' (double sealed) – for use with flexible sheet flooring such as vinyl



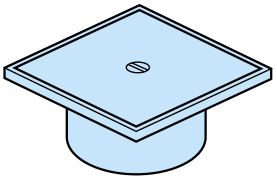
L53 series

Hinged cover with a circular non-secured grating inside (unsealed)



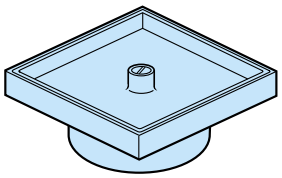
L5597

'SuperSeal' (double sealed) – for use with tiled or epoxy resin floor



L5897

'SuperSeal' (double sealed). Recessed for flooring material (22mm recess depth)



Spec. Code	Pipework System	Pipework Nom. dia.	Overall dia./width mm	Overall length mm	Overall height mm	Throat dia. inches	Load rating class	kg
K5197	C.I. + P*	100	176	–	60	4	L15	1.9
K5297	C.I. + P*	100	150	–	53	4	L15	1.2
K5397	C.I. + P*	100	150	–	53	4	L15	1.8
K5597	C.I. + P*	100	150	–	53	4	L15	1.4
K5697	C.I. + P*	100	176	–	60	4	L15	2.4
L5395	C.I. + P*	100	135	135	55	4	K3	1.1
L5398	C.I. + P*	100	150	150	55	4	K3	1.3
L5597	C.I. + P*	100	147	147	57	4	L15	1.9
L5897	C.I. + P*	100	150	150	75	4	L15	2.0

** C.I. + P means cast iron BS 416/DIN 19522 and plastic.*

Covers have a spigot length of 25mm minimum.

Options

Suffix

H Fitted with Pin Torx* screw(s) for security applications (not L53 series).
**Pin Hex screw if grade 316 specified.*

I Tapped to provide a direct connection for waste pipes – specify size BSP, 1¼", 1½" or 2" (applies to K5297 and K5197).

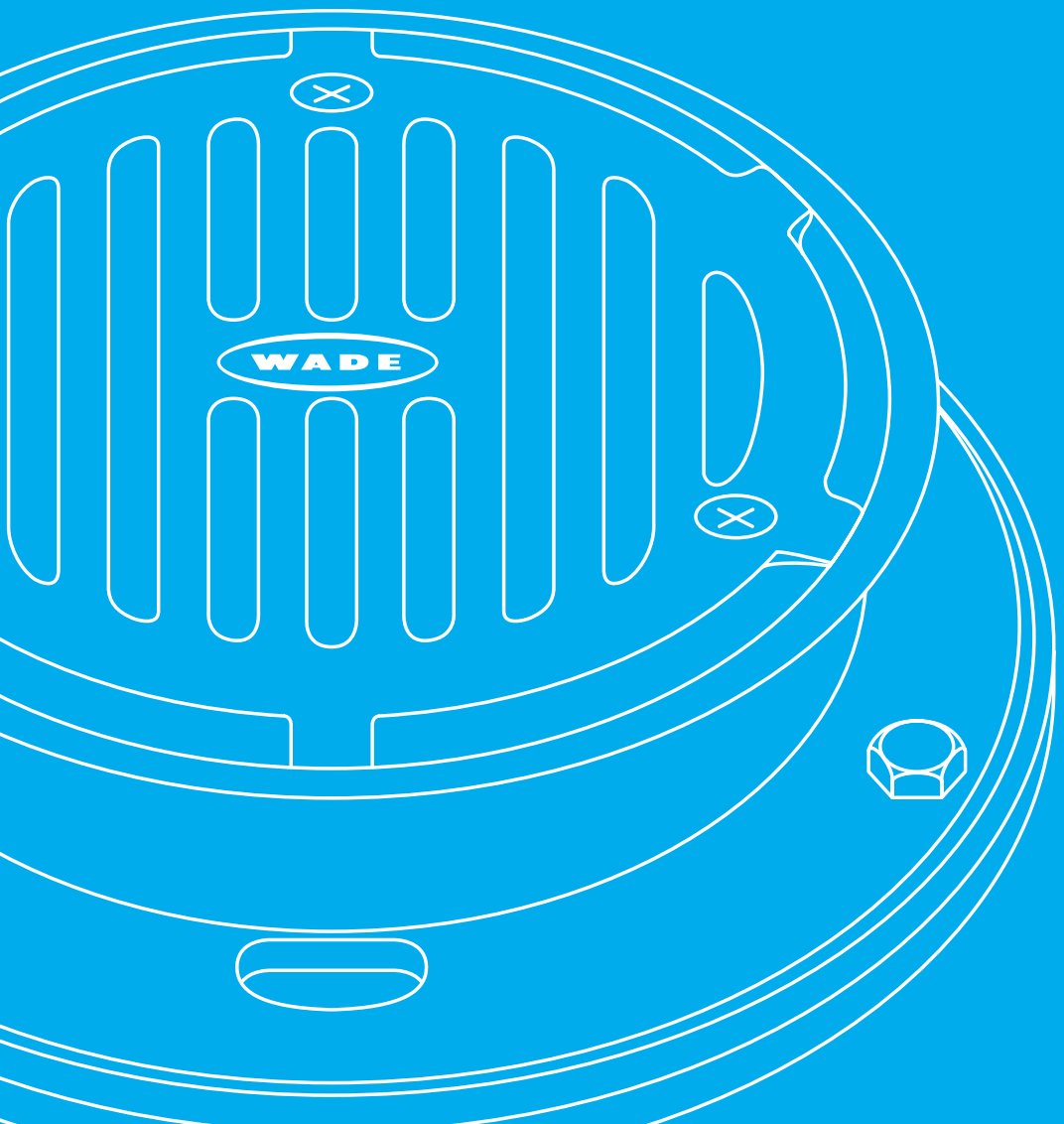
M Made of grade 316 stainless steel (K51 and K56 series have sherardized cast iron frame).

P Polished.

See section 5X for a range of accessories including filter buckets and removable bottle trap.

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Uni-Level and Multi-Level



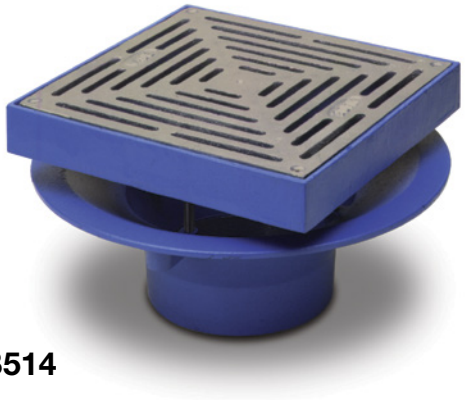
7-8

Uni-Level and Multi-Level

Uni-Level are designed for applications with asphalt/composition finished floors. Multi-Level are height-adjustable gullies designed for use with unfinished (e.g. bare concrete) floors.



WB324



WB514

Uni-Level

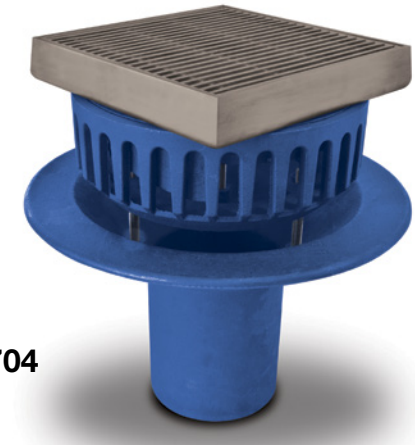
Uni-Level are designed for applications with asphalt/composition finished floors. These fixed height gully assemblies include a membrane clamping collar to ensure a watertight joint between the gully body and membrane.

Secured ductile iron gratings with load class L15 and M125, suitable for areas subject to car and light vehicular traffic, are removable without disturbing the membrane and provide excellent drainage performance.

See pages 7.1 to 7.2.



F204



WD704

Multi-Level

Multi-Level are height-adjustable gullies designed for use with unfinished (e.g. bare concrete) floors. Multi-Level gullies include the facility for a membrane clamping collar to ensure a watertight joint between the gully body and membrane.

Gratings are available to suit a range of requirements, from plant rooms to pedestrian areas, of ductile iron or stainless steel. Drainage is also provided at membrane level via weepholes or a slotted collar.

See pages 8.1 to 8.5.

Gullies for asphalt/composition finished floors

Cast iron, non-trapped, Uni-Level

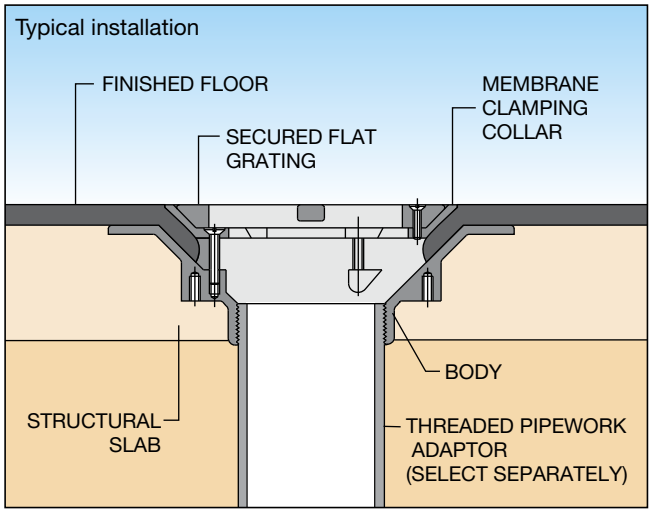
For areas subject to car and light vehicular traffic.

Connections

Bodies with spigot outlet are for direct connection to BS 416 pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in Section 10.

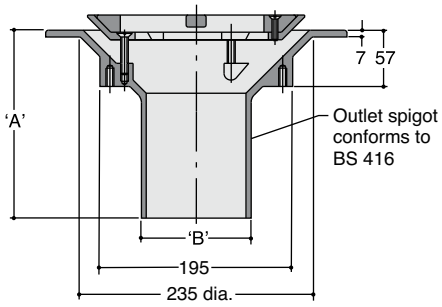
WB324





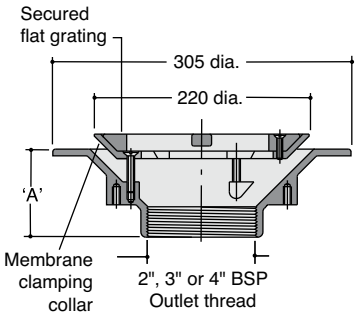
WB30 series

(Integral) spigot outlet



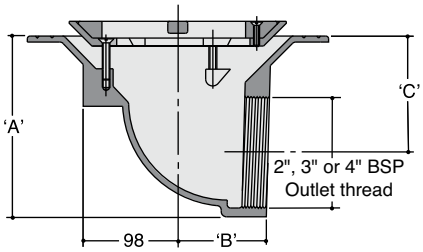
WB32 series

Vertical threaded outlet



WB33 series

Horizontal threaded outlet



Spec. Code	Outlet size	Outlet type	A mm	B mm	C mm	Body free area cm²	kg
WB302	50mm	Spigot	238	60	–	19	8.5
WB303	75mm	Spigot	165	87	–	44	6.2
WB304	100mm	Spigot	190	112	–	78	7.1
WB322	2" BSP	Vertical, threaded	90	–	–	19	7.5
WB323	3" BSP	Vertical, threaded	90	–	–	44	6.5
WB324	4" BSP	Vertical, threaded	90	–	–	78	5.9
WB332	2" BSP	Horizontal, threaded	119	145	80.5	19	8.6
WB333	3" BSP	Horizontal, threaded	119	145	67.5	44	8.0
WB334	4" BSP	Horizontal, threaded	183	90	117.0	78	9.8

For information on flow rates please contact our Technical Services Department.

Features

Bodies – choice of outlet type and size as illustrated.
Grating – ductile iron with sherardized protective coating; secured, non height-adjustable.

Dia. mm	Load rating N/mm²	Class	Free area cm²	Max. aperture width mm
220	10	L15	130	13

Membrane clamping collar which also serves to connect the grating to the body is included with this series.

Options

Filter bucket, stainless steel – WG301.

Notes

1. *Vari-Level grating K2501A shown in Section 5G ci when used with any Vari-Level body shown in Section 5B, and direct connection grating K2591A shown in Section 6G ci are also suitable for car and light vehicular traffic areas with an asphalt/composition finish.*
2. *Vari-Level gratings shown in Section 5G are suitable for use in asphalt/composition finished floors subject to pedestrian traffic, if used with Vari-Level bodies D10-D12, shown in Section 5B ntcibm.*

Gullies for asphalt/composition finished floors

Cast iron, non-trapped, Uni-Level

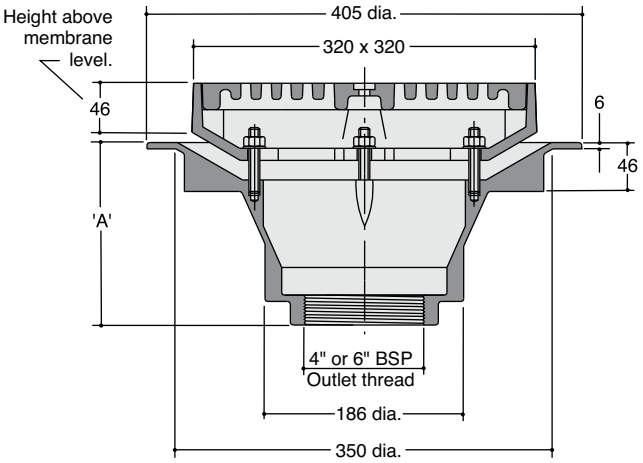
For areas subject to car and light vehicular traffic.

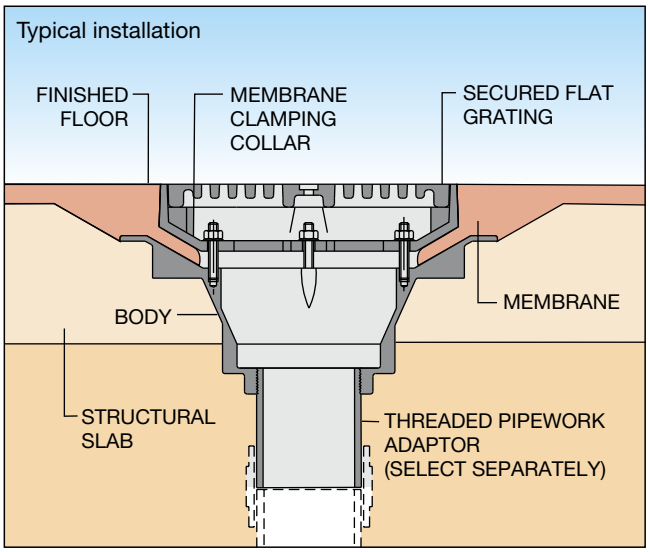
Connections

Bodies have BSP threaded outlet and are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in Section 10.

WB514







Spec. Code	Outlet size	A mm	Body free area cm²	kg
WB514	4" BSP	171	78	26.4
WB516	6" BSP	149	176	23.9

Features

Bodies – choice of outlet size as illustrated.
Grating – ductile iron with sherardized protective coating; secured, non height-adjustable.

Size mm	Load rating N/mm²	Class	Free area cm²	Max. aperture width mm
320 x 320	5	M125	295	9

Membrane clamping collar which also serves to connect the grating to the body is included with this series.

For information on flow rates please contact our Technical Services Department.

Options

Filter bucket, stainless steel – WH402.

Notes

1. *Vari-Level grating K2501A shown in Section 5G ci when used with any Vari-Level body shown in Section 5B, and direct connection grating K2591A shown in Section 6G ci are also suitable for car and light vehicular traffic areas with an asphalt/composition finish.*
2. *Vari-Level gratings shown in Section 5G are suitable for use in asphalt/composition finished floors subject to pedestrian traffic, if used with Vari-Level bodies D10-D12, shown in Section 5B ntcibm.*

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Gullies for unfinished floors

Cast iron, trapped or non-trapped, Multi-Level

For areas subject to car and light vehicular traffic.

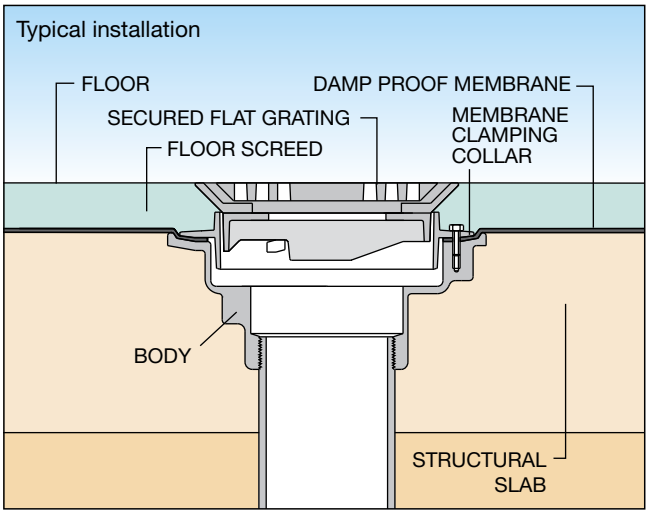
Connections

Bodies (see Section 5B, series D2-D8 and GD) with spigot outlet are for direct connection to pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in Section 10.

D204

Body with **M101** grating shown with optional weepholes





Features

Bodies – select from Vari-Level series D2-D8 and GD shown in Section 5B.
Grating – ductile iron with sherardized protective coating; secured, height-adjustable.
Membrane clamping collar (required) – cast iron; also serves to connect the grating to the body.

Spec. Code Grating	Collar	Load rating class	Free area cm²	Max. aperture width mm	kg
M101	C.M1	L15	130	13	3.7

220mm dia.



Height adjustability – The grating sits in an adjustable collar; by rotating this assembly its height above the body flange can be adjusted to suit floor level within the following limits;
Maximum height – 85mm.
Minimum height – 50mm.
Extra height can be obtained by means of grating extension U301.

Notes

1. *For finished floors in pedestrian areas, gratings are also available made of nickel bronze or polished bronze. To specify/order add suffix 'NB' or 'PB'. For information on their load rating, please contact our Technical Services Department.*
2. *A range of Vari-Level cast iron gratings, shown in section 5G ci, and their direct connection versions shown in section 6G ci, are also available for use in unfinished floors.*

For information on flow rates please contact our Technical Services Department.

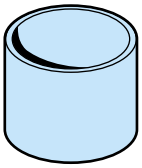
Options

Bolt-on funnels – Cast iron, sherardized

For use in applications where provision for indirect waste or condensate drainage is required in addition to floor drainage.

U502

To take single indirect waste pipe.



Dia. 100mm
Ht 100mm

U602

To take multiple indirect waste pipes; (for use with gratings. min. 150mm dia.).

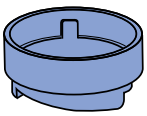


W 85mm
L 225mm
Ht 96mm

Extension – Cast iron

U301

Increases height by between 50mm and 69mm.



May be stacked to achieve extra height (Caution: If using with GD series body, access to rodding plug will be restricted).

Side inlets – select from Section 9.
Filter bucket – stainless steel – add suffix 'B'.
Weepholes – add suffix 'W' to membrane clamping collar Spec. Code e.g. C.M1W (to provide supplementary drainage at membrane level).

Gullies for unfinished floors

Cast iron, non-trapped, Multi-Level

For areas subject to car and light vehicular traffic.

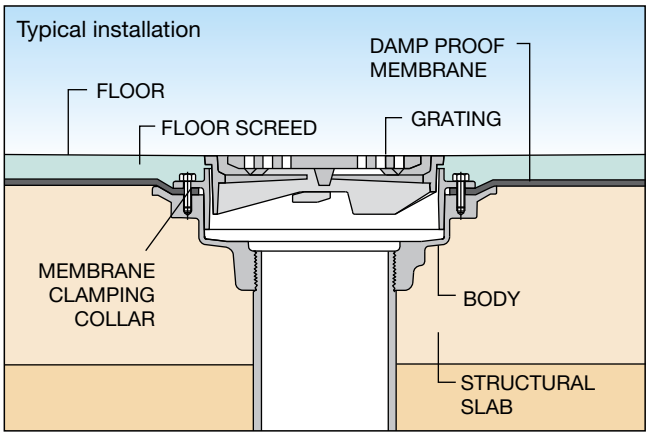
Connections

Bodies have BSP threaded outlet and are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in Section 10.

E204

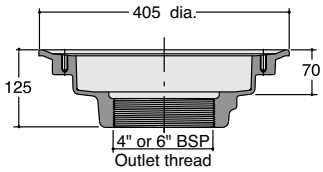
Body with membrane clamping collar, weepholes and **M301** grating





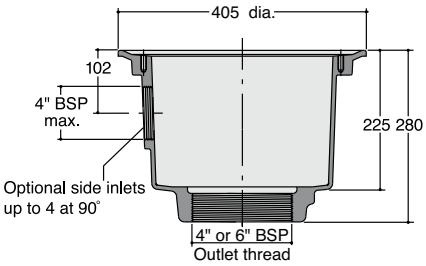
E2 series

Medium Sump – vertical threaded outlet



E4 series

Deep Sump – vertical threaded outlet + optional side inlet



Body Spec. Code	Outlet size BSP	Free area cm²	kg
E204	4" BSP	76	17.7
E206	6" BSP	176	12.0
E404	4" BSP	78	29.4
E406	6" BSP	176	29.0

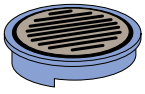
Features

Bodies – medium or deep sump, vertical outlet.
Grating – M401 ductile iron, M301 cast iron, with sherardized protective coating; height-adjustable. Select circular or square.
Membrane clamping collar (required) – cast iron with weepholes; also serves to connect the grating to the body.

Spec. Code Grating	Collar	Load rating class	Free area cm²	Max. aperture width mm	kg
M301	C.E2	L15	200	11	10.0
M401	C.E2	L15	300	12	10.0

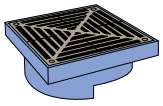
M301

280mm dia.



M401

270mm sq.



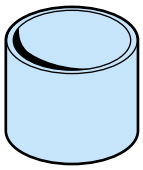
Height adjustability – The grating sits in an adjustable collar; by rotating this assembly its height above the body flange can be adjusted to suit floor level within the following limits;
Maximum height – M301 – 83mm, M401 – 111mm.
Minimum height – M301 – 33mm, M401 – 61mm.
Extra height can be obtained by means of grating extension U401SS.
Weepholes – to provide supplementary drainage at membrane level.

Bolt-on funnels – Cast iron, sherardized

For use in applications where provision for indirect waste or condensate drainage is required in addition to floor drainage.

U502

To take single indirect waste pipe.



Dia. 100mm
Ht 100mm

U602

To take multiple indirect waste pipes; (for use with gratings. min. 150mm dia.).

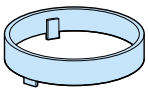


W 85mm
L 225mm
Ht 96mm

Extension - Stainless steel

U401SS

Increases height by 64mm, may be stacked to achieve extra height.



Options

Filter bucket – stainless steel – add suffix 'B' to grating Spec. Code.
Side inlets – select from Section 9 (E4 only).

Notes

1. *For finished floors in pedestrian areas, gratings are also available made of nickel bronze or polished bronze. To specify/order add suffix 'NB' or 'PB'. For information on their load rating, please contact our Technical Services Department.*
2. *A range of Vari-Level cast iron gratings, shown in Section 5G ci, and their direct connection versions shown in Section 6G ci, are also available for use in unfinished floors.*

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Gullies for unfinished floors

Cast iron or stainless steel, non-trapped, Multi-Level

For use in car parks, yards, warehouses, plant rooms etc. Versions available with cast iron or stainless steel body.

Connections

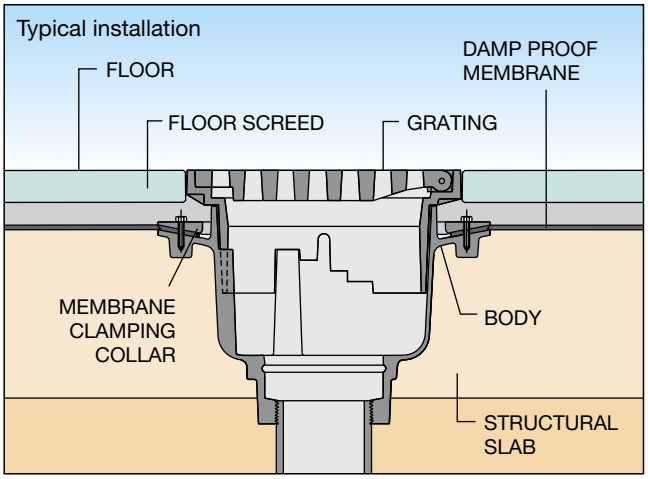
Bodies with spigot outlet are for direct connections to BS 416 pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in Section 10.

F204



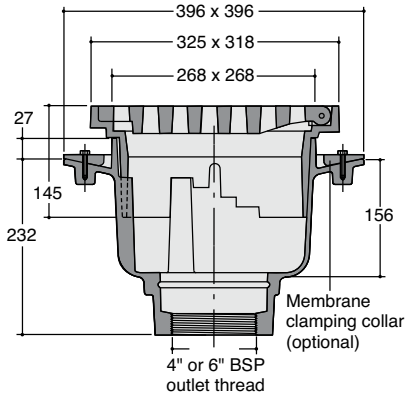
F214





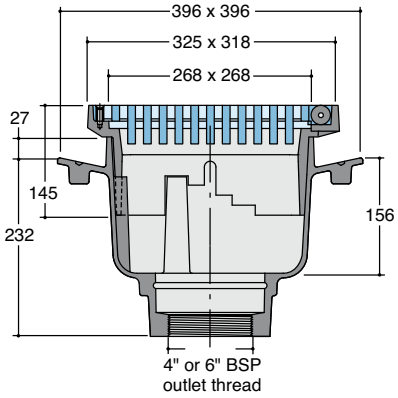
F204, F206

With cast iron body and sherardized ductile iron hinged grating



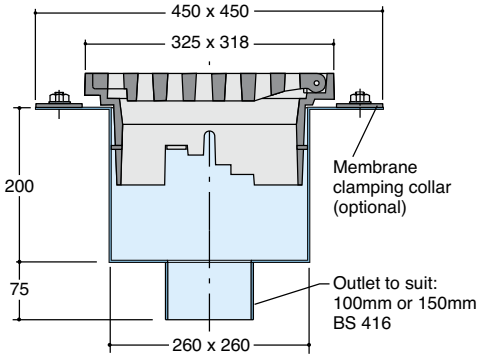
F214, F216

With cast iron body and stainless steel hinged grating



F304, F306

With cast iron body and sherardized ductile iron hinged grating



Spec. Code Gully	Collar	Outlet size BSP	kg	Load rating class	Free area cm²	Max. aperture width mm
F204	C.F2	4" BSP	42.8	M125	280	19
F206	C.F2	6" BSP	42.8	M125	280	19
F214	C.F2	4" BSP	49.3	P400*	280	19
F216	C.F2	6" BSP	49.3	P400*	280	19
F304	C.F3	100mm BS 416	24.3	M125	280	19
F306	C.F3	150mm BS 416	24.7	M125	280	19

*__Note:__ *Grating seat must be fully supported to achieve load rating class.*

Features

Height adjustability – The grating sits in an adjustable collar; by rotating this assembly a quarter turn at a time its height above the body flange can be adjusted, in 12mm increments, within the following limits;

F2 series	F3 series
Maximum height – 106mm	Maximum height – 82mm
Minimum height – 70mm	Minimum height – 46mm

Weepholes – (to provide supplementary drainage at membrane level).

For information on flow rates please contact our Technical Services Department.

Options

Bodies – Cast iron or stainless steel with 4" or 6" outlet

Membrane clamping collar

Optional – see table for collar Spec. Code

Filter bucket – stainless steel, add suffix 'B'

Removable bell trap – U1704 (F304 only)
U1706 (F306 only)

Notes

1. *For finished floors in pedestrian areas, gratings are also available made of nickel bronze or polished bronze.*
   To specify/order add suffix 'NB' or 'PB'.
   For information on their load rating, please contact our Technical Services Department.
   Maximum and Minimum height adjustability dimensions for the non-ferrous versions are 113mm and 80mm (F2 series) 89mm and 56mm (F3 series) in 11mm increments.
2. *A range of Vari-Level cast iron gratings, shown in Section 5G ci, and their direct connection versions shown in Section 6G ci, are also available for use in unfinished floors.*

Gullies for unfinished floors

Cast iron, non-trapped, Multi-Level

For areas subject to car and light vehicular traffic, requiring surface and sub-surface drainage over a lower level membrane.

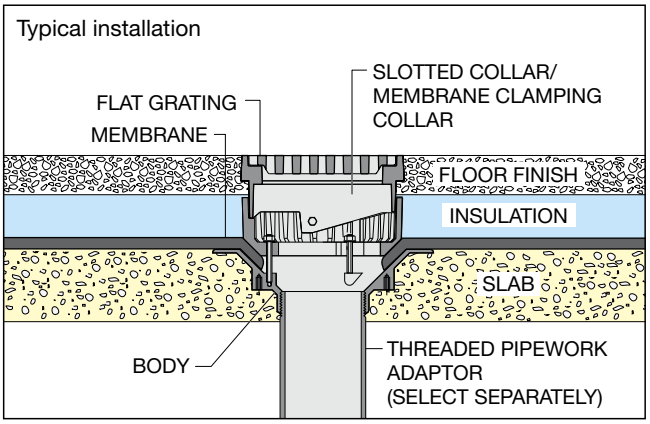
Connections

Bodies with spigot outlet are for direct connections to BS 416 pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in Section 10.

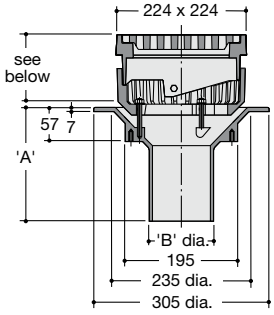
WD304



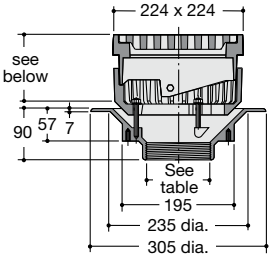
Versions illustrated have square grating, for versions with 220mm dia. circular grating, see table below.



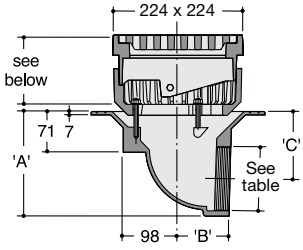
WD30 series



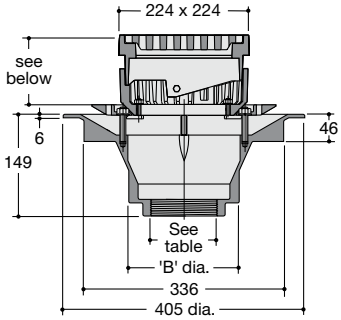
WD32 series



WD33 series



WD6 series



Gully Spec. Code Circular	Square	Outlet size	Outlet type	A mm	B mm	C mm	Body free area cm²	kg Circular	Square
WD202	WD302	50mm	Spigot	238	60	–	19	13.7	14.9
WD203	WD303	75mm	Spigot	165	87	–	44	12.5	12.6
WD204	WD304	100mm	Spigot	190	112	–	78	12.3	13.5
WD222	WD322	2" BSP	Vertical, threaded	–	–	–	19	12.7	13.9
WD223	WD323	3" BSP	Vertical, threaded	–	–	–	44	11.7	12.9
WD224	WD324	4" BSP	Vertical, threaded	–	–	–	78	11.1	12.3
WD232	WD332	2" BSP	Horizontal, threaded	119	145	80.5	19	13.8	15.0
WD233	WD333	3" BSP	Horizontal, threaded	119	145	67.5	44	13.2	14.4
WD234	WD334	4" BSP	Horizontal, threaded	183	90	117	78	15.0	16.2
WD514	WD614	4" BSP	Vertical, threaded	–	186	–	78	20.1	21.3
WD516	WD616	6" BSP	Vertical, threaded	–	186	–	176	17.6	18.8
WD518	WD618	200mm	Spigot	–	210	–	314	21.0	22.1

Features

Bodies – medium or deep sump, vertical or horizontal outlet.
Grating – Circular – ductile iron with sherardized protective coating; Square – cast iron with sherardized protective coating.

	Size mm	Load rating class	Free area cm²	Max. aperture width mm
Circular	220 dia.	L15	130	13
Square	224 x 224	L15	170	13

Height adjustable – WD2 – 78 min, 105 max
WD3 – 94 min, 121 max
WD5 – 90 min, 117 max
WD6 – 106 min, 133 max

Membrane clamping collar which also serves to connect the grating to the body is included with this series.

For information on flow rates please contact our Technical Services Department.

Options

Filter bucket – WD2 and WD3 series – WG301.
– WD5 and WD6 series – WG301.
Extension – 96mm additional height; Cast iron – WG501.
Extension – 35mm additional height; Cast iron – WG502.

Notes

For finished floors in pedestrian areas, gratings are also available made of nickel bronze or polished bronze. To specify/order add suffix 'NB' or 'PB'.

For information on their load rating, please contact our Technical Services Department.

Tel: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

Gullies for unfinished floors

Cast iron with stainless steel grating. Non-trapped, Multi-Level

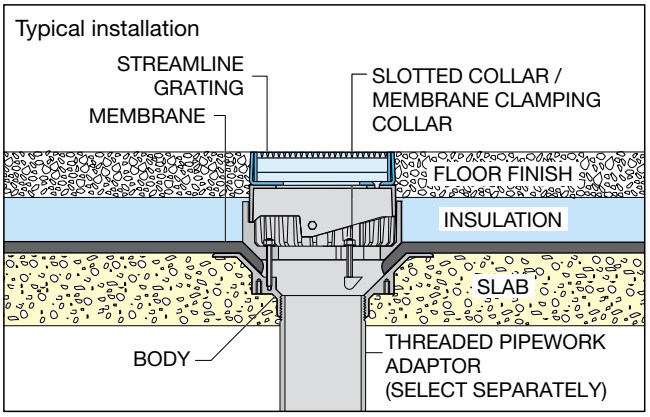
For areas subject to pedestrian traffic, requiring surface and sub-surface drainage over a lower level membrane.

Connections

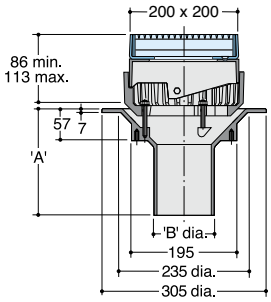
Bodies with spigot outlet are for direct connections to BS 416 pipework; versions with BSP threaded outlet are for connection to pipework by means of a threaded pipework adaptor. Details of adaptors for connecting to different types and sizes of pipework are shown in Section 10.

WD704

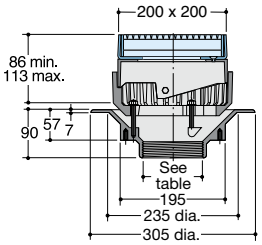




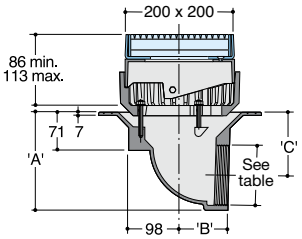
WD70 series



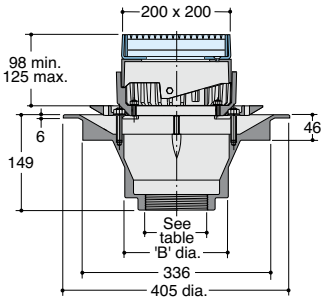
WD72 series



WD73 series



WD64 series



Gully Spec. Code	Outlet size	Outlet type	A mm	B mm	C mm	Body free area cm²	kg
WD702	50mm	Spigot	238	60	–	19	13.3
WD703	75mm	Spigot	165	87	–	44	12.1
WD704	100mm	Spigot	190	112	–	78	11.9
WD722	2" BSP	Vertical, threaded	–	–	–	19	12.3
WD723	3" BSP	Vertical, threaded	–	–	–	44	11.3
WD724	4" BSP	Vertical, threaded	–	–	–	78	10.7
WD732	2" BSP	Horizontal, threaded	119	145	80.5	19	13.4
WD733	3" BSP	Horizontal, threaded	119	145	67.5	44	12.8
WD734	4" BSP	Horizontal, threaded	183	90	117	78	14.6
WD644	4" BSP	Vertical, threaded	–	186	–	78	19.7
WD646	6" BSP	Vertical, threaded	–	186	–	176	17.6
WD648	200mm	Vertical, threaded	–	210	–	314	17.6

Features

Bodies – medium or deep sump, vertical or horizontal outlet.
Grating – stainless steel – grade 304 'streamline' reverse wedge profile with 5mm slot width; height adjustable. For use in high specification applications where high corrosion resistance is a requirement.

In applications having an aggressive atmosphere, grade 316 is recommended and is available on request.

Size mm	Load rating class	Free area cm²	Max. aperture width mm
200 x 200	L15	216	5

Height adjustable – WD70 – WD73 – 86 min, 113 max
WD64 – 98 min, 125 max
Membrane clamping collar which also serves to connect the grating to the body is included with this series.

For information on flow rates please contact our Technical Services Department.

Options

Filter bucket – WD70-WD73 series – WG301.
– WD64 series – WG301.
Extension – 96mm additional height; Cast iron – WG501.
Extension – 35mm additional height; Cast iron – WG502.

Side inlets

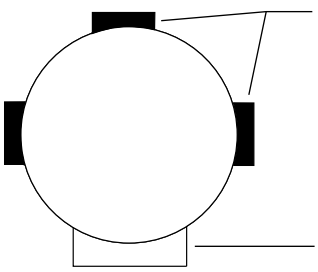
Side inlets in a gully permit the underfloor connection of pipes from fixtures such as sinks and wash basins, from drainage channels and from other gullies.

Side inlets in Wade trapped gullies are located completely above the water level, except in G102, H102 and GD series where the inlets are partially below the water level.

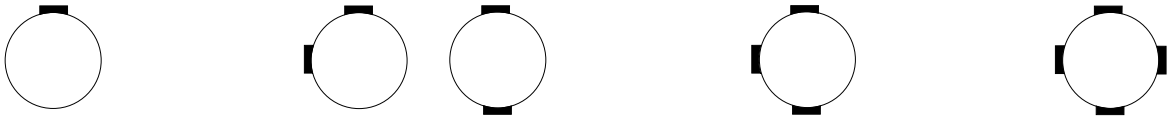
The illustrations represent typical gully bodies, **viewed from above,** and show the **Spec. Codes** for all possible combinations of **locations.**

Unless otherwise requested, side inlets in cast iron gully bodies will be supplied as BSP female threads (specify thread size); stainless steel bodies have BSP female threads up to 2"; above 2", spigot inlets are supplied to suit BS 416 pipework.

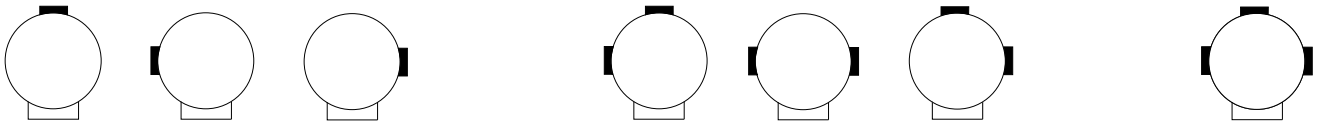
GP1104 plastic gully body has three side inlets moulded-in that will accept 50mm plastic pipework; these inlets are usable by removing knock-outs from the body on site.



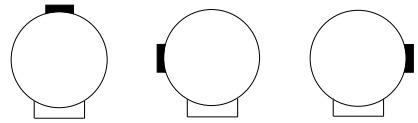
Gully bodies with vertical outlet

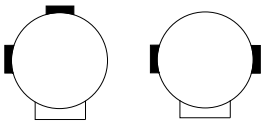


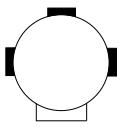
Gully bodies with 'P' or 'S' trapped outlet



Gully bodies with horizontal outlet







To specify/order

Quote the Spec. Code for the selected **body** with suffix '**I**' and the **locations** and **size** of each inlet.
e.g. G304 body with 2 side inlets tapped 1.5" BSP, in locations per illustration 2B.
Specify: G304I 2B 1.5

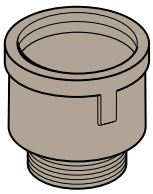
Adaptors

Connections

Adaptors and couplings are available to connect Wade products to pipework and fittings made by others.

T6 series

Hub adaptor for caulk joint



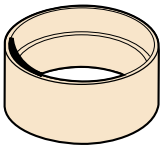
T1103

Push fit coupling BS 416/437 to Supersleve



T12 series

Copper to BS 416. Adaptor must be brazed/ soldered to copper pipe before connecting to BS 416 by means of a proprietary coupling



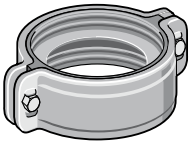
T1501

MJ coupling BS 416 to plastic



T1603

MJ coupling 75mm BS 416 to Ensign



Connections		Adaptor	
From	To	Spec. Code	kg
2" BSP female	50mm cast iron caulk joint	**T601**	0.6
3" BSP female	75mm cast iron caulk joint	**T602**	2.6
4" BSP female	100mm cast iron caulk joint	**T603**	3.2
100mm BS 416 or BS 437	100mm Supersleve	**T1103**	0.2
50mm BS 416	50mm copper	**T1201**	0.4
75mm BS 416	75mm copper	**T1202**	0.6
100mm BS 416	100mm copper	**T1203**	0.7
100mm BS 416	110mm plastic	**T1501**	0.3
75mm BS 416	75mm DIN 19522 Ensign	**T1603**	1.2

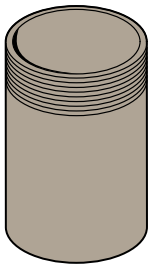
Threaded pipework adaptors

A comprehensive range of threaded pipework adaptors, shown in the following table, is available to enable gully bodies with BSP threaded outlet to be connected speedily and effectively to all pipework in general use. To complete the connection a coupling may be required as indicated.

Longer lengths, such as required to pass through a slab, can be made in 10mm increments up to 900mm (except T401, T501, T502, T1702 and T1704).

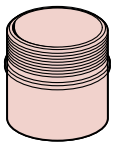
To specify/order add '#' and length (mm) to Spec. Code.

On request, adaptors may also be threaded both ends, for details, please contact our Technical Services Department.



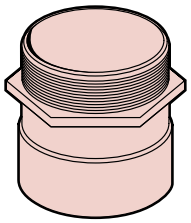
T1702*

Threaded pipework adaptor, plastic (ABS)



T1704*

Threaded pipework adaptor, plastic (ABS)

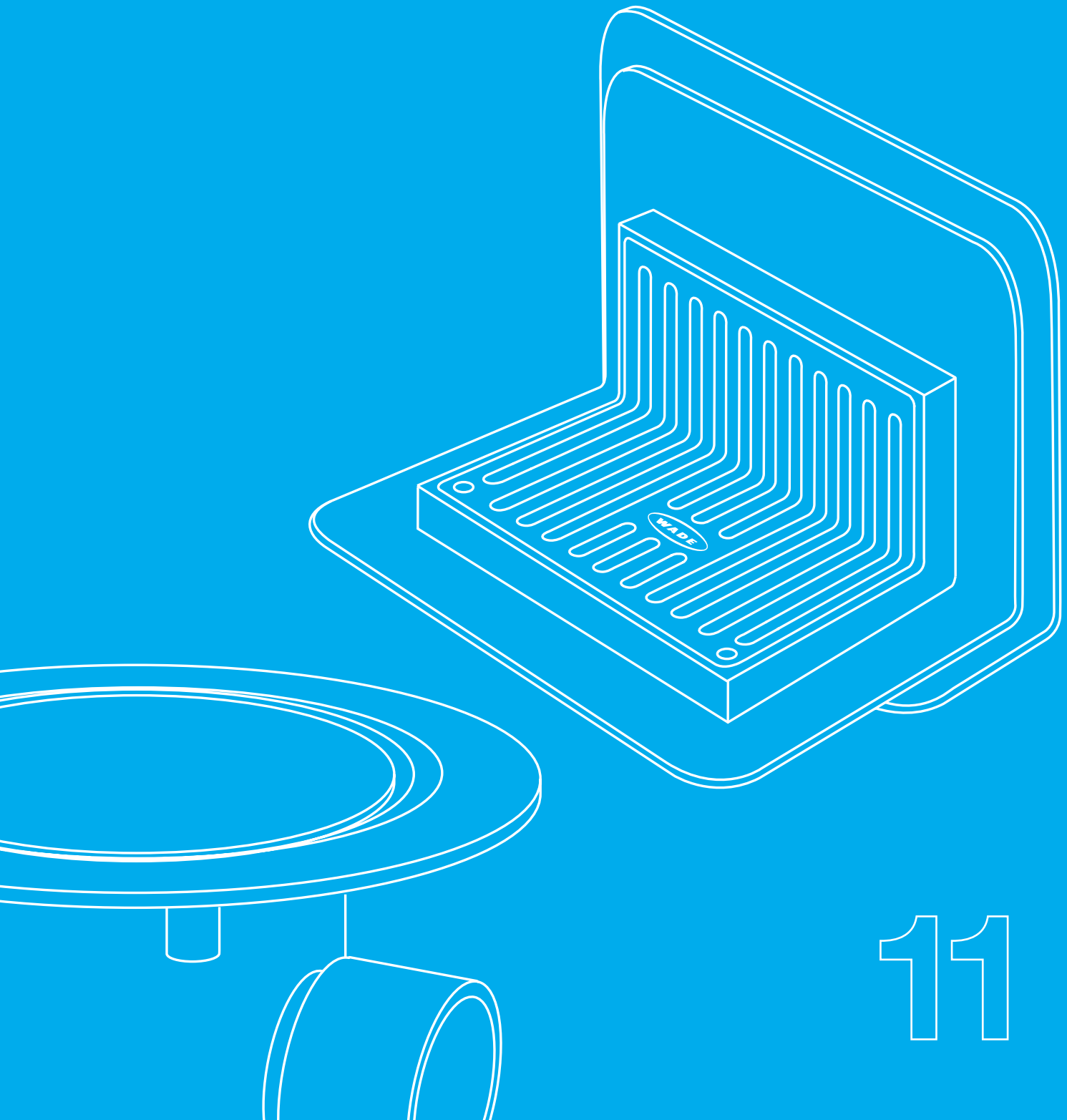


Pipework system	Nom dia. mm	Body outlet BSP	Spec. Code	O.D. mm	Length mm	Material	kg	Required coupling
Cast iron BS 416	50	2"	**T101**	60	90	Mild steel, sherardized	0.5	Proprietary
Cast iron BS 416	75	3"	**T102**	87	90	Mild steel, sherardized	0.9	Proprietary
Cast iron BS 416	100	4"	**T103**	111	90	Cast iron†	1.2	Proprietary
Cast iron BS 416	150	6"	**T104**	162	90	Cast iron	1.1	Proprietary
Cast iron BS 437	100	4"	**T105**	117	90	Cast iron	1.4	Proprietary
Cast iron BS 437	150	6"	**T106**	171	90	Cast iron	1.8	Proprietary
Cast iron DIN 19522 (Ensign + SMU)	50	2"	**T101**	60	90	Mild steel, sherardized	0.5	Proprietary
Cast iron DIN 19522 (SMU)	75	3"	**T108**	84	90	Mild steel, sherardized	0.7	Proprietary
Cast iron DIN 19522 (Ensign)	75	3"	**T102**	87	90	Mild steel, sherardized	0.9	Wade T1603
Cast iron DIN 19522 (Ensign + SMU)	100	4"	**T103**	111	90	Cast iron†	1.2	Proprietary
Cast iron DIN 19522 (Ensign + SMU)	150	6"	**T104**	162	90	Cast iron	1.1	Proprietary
Stainless steel (Europipe)	50	2"	**T1802**	50	90	Plastic (ABS)	0.2	Proprietary
Stainless steel (Europipe)	100	4"	**T302**	110	120	Plastic (UPVC)	0.4	Proprietary
Plastic	50	2"	**T1702***	54	60	Plastic (ABS)	0.1	None
Plastic	82	3"	**T301**	82	140	Plastic (ABS)	0.2	Proprietary
Plastic	110	4"	**T1704***	110	126	Plastic (ABS)	0.2	None
Plastic	160	6"	**T303**	160	166	Plastic (ABS)	0.6	Proprietary
Clay (Supersleve)	100	4"	**T501**	122	130	Cast iron	2.8	Proprietary
Clay (Supersleve)	150	6"	**T502**	178	130	Cast iron	4.6	Proprietary
HDPE	100	4"	**T103**	111	90	Cast iron	1.2	Wade T1501

** Solvent weld socket.*

† ***T103*** *in lengths greater than 600mm is mild steel, sherardized.*

Specialised applications



11

Specialised applications

Over the years Wade has been asked to provide solutions to various drainage problems. This section includes examples of products, originally designed for a particular project, but which have become available for use elsewhere.

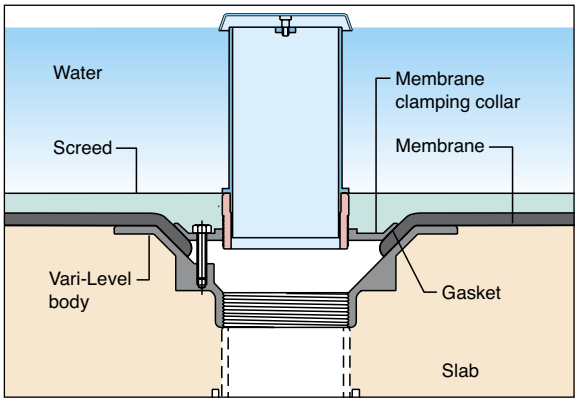
Please browse this section to see the full range, a sample of which is illustrated below.

Typical installations



K3202

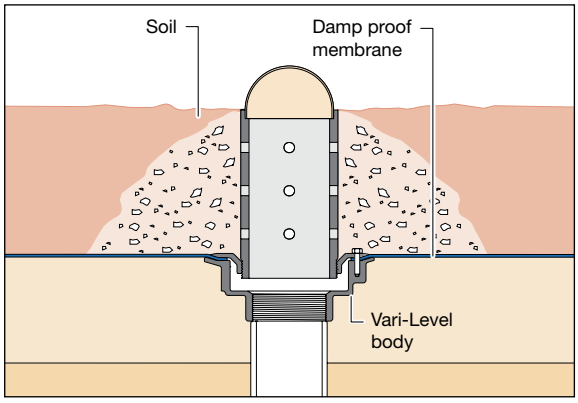
Overflow gullies for decorative pools, baptismal pools and fonts.
See page 11O.





P901

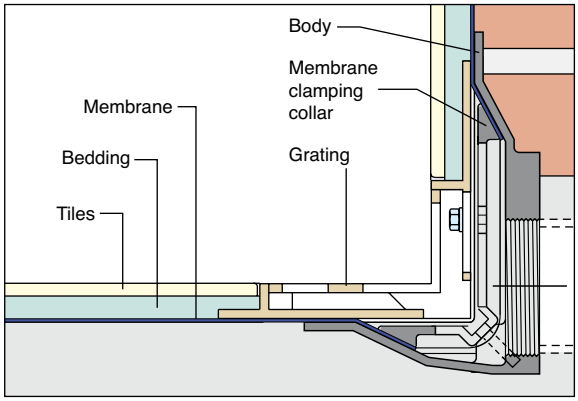
Drainage of planting areas and roof gardens.
See page 11P.





P14 series

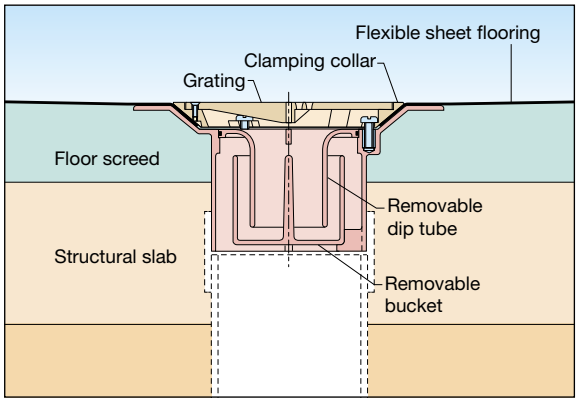
90° gully for use in shower areas etc.
See page 11S.





GV6103

Gully assemblies for flexible sheet flooring such as vinyl.
See page 11SF1 – 11SF2.

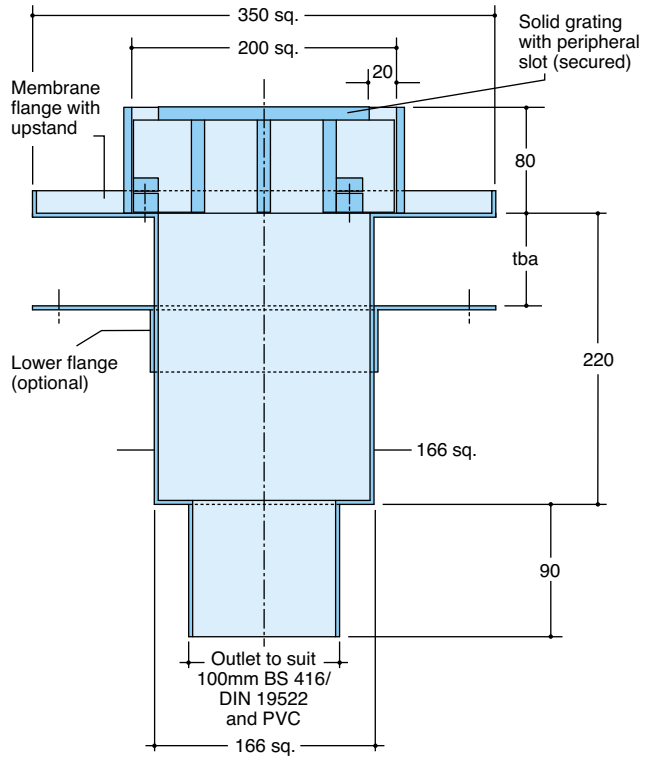


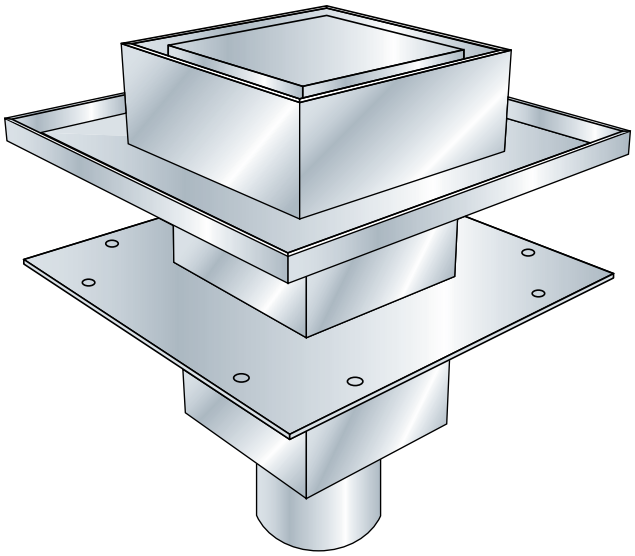
Heavy duty lorry deck gully

Stainless steel – grade 304, matt finish

Q904

Heavy duty gully with peripheral drainage slot, designed for use in areas subject to high loads such as lorry decks, service and parking areas. Optional lower flange may be used as a deck mounting flange and/or a membrane flange.





Spec. Code	Grating free area cm²	Max. aperture width mm	Load rating class	kg
Q904	144	20	P400*	17.5

*__Note:__ *Grating seat must be fully supported to achieve load rating class.*

Features

Grating – Stainless steel, secured

Options

Lower flange – add suffix 'F' – specify position

Fitted with Pin Torx* screws for security application – add suffix 'H'

**Pin Hex screws if grade 316 specified.*

Made of grade 316 stainless steel – add suffix 'M'

Weepholes (upper flange) – add suffix 'W'

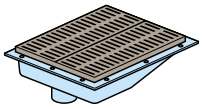
Weepholes (lower flange) – add suffix 'W2'

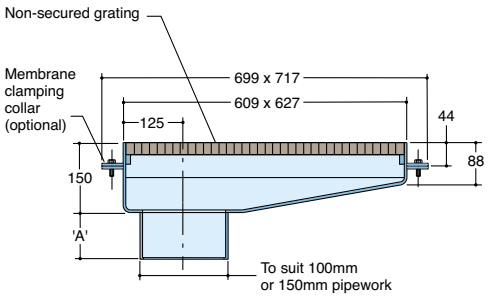
Dimensions can be amended to suit specific application – please contact our Technical Services Department with your requirements.

Large gullies

Q1 series

For use in factories, service and parking areas, warehouses etc., where very large volumes of water are discharged





Material

Body – stainless steel, grade 304
Grating – ductile iron, sherardized

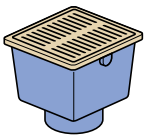
Options

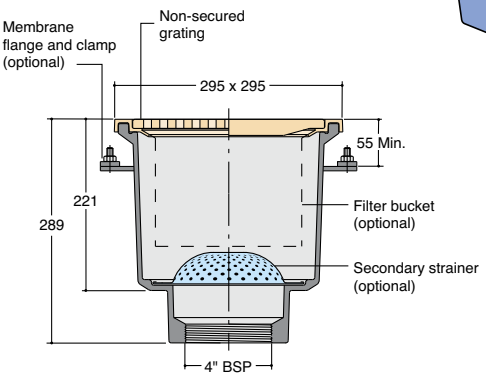
Membrane clamping collar – add suffix 'C'

Spec. Code	Outlet size	Grating free area cm²	'A'	Load rating class	kg
Q105	100mm BS 416 & plastic	1250	90	M125	100.0
Q106	150mm BS 416	1250	100	M125	100.0

Q3 series

For use as a hopper drain, or an indirect waste receiver, for pedestrian traffic only





Material

Body Q301 – cast iron, lacquered
Body Q302 – cast iron, plastic coated
Grating – nickel bronze

Other materials

Versions also available with cast iron grating

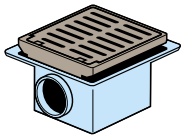
Options

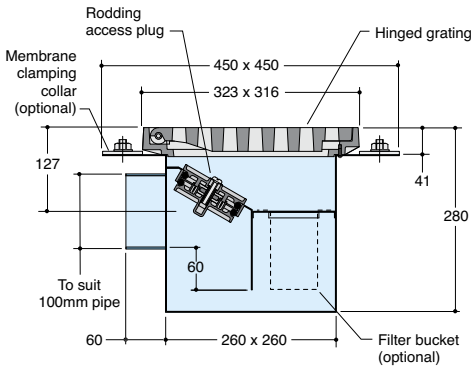
Flange and membrane clamp – add suffix 'F'
Stainless steel secondary strainer – add suffix 'D'
Stainless steel filter bucket – add suffix 'B'

Spec. Code	Grating free area cm²	Load rating class	kg
Q301	205	L15	22.4
Q302	205	L15	22.4

Q403

For use in service and parking areas, factories, warehouses etc. Trapped gully with hinged ductile iron grating and rodding access





Material

Body – stainless steel
Grating – ductile iron, sherardized

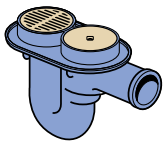
Options

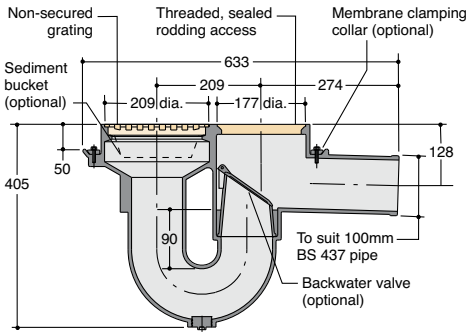
Stainless steel filter bucket – add suffix 'B'
Membrane clamping collar – Spec. Code C.Q4

Spec. Code	Outlet size mm	Grating free area cm²	Load rating class	kg
Q403	100mm BS 416	280	M125	23.0

Q501

For use where a trapped side outlet is required in pedestrian traffic areas





Material

Body – cast iron, lacquered grating – nickel bronze
Access cover – nickel bronze

Options

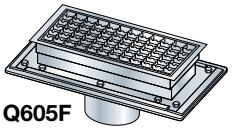
Filter bucket – add suffix 'B'
Membrane clamping collar – Spec. Code C.Q5
Gunmetal backwater valve – add suffix 'V'

Spec. Code	Outlet size mm	Grating free area cm²	Load rating class	kg
Q501	100mm BS 437	125	L15	40.0

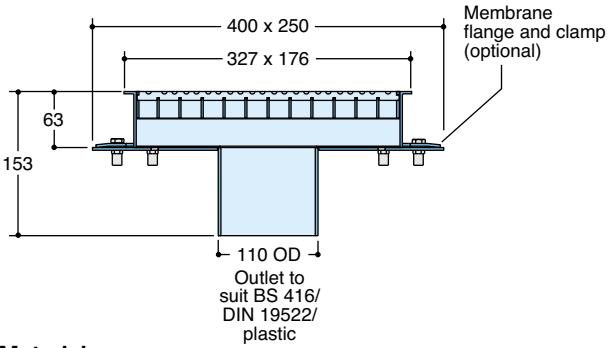
Large gullies

Q605

For use in gutters and trenches



Q605F



Material

Body and grating – stainless steel, grade 304

Options

Membrane flange and clamp – add suffix 'F'
Secured grating – add suffix 'L'

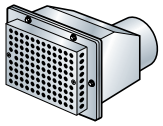
Note

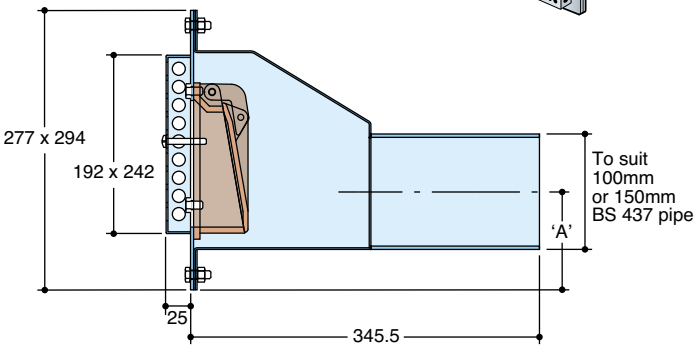
Wade manufacture a wide range of linear drainage products – please refer to our 'Linear Drainage' brochure.

Spec. Code	Grating free area cm²	Grating type	Load rating class	kg
Q605	360	Anti-slip mesh	L15	3.7
Q615	360	Plain mesh	L15	3.7
Q625	245	Streamline	L15	3.6
Q635	100	Perforated circular	K3	3.0
Q645	95	Perforated square	K3	3.0

Q8 series

For use in pools or pits where safeguard against backflow is required





Material

Body and grating – stainless steel, grade 304
Backwater valve – gunmetal

Spec. Code	Outlet size	A	Grating free area cm²	Load rating class	kg
Q801	100mm	89mm	185	N/A	22.0
Q802	150mm	116mm	185	N/A	22.0

April 2018 **Tel**: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

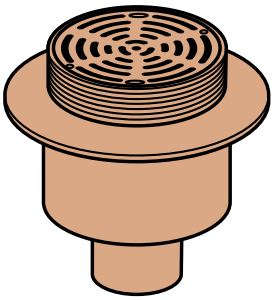
Gunmetal non-trapped gullies

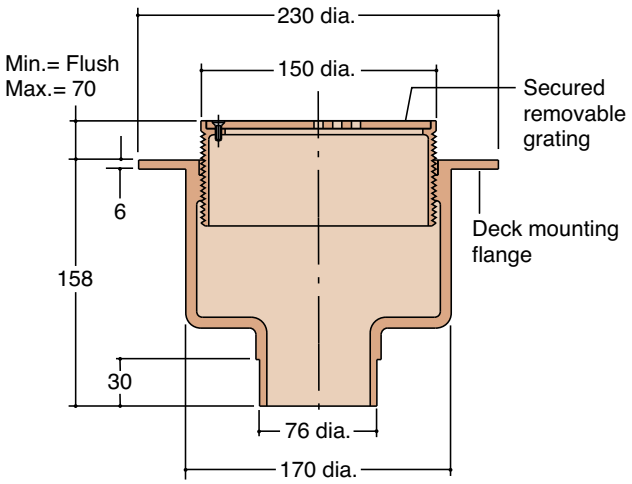
For use in metal decks

Non-spark gunmetal gullies are for use in metal decks such as on oil rigs and ships. Gratings are height adjustable by means of their thread, enabling installation at finished floor level. Versions are available with choice of outlet and gratings to suit different floor finishes.

P301

For use with tile or composition flooring





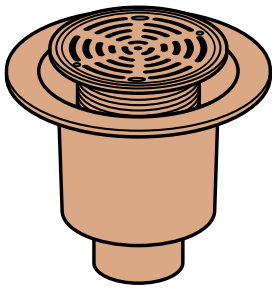
Spec. Code	Outlet size mm	Grating free area cm²	Max. aperture width mm	Load rating class	kg
P301	75	48	7	L15	8.0

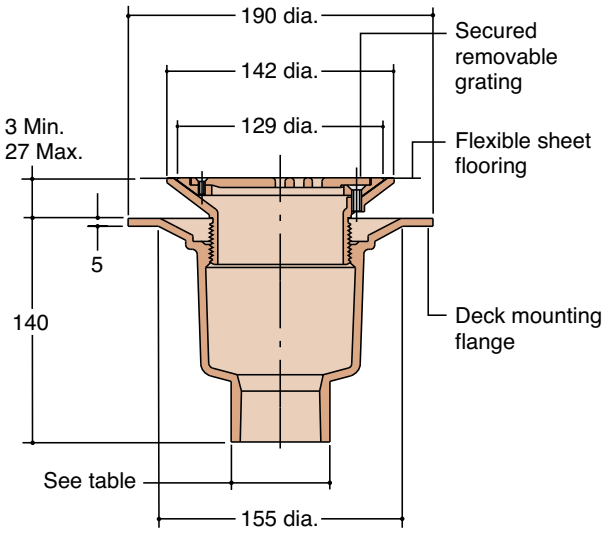
Note

Flanged outlets also available. Deck mounting flange can be drilled to suit specific requirements.

P5 series

For use with flexible sheet flooring such as vinyl





Spec. Code	Outlet size mm	Outlet connection	Grating free area cm²	Max. aperture width mm	Load rating class	kg
P501	50	2" BSPT male	32	7	L15	4.1
P502	50	*Copper connection	32	7	L15	4.1

** Please advise copper pipe specification.*

Note

Deck mounting flange can be drilled to suit specific requirements.

For information on flow rates please contact our Technical Services Department.

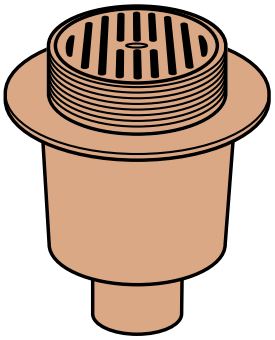
Gunmetal trapped gullies

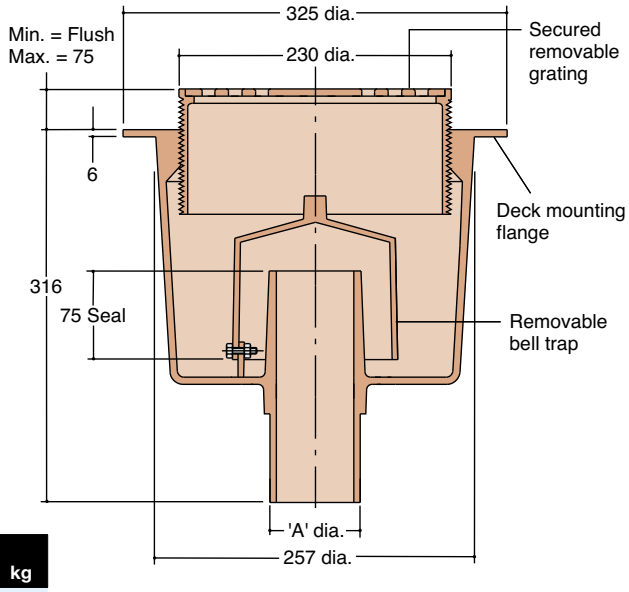
For use in metal decks

Non-spark gunmetal gullies with deep sump body are for use in metal decks such as on oil rigs and ships. Gratings are height adjustable by means of their thread, enabling installation at finished floor level. Versions are available with choice of outlet, gratings to suit different floor finishes and removable bell trap.

P4 series

For use with tile or resin flooring





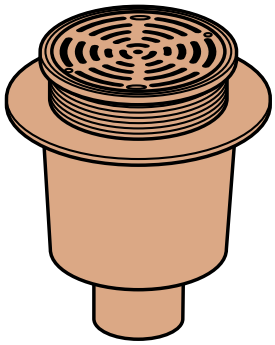
Spec. Code	Outlet size mm	Dia. A mm	Grating free area cm²	Max. aperture width mm	Load rating class	kg
P403	75	76	125	11	L15	28.0
P404	100	108	125	11	L15	30.0

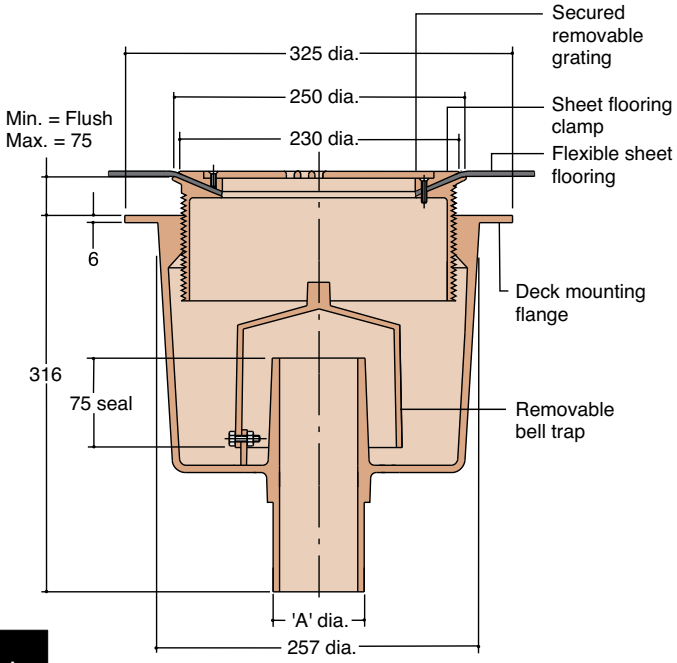
Note

Flanged outlets also available. Deck mounting flange can be drilled to suit specific requirements.

P4 series

For use with flexible sheet flooring such as vinyl





Spec. Code	Outlet size mm	Dia. A mm	Grating free area cm²	Max. aperture width mm	Load rating class	kg
P413	75	76	106	7	L15	28.0
P414	100	108	106	7	L15	30.0

Note

Flanged outlets also available. Deck mounting flange can be drilled to suit specific requirements.

For information on flow rates please contact our Technical Services Department.

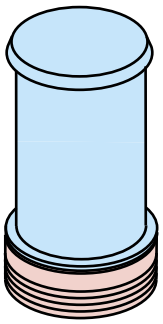
April 2018 **Tel**: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

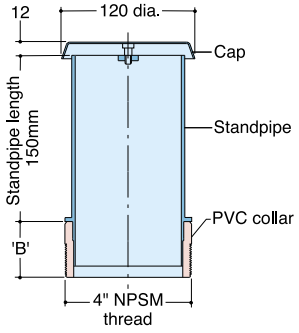
Overflow gullies

For decorative pools, baptismal pools and fonts

To prevent the depth of water exceeding the required maximum, a polished, stainless steel standpipe receives excess or surges of water for discharge via any Vari-Level body, shown in Section 5B. The standpipe is easily removed when the pool/font is required to be emptied of water.

K3201

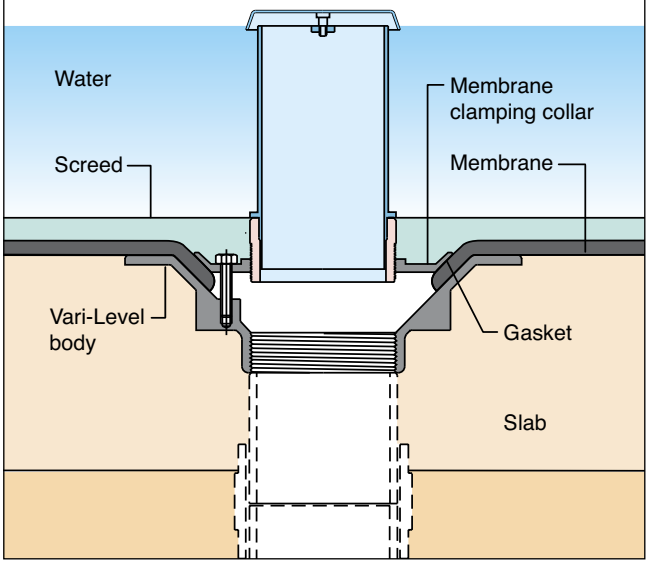




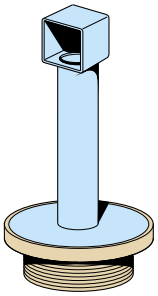
Spec. Code	B	kg
K3201 Without cap	50	1.8
K3202 With cap	50	1.8

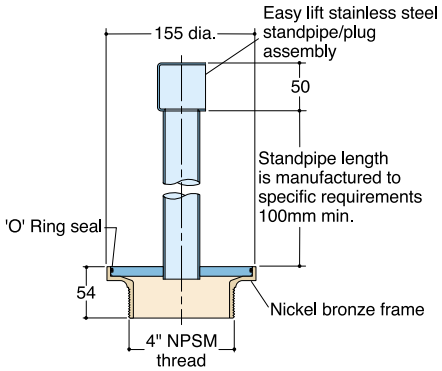
To specify/order other standpipe lengths, add '#' and length (mm) to Spec. Code.

Typical installation

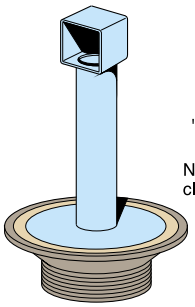


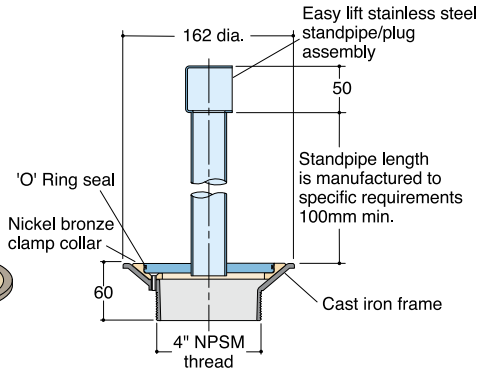
K3211



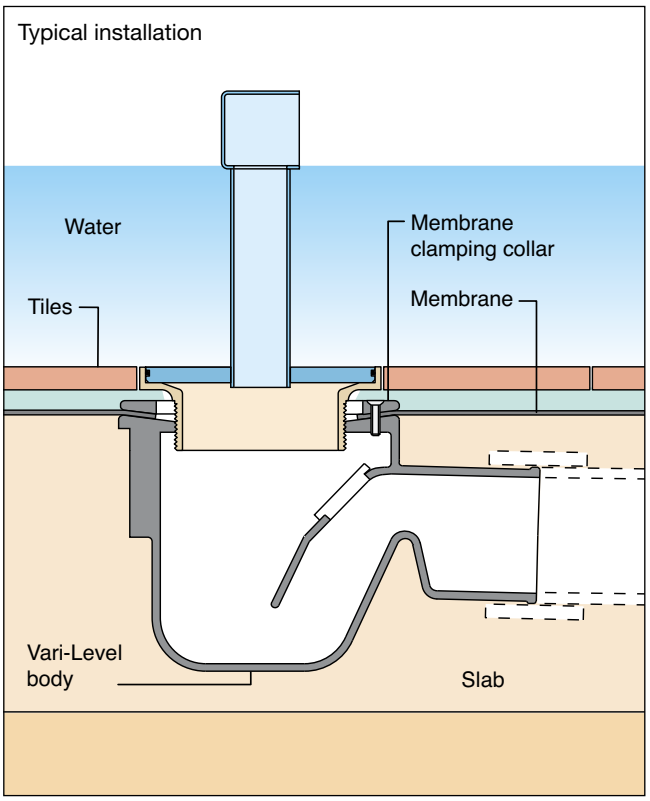


K3212





Typical installation



Spec. Code	Floor finish
K3211 + Standpipe length (mm)	Marble, tiles etc.
K3212 + Standpipe length (mm)	Flexible sheet flooring such as vinyl, certain trowel applied resins

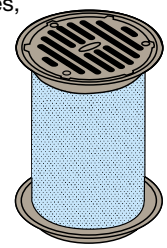
Accessories – select from Section 5X.

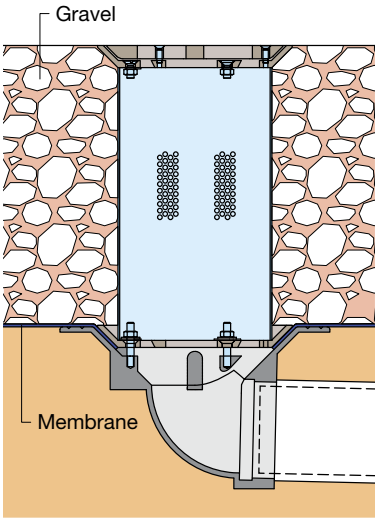
Drainage of planting areas and roof gardens

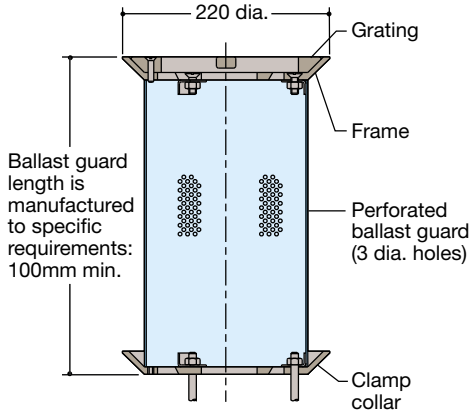
Wade offers a range of products providing drainage of moisture in planting areas and flower boxes, minimising loss of soil.

P8 series

For applications where a grating is required at the surface, in a paved area, or where access is required; for use with D10-D12 series bodies, shown on page 5B ntcibm







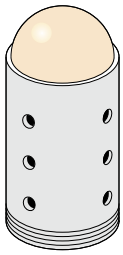
Spec. Code	kg
P801 + length (mm)	4.0

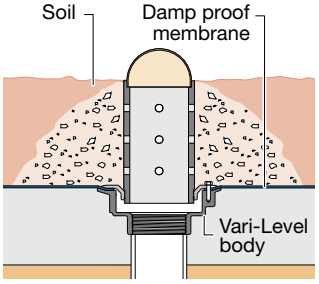
Load rating class: K3

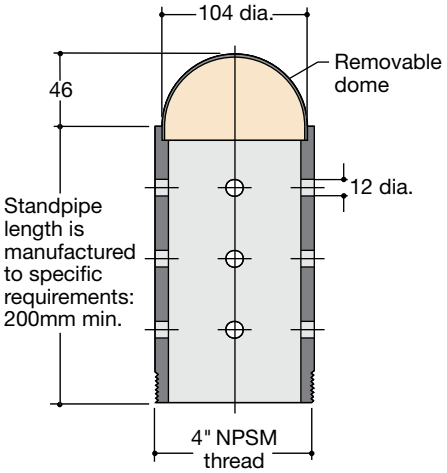
Material
Grating – ductile iron, sherardized
Ballast guard – stainless steel
Frame/clamp collar – cast iron, lacquered

P9 series

For applications where the standpipe is concealed by soil; for use with Vari-Level bodies shown in Section 5B. Dome is removable for access purposes







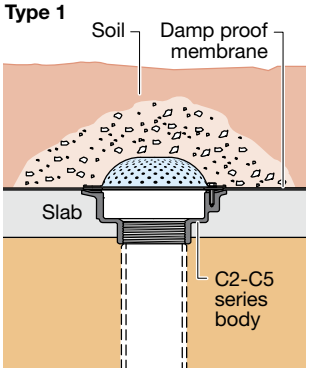
Spec. Code	kg
P901 + Standpipe length (mm)	0.7

Material
Dome – copper
Standpipe – PVC

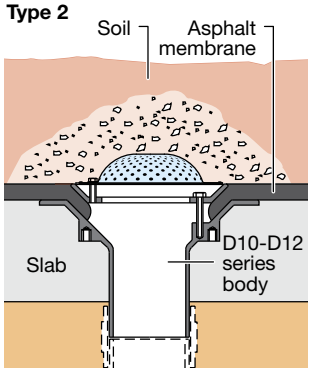
P10 series

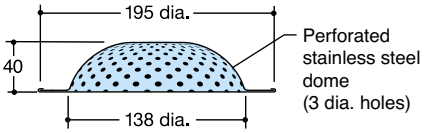
For applications where all drainage is concealed by soil; versions available to suit asphalt or sheet/brush on membranes

Type 1



Type 2





Material: Stainless steel

Spec. Code	Installation type	Membrane	Dome free area cm²	kg
P1001	1	Sheet or brush on	115	0.3
P1002	2	All types (inc. asphalt)	115	1.3

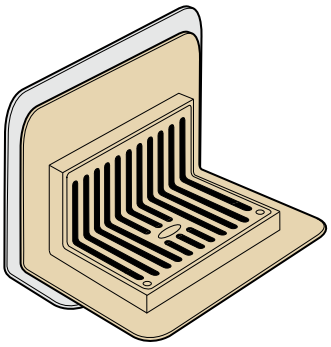
90° gullies

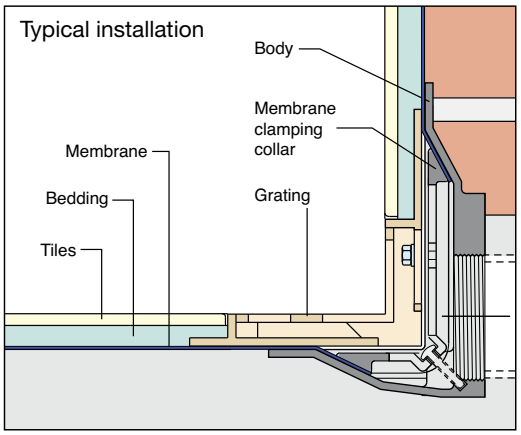
For use in shower areas etc.

Cast iron body and clamp with nickel bronze or stainless steel grating

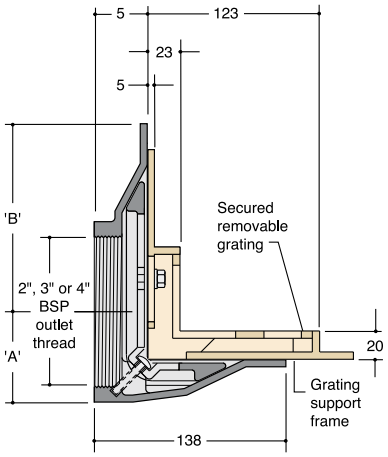
P14 series

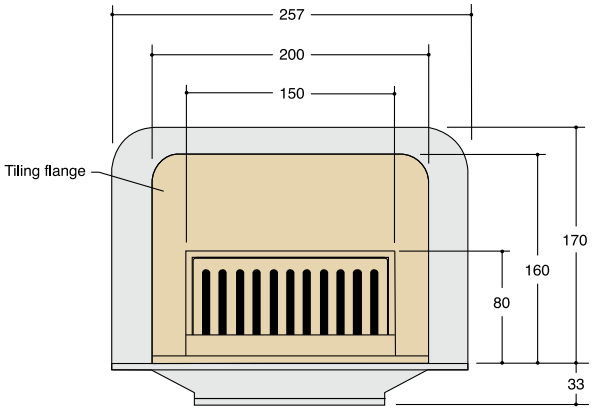
A flush fitting non-trapped gully for use in areas where drainage is required at the junction of a wall and floor. The lacquered cast iron body has horizontal outlet, available in three sizes; the secured grating is of nickel bronze or stainless steel



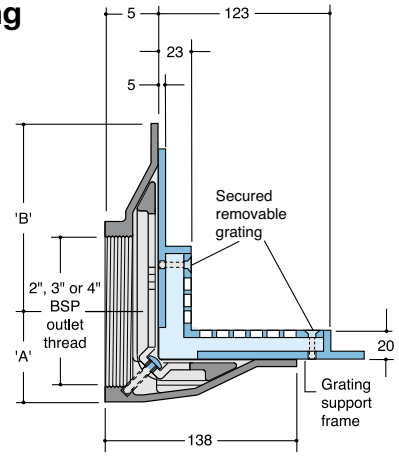


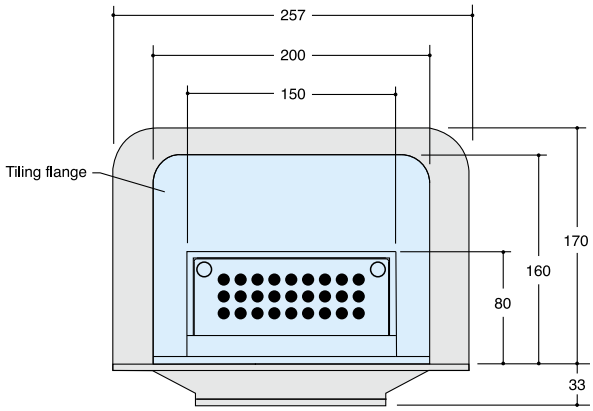
Nickel bronze grating





Stainless steel grating





Spec. Code	Outlet size	A mm	B mm	Grating	Grating free area cm²	Load rating class	Max. aperture width mm	kg
P1412	2" BSP	39	164	Nickel bronze	82	K3	6	7.3
P1413	3" BSP	52	151	Nickel bronze	82	K3	6	6.6
P1414	4" BSP	65	137	Nickel bronze	82	K3	6	6.2

Spec. Code	Outlet size	A mm	B mm	Grating	Grating free area cm²	Load rating class	Max. aperture width mm	kg
P1422	2" BSP	39	164	Stainless steel	40	K3	8	7.3
P1423	3" BSP	52	151	Stainless steel	40	K3	8	6.6
P1424	4" BSP	65	137	Stainless steel	40	K3	8	6.2

Options

Suffix

H Fitted with Pin Torx* screws for security applications.
**Pin Hex screws if grade 316 specified.*

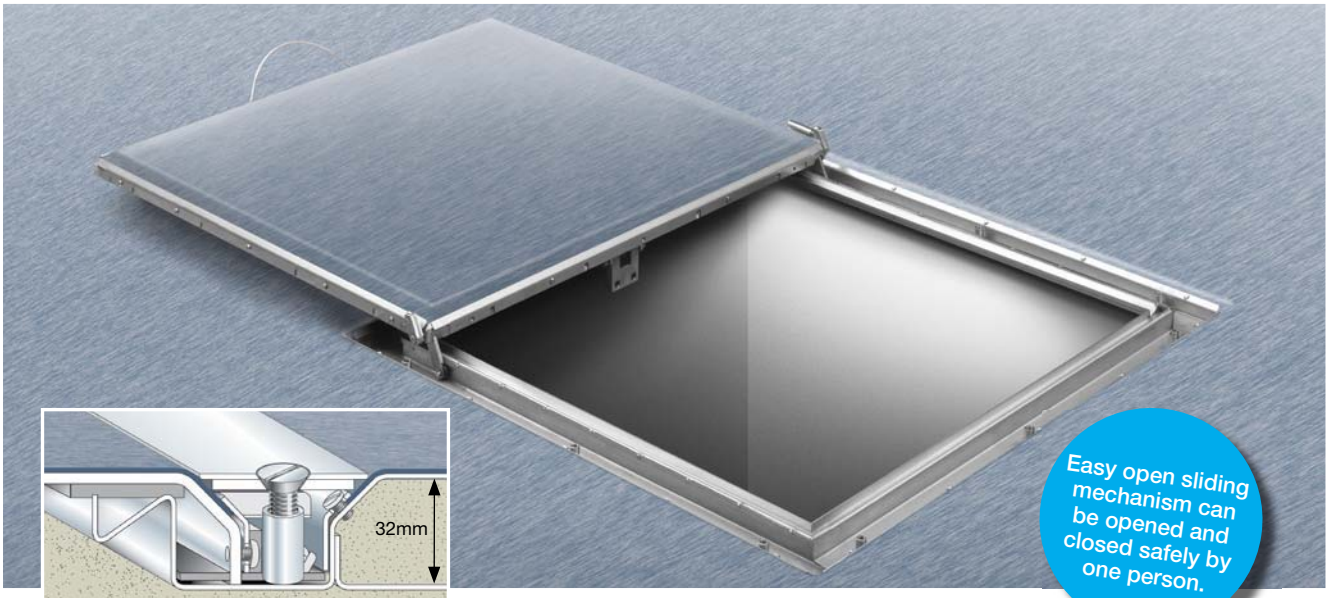
M Made of grade 316 stainless steel (P1422 – P1424).

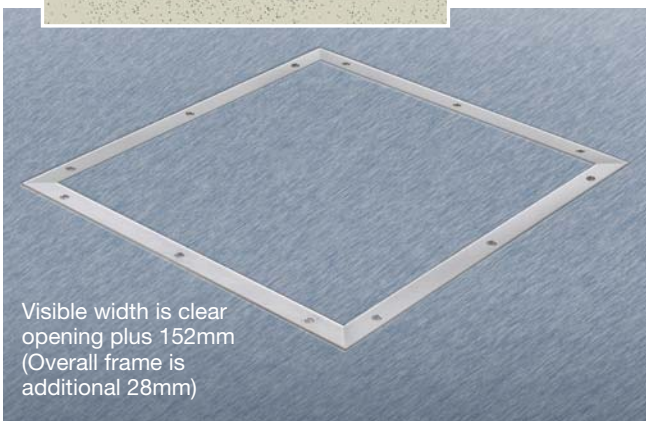
Double sealed sliding access cover

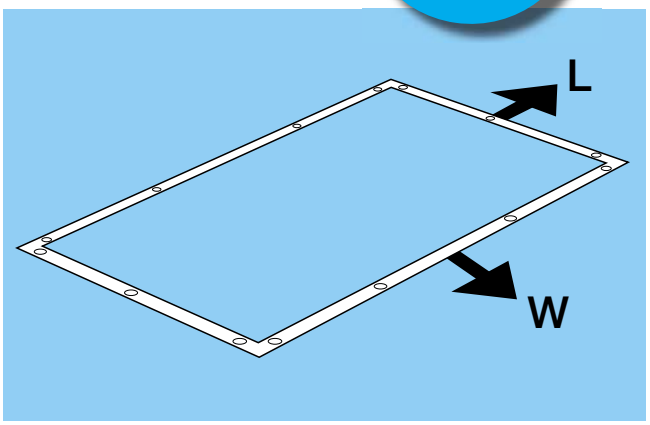
For man entry for use with flexible sheet flooring such as vinyl

Stainless steel – Grade 304

Wade has solved the problem of access to inspection chambers and service ducts within buildings where sheet floor covering is used. A watertight joint formed between the sheet floor covering and the edge of the frame, prevents water from seeping into the structure.







Reliable – Floor material edges remain clamped even when cover is removed.

Hygienic – No holes, recesses or dirt traps.

Air tight – Double sealed by closed cell neoprene gaskets to meet all current building regulations.

Safe – All edges of floor material are securely clamped in position by concealed clamp strips. No steps or exposed edges.

Unobtrusive – When installed only a 50mm wide stainless steel clamping frame is visible.

Vandal resistant – Cover is removable only after loosening several screws.

Watertight – Clamped flooring prevents water from seeping into the structure.

Versatile – Designed for flooring thickness from 2-4mm.

Material – Stainless steel – grade 304
For use in high specification applications including food preparation, prison cells, showers and areas where high corrosion resistance is a requirement. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request.

Spec. Code	Clear opening size mm	Overall size	Opening direction	Man entry	Load rating class	kg
RS231	450 x 450	684 x 684	–	x	K3	21.7
RS232L	450 x 600	684 x 834	Length	x	K3	25.6
RS232W	600 x 450	834 x 684	Width	x	K3	25.3
RS233	600 x 600	834 x 834	–	✓	K3	29.7
RS234L	600 x 750	834 x 984	Length	✓	K3	34.2
RS234W	750 x 600	984 x 834	Width	✓	K3	33.8
RS235	750 x 750	984 x 984	–	✓	K3	38.8
RS236L	600 x 900	834 x 1134	Length	✓	K3	38.7
RS236W	900 x 600	1134 x 834	Width	✓	K3	37.8

Visible width is clear opening plus 202mm (Overall frame is additional 32mm).

Options

Suffix

H Fitted with Pin Torx screws for security applications.

Openings for man entry shall comply with the safety requirements in force at the place of installation, generally this is considered to be at least 600 x 600.

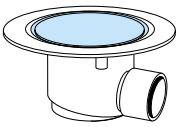
Gully assemblies for flexible sheet flooring

'P' trapped gully – 50mm seal

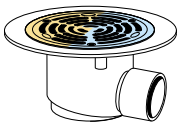
For use in wet bathrooms and shower areas decked with flexible sheet flooring such as vinyl, of a thickness up to 3.5mm.

GV5 series

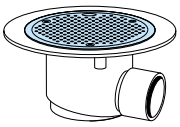
50mm socket outlet



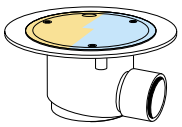
1. Peripheral slot



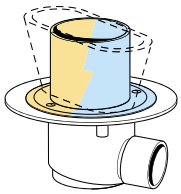
2. Slotted grating



3. Security grating

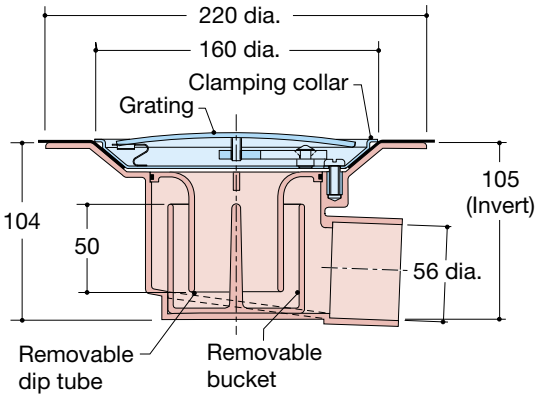


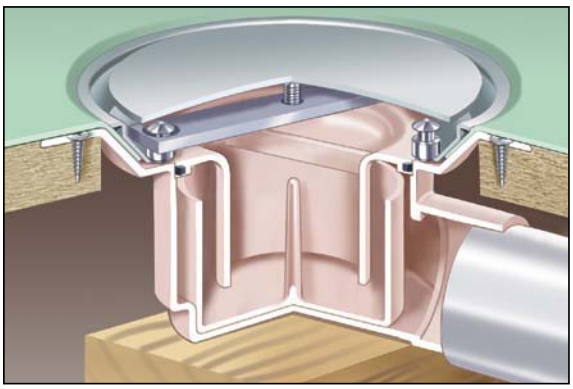
4. Solid cover



5. Funnel

GV5007





Spec. Code	Illustration No.	Top material	Version	Max. aperture width mm	Load rating class	kg
GV5007	1	Stainless steel	Grating (peripheral slot)	6	K3	1.2
GV5103	2	Nickel bronze	Grating (slotted)	7	L15	1.5
GV5107	2	Stainless steel	Grating (slotted)	6	L15	1.0
GV5247	3	Stainless steel	Security grating (4mm aperture)	4	K3	1.0
GV5503	4	Nickel bronze	Solid cover (gasketed)	n/a	L15	1.9
GV5517	4	Stainless steel	Solid cover (unsealed)	n/a	L15	1.2
GV5803	5	Nickel bronze	Funnel (tapered) 101 dia x 100H	n/a	n/a	2.4
GV5817	5	Stainless steel	Funnel (parallel) 101 dia x 101H	n/a	n/a	1.7
GV5823	5	Nickel bronze	Funnel (oval) 224L x 85W x 99H	n/a	n/a	3.7

Features

Watertight – clamping collar provides a water-tight seal between the flooring material and gully even when the grating is removed.
Water seal – formed by a bucket and dip tube, the water seal depth of 50mm complies with plumbing codes of practice in the U.K.
Flow rate – (grating and funnel versions) rate in excess of 40 l/min; comfortably exceeds the minimum rate of 24 l/min required by BS EN 274 for the discharge from a single shower head.
Vandal resistant – GV5007 secured grating has no visible fixings and is removable only upon depressing an unobtrusive lever.
Accessible – removable grating/cover/funnel and trap enable easy access from above for maintenance purposes.
Bucket – removable bucket helps to eliminate blockages and intercepts jewellery and other items which might otherwise be washed away.
Outlet – 50mm socket for solvent-weld connection to PVC pipework.
Installation – ideally suited for installation in timber or concrete floors or where space is limited.
Quality – stainless steel or nickel bronze grating/cover/funnel with matt finish (GV5817 polished), combines durability, safety and good looks.

Material

Grating/cover/funnel/clamping collar – Stainless steel or nickel bronze
Body/dip tube/bucket – plastic (ABS)

Options

Suffix

H Fitted with Pin Torx* screws for security applications (not GV5007). **Note** GV5247 is fitted with Pin Torx screws as standard.
**Pin Hex screws if grade 316 specified.*

I Tapped to provide a direct connection for waste pipes – specify size 1¼", 1½", or 2" (solid cover versions only).

M Grade 316 grating/cover/funnel (not GV5007).

P Polished – Stainless steel only. (GV5817 is polished as standard).

Notes

1. *The gully must be supported and installed in accordance with instructions which accompany the product.*
2. *Frequent cleaning will be necessary in applications where very high amounts of hair and other waste material are present.*
3. *Maximum continuous operating temperature of 75°.*

April 2018 **Tel**: +44(0)1787 475151 **Fax**: +44(0)1787 475579 **E-mail**: sales@wadeint.co.uk **Web**: www.wadeint.co.uk

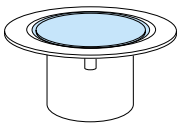
Gully assemblies for flexible sheet flooring

Trapped gully with vertical outlet – 50mm seal

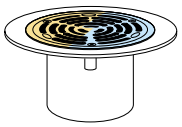
For use in wet bathrooms, kitchen and shower areas decked with flexible sheet flooring such as vinyl, of a thickness up to 3.5mm.

GV6 series

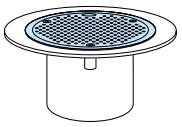
110mm spigot outlet with 50mm reducer



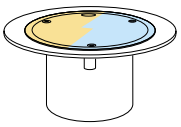
1. Peripheral slot



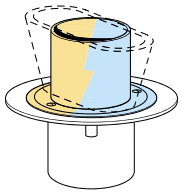
2. Slotted grating



3. Security grating

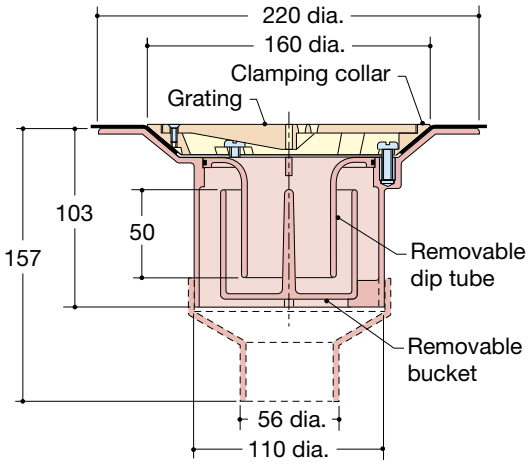


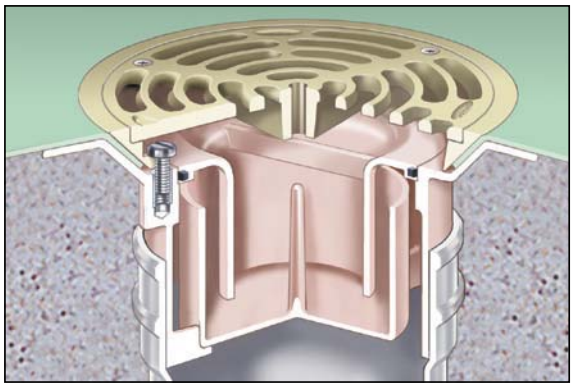
4. Solid cover



5. Funnel

GV6103





Spec. Code	Illustration No.	Top material	Version	Max. aperture width mm	Load rating class	kg
GV6007	1	Stainless steel	Grating (peripheral slot)	6	K3	1.2
GV6103	2	Nickel bronze	Grating (slotted)	7	L15	1.5
GV6107	2	Stainless steel	Grating (slotted)	6	L15	1.0
GV6247	3	Stainless steel	Security grating (4mm aperture)	4	K3	1.0
GV6503	4	Nickel bronze	Solid cover (gasketed)	n/a	L15	1.9
GV6517	4	Stainless steel	Solid cover (unsealed)	n/a	L15	1.2
GV6803	5	Nickel bronze	Funnel (tapered) 101 dia x 100H	n/a	n/a	2.4
GV6817	5	Stainless steel	Funnel (parallel) 101 dia x 101H	n/a	n/a	1.7
GV6823	5	Nickel bronze	Funnel (oval) 224L x 85W x 99H	n/a	n/a	3.7

Features

Watertight – clamping collar provides a water-tight seal between the flooring material and gully even when the grating is removed.
Water seal – formed by a bucket and dip tube, the water seal depth of 50mm complies with plumbing codes of practice in the U.K.
Flow rate – (grating and funnel versions) rate in excess of 40 l/min; comfortably exceeds the minimum rate of 24 l/min required by BS EN 274 for the discharge from a single shower head.
Vandal resistant – GV6007 secured grating has no visible fixings and is removable only upon depressing an unobtrusive lever.
Accessible – removable grating/cover/funnel and trap enable easy access from above for maintenance purposes.
Bucket – removable bucket helps to eliminate blockages and intercepts jewellery and other items which might otherwise be washed away.
Outlet – 110mm spigot outlet for solvent-weld or ring-seal connection to PVC pipework (50mm reducer supplied loose).
Installation – ideally suited for installation in timber or concrete floors or where space is limited.
Quality – stainless steel or nickel bronze grating/cover/funnel with matt finish (GV6817 polished), combines durability, safety and good looks.

Material

Grating/cover/funnel/clamping collar – Stainless steel or nickel bronze
Body/dip tube/bucket – plastic (ABS)

Options

Suffix

H Fitted with Pin Torx* screws for security applications (not GV6007). **Note** GV6247 are fitted with Pin Torx screws as standard.
**Pin Hex screws if grade 316 specified.*

I Tapped to provide a direct connection for waste pipes – specify size 1¼", 1½", or 2" (solid cover versions only).

M Grade 316 grating/cover/funnel (not GV6007).

P Polished – Stainless steel only. (GV6817 is polished as standard).

Notes

1. *The gully must be supported and installed in accordance with instructions which accompany the product.*
2. *Frequent cleaning will be necessary in applications where very high amounts of hair and other waste material are present.*
3. *Maximum continuous operating temperature of 75°*

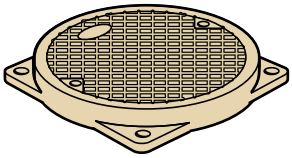
Access covers general purpose

Nickel bronze – BS BN 1982

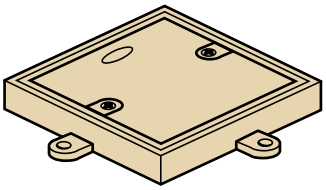
Satin finish

Versions are suited to pedestrian areas, to provide access to services.

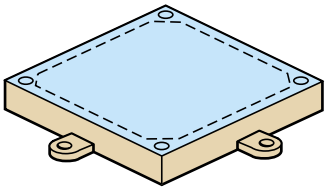
R311
Unsealed, secured, removable



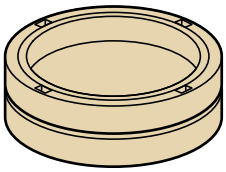
R4 series
Unsealed, secured, removable



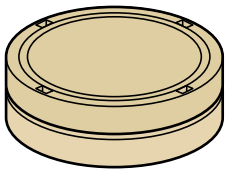
R5 series
Nickel bronze frame with stainless steel, unsealed, secured removable cover for use in a wall



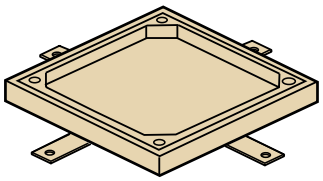
R611
Sealed, recessed for flooring material (20mm recess depth)



R621
Sealed, solid cover



R801
Sealed, secured, recessed for flooring material (19mm recess depth)



Spec. Code	Overall dia./ width mm	Overall length mm	Overall height mm	Load rating class	kg
R311	186	–	25	L15	2.5
R411	178	178	23	L15	2.4
R412	229	229	25	L15	2.8
R511	178	178	29	n/a	1.8
R512	229	229	29	n/a	2.5
R611	138	–	48	L15	2.0
R621	138	–	48	L15	2.0
R801	205	205	30	L15	4.3

Note
A range of Vari-Level access covers of cast iron, nickel bronze and stainless steel is shown in Section 5V. Direct connection versions are shown in Section 6V.

Access covers in a marble floor

R611 sealed access covers conceal electrical power points at the Burrel Collection, Glasgow.



Non-freeze water points

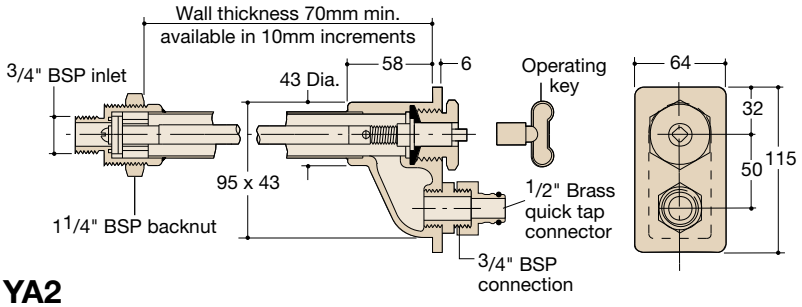
The *Wade non-freeze water point* provides an external water source for plant watering, area cleaning, vehicle wash down and similar activities.

The product is designed to be installed with the valve seal located inside a building, whilst the on/off control mechanism and hose connections are outside; when the valve is turned off, water drains out from the unit so that freezing cannot occur.

Made to suit a given wall thickness the product can be supplied with a wall box with optional locking cover to deter unauthorised access.

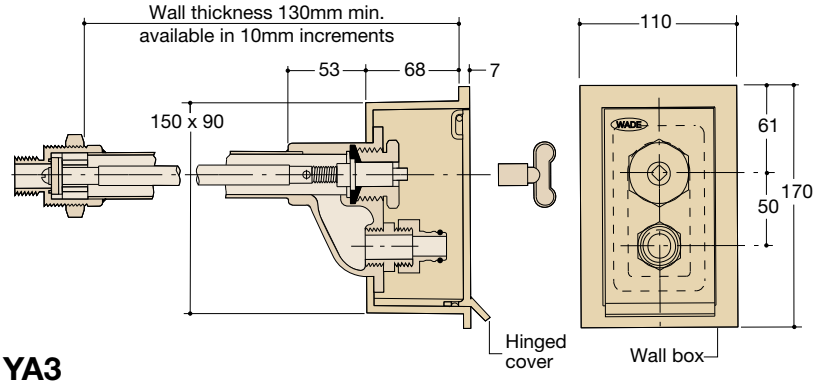
The *Wade non-freeze water point* is a UK Water Byelaws Scheme Approved Product WRAS APPROVED PRODUCT

YA1



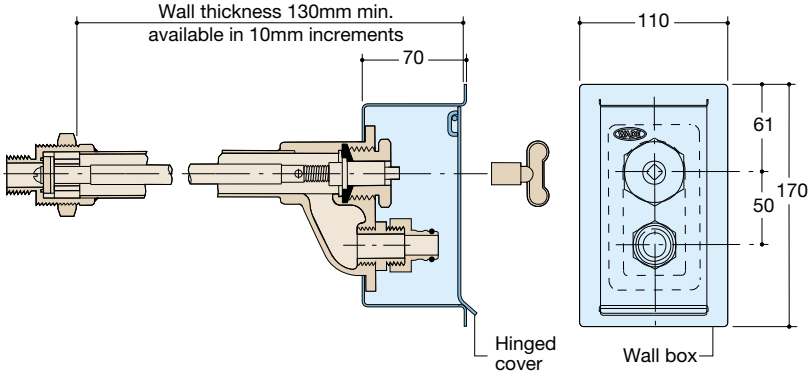


YA2



Cautionary note
Water points are non-freeze only when installed in the horizontal position, and are suitable for use only at normal mains supply pressure (up to 10 bar maximum).

YA3



Spec. Code	Wall box material/finish
YA101 + wall thickness mm	Without wall box
YA211 + wall thickness mm	Aluminium – white epoxy coated
YA212 + wall thickness mm	Nickel bronze – satin
YA213 + wall thickness mm	Gunmetal – satin
YA304 + wall thickness mm	Stainless steel grade 304 – satin
YA316 + wall thickness mm	Stainless steel grade 316 – satin

Installation notes

1. *Install with inlet end on the inside of the building, in compliance with Water Regulations, Schedule 2, paragraph 15 (backflow prevention), as applicable to the installation's fluid category (determined by specifier).*
2. *Flush supply pipework before connecting.*
3. *Connect, and check for leaks – if leaking, remove centre stem assembly, examine and clean washer and seating, re-assemble and again check for leaks.*

Options

Suffix 'L'
Locking cover. (Only available on versions with wall box).

Other finishes
Details on request.

Material

Water point: Cast gunmetal, copper tube, brass rod, malleable iron backnut.
Wall box material – see table.

Materials care and maintenance

Materials and finish of Wade floor gullies and access covers, described below, are selected to provide lasting performance and to blend with surroundings. The products require the minimum of maintenance, but periodic inspection should be carried out to ensure absence of matter which could impede drainage. Measures set out below will sustain appearance and prolong service life.

Stainless steel – Austenitic grade 304 and 316

Used for bodies, gratings, funnels, access covers, filter buckets and fixings.

A corrosion-resistant metal containing significant amounts of nickel and chromium; AISI grade 304 stainless steel is used as standard, which is suitable for general use in and around buildings including most coastal locations. In applications such as swimming pools or having an aggressive atmosphere, grade 316 is recommended and is available on request. An even higher grade may be required for applications in highly corrosive environments including where exposure to seawater may be anticipated.

Clean with soap and warm water rinse and wipe dry. Gratings may also be cleaned in certain dishwashers.

Under no circumstances treat with metal scouring pads, metal scrapers or wire wool as these will contaminate surfaces leaving rust spots.

Nickel bronze – BS EN 1982

Used with satin finish for gratings, funnels and access covers.

A cast alloy with a fine grain effect which blends well with most floor finishes. The satin finish is generally maintained by the slight abrasive action of passing traffic. In unused areas the material will gradually tarnish. To restore lustre, apply a plain nylon scouring pad (not soap-filled) in the direction of the grain.

Note: Avoid covering nickel bronze items with plastic sheeting after installation, otherwise blackening may occur.

Polished bronze/gunmetal – BS EN 1982

Used for gratings, funnels and access covers.

Polished bronze is a cast alloy, suited for finished floors where the rich, bronze colour complements the decor, which is polished to a “mirror” finish. If left alone polished bronze will gradually tarnish. To restore lustre, use metal polish and buff with a cloth. The mirror finish must not be treated with any abrasive cleaning material otherwise the surface will be permanently scratched.

Unpolished gunmetal has a fine grain satin finish, which is generally maintained by the slight abrasive action of passing traffic. In unused areas the material will gradually tarnish. To restore lustre, apply a plain nylon scouring pad (not soap-filled) in the direction of the grain.

Ductile iron – BS EN 1563 + 1564

Used only for gratings.

A casting with the ductility of steel, yet with more than twice the tensile strength of cast iron. A zinc anti-corrosion coating is applied by sherardizing.

Cast iron – BS EN 1561

Used for bodies, membrane clamping collars, threaded pipework adaptors and accessories such as extensions.

A widely used metal in the drainage industry, its resistance to corrosion permits extended use under extreme conditions. Castings are coated with a high grade lacquer paint to provide internal and external surface coverage. Paint will gradually wear off and is replaceable; oxidisation (surface rusting) is a natural process which does not weaken the material.

A zinc anti-corrosion coating is applied to certain castings by sherardizing.

Polypropylene

Used for the removable trap in stainless steel gullies.

Maximum continuous operating temperature of 100°C.

ABS

Used for bodies, dip tubes, extensions and threaded pipework adaptors.

A cost-effective, fire-resistant material, with a maximum continuous operating temperature of 75°C.

Nylon 6

Used for bottle trap, filter bucket and ‘SuperSeal’ plug.

Chosen for its toughness and durability; maximum continuous operating temperature of 180°C.

Neoprene

Used for gaskets and seals.

Maximum continuous operating temperature of 100°C.

Nitrile

Used for O-rings in ‘SuperSeal’ plug assemblies.

Maximum continuous operating temperature of 110°C.

Silicone rubber

Used for O-ring in removable bottle trap.

Maximum continuous operating temperature of 250°C.

Glossary

ACCESS COVER
Removable, solid cover set in a frame at finished floor level to enable access to pipework or services without disturbing the floor finish; most versions are sealed.

ADAPTOR
Component used to connect one item to another.

APERTURES
Openings in a GRATING which may be holes or slots.

AUXILIARY INLET
See SIDE INLET

BACK INLET
See SIDE INLET

BACKWATER VALVE
Non-return valve fitted to a GRATING or BODY which prevents the flow of foul water back into a drained area.

BELL TRAP
TRAP with vertical inlet and outlet on the same axis.

BODY
Bowl-like part of a GULLY, fitted below or in the floor, on which the GRATING is generally fitted and to which pipework is connected; may be trapped or non-trapped.

BODY ASSEMBLY
Body with factory-fitted components.

BODY COLLAR
See MEMBRANE CLAMPING COLLAR

BUCKET
Removable receptacle fitted within a GULLY to intercept solids, debris etc.

CHANNEL GRATING
Long, narrow gratings fitted in a channel, or frame, to provide linear drainage.

CLAMP COLLAR/RING
See MEMBRANE CLAMPING COLLAR

CLAMPING DEVICE
See MEMBRANE CLAMPING COLLAR

CLEANOUT
See ACCESS COVER

COVER
See ACCESS COVER

DAMP-PROOF MEMBRANE (DPM)
Protective covering generally laid on top of a structural slab in a ground floor to prevent damp from entering the building. When a GULLY is fitted in such a floor, the membrane is dressed on the FLANGE, into the mouth of the BODY, and clamped with a MEMBRANE CLAMPING COLLAR to ensure a watertight joint.

DEEP SEAL
WATER SEAL of 75mm or more.

DIRECT CONNECTION
Version of BODY/GRATING/COVER, outlet of which is machined to enable direct connection to pipework.

EXTENSION
Accessory used to increase the effective height of a GRATING or COVER above a BODY.

FILTER BUCKET
See BUCKET

FFL
FINISHED FLOOR level.

FINISHED FLOOR
Floor covered with asphalt, carpet, ceramic tiles, flexible sheet, marble, paviors, resin, terrazzo, vinyl, or wood etc.

FLANGE
Part of the BODY leading to the mouth, over which the DAMP-PROOF MEMBRANE is laid.

FLEXIBLE SHEET
Flexible watertight finished layer for floors, affixed to the FLANGE by means of a CLAMPING COLLAR; requires GRATINGS and COVERS to suit.

FLOOR DRAIN
See GULLY

FLOW RATE
Maximum amount of liquid (litres/sec.) that can be drained, at a given head of water. See page 2 Design Considerations.

FRAME
Support for a GRATING or COVER which is connected to a BODY either directly or by means of a MEMBRANE CLAMPING COLLAR.

FUNNEL
Accessory to receive waste pipes, condensate lines or discharges from sinks, refrigeration units, boiling pans etc.

GRATE
See GRATING

GRATING
Removable component of a GULLY fitted at floor level; upper surface contains APERTURES to receive waste water; generally fitted in a FRAME; most versions are HEIGHT ADJUSTABLE (VARI-LEVEL or MULTI-LEVEL) and can be increased in height by means of an EXTENSION; versions available for DIRECT CONNECTION to pipework.

GRATING FREE AREA
Area of APERTURES in a GRATING, expressed in cm2.

GULLY
Discharge fitting, the top of which is a GRATING or COVER, capable of installation at floor level, intended to receive waste water either through APERTURES in a GRATING and/or from pipes connected to the BODY of the gully, may be trapped or non-trapped.

HEAD OF WATER
Height of water above the GRATING, used to determine FLOW RATE.

HEIGHT ADJUSTABILITY
Facility to adjust the height of a GRATING or COVER above the FLANGE to suit floor level.

Glossary

I.D.
Internal diameter.

K3
LOAD RATING class, see page 2 for details.

L15
LOAD RATING class, see page 2 for details.

LOAD RATING
Capability to withstand loads, expressed in classes, or N/mm2. (see page 2 for details).

M125
LOAD RATING class, see page 2 for details.

MEMBRANE CLAMPING COLLAR
Used to clamp a DAMP-PROOF MEMBRANE to a BODY; supplied with some series as part of the BODY, but on others it is an option. (See Section 5C for Vari-Level versions).

M.J.
Mechanical joint.

MULTI-LEVEL
Range of gullies in which the height of a GRATING may be adjusted to suit floor level, using a 'peg and cam' principle.

O.D.
Outside diameter.

OUTLET
Part of BODY through which waste water is discharged into connecting pipework.

'P' TRAP
TRAP with a vertical inlet, and an OUTLET inclined slightly below the horizontal.

PLANT ROOM
Part of premises housing machinery and/or services.

PLANTING AREAS
Gardens, shrubberies etc., may be located on a roof.

'Q' TRAP
TRAP with a vertical inlet, and an outlet inclined at 45° below the horizontal.

RAISING PIECE
See EXTENSION

RODDING EYE/POINT
See ACCESS COVER

'S' TRAP
TRAP with a vertical inlet and an offset outlet parallel to it.

SEAL
See WATER SEAL

SIDE INLET
Permits the underfloor connection of other fixtures (sinks, wash basins etc) into a GULLY.

STRAINER
Meshed accessory used to intercept debris. (term is sometimes used by others to denote GRATING).

STREAMLINE (GRATINGS)
Stainless steel (304) reverse wedge profile with 5mm slot width. Grade 316 available to order.

SUMP
Bowl of BODY; large sump enables sudden surges of waste water to be retained, thereby controlling flow through the GULLY.

SUPERSEAL
Range of quick-release, double-sealed ACCESS COVERS.

THREAD
Four standard types are used in Wade GULLIES:

BSP (British Standard Pipe) – outlet thread of a BODY, connection to SIDE INLET;

BSPT (British Standard Pipe, Tapered) – thread on screw-in THREADED PIPEWORK ADAPTORS;

NPSM (National Pipe Straight Mechanical) – thread on GRATINGS allowing easy height adjustment when installed with BODY, MEMBRANE CLAMPING COLLAR, or ADAPTOR;

Metric-I.S.O. – thread used for all fixing screws, studs etc.

THREADED PIPEWORK ADAPTOR
Converts threaded outlet BODY to a spigot outlet allowing connection to pipework using a proprietary coupling.

TRAP
Removable or integral part of a BODY which prevents, by means of a WATER SEAL, the passage of foul air from the outlet to the inlet.

TRAP SEAL
See WATER SEAL

TUNDISH
See FUNNEL

UNFINISHED FLOOR
Generally, bare concrete.

UNI-LEVEL
Range of gullies with non-height ADJUSTABLE grating.

VARI-LEVEL
Range of gullies comprising various BODIES which accept various GRATINGS and COVERS which are HEIGHT ADJUSTABLE with a fine thread to enable accurate installation at FINISHED FLOOR LEVEL.

VINYL
A form of flexible sheet flooring; requires GRATINGS and COVERS to suit.

WATER SEAL
Effective height of water (min. 50mm) in a trap which prevents the passage of foul air.

WEEPHOLES
(Optional) holes located in a MEMBRANE CLAMPING COLLAR or a BODY which provide supplementary drainage at membrane level.

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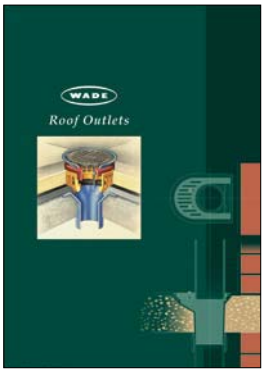
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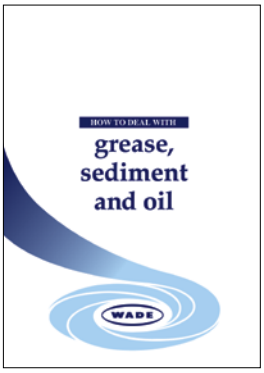


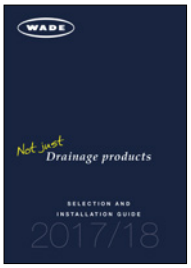
Other Wade literature











Service

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In line with general practice all dimensions shown are nominal.

Dimensions are generally given in mm (other units are specified).

Quality assurance

Certification of compliance with BS EN ISO 9001 underlines our commitment to quality and service.



QUALITY BY TRADITION WADE PERFORMANCE BY DESIGN

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