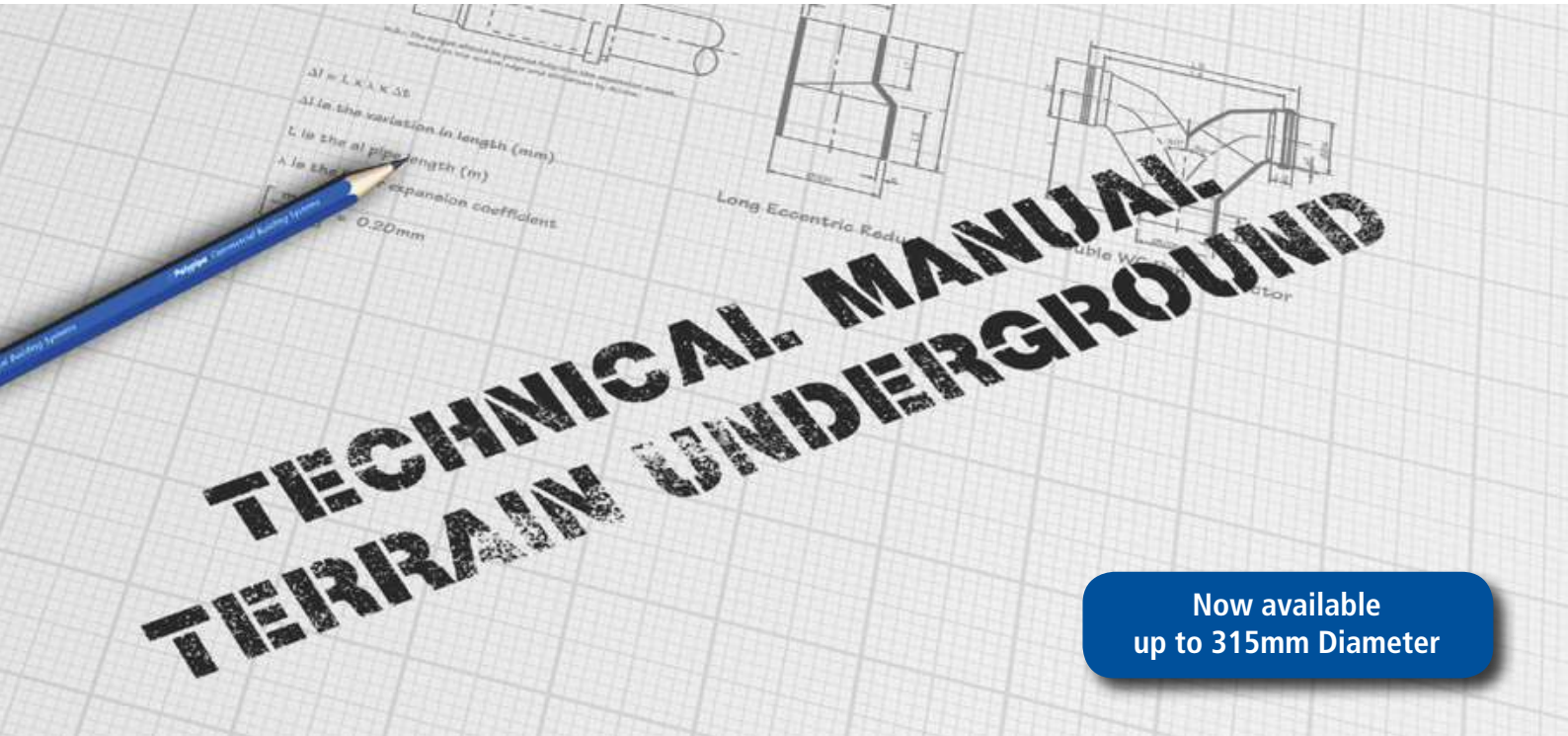
TERRAIN

TUGTM2 - PT | September 2011

Terrain Underground

PVC-u underground drainage systems



Terrain Underground

Using the latest plastics manufacturing technology to satisfy the requirements of today's installers, the Terrain underground range offers both rigid and foam core pipe and a comprehensive range of fittings to suit all applications. Terrain underground products represent the benchmark for quality, supported with outstanding service levels. Our comprehensive range of underground drainage products are suitable for commercial, industrial, housing and public sector developments.

- Industry leading
- Simple to install
- Flexible, to accommodate normal ground movement
- Adaptable, to connect to existing drainage systems
- Supported through extensive technical experience on all aspects of design and installation
- Fully accredited product system

Solid wall pipes and fittings

Available in 82, 110, 160, 200, 250 & 315mm diameters.

110 and 160mm comply with BS EN 1401 (BS 4660).

Foamcore pipe

Manufactured using the latest tri-extrusion techniques to produce a three layer pipe that is 25% lighter than standard PVC-u pipe.

Available in 110 and 160mm diameters.

As you would expect from a market leader our products come with all relevant standards including:

Manufacturing Standards

BS EN 1401:1998 Underground Drainage

BS EN 7158:2001 Plastic Chambers for Drains and Sewers

Quality Management Systems Standards

EN ISO 9001:2008 Management System

EN ISO14001:2004 Management System

BS OHSAS 18001:2007 Management System

PASS 99:2006 Integrated Management Registration

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Sustainable Materials

Plastics are among the most researched materials in the world and rapid technological and manufacturing developments made in recent years have allowed for continuous innovation.

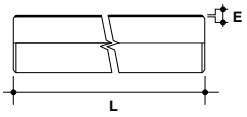
Polypipe Terrain pioneered the development of PVC material for the manufacture of drainage pipes and fittings; we remain at the forefront of the industry across the globe with the use of ever-more environmentally friendly materials with no loss of mechanical characteristics.

Utilising a sustainable material composition contributes significantly to an environmentally friendly manufacturing process and gives a finished product that can be recycled in accordance with British Standards.

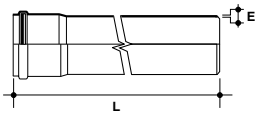
For further information, please refer to www.polypipe.com

Terrain Drainage System

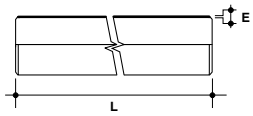
Terrain pipes & fittings



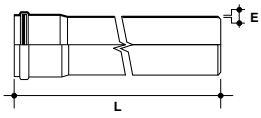
	Size (mm)	L	E (min)	Code
SOLID WALL PIPE PLAIN ENDED				
	82	3m	2.25	**3DP3**
♥	110	3m	3.2	**4DP3**
♥	160	3m	4.1	**6DP3**
	82	5.8m	2.25	**3DP58**
♥	110	5.8m	3.2	**4DP58**
♥	160	5.8m	4.1	**6DP58**



	Size (mm)	L	E (min)	Code
SOLID WALL PIPE SINGLE SOCKET				
♥	110	3m	3.2	**4DP3S**
♥	110	6m	3.2	**4DP6S**
♥	160	6m	4.1	**6DP6S**



	Size (mm)	L	E (min)	Code
FOAMCORE PIPE PLAIN ENDED				
	110	3m	3.2	**4EUP3**
	110	5.8m	3.2	**4EUP58**
	160	5.8m	4.1	**6EUP58**



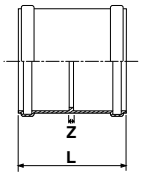
	Size (mm)	L	E (min)	Code
FOAMCORE PIPE SINGLE SOCKET				
	110	3m	3.2	**4EUP3S**
	110	6m	3.2	**4EUP6S**
	160	3m	4.1	**6EUP3S**
	160	6m	4.1	**6EUP6S**

Please refer to pages 10/11 for diameters 200-315mm

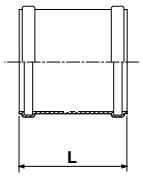
All dimensions in mm unless otherwise stated

Terrain pipes & fittings D Range

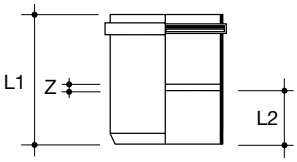
	Size (mm)	L	Z	Code
COUPLER DOUBLE SOCKET - with central stop				
	82	136	3.5	**3D20D**
♆	110	122	2	**4D20D**
♆	160	154	4	**6D20D**



	Size (mm)	L	Code
SLIP COUPLER - for inserting new fittings into existing pipework (e.g. refurbishment or repair)			
♆	110	122	**4D20DSC**
♆	160	154	**6D20DSC**

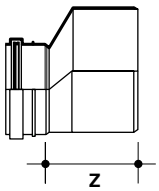


	Size (mm)	L1	L2	L3	Code
PIPE END SOCKET					
♆	110	121	48	3	**4D69**
♆	160	167	68	3	**6D69**

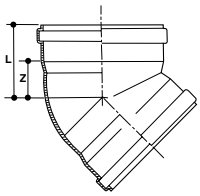


	Size (mm)	Z	Code
LEVEL INVERT TAPER - larger end spigot and smaller end socket			
♆	110/82	104	**43DT**
♆	160/110	143	**64DT**

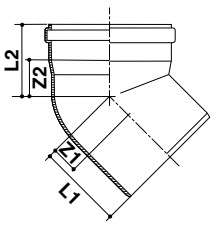
Material: PVC-u



	Size (mm)	Angle°	L	Z	Code
SHORT RADIUS BEND DOUBLE SOCKET - to change pipe direction: 87½°, 45°, 30° & 15° as standard					
	82	87½	142	70	**3D23D**
	82	45	97	25	**3D25D**
♆	110	87½	120	70	**4D23D**
♆	110	45	87	37	**4D25D**
♆	110	30	83	27	**4D27D**
♆	110	15	76	20	**4D29D**
♆	160	87½	202	124	**6D23D**
♆	160	45	122	49	**6D25D**
♆	160	30	114	40	**6D27D**
♆	160	15	101	28	**6D29D**



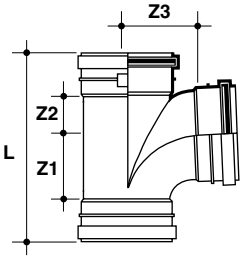
	Size (mm)	Angle°	L1	L2	Z1	Z2	Code
SHORT RADIUS BEND SINGLE SOCKET - to change pipe direction: 87½°, 45°, 30° & 15° as standard							
♆	110	87½	117	119	59	69	**4D23**
♆	110	45	85	89	27	39	**4D25**
♆	110	30	78	86	17	29	**4D27**
♆	110	15	71	79	9	22	**4D29**
♆	160	87½	164	166	84	100	**6D23**
♆	160	45	117	116	37	50	**6D25**
♆	160	30	107	112	25	40	**6D27**
♆	160	15	96	100	14	28	**6D29**



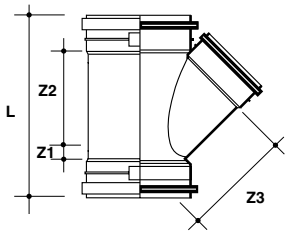
All dimensions in mm unless otherwise stated

Terrain Drainage System

Terrain pipes & fittings D Range

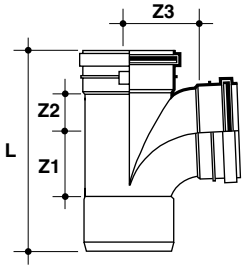


	Size (mm)	Angle°	L	Z1	Z2	Z3	Code
SINGLE EQUAL JUNCTION - to join 82mm main pipe at an angle: 45° as standard							
	110	87½	268	87	57	87	**4D30D**
	160	87½	338	95	99	99	**6D30D**
BBA	82	45	265	19	108	102	**3D33D**
	110	45	294	37	137	137	**4D33D**
	160	45	399	52	203	203	**6D33D**



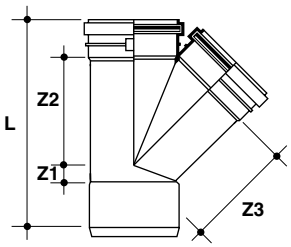
	Size (mm)	Angle°	L	Z1	Z2	Z3	Code
SINGLE UNEQUAL JUNCTION (all sockets) - to join 110mm branch pipe to 160mm main pipe at an angle							
	160/110	45	278	27	143	143	**64D33D**
	160/110	87½	397	38	205	205	**64D30D**

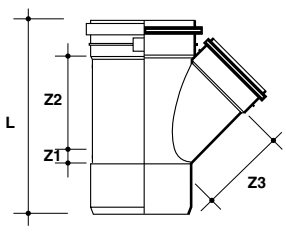
45° and 87½° as standard.



	Size (mm)	Angle°	L	Z1	Z2	Z3	Code
SINGLE EQUAL JUNCTION SPIGOT OUTLET - to join 110 or 160mm branch to 110 or 160mm main pipe at an angle							
	110	87½	239	59	69	69	**4D30**
	110	45	278	27	143	143	**4D33**
	160	45	397	38	205	205	**6D33**

(110mm) 87½° and 45° as standard. (160mm) 45° as standard.





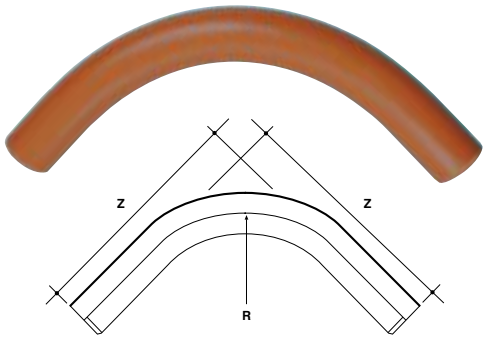
	Size (mm)	Angle°	L	Z1	Z2	Z3	Code
SPIGOT OUTLET - to join 110mm branch pipe to 110 or 160mm main pipe at an angle							
	160/110	45	326	2	168	176	**64D33**

45° as standard.

All dimensions in mm unless otherwise stated

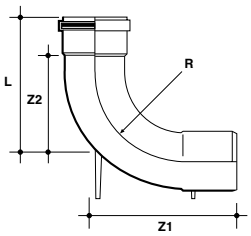
Terrain pipes & fittings

Size (mm)	Angle°	R	Z	Code
LONG RADIUS BENDS (plain ended) - 90° and 45° as standard				
110	90	455	539	**4D22**
110	45	455	368	**4D28**



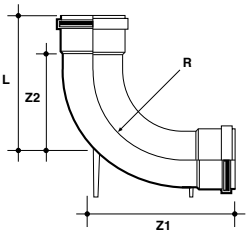
Size (mm)	Angle°	L	R	Z1	Z2	Code
REST BEND SINGLE SOCKET - to change 110mm at base of soil stack: 87½° as standard						
110	87½	230	200	245	170	**4D21**

Satisfies recommendations of BS 5772: 1994.



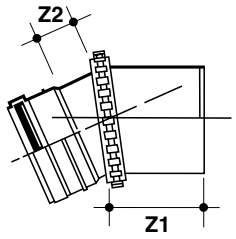
Size (mm)	Angle°	L	R	Z1	Z2	Code
REST BEND DOUBLE SOCKET - to change 110mm at base of soil stack: 87½° as standard						
110	87½	205	200	245	170	**4D21D**

Satisfies recommendations of BS 5772: 1994.



Size (mm)	Angle°	Z1	Z2	Code
VARIABLE BEND SINGLE SOCKET - to change 110mm pipe direction by 0-25°				
110	0-25	86	45	**4DV40**

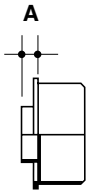
Z dimensions are constant whichever angle is selected.
Any non-standard angle can be achieved if used in conjunction with a standard fitting.



All dimensions in mm unless otherwise stated

Terrain Drainage System

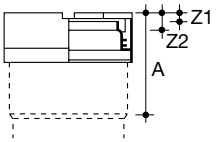
Terrain pipes & fittings



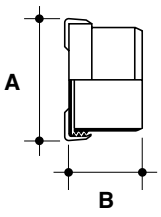
Size (mm)	A	Code
SOCKET PLUG - to blank off any ring seal socket		
110	18	**4D68**
160	16	**6D68**

Size (mm)	A	Code
TEMPORARY SITE CAP - for temporary capping of system		
110	30	**4D65**

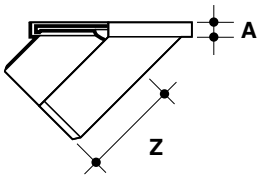
Versions for external and internal use.



Size (mm)	A	Z1	Z2	Code
ACCESS CAP - Solvent Skt				
83	83	16	32	**3D63**
110	97	21	46	**4D63**
160	122	22	42	**6D63**



Size (mm)	A	B	Code
ACCESS CAP - to allow full bore access to 82, 110 or 160mm pipework for inspection or rodding			
82	101	85	**3D64**
110	118	103	**4D64**
160	186	107	**6D64**



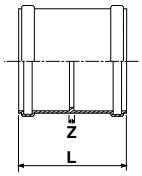
Size (mm)	A	Z	Code
RODDING EYE - elliptical rodding eye with 110mm pipe size spigot			
110	13	95	**4DRE**

Material: Aluminium. Access aperture size: 118 x 90mm.

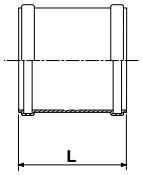
All dimensions in mm unless otherwise stated

Terrain pipes & fittings DX Range

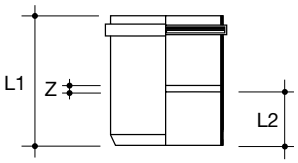
	Size (mm)	L	Z	Code
COUPLER DOUBLE SOCKET - with central stop				
	110	122	2	**4D20DX**
	160	154	4	**6D20DX**



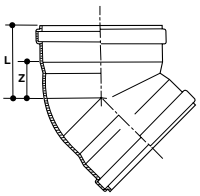
	Size (mm)	L	Code
SLIP COUPLER - for inserting new fittings into existing pipework (e.g. refurbishment or repair)			
	110	122	**4D20DSCX**
	160	154	**6D20DSCX**



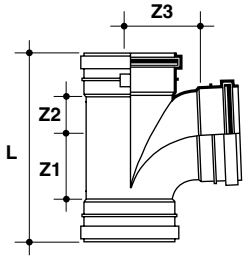
	Size (mm)	L1	L2	L3	Code
PIPE END SOCKET					
	110	121	48	3	**4D69**
	160	167	68	3	**6D69**



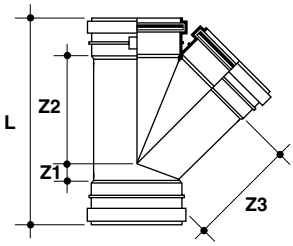
	Size (mm)	Angle°	L	Z	Code
SHORT RADIUS BEND DOUBLE SOCKET - to change pipe direction: 87½°, 45°, 30° & 15° as standard					
	110	87½	120	70	**4D23DX**
	110	45	87	37	**4D25DX**
	160	87½	202	124	**6D23DX**
	160	45	122	49	**6D25DX**



	Size (mm)	Angle°	L	Z1	Z2	Z3	Code
SINGLE EQUAL JUNCTION (all equal sockets) - to join 110 or 160mm branch to 110 or 160mm main pipe at an angle							
	110	87½	268	87	57	87	**4D30DX**
	160	87½	338	95	99	99	**6D30DX**
	110	45	294	37	137	137	**4D33DX**
	160	45	399	52	203	203	**6D33DX**



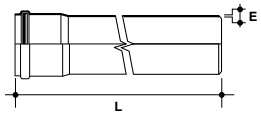
	Size (mm)	Angle°	L	Z1	Z2	Z3	Code
UNEQUAL SOCKETS							
	160/110	45	325	11	166	171	**64D33DX**



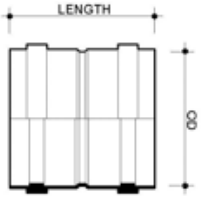
All dimensions in mm unless otherwise stated

Terrain Drainage System

Terrain large diameter pipes & fittings

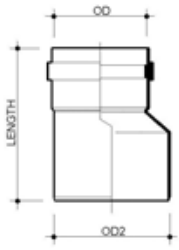


Size (mm)	L	E (min)	Code
SOLID WALL PIPE SINGLE SOCKET			
200	5.8m	4.9	**8DP58S**
250	5.8m	6.2	**10DP58S**
315	5.8m	7.7	**12DP58S**

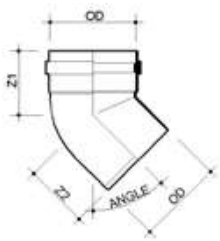


Size (mm)	L	OD	Code
COUPLER DOUBLE SOCKET			
200	216	200	**UG801***
250	270	250	**UG1001***
315	170	315	**UG1201**
315	170	315	**UG1200****

*Remove centre stop for use as slip coupling
** Slip coupler



Size (mm)	L	OD	OD2	Code
LEVEL INVERT TAPER				
160/200	264	160	200	**UG821**
200/250	330	200	250	**UG1021**
315	415	250	315	**UG1221**



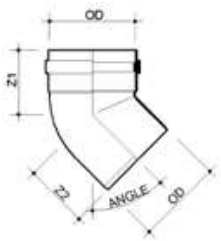
Size (mm)	Angle°	OD	L	Z	Code
SHORT RADIUS BEND DOUBLE SOCKET					
200	45	200	160	130	**UG803**
200	15	200	150	150	**UG809**

All dimensions in mm unless otherwise stated

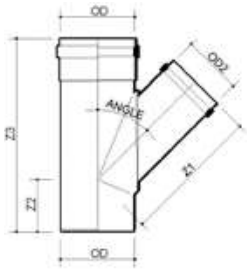
Large Diameter Pipes & Fittings

Terrain large diameter pipes & fittings

Size (mm)	Angle°	OD	Z1	Z2	Code
SHORT RADIUS BEND SINGLE SOCKET					
200	87½	200	210	210	**UG812**
200	45	200	150	150	**UG804**
200	15	200	160	130	**UG810**
250	87½	250	262½	262½	**UG1012**
250	45	250	187½	187½	**UG1004**
250	30	250	190	190	**UG1068**
250	15	250	190	190	**UG1010**
315	87½	315	330	330	**UG1212**
315	45	315	235	235	**UG1204**
315	30	315	251	204	**UG1268**
315	15	315	251	204	**UG1210**

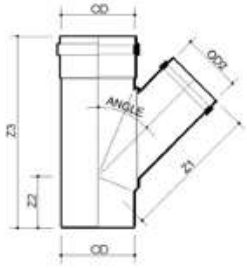


Size (mm)	Angle°	OD	Z1	Z2	Z3	Code
SINGLE EQUAL JUNCTIONS						
200	45	200	360	140	490	**UG806**
200	45	200	360	140	490	**UG805**
250	45	250	495	175	650	**UG1006**
315	45	315	600	200	860	**UG1206**

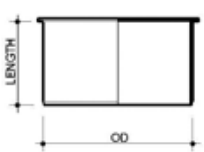


Size (mm)	Angle°	OD	OD2	Z1	Z2	Z3	Code
SINGLE UNEQUAL JUNCTIONS (DOUBLE SOCKET)							
200/110	45	200	110	310	140	490	**UG836**
200/160	45	200	160	310	140	490	**UG837**
250/110	45	250	110	400	175	650	**UG1036**
250/160	45	250	160	400	175	650	**UG1016**
250/200	45	250	200	465	175	650	**UG1017**
315/110	45	315	110	516	220	860	**UG1236**
315/160	45	315	160	516	220	860	**UG1216**
315/200	45	315	200	600	220	860	**UG1217**
315/250	45	315	250	680	220	860	**UG1218**
200/110	45						**UG835***
200/110	45						**UG831***

*Triple Socket



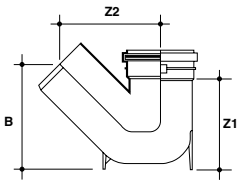
Size (mm)	OD	Code
SOCKET PLUG		
200	200	**UG820**
250	250	**UG1020**
315	315	**UG1220**



All dimensions in mm unless otherwise stated

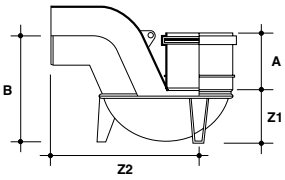
Terrain Drainage System

Terrain gullies & hoppers

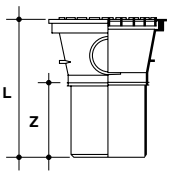


Size (mm)	A	B	Z1	Z2	Code
GULLY TRAP - to obtain 'P' trap, add 45° bend					
110	50	190	120	210	**4DG90**

Material: Polypropylene

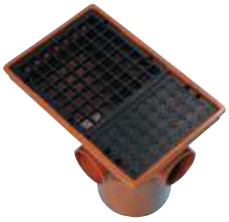


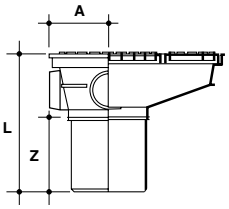
Size (mm)	A	B	Z1	Z2	Code
'P' TRAP - to obtain 'Q' or 'S' trap, add 45° or 87½° bend					
110	104	193	92	265	**4DG91**



Size (mm)	L	Z	Code
SQUARE HOPPER HEAD - Spigot outlet may be cut off to reveal socket which can accept solvent-welded pipe as extended spigot			
110	203	105	**4DG92**

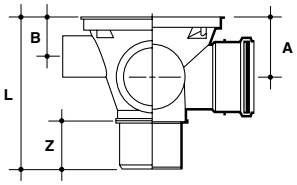
Material: PVC-u and Polypropylene. Terracotta body with black grid.





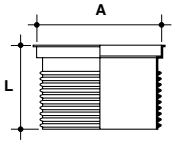
Size (mm)	A	L	Z	Code
RECTANGULAR HOPPER HEAD - Back inlet plate incorporates two easily removable discs to create apertures for insertion of 40mm waste pipes				
110	85	203	105	**4DG93**

Material: PVC-u and Polypropylene. Terracotta body with black grid.



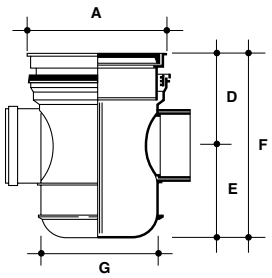
Size (mm)	A	B	L	Z	Code
CIRCULAR GULLY - Incorporates plugged horizontal pipe entries: 2 x 110mm spigots, 1 x 110mm ring seal socket and 1 x 68mm rainwater pipe socket					
110	104	193	92	265	**4DG80**

Material: PVC-u. Spigot outlet may be cut off to reveal socket which can accept solvent-welded pipe as extended spigot.



A	L	Code
EXTENSION PIECE - to extend upper aperture of 4DG80 Circular Gully to surface level or to lower horizontal pipe entries beneath surface level		
213	150	**4DG81**

Requires mastic sealant for forming airtight/watertight seal.



Size (mm)	A	D	E	F	G	Code
BOTTLE GULLY WITH ROUND COVER - removable dip tube provides 50mm deep trap						
110	213	150	154	304	190	**4DG97**

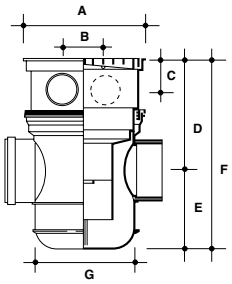
Material: PVC-u and Polypropylene. Incorporates 110mm back inlet connection. Terracotta body with black cover.

All dimensions in mm unless otherwise stated

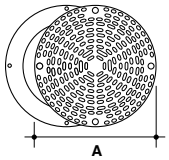
Terrain gullies & hoppers

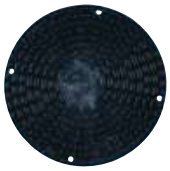
Size (mm)	A	B	C	D	E	F	G	Code
BOTTLE GULLY WITH SQUARE COVER - removable dip tube provides 50mm deep trap								
110	232	76	60	212	154	366	190	**4DG89**

Material: PVC-u and Polypropylene. Incorporates 2 x waste back inlet connections, can also accept up to 6 different pipes either direct or via adaptors. Terracotta body with black grid.



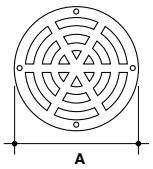
A	Code
SEALED COVER - to cap 4DG80 Cirular Gully or 4DG81 extension	
211	**4DG82**

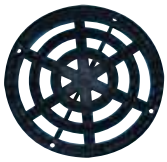




A	Code
CIRCULAR GRATING - to provide an open grating for surface water drainage for 4DG80 Circular Gully or 4DG81 Extension Piece	
211	**4DG83**

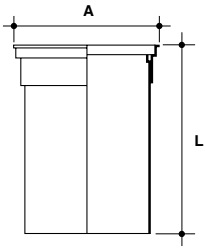
Also: spare grating for 4DG97 Bottle Gully.





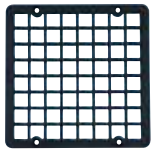
Size (mm)	A	L	Code
RAISING PIECE - to extend upper aperture of 4DG97 Bottle Gully to surface level or to lower horizontal pipe entries beneath surface level			
200	213	470	**4DG96**

Material: PVC-u and Polypropylene. Terracotta body with black grid.



Depth (mm)	Width (mm)	Height (mm)	Code
SQUARE HOPPER HEAD - spare grid for 4DG92 Hopper Head			
13	155	155	**4DG92G**

Material: Polypropylene.



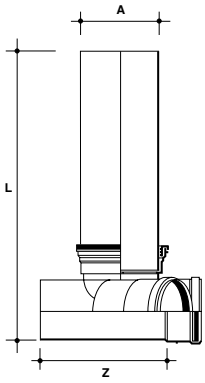
Width (mm)	Height (mm)	Code
SQUARE SEALED COVER - converts 4DG92 Square Hopper Head from open grid to sealed cover		
155	155	**4DG92GS**

Material: Polypropylene.

All dimensions in mm unless otherwise stated

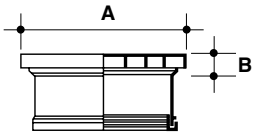
Terrain Drainage System

Terrain inspection chambers



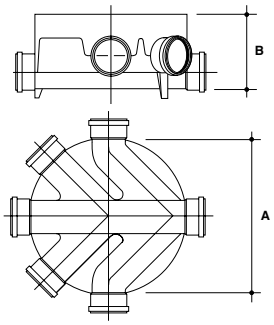
Size (mm)	A	L	Z	Code
SHALLOW INSPECTION CHAMBER - to allow inspection of drainage system				
110	200	586	261	**4DI600**

Supplied with 2 plugs for unused entries 200mm socket has angular tolerance of ± 7° allowing up to 14° adjustment to accommodate pipe variation and ground fall.
9163.4 Access Door may be fitted to the lower opening to achieve double seal.
Access aperture size: 162 x 100mm.



Size (mm)	A	B	Code
SEALED COVER AND FRAME - to cap 4DI600 Shallow Inspection Chamber			
110	211	43	**4DIFC1**

Ring seal joint to shaft.

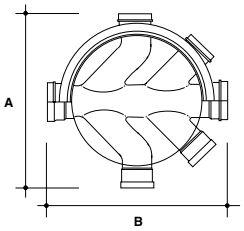


Size (mm)	A	B	Code
INSPECTION CHAMBER BASE (470mm diameter) - to allow inspection of drainage system, incorporating 110mm main channel and 4 x 110mm branch inlets			
110	470	240	**4DI240B**

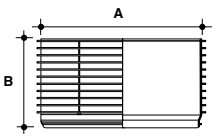
Material: Polypropylene. Supplied with 4 x blanking plugs.

Size (mm)	A	B	C	Code
UNEQUAL INSPECTION CHAMBER BASE (475mm diameter) - to allow inspection of drainage system, incorporating 160mm main channel, 2 x 160mm and 2 x 110mm branch inlets				
160/110	610	610	250	**64DI240B**

Material: Polyethylene. Supplied with 4 x blanking plugs.



	Diameter	Code
ADAPTOR SEAL RING		
	470	**6DI235S**



	A	B	Code
RAISING PIECE - to extend height of Marscar Access Bowl (4DMB) or Inspection Chamber Base (4DI240B) or Unequal Inspection Chamber Base (64DI240B) to surface level			
	470	240	**4DI235R**

Material: Polypropylene.

Please Note: Purchased as individual items according to final installation depth requirements.

Note: When using the 64D1240B base unit with raising pieces, the seal ring on the first raising piece (4D1235R) must be replaced with a 6D1235S.

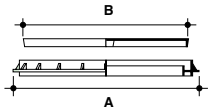
All dimensions in mm unless otherwise stated

Inspection Chambers

Terrain inspection chambers

	A	B	Code
COVER AND FRAME - BS EN 124: 1994 - Group 1, Class A15 (formerly BS497: 1976 Class C+)			
	579	454	**4DIFC4**

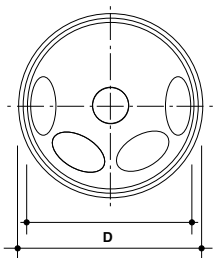
Material: Polypropylene cover and frame. For domestic drive-ways accessible to vehicles up to one tonne maximum wheel load.

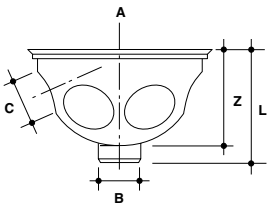


Size (mm)	A	B	C	D	L	Z	Code
MARSCAR ACCESS BOWL - Unique design access chamber enabling up to 4 inlet connections from shallow drains							
110	213	150	154	304	190	230	**4DMB**

Material: UPVC. Single outlet at centre of base of bowl enables connection to underlying drain run up to 10 metres deep without need for manholes. Bowl shape and inlet angles create self-cleaning swirl action.

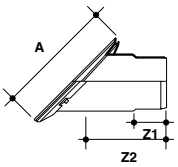
* Requires 4DM1





Size (mm)	A	Z1	Z2	Code
PRE-CUT INLET HOLE FOR CONNECTION OF 110MM PIPE - 2-part component: connector with seal and locking cap				
110	180	90	162	**4DM1**

Material: Polypropylene



Size (ml)	Code
TERRAIN ACCESSORIES - CLEANING FLUID - for cleaning PVC-u pipe and fittings before applying Liquid Weld	
125	**9101.125**
250	**9101.250**

Material: Acetone. Screw top cans.

Size (ml)		Code
TERRAIN ACCESSORIES - LUBRICANT - for lubricating seal rings on expansion fittings		
250	Tub (Silicone)	**9136.250**
500	Tub (Soluble)	**9136.500**

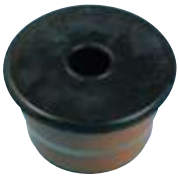
Material: Silicone grease or Soluble lubricant.

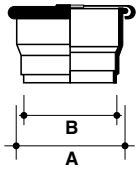
Size (ml)		Code
TERRAIN ACCESSORIES - LIQUID WELD - for solvent jointing of PVC-u pipes and fittings cap, incorporates integral brush		
125	Tube	**9100.125**
250	Tub	**9100.250**
500	Tub	**9100.500**

All dimensions in mm unless otherwise stated

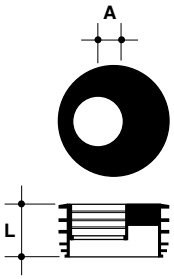
Terrain Adaptors

Terrain adaptors



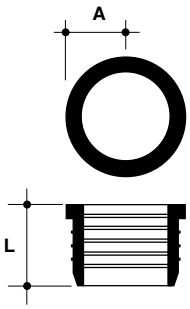


Size (mm)	A	B	Code
UNIVERSAL RAINWATER ADAPTOR - for connecting round and square PVC-u rainwater downpipe (up to 68mm) to underground drainpipe			
110	110	102	**4D76**



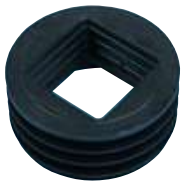
Size (mm)	A	L	Code
UNIVERSAL RAINWATER ADAPTOR - for connecting round and square PVC-u rainwater downpipe (up to 68mm) to underground drainpipe			
110	8	40	**4DW200**

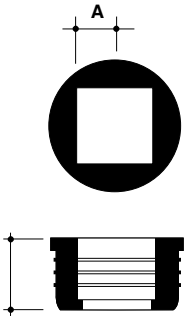
Material: EPDM



Size (mm)	A	L	Code
ADAPTOR TO ABOVE GROUND DRAIN - for connecting 68mm downpipes and 82mm underground drain			
82/68	41	54	**3DW25**
110/68	56	54	**4DW25**
110/82	56	54	**4DW3**

Material: Flex PVC. For round downpipe.





Size (mm)	A	L	Code
ADAPTOR TO ABOVE GROUND DRAIN - for connecting 62mm or 75mm downpipes and 82mm underground drain			
110/62	56	54	**4DW23**
110/75	37	58	**4DW33**

Material: Flex PVC. For square downpipe.

All dimensions in mm unless otherwise stated

Flexicon Adaptors

Flexicon adaptors

	Range AB mm	Length (min)	Code	Driver
FLEXICON UNIVERSAL ADAPTORS (XAC)				
	120 - 135/100 - 115	100	XAC400	7mm/8mm
	180 - 200/160 - 180	150	XAC600	8mm/8mm
	260 - 285/180 - 205	150	XAC800	8mm/8mm

	Range AB mm	Length (min)	Code	Driver
FLEXICON DRAINAGE ADAPTORS (XAC)				
	100 - 115/75 - 85	100	XAC85/115	7mm/7mm
	100 - 115/85 - 95	100	XAC95/115	7mm/7mm
	130 - 145/110 - 125	120	XAC125/145	7mm/7mm
	145 - 160/110 - 125	120	XAC125/160	7mm/7mm
	145 - 160/125 - 140	120	XAC140/160	7mm/7mm
	150 - 165/110 - 115	120	XAC115/165	7mm/7mm
	160 - 175/110 - 125	120	XAC125/175	7mm/7mm
	170 - 185/145 - 160	120	XAC160/185	7mm/7mm
	175 - 190/110 - 125	120	XAC125/190	7mm/7mm
	175 - 190/125 - 140	120	XAC140/190	7mm/7mm
	180 - 195/160 - 175	120	XAC175/195	7mm/7mm
	190 - 205/110 - 125	150	XAC125/205	8mm/7mm
	195 - 210/160 - 175	150	XAC175/210	8mm/7mm
	215 - 230/125 - 140	150	XAC140/230	8mm/7mm
	215 - 230/145 - 160	150	XAC160/230	8mm/7mm
	213 - 230/175 - 190	150	XAC190/230	8mm/8mm
	230 - 245/125 - 140	150	XAC140/245	8mm/7mm
	230 - 245/145 - 160	150	XAC160/245	8mm/7mm
	230 - 245/175 - 190	150	XAC190/245	8mm/8mm
	245 - 260/145 - 160	150	XAC160/260	8mm/7mm
	245 - 260/175 - 190	150	XAC190/260	8mm/8mm
	265 - 280/145 - 160	150	XAC160/280	8mm/8mm
	260 - 285/240 - 265	150	XAC900	8mm/8mm
	305 - 320/145 - 160	150	XAC160/320	8mm/8mm
	305 - 320/175 - 190	150	XAC190/320	8mm/8mm

	Range AB mm	Length (min)	Code	Driver
FLEXICON PLUMBING ADAPTORS (XPA)				
	50 - 65/30 - 45	80	XPA45/65	7mm/7mm
	80 - 95/45 - 50	100	XPA50/95	7mm/7mm
	100 - 115/45 - 50	100	XPA50/115	7mm/7mm
	80 - 95/50 - 65	100	XPA65/95	7mm/7mm
	100 - 115/50 - 65	100	XPA65/115	7mm/7mm

All dimensions in mm unless otherwise stated

Flexicon couplings

	Range AB mm	Length (min)	Code	Driver
FLEXICON DRAIN COUPLINGS (XDR)				
	50 - 65	95	XDR65	7mm
	80 - 95	110	XDR95	7mm
	100 - 115	110	XDR115	7mm
	110 - 125	120	XDR125	7mm
	120 - 135	120	XDR135	7mm
	135 - 150	120	XDR150	7mm
	150 - 165	120	XDR165	7mm
	150 - 175	120	XDR175	7mm
	160 - 180	120	XDR180	7mm
	175 - 200	150	XDR200	8mm
	200 - 215	150	XDR215	8mm
	200 - 225	150	XDR225	8mm
	225 - 250	150	XDR250	8mm
	250 - 275	150	XDR275	8mm

	Range AB mm	Length (min)	Code	Driver
FLEXICON SHEAR BAND STANDARD COUPLINGS (XSB)				
	100 - 115	120	XSB115	8mm
	110 - 120	120	XSB120	8mm
	110 - 125	120	XSB125	8mm
	120 - 135	120	XSB135	8mm
	135 - 150	120	XSB150	8mm
	150 - 165	120	XSB165	8mm
	160 - 175	120	XSB175	8mm
	160 - 180	120	XSB180	8mm
	175 - 200	150	XSB200	8mm
	200 - 215	150	XSB215	8mm
	200 - 225	150	XSB225	8mm
	225 - 250	150	XSB250	8mm
	250 - 275	150	XSB275	8mm
	265 - 290	150	XSB290	8mm
	285 - 310	190	XSB310	8mm
	295 - 320	190	XSB320	8mm
	305 - 335	190	XSB335	8mm
	315 - 345	190	XSB345	8mm
	345 - 360	190	XSB360	8mm
	360 - 385	190	XSB385	8mm
	385 - 410	190	XSB410	8mm

All dimensions in mm unless otherwise stated

Accessories

Flexicon end caps

Range AB mm	Code	Driver
FLEXICON END CAPS (XST)		
20 - 32	**XST32**	**7mm**
30 - 42	**XST42**	**7mm**
40 - 50	**XST50**	**7mm**
50 - 65	**XST65**	**7mm**
80 - 95	**XST95**	**7mm**
100 - 115	**XST115**	**7mm**
110 - 125	**XST125**	**7mm**
120 - 135	**XST135**	**7mm**
135 - 150	**XST150**	**7mm**
145 - 160	**XST160**	**7mm**
165 -0180	**XST180**	**7mm**
185 - 200	**XST200**	**8mm**
200 - 215	**XST215**	**8mm**

Range A/B mm	Code
FLEXICON ACCESSORIES - FLEXIDRIVER - flexible screwdriver	
7mm Flexidriver	**XFD700**
8mm Flexidriver	**XFD800**

All dimensions in mm unless otherwise stated

Terrain System Planning

System planning

Handling

- Take all reasonable care when handling PVC-u, particularly in very cold conditions when the impact strength of the material is reduced.
- Do not throw or drop pipes, or drag them along hard surfaces.
- In case of mechanical handling, use protective slings and padded supports. Metal chains and hooks should not make direct contact with the pipe.

On-site storage

- Stack pipe lengths:
  - either on a flat base
  - or on level ground
  - or on 75mm x 75mm timber at 1.0m maximum centres
- Provide side support with 75mm wide battens at 1m centres (Fig. 1).
- Maximum stack: seven layers high.
- Ideally, stacks should contain one diameter pipe size only. Where this is not possible, stack largest diameter pipes at base of stack. Small pipes may be nested inside larger pipes.
- If stored in the open for long periods, or exposed to strong sunlight, cover the stack with opaque sheeting.
- Store fittings under cover. Do not remove from cartons or packaging until required.
- Store solvent cement and cleaning fluid in a cool place in accordance with the relevant regulations detailed in the Health & Safety at Work Act 1974.

Storage in hot climates

- Ultra-violet light can affect pipes and fittings: pipe colour may change and rubber seals may be degraded.
- Accordingly:
  - store all materials in well-ventilated, shady conditions
  - do NOT expose to direct sunlight
  - keep fittings in original packaging until required for use
- Maximum stack (hot conditions): six layers high.

Site safety

- The relevant regulations detailed in the Health & Safety at Work Act 1974, and Construction (Design & Management) Regulations 1995, must be adhered to on-site.
- COSHH data sheets are available on request.

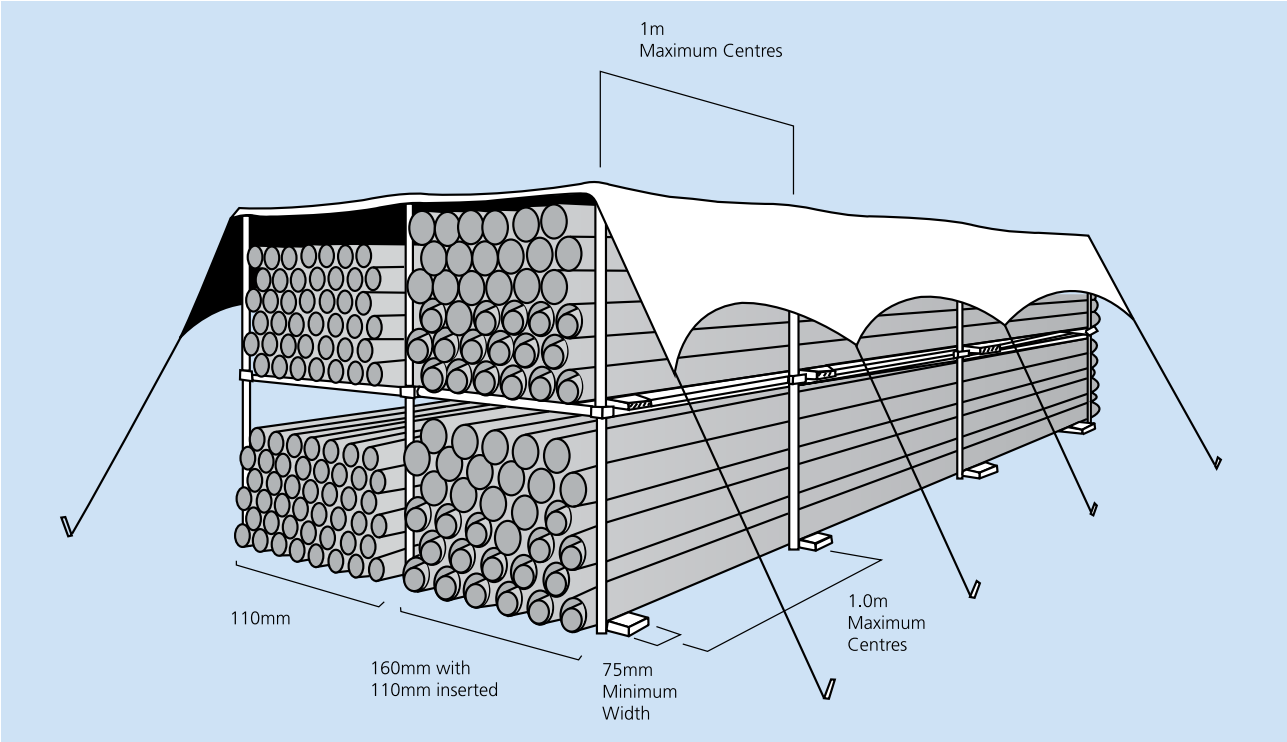


Fig. 1 Pipe stacking

All dimensions in mm unless otherwise stated

Seal ring jointing

Important: A 9mm expansion gap must be created at all seal ring joints to allow pipes to expand or contract without stressing during wide temperature variations.

Step 1

Pipe lengths are supplied ready-chamfered. For site-cut pipes and offcuts, ensure cut is square - then file ends to provide 45° external chamfer. (Do not chamfer to a knife edge.) Lubricate rubber seal with 9136 Lubricant (Fig. 2a).

Step 2

Push pipe fully into socket. Mark pipe against socket edge as shown (Fig. 2b).

Step 3

Withdraw pipe until mark is 9mm from socket edge to provide required expansion gap (Figs 2c and 2d).

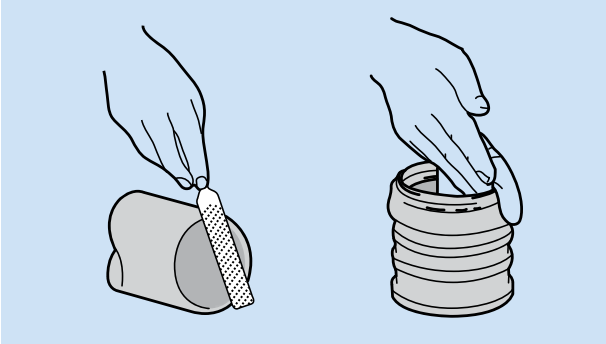


Fig. 2a Filing chamfer

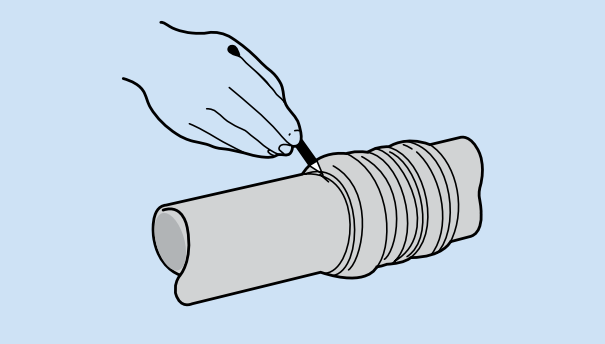


Fig. 2b Pushing in pipe/marking pipe

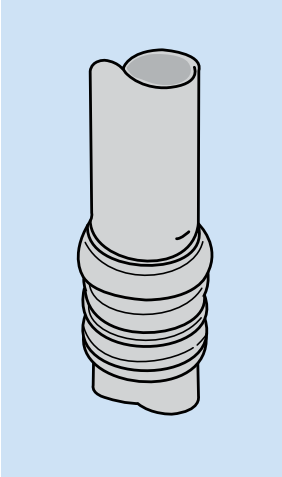


Fig. 2c Pipe withdrawn by 9mm

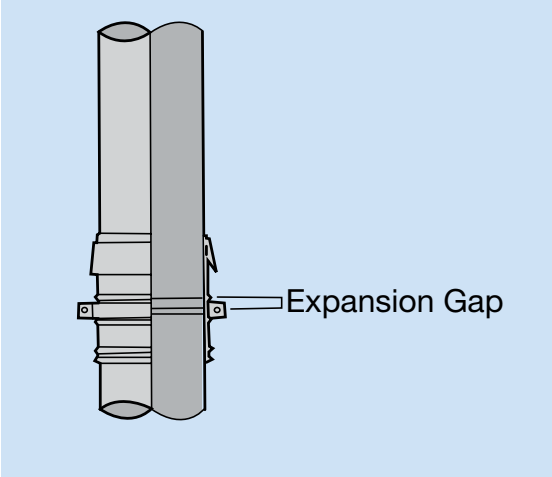


Fig. 2d Pipe Expansion gap

Terrain System Planning

System planning

Pipe bedding and backfill

All bedding and backfilling of Terrain Underground pipes should be in accordance with BS EN 5955: Part 6 Installation of PVC-u pipework for gravity drains and sewers, or the BBA Certificate.

Terrain 110mm and 160mm PVC-u underground drainage systems have been awarded British Board of Agrément Certificate No. 94/3049. This allows:

- **50mm depth of granular bedding (Fig. 3)**
- **Where the as-dug soil is suitable, pipes may be laid directly on a trimmed trench bottom (Fig. 4)**

Suitable material is defined as granular material in accordance with the recommendations of BS EN 5955: Part 6: 1980 having a nominal particle size not exceeding 10mm or 14mm for 110mm and 160mm diameter pipes respectively, or that which passes the tests described in appendix A of the above standard.

Where the as-dug material is unsuitable

A bed of suitable imported granular material must be laid on the trench bottom prior to installation of pipes and be used for sidefill up to the level of the crown of the pipe.

If the trench may be hand trimmed by shovel and is not puddled when walked on, a bed of 50mm is sufficient (Fig. 3).

When pipes are to be laid in hard ground requiring mechanical means of trimming (e.g. rock, compacted sand or gravel), or in very soft or wet ground, a bed of min. 100mm is required (Fig. 5).

Drains under buildings

Where drains are required to be laid under buildings, deep hardcore from within the foundation boundaries should be compacted prior to excavating the trench for the pipe. Suitable material should then be employed for the bedding and backfilling.

When trenches are dug from original ground, pipes may be laid and surrounded with appropriate material before the top layer of hardcore is placed.

Where pipes pass through a wall or foundations of a building, they should be protected by a lintel or sleeve.

Shallow drains

Where there is risk of damage, pipes laid at less than 600mm depth (not under a road) should be protected by use of a paving slab or similar. A minimum 75mm cushioning layer of granular material must be laid between any slab and the crown of the pipe.

Pipes laid under roads

The minimum cover under roads should be 1.2m from the top of the pipe. Where this is less than 1.2m additional protection is required ie. reinforced bridging slabs.

Requirements for imported material for backfill

Nominal pipe size	Material complying with BS 882: 1992
110mm	10mm nominal single-sized aggregate
160mm	14mm nominal single-sized aggregate

Fig. 4

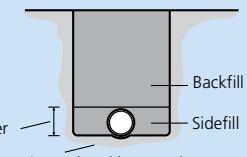


Fig. 3

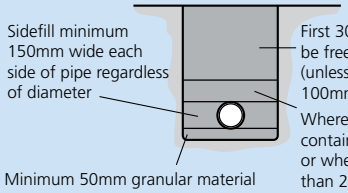
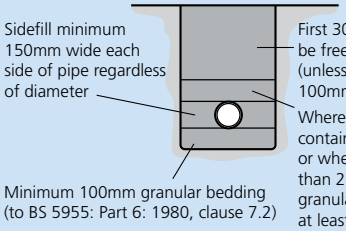


Fig. 5



All dimensions in mm unless otherwise stated

System planning

Rodding points

Rodding points may be used on drains with invert depths up to 2m. They may be located at the head of a drain or at intermediate positions as an alternative to an inspection chamber or manhole. However,

- **Because rodding is possible in the direction of flow only, sufficient rodding points must be incorporated to provide access to all parts of the drain.**
- **As it is not possible to remove debris from a rodding point, an inspection chamber or manhole must be provided at a point downstream.**

During installation, care must be taken to ensure no load is transferred onto the branch upstand of the pipe.

Shallow inspection chamber

Provides an alternative to traditional manholes for invert depths up to 600mm. Intermediate depths can be accommodated by cutting chamber riser with a fine-tooth saw. The base unit is supplied with two contoured plugs sealing the two side connections. For left or right hand single connections, the appropriate plug is removed. The 4DI600 Shallow Inspection Chamber can be used with 4DIFC1 Sealed Cover and Frame (PVC-u) (Fig. 6).
If situated in an area where it may be damaged, the frame should be surrounded with concrete to prevent movement and provide extra security.

Inspection chambers

The Terrain 4DI240B and 64DI240B Inspection Chambers provide an alternative to traditional manholes for invert depths up to 1.2 metres. It comprises a base unit and three raising pieces (4DI235R) to allow a range of heights to be easily achieved (Fig. 7).

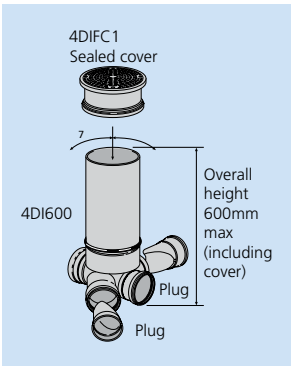


Fig. 6

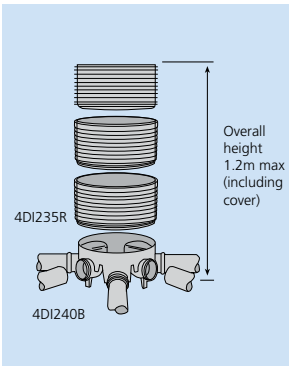


Fig. 7

Overall heights

Overall heights	
Including cast iron frame and cover	
Base Unit	285mm
Base unit plus 1 raising piece	520mm
Base unit plus 2 raising pieces	755mm
Base unit plus 3 raising pieces	990mm
Base unit plus 4 raising pieces	1225mm

Intermediate heights can be achieved by cutting the top raising piece as necessary. Chambers should be installed on a 100mm bed of suitable granular material or as dug material. The bedding material must be evenly compacted under the base so that the chamber is fully supported. Different covers are available to meet varying application requirements:

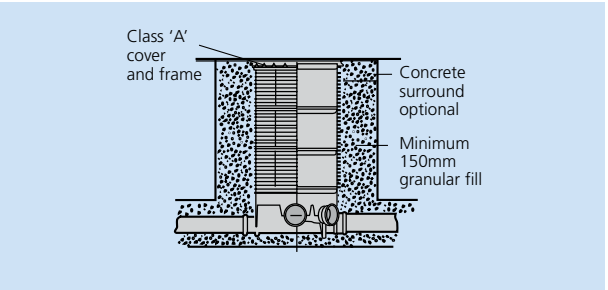


Fig. 8

Polypropylene cover and frame (4DIFC4):

For use where cars and light vehicles have access but NOT heavy vehicles (Fig. 9) rated to 35kN.

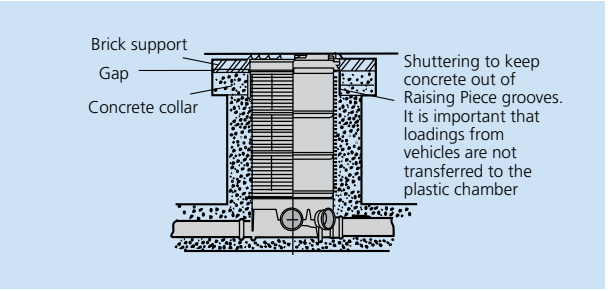


Fig. 9

Terrain System Planning

System planning

Suitable for invert depths of up to 1.2metres, the 64DI240B Unequal Inspection Chamber incorporates a through drain of 160mm and side connections of 110mm (Fig. 10).

The specific required height can be achieved by cutting the chamber body or extension piece (4DI235R) with a fine-tooth saw.

The unit is supplied with all inlets and outlets blanked off. These are easily opened for use by cutting off the ends with a fine tooth saw.

The appropriate cover should be selected, as for the Terrain Inspection Chamber. For installation details see page 21.

One or more inspection chamber bases 4DI240B or 64DI240B with upstand removed may be used at the base of manholes as an alternative to benching in half channel or slip couplings.

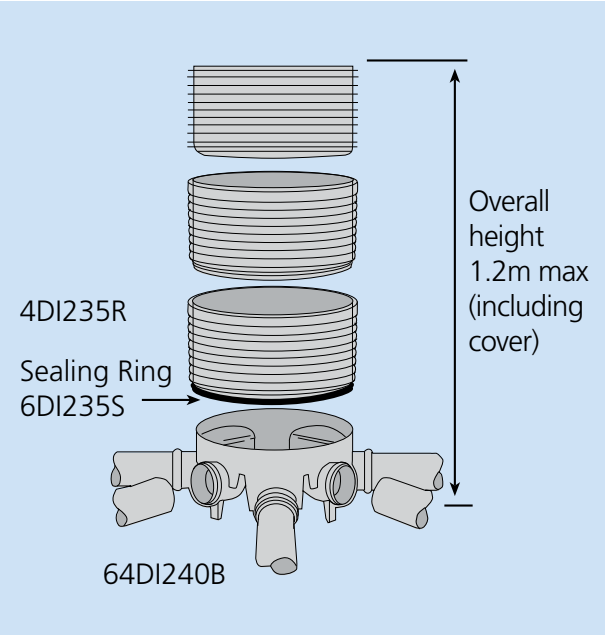


Fig. 10

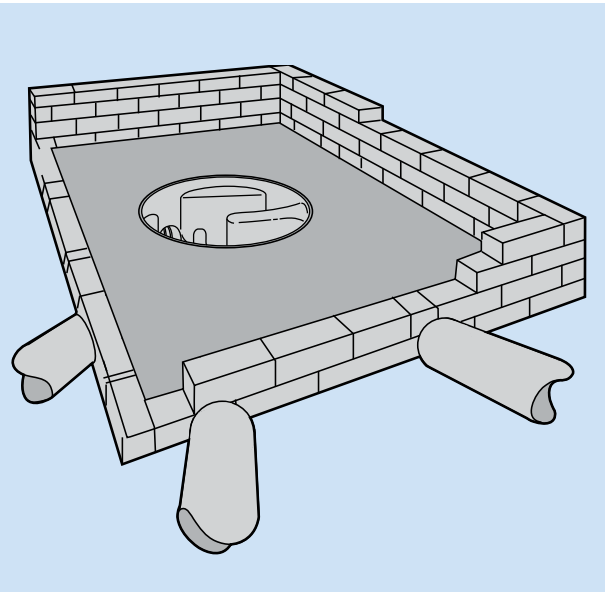


Fig. 11

All dimensions in mm unless otherwise stated

Marscar system

The 4DMB Marscar Bowl has 4 inlet options. One is open, the other 3 are blanked off with removable caps (Fig. 12). An additional 2 inlets may be cut into the bowl if required. Up to 3 raising pieces (4DI235R) are available to achieve a maximum invert depth of bowl of 1m. The final raising piece may be cut as necessary to reach precise height required. All items - outlet, pipework, junction or bend are assembled using standard 'push-fit' jointing procedures. No special sealing compound is required. See page 21, Figs 8 and 9 for cover and frame installation details.

Design

The bowl may be rotated in any direction to suit lateral connections, even against the flow. The four pre-cut inlets are each adjustable by varying degrees to accommodate pipe runs.

*For areas outside adjustment and to overcome changes in vertical angle or entry when rotating the pipe: **either**

- **4DV40 Variable Bend may be used or**
- **4D25D Bend 45° will achieve maximum adjustment to align inlet with pipe runs**

Optimum cleansing of bowl

To achieve optimum cleansing of bowl, the inlet should be orientated to create circular flow (Fig. 14). The desired angle of entry may be achieved by rotating the bowl and using an additional bend (up to 45°) to align with branch drain (Fig. 14a). Inlet(s) positions which will cause flow directly across the bowl should be avoided (Fig. 14b).

Drop-out pipe lengths

Depth*	B: Drop-out pipe effective length		
	110mm bend	110mm junction	160mm junction
220mm	0mm	n/a	n/a
500mm	460mm	355mm	290mm
750mm	815mm	710mm	640mm
1000mm	1170mm	1065mm	995mm
1250mm	1525mm	1415mm	1350mm
1500mm	1875mm	1770mm	1700mm
1750mm	2230mm	2125mm	2055mm
2000mm	2585mm	2475mm	2410mm

* Depth from invert of bowl to invert of pipe.

Invert depths and drop-out pipe lengths

The following tables allow assessment of invert depths (Fig. 15), effective lengths of drop-out pipe and linear displacement for Marscar bowl installation.

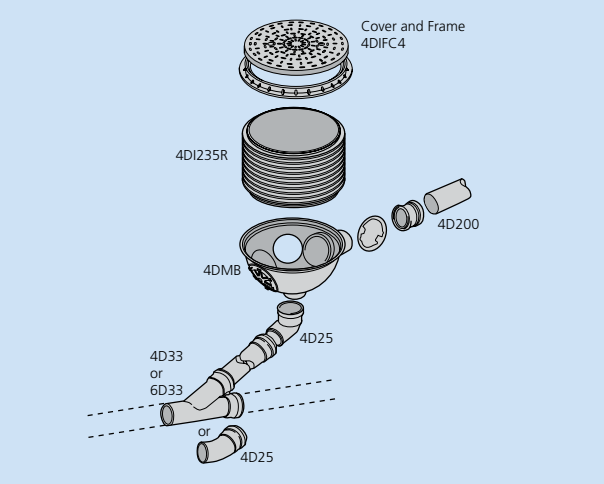


Fig. 12

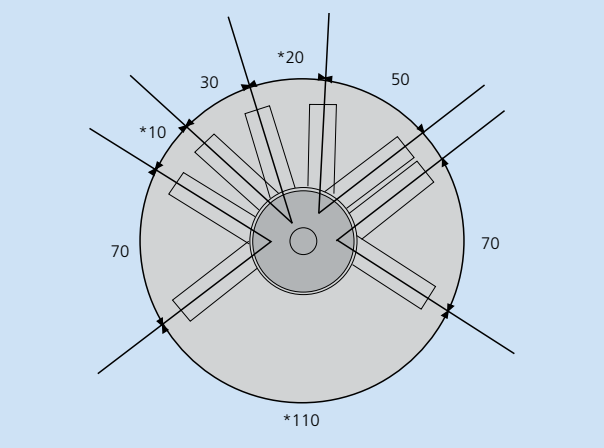


Fig. 13

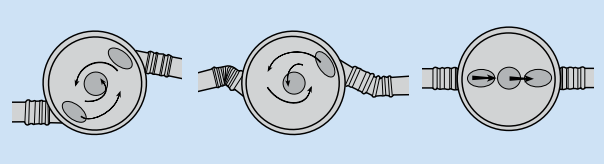


Fig. 14a Fig. 14b Fig. 14c

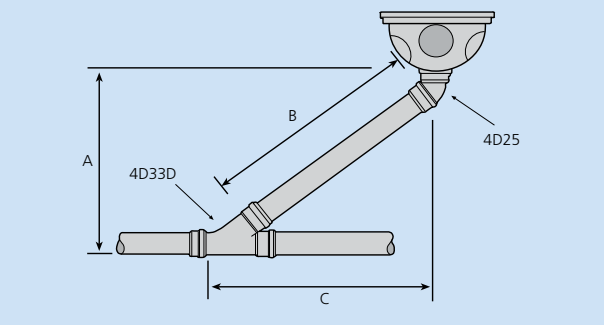


Fig. 15

All dimensions in mm unless otherwise stated

System planning

Bottle gully - square cover (Fig. 16)

The frame and cover may be rotated to meet site requirements and the square grid cut away to suit rainwater or waste pipe entry. The back inlet socket is suitable for solvent weld connection of 110mm diameter pipe. A push-in blank plug is supplied for use when connection is not required.

To connect waste pipes to back inlet bosses: remove rubber plug from side bosses and solvent-weld appropriate fitting (Fig. 17).

For straight connectors

Straight connectors	
32mm	117.125
40mm	117.15
50mm	117.2

For 90° bend connectors

90° Bend connectors	
32mm	117.15.90 & 224.15.125
40mm	117.15.90
50mm	117.2.90

NOTE: The height of the cover and frame (with the back inlets) may be raised by cutting off the spigot and extending with 200mm pipe.

Bottle gully - round cover (Fig. 18)

To connect 110mm pipe to back inlet socket: remove polypropylene plug and solvent-weld pipe or spigot of fitting. The gully may be extended by using the 4DG96 Raising Piece (Fig. 19). The grating and frame should be removed from the gully and the raising piece inserted. The grating should then be fixed to the top of the raising piece. The original gully frame unit should be discarded.

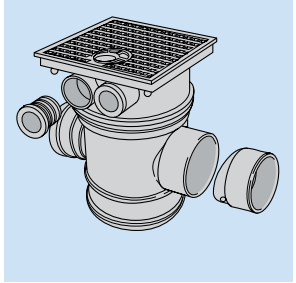


Fig. 16

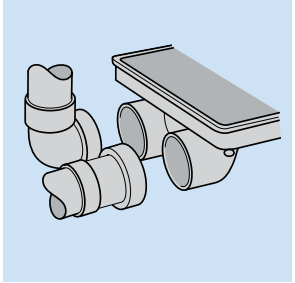


Fig. 17

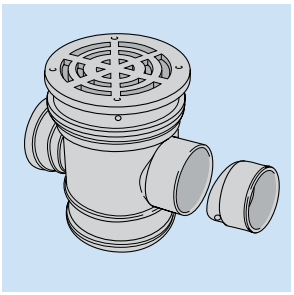


Fig. 18

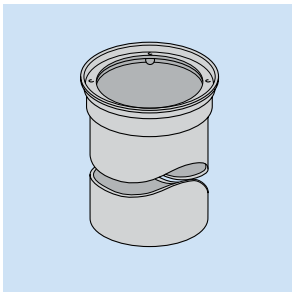


Fig. 19

Gully traps/bends arrangements

P Trap

- Use 4DG90 Gully Trap and 4D25D Bend 45° (Fig. 20)

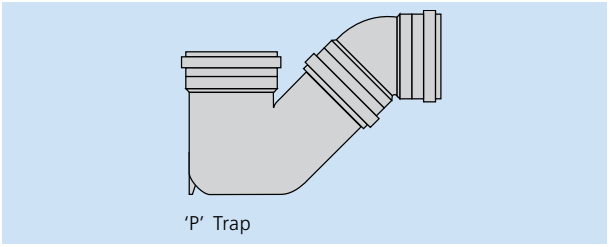


Fig. 20

Q Trap

- Use 4DG90 Gully Trap and 4D23D Bend 871/2° (Fig. 21)

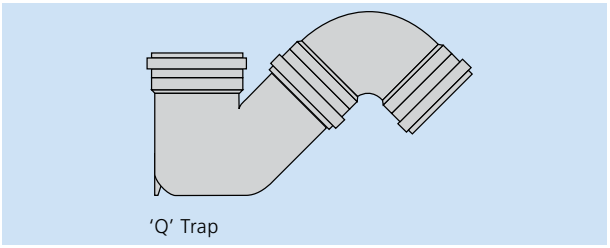


Fig. 21

Q Trap

- Use 4DG90 Gully Trap with 4D23D Bend 871/2° and 4D25 Bend 45° (Fig. 22)

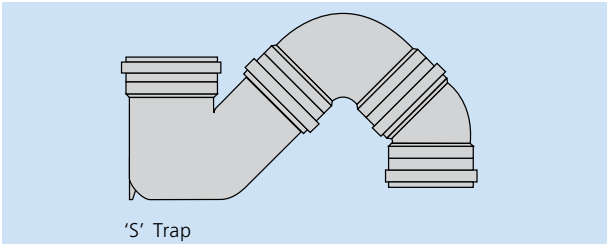


Fig. 22

All dimensions in mm unless otherwise stated

Circular gully and traps (Fig. 23)

This 4DG80 gully is designed to accept both the 4DG82 Sealed Cover and the 4DG83 Circular Grating.

Where required, the unit may be extended by fitting the 4DG81 Extension Piece into the top of the gully.

The gully fitting incorporates:

- **2 x side spigot inlets (110mm dia spigots)**
- **1 x 110mm ring seal socket inlet**
- **1 x 68mm spigot inlet, to accept rainwater pipe**

Each inlet is fitted with a removable polypropylene plug.

The 110mm spigot outlet may be removed - by cutting with a fine-tooth hand saw - to leave a socket to accept 110mm pipe with solvent-weld joint.

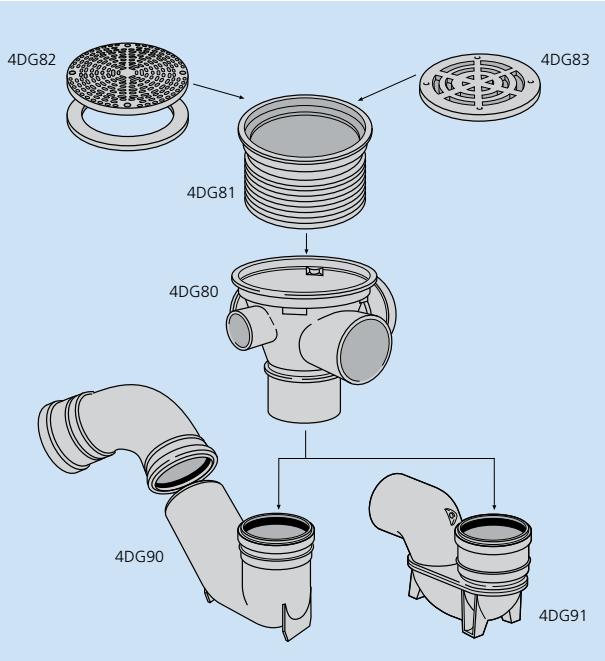


Fig. 23

Hoppers and traps (Fig. 24)

Hoppers are supplied with open grids which snap into place. Sealed covers are available and should be secured using the self-tapping screws provided.

The 110mm spigot outlets may be removed – by cutting with a fine-tooth hand saw – to leave a socket to accept 110mm pipe with solvent-weld joint

To connect waste pipe to side bosses

- **Drill out blanking plug using a 51mm diameter hole saw**
- **Solvent-weld appropriate fitting:**

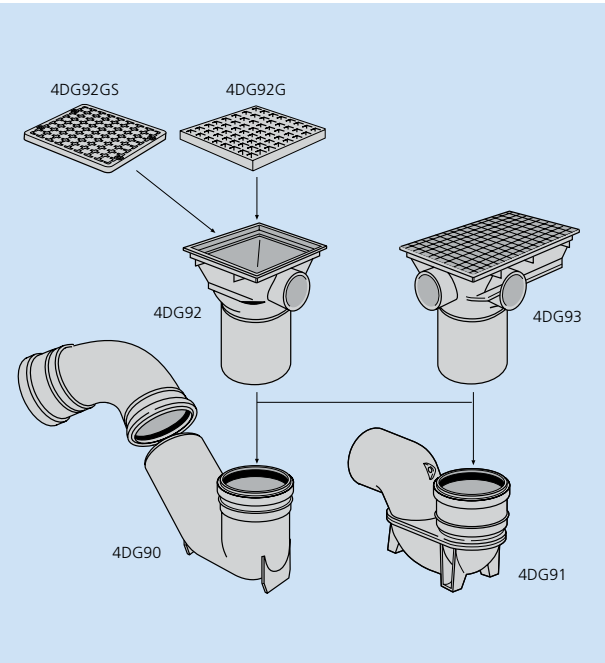


Fig. 24

For straight connectors

Straight connectors	
32mm	117.125
40mm	117.15
50mm	117.2

For 90° bend connectors

90° Bend connectors	
32mm	117.15.90 & 224.15.125
40mm	117.15.90
50mm	117.2.90

System planning

System connections to above ground drainage

Connecting to soil system (soil pipe to BS EN 1329)

- **110mm Underground Pipe to 110mm Soil Pipe**
  110mm Underground Pipe may be connected directly to 110mm Soil Pipe (Fig. 25)
- A 45° external chamfer should be filed onto the end of square cut soil pipe. The soil pipe is then push-fit into the underground drain ring seal socket, using **9136 Lubricant**
- **110mm Underground Pipe to 82mm Soil Pipe** (Fig. 26)
  Connection should be made using the **4DW3 Socket Reducer.** The socket reducer is inserted into the plain end of the underground pipe. The 82mm soil pipe is then pushed into top of reducer

Connecting to waste system (waste pipe to BS EN 5255/1566)

Connection is made using the **124 Socket Reducer**. The socket reducer is pushed into the ring seal of the socket on the underground drain pipe. The waste pipe is solvent-welded into reducer. Additional reducers may be used as required.

Connecting to rainwater or waste system (using rubber adaptor) (Fig. 27)

The **4DW Adaptor** enables simple push-fit connection of 110mm underground pipe to waste or rainwater systems. It is available for the following pipe sizes:

Rainwater	
68mm round	4DW25
62mm square	4DW23
75mm square	4DW33
82mm round	4DW3

Waste	
32mm round	
40mm square	4DW200
50mm round	

Connecting to BS EN 5255/524/1566 waste pipe (Fig. 28) (also to copper waste pipe)

The centre of **4D68/6D68 Socket Plug** should be drilled out, ready for solvent-weld connection of the appropriate size **4DW Boss Adaptor**. Seal rings on 4DW and underground drain socket should be lubricated using **9136 Lubricant**. The socket plug is then inserted into the underground drain socket and **200 Waste Pipe** (or copper waste pipe) into 4DW adaptor.

All dimensions in mm unless otherwise stated

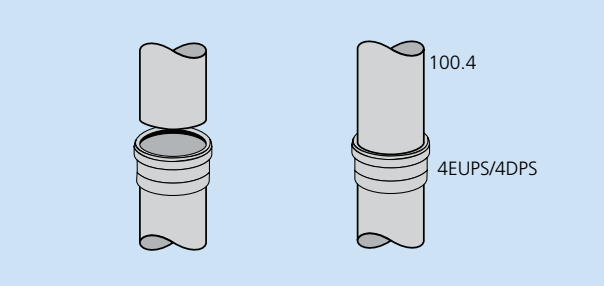


Fig. 25

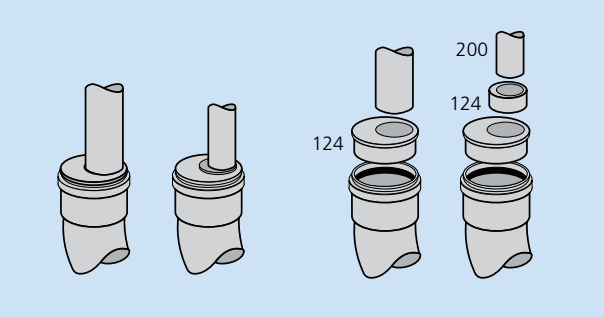


Fig. 26

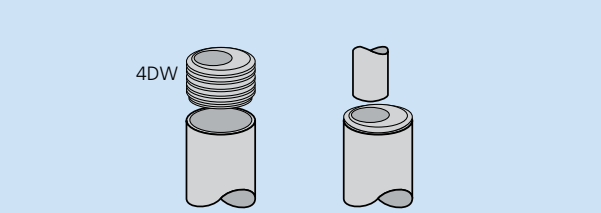


Fig. 27

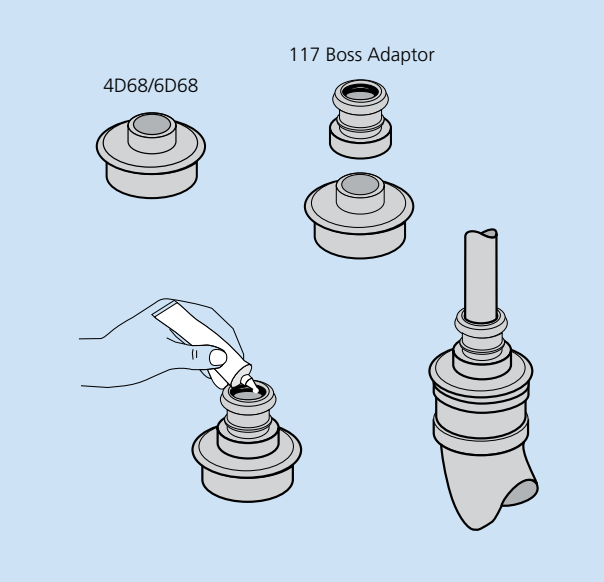


Fig. 28

Further Information

Further information and assistance

Terrain products are backed by a comprehensive technical advisory service, available to provide advice and design guidance on all aspects of above and below ground drainage.

Technical services include:

- **Soil and waste schematics and applicable details**
- **Specification, product scheduling and estimating**
- **CAD drawings, including products and application details on disk**

Many products are also available in CAD format for ready incorporation into design drawings. To obtain a disk or CD Rom in the appropriate format, simply contact Technical Services.

- **On-site advice and problem solving**
- **Prefabrication and fabrication design service**

For prompt assistance, please contact the
Terrain Technical Services Department:
Tel: **+44 (0)1622 795200**
Fax: **+44 (0)1622 716796**

Special component design service

For over 30 years our Fabrication Service has been helping specifiers and contractors overcome problems on-site and at the design stage of projects. We can provide the solution to even the most demanding problems with specials fabricated to order.

Terrain standard specials

Created from modifications to standard products to meet frequently occurring design problems. These are identified with an F prefix in the product listing where applicable.

Terrain design specials

Products can be manufactured on a one-off or small batch basis to meet the demands of unique installations/ applications. These can be produced to customer specification in virtually any size or shape.
Contact Technical Services for further assistance.

Materials and colours

Pipe and most fittings are manufactured in terracotta PVC-u. Where other materials are used these are generally PP/PE.

Quality assurance

Terrain is accredited to BS EN ISO 9001:2000 Quality Management Systems.

Standards compliance

Terrain underground complies with the appropriate British Standard/European Norm and, where applicable, is Kitemarked to BS EN 1401:1998.

The Inspection Chamber Base (4DI240B) and Raising Piece (4DI235R) meet the requirements of BS 7158:2001 for Plastic Inspection Chambers for drains.

Certifications

Foamcore pipe is covered by the following British Board of Agrément certificate: **95/3086**
Eurodrain (Foamcore) Underground Drainage Pipe 110 and 160mm comply with BS EN 1401 (BS 4660).
EN1401:1998 Underground Drainage.
EN7158:2001 Plastic Inspection Chambers for Drains and Sewers.

Availability

For details of a wide range of stockists, please contact your local office. Details can be found on the back cover.

Non UK Basic Design Principals

Pipe Sizes

The correct sized pipes should be used throughout the installation to ensure an efficient flow through the drainage system.

Gradient

Typical gradients for below ground systems are:
110 mm diameter - 1:80
160 mm diameter - 1:1.50

Typical gradients for above ground system are:
32-50 mm diameter - 1:45
82 mm - 160 mm diameter -1:23

Pipe Joints

All pipe joints should be free from dirt or obstructions. Pipes should be chamfered before inserting into a rubber seal ring joint, or cleaned before solvent-welding.

Access

Access to a drainage system should be included wherever there is a change in direction.

Sealed System

It is important to ensure that the drainage system is completely sealed to prevent leakages.

Bedding & Backfill

Underground pipework and backfilling of inspection chambers should be carried out as detailed in the Terrain installation guide.

Venting

All drainage systems require a vent to allow fresh air to be taken into the system to ensure a smooth running to the discharge.

High Temperature Waste

Where hot water enters the drainage system, a high temperature MuPVC waste should be used.

Expansion

It is important to allow for expansion in all plastic drainage systems. Push-fit joints should NOT be inserted to the full depth. Solvent weld systems should use expansion joints where required.

Bracketing

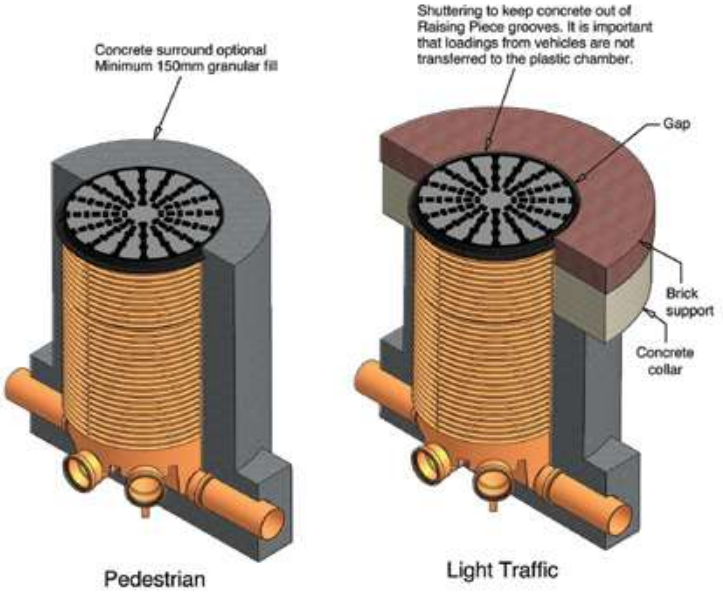
Above ground pipework should be correctly bracketed to hold the system securely in place. Vertically every 2 metres, horizontally every 1 metre. This will also assist expansion control.

Traps

Each appliance (Shower, Basin etc.) should have its own trap. Connection to a floor gully provides an additional trap to prevent foul odours escaping into living space areas.

Non-Return Valve

The use of a non-return valve outside the building prevents any external drainage issues backing up into the property.



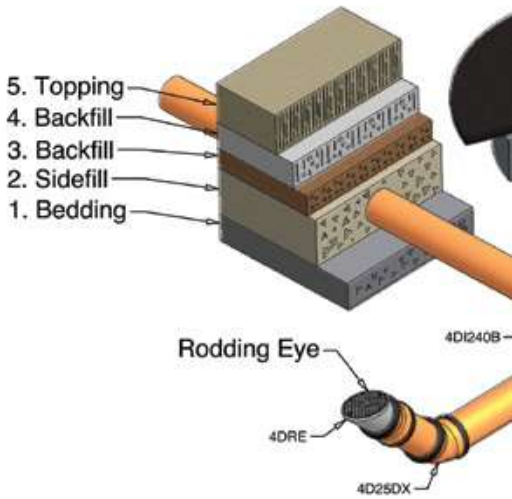
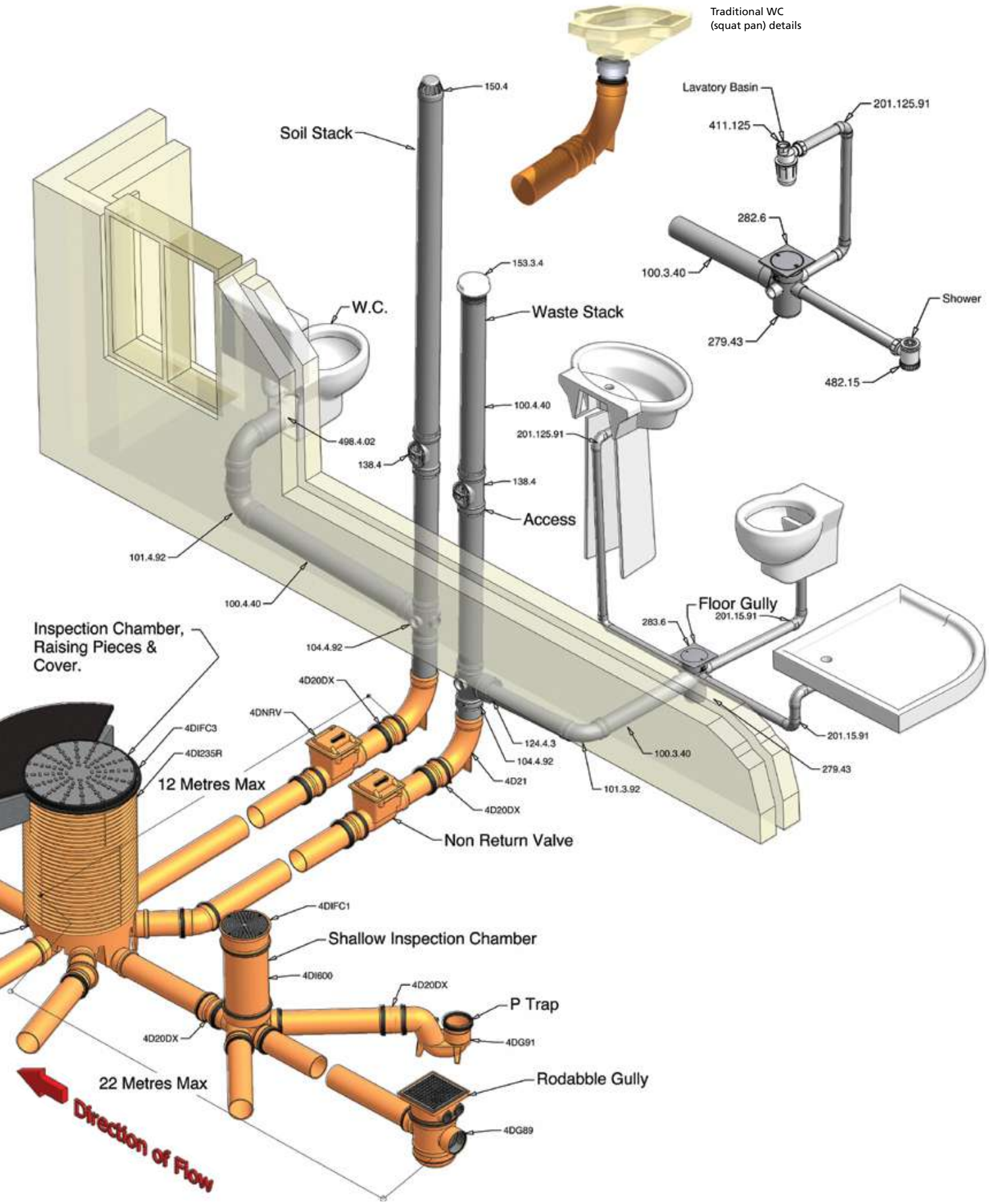


Fig. 29

Traditional WC
(squat pan) details



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3D25D	SHORT RADIUS BEND DOUBLE SOCKET	5
3D33D	SINGLE EQUAL JUNCTION	6
3D63	ACCESS CAP	8
3D64	ACCESS CAP	8
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3DP58	SOLID WALL PIPE PLAIN ENDED	4
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4D20DSCX	SLIP COUPLER	9
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4D21D	REST BEND DOUBLE SOCKET	7
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All dimensions in mm unless otherwise stated

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