

Concrete Drainage

Keyline branches stock a comprehensive range of concrete drainage products including:

- Manhole and Soakaway Rings
- Manhole Cover Slabs and Seating Rings
- Domestic Inspection Chambers

No matter what the size of the project, we can provide a wide variety of competitively priced products from stock or direct from our manufacturers' works, including:

- Circular and Elliptical Concrete Pipes
- Box Culverts



Concrete Manholes and Soakaways

Precast concrete manholes made to BS EN 5911-3 and BS EN 1917 are available in DN 900 - 3000 with metric depths of 1000, 750, 500 and 250mm, all with tongue and groove joints.

They are available plain or perforated with the option of mild or stainless steel plastic encapsulated double steps, or without steps for use with ladders or winches.

A wide variety of cover slabs and cover frame adjusting units with either standard access or special access is available.

Designers and users should take into account current requirements for manhole access as detailed in the Health and Safety Code of Practice Regulations and Guidance issued under the Confined Spaces Regulations 1997.



Manhole Rings

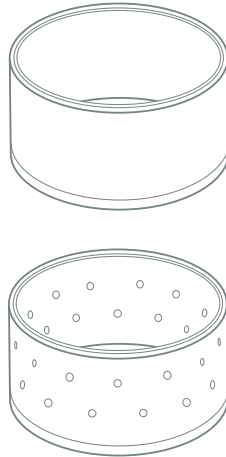
Chamber Ring DN	Available Depth of Section mm				Wall Thickness mm	Lifting Holes No. x Diameter	Approx Weight (inc. steps) kg/m	Metres per 24T Full Load m
	250	500	750	1000				
900**	•	•	•	•	70	2 x 40	520	42
1050	•	•	•	•	80	2 x 40	680	35
1200	•	•	•	•	90	2 x 40	875	27
1350*		•	•	•	95	2 x 40	1025	23
1500		•	•	•	100	2 x 40	1215	19
1800		•	•	•	115	3 x 45	1730	13
2100		•	•	•	125	4 x 45	2185	10
2400		•	•	•	140	3 x 50	2700	8
2700		•	•	•	175	4 x 50	3800	6
3000		•	•	•	210	4 x 50	5050	4

*Not Kitemarked

**No Steps in 900 Ring

Soakaway Rings

Chamber rings have 75mm perforations built in during manufacture. In soakaway applications the aim is to disperse water into the sub-soil. The following tables indicate the diameter and depth required to draw a range of surface areas.



Soakaway Rings

Soakaway Ring	Perforations per Section (75mm diameter)					
	500mm deep		750mm deep		1000mm deep	
DN	Rows	Perfs. per Row	Rows	Perfs. per Row	Rows	Perfs. per Row
900	2	3	3	3	4	3
1050	2	3	3	3	4	3
1200	2	4	3	4	4	4
1350*	2	4	3	4	4	4
1500	2	5	3	5	4	5
1800	2	6	3	6	4	6
2100	2	6	3	6	4	6
2400	2	7	3	7	4	7
2700	2	8	3	8	4	8
3000	2	9	3	9	4	9

*Not Kitemarked

Soakaway Rings

The following table gives the required depth in metres based on these parameters:

Area to be Covered m ²	Nominal Internal Diameter mm									
	900	1050	1200	1350*	1500	1800	2100	2400	2700	3000
25	0.64	-	-	-	-	-	-	-	-	-
50	1.27	0.93	0.71	-	-	-	-	-	-	-
75	1.91	1.40	1.07	0.85	0.69	-	-	-	-	-
100	2.54	1.86	1.43	1.13	0.91	0.65	-	-	-	-
125	3.18	2.33	1.79	1.41	1.14	0.81	0.60	-	-	-
150	-	2.80	2.14	1.69	1.37	0.98	0.72	-	-	-
175	-	3.26	2.50	1.97	1.60	1.14	0.84	0.64	-	-
200	-	-	2.86	2.25	1.83	1.30	0.96	0.74	-	-
250	-	-	3.57	2.82	2.28	1.63	1.20	0.92	0.73	-

*Not Kitemarked

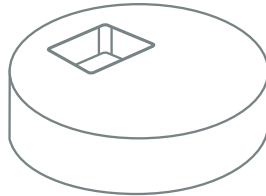
Area to be Covered m ²	Nominal Internal Diameter mm									
	900	1050	1200	1350*	1500	1800	2100	2400	2700	3000
300	-	-	-	3.38	2.74	1.96	1.44	1.11	0.87	0.71
400	-	-	-	4.51	3.65	2.61	1.92	1.47	1.16	0.94
500	-	-	-	-	4.57	3.27	2.41	1.84	1.46	1.18
600	-	-	-	-	-	3.92	2.89	2.21	1.75	1.41
700	-	-	-	-	-	4.58	3.37	2.58	2.04	1.65
800	-	-	-	-	-	-	3.85	2.95	2.33	1.89
900	-	-	-	-	-	-	4.33	3.32	2.62	2.12
1000	-	-	-	-	-	-	-	3.68	2.91	2.36

The above table is only a guide. Products may vary by manufacturer.

Manhole Cover Slabs

Concrete cover frame seating rings are available to seat a ductile cover and frame. Access hole sizes vary according to manhole diameter and depth. Heavy duty reinforced cover slabs can be supplied with a variety of standard and non-standard access hole sizes.

Designers and users should ensure that they have taken into account the current requirements for manhole access as detailed in the Health and Safety Code of Practice, Regulations and Guidance issued by the Health and Safety Executive under the Confined Spaces Regulations 1997 and other relevant requirements.



Cover Slabs

Manhole DN	Overall Diameter mm	Effective Thickness mm	Approx Weight kg
900	1108	135	215
1050	1278	135	330
1200	1460	135	480
1350*	1629	160	740
1500	1789	160	925
1800	2130	200	1625
2100	2450	200	2250
2400	2870	200	2865
2700	3175	205	3800
3000	3350	200	4970

*Not Kitemarked

Adjusting Units (Seating Rings)

- Designed to replace engineering bricks to seat a ductile cover and frame
- Effective thickness is 65mm i.e. the thickness of a standard brick
- Average compressive strength similar to Class B engineering bricks
- Adjusting units can be supplied with access hole sizes as in the table opposite

Corbel & Adjusting Units Data

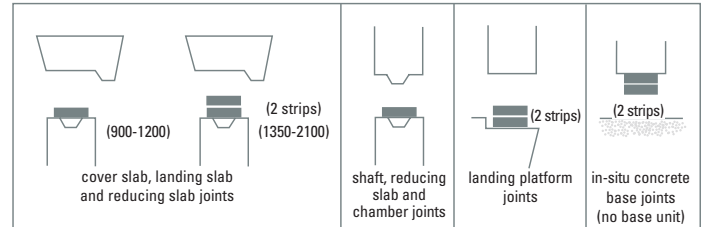
Manhole DN	Access Size and Position for Manhole Depth	
	<1.5m	≥1.5m
900	675 x 675 Central	675 x 675 Central
1050	750 x 750 Central	675 x 675 Central
1200	750 x 600 Central	675 x 675 Central 675 x 675 Eccentric
1350*	1200 x 675 Central	675 x 675 Central 675 x 675 Eccentric
1500 - 3000	1200 x 675 Central	675 x 675 Central 675 x 675 Eccentric

*Not Kitemarked

Manhole Jointing Compound (TOKSTRIP)

Manholes are designed and manufactured to provide accurate joint profiles with a high quality finish. When used in conjunction with flexible jointing compound, contractors can construct watertight manholes quickly, without the need for a concrete surround.

Chamber Ring	DN	900	1050	1200	1350	1500	1800	2100	2400	2700	3000
Jointing Compound	mm	12 x 60		12 x 80				12 x 120			
Metres per Carton	m	24		18				12			
Jointing Compound per Joint	m	3.1	3.6	4.1	4.6	5.1	6.1	7.0	8.0	9.0	10.0
Joints per Carton	no.	7.7	6.6	4.4	3.9	3.5	3.0	1.7	1.5	1.3	1.2
Primer per Carton	ltr	0.9	1.0	0.9	0.9	1.0	1.1	0.9	0.9	1.0	1.1

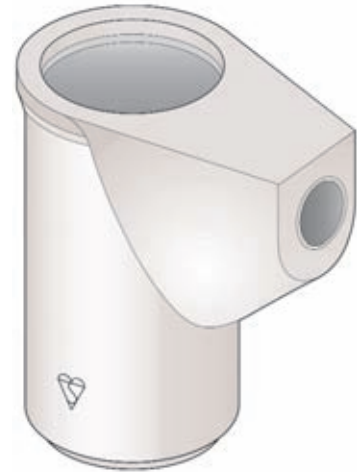


Road Gullies

Kitemarked gullies made to BS EN 5911-6: 2004 may be supplied with adaptors for connection to clay or plastic pipes.

Road Gullies

Nominal Diameter mm	Nominal Depth mm	Approx Weight kg
375	750	185
375	900	200
450	750	260
450	900	290
450	1050	320

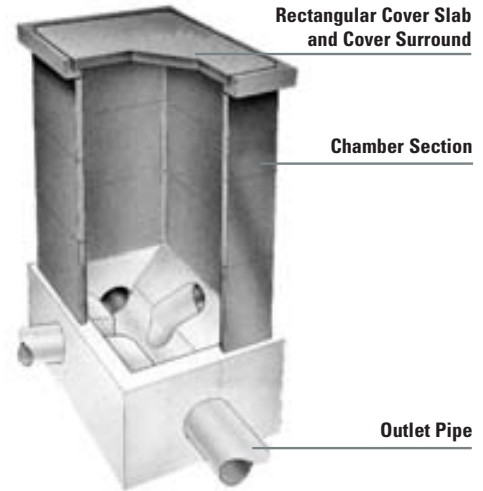


Rectangular Inspection Chambers

Keyline's range of precast concrete rectangular inspection chambers offers suitable access to drainage and cable systems. Being made of high strength concrete in factory controlled conditions there is no necessity to surround units with in-situ concrete, thus making them an economic solution to the need for access to underground utilities.

A choice of top covers and surrounds to suit various loading conditions is available.

- For use in highway and domestic situations
- No need for concrete surround
- Comprehensive range of concrete cover slabs and surrounds
- Manufactured to BS Kitemark Scheme BS EN 5911-200 Part 2



Inspection Chambers supplied by Marshalls (BS EN 5911-200)

Chamber Section

Type	Order Ref	Depth mm	Internal Length mm	Internal Width mm	Wall Thickness mm	Approx Weight kg	Keyline Code
A	A150	150	600	450	50	44	751824
	A225	225				58	763610
B	B150	150	750	600	60	67	763611
	B225	225				100	763612
C	C150	150	1000	675	65	83	763613
D	D150	150	1200	750	75	115	763614
	D225	225				173	763615

Reducers and Closer Slabs

Type	Order Ref	Overall Size	Internal Dimension Reduce from mm	Internal Dimension Reduce to mm	Depth mm	Approx Weight kg	Keyline Code
B to A reducer	BAR	730 x 315	750 x 600	600 x 450	50	26	763616
D to B reducer	DBR	910 x 620	1200 x 750	750 x 600	75	97	763617

Cover Slabs

Type	Clear Opening	Order Ref	Length mm	Width mm	Thickness mm	Approx Weight kg	Keyline Code
For B section	600 x 600	BCS	870	870	70	55	763624
For C section	600 x 450	CCS	1150	825	60	89	763625
For D section	600 x 600	DCS	1366	916	90	150	763626
For D section	600 x 600	SDCS	1380	930	150	300	763627

Covers

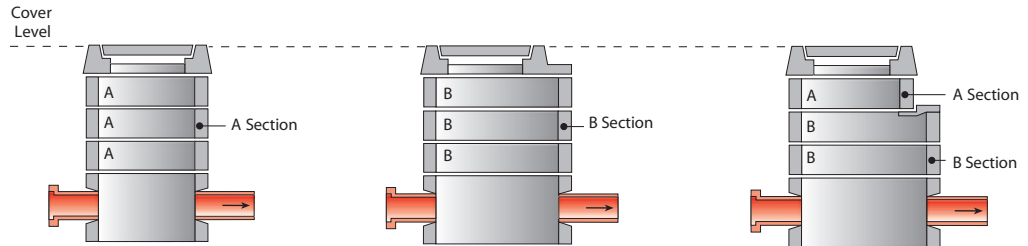
Type	Clear Opening mm	Order Ref	Length mm	Width mm	Thickness mm	Approx Weight kg	Keyline Code
Regular <small>(Handhole)</small>	600 x 450	HC1	700	545	60	55	763622
Regular <small>(Keyhole)</small>	600 x 450	KC1	700	545	60	55	763623
Regular <small>(Handhole)</small>	600 x 600	HC2	695	695	75	93	763618
Regular <small>(Keyhole)</small>	600 x 600	KC2	695	695	75	93	763619

Frames

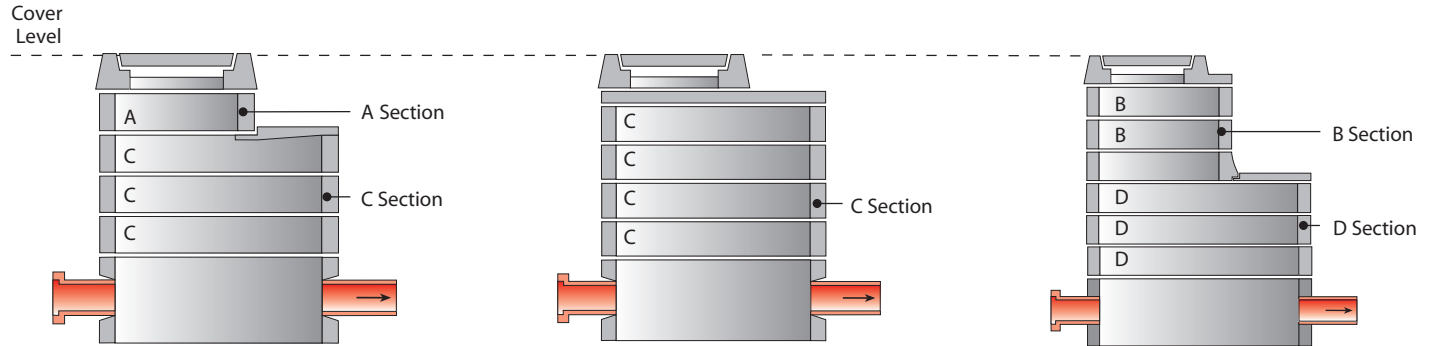
Type	Order Ref	Length mm	Width mm	Thickness mm	Approx Weight kg	Keyline Code
For use with "A" Section						
Standard Frame	F1	850	700	123	46	763620
For use with "D" Section						
Standard Frame	F2	865	865	138	80	763621

Typical Inspection Chambers

Less than 0.6m deep.

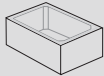


For Inspection Chambers in excess of 1.2m deep a 450 x 600mm opening can be used providing it is restricted in size to 300 x 300mm maximum (a section of A96 or A192 mesh can easily be used to achieve this).



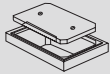
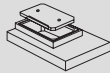
Inspection Chambers supplied by Milton Precast (BS EN 5911-200)

Chamber Section

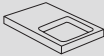
	Size mm	Effective Depth mm	Wall Thickness mm	Nominal Weight of Unit kg	Number of Units per Pallet	Approx Total Weight of Product & Pallet kg	Supplier Code	Keyline Code
	600 x 450	152	51	45	32	1445	D604515P	770340
		229	51	65	20	1315	D604522P	770324
		305	51	85	16	1365	D604530P	770325
	750 x 600	152	60	65	18	1205	D756015P	751858
		229	60	100	12	1200	D756022P	751859
	1000 x 675	152	64	85	16	1380	D106715P	751863
		229	64	125	10	1290	D106722P	751864
	1200 x 750	150	75	115	8	955	D127515P	802244
		500	75	390	*	*	D127550P	924456
	1475 x 1025	250	100	335	*	*	-	-

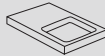
* Sizes supplied individually

Rectangular Cover and Cover Surround

	Chamber Size mm	Access mm	Effective Thickness mm	Approx Weight of Unit kg	Number of Units per Pallet	Approx Total Weight of Product & Pallet kg	Supplier Code	Keyline Code
	600 x 450 (Light Duty)	600 x 450	104	80	16	1335	D6045NCCSP	770326
	750 x 600 (Light Duty)	600 x 450 (central)	116	100	12	1235	D7560NCCSP	751861
	1000 x 675 (Light Duty)	600 x 450 (offset)	134	140	12	1710	D1067NCCSP	751866
	Cover	To suit 600 x 450 (access)	51	40	-	-	-	-

Cover Slabs

	Chamber Size mm	Access mm	Effective Thickness mm	Approx Weight of Unit kg	Number of Units per Pallet	Approx Total Weight of Product & Pallet kg
	600 x 450 (Light Duty)	600 x 450*	64	41	24	995
	750 x 600 (Light Duty)	600 x 450*	70	58	24	1430
	1000 x 675 (Light Duty)	750 x 600* (offset)	75	70	20	1475
	1000 x 750 (Light Duty)	600 x 450* (offset)	76	105	20	2175
	1200 x 750 (Light Duty)	600 x 600* (offset)	69	150	5	765

	Chamber Size mm	Access mm	Effective Thickness mm	Approx Weight of Unit kg	Number of Units per Pallet	Approx Total Weight of Product & Pallet kg
	1200 x 750 (Heavy Duty)	600 x 600* (offset)	144	310	5	1565
	1475 x 1025 (Heavy Duty)	600 x 600*	144	640	-	-

* Other accesses available

Box Culverts

Concrete box culverts are specified and used regularly for culverting highways, storm and foul sewers, sea outfalls, tunnels and subways, underpasses, stream crossings, vertical chambers and in modified form as channels with removable slabs or as portals. In addition they may be used as tanks for attenuation of storm or foul water.

Box culverts provide high flow capacities even where the gradient is low or headroom is restricted. They are individually designed to cater for a wide range of external loading conditions from shallow to deep fill.

The table below shows a sample range of the box culverts available through Keyline. **We can also offer a free design service.**

For general enquiries please contact your local Keyline branch for more information.



Box Culverts - Guide to Sizes Available

Type	Internal Dimensions			Flow Rate at Fall 1:1000-m ³ /s	Normal Weight of Standard Units T
	Width m	Height m	Length m		
MC10.05*	1.00	0.50	2.0	0.58	2.25
MC12.05	1.25	0.50	2.0	0.74	2.66
MC13.05	1.375	0.50	2.0	0.84	2.81
MC13.10	1.375	1.00	2.0	2.25	3.44
MC15.07	1.50	0.75	2.0	1.62	3.84
MC15.15	1.50	1.50	2.0	4.20	4.80
MC17.07	1.75	0.75	2.0	2.03	4.22
MC17.15	1.75	1.50	2.0	5.28	5.63
MC18.10	1.875	1.00	2.0	3.37	5.09
MC20.10*	2.00	1.00	2.0	3.69	5.79
MC20.20	2.00	2.00	2.0	9.31	7.30
MC22.12	2.25	1.25	2.0	5.94	6.60

Type	Internal Dimensions			Flow Rate at Fall 1:1000-m ³ /s	Normal Weight of Standard Units T
	Width m	Height m	Length m		
MC22.17	2.25	1.75	2.0	9.31	7.35
MC25.10	2.50	1.00	2.0	5.03	8.78
MC25.17	2.50	1.75	1.5	10.83	7.70
MC27.12	2.75	1.25	1.5	7.84	8.34
MC27.20	2.75	2.00	1.5	14.78	9.60
MC30.20	3.00	2.00	1.0	16.72	7.54
MC30.27	3.00	2.75	1.0	25.19	8.43
MC35.15	3.50	1.50	1.0	14.00	7.73
MC40.25	4.00	2.50	1.0	33.53	9.97

This is not a complete range - contact your local Keyline branch for additional sizes.

* NB: units MC10.05 and MC20.10 are available from manufacturers stock (subject to availability).

Concrete Pipes

Keyline offers an extensive range of precast flexible joint pipes from DN 300 to DN 2400, including bends, junctions and shorter lengths for rocker and butt pipes.

Pipes are supplied with rolling gasket, sliding gasket or captive gasket joints, dependent upon contractors' needs and manufacturers' production processes. Contractors should refer to our manufacturers' installation recommendations, in addition to relevant regulations, as there are lifting and handling systems and specific jointing procedures available.

All products are available to meet classes of exposure to sulphate attack. Concrete pipes are vertically cast using vibration to compact a semi-dry concrete mix into the mould. Pipes are manufactured to BS EN 1916 and Kitemarked as appropriate.

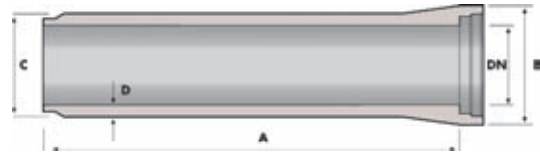


Concrete Pipes

Nominal Size	Pipe Dimensions				Delivery Details			Minimum Crushing Load Class 120 kN/m
	Effective Length	External Diameter		Wall Thickness	Approx. Weight of Pipe		Pipes Per Normal 24T Full Load	
		Socket	Barrel		Full Length	Rocker		
DN	'A' mm	'B' mm	'C' mm	'D' mm	kg	kg		
300	2500	487	410	55	425	135	53	36
375	2500	562	485	55	505	155	46	45
450	2500	670	578	64	710	225	33	54
525	2500	792	669	72	950	300	25	63
600	2500	876	768	84	1215	375	19	72
675	2500	968	825	75	1275	650	19	81
750	2500	1056	910	80	1500	750	16	90
800	2500	1130	975	85	1650	775	14	96
900	2500	1248	1080	90	2025	925	12	108
1050	2500	1436	1260	105	2700	1250	9	126
1200	2500	1616	1440	120	3500	1550	7	144
1400	2500	1740	1680	150	4550	2275	5	168
1500	2500	1950	1800	150	5300	2700	4	180

All dimensions and weights are approximate. Customers should ensure that lifting equipment has sufficient capacity to allow for variations. Products may vary by manufacturer.

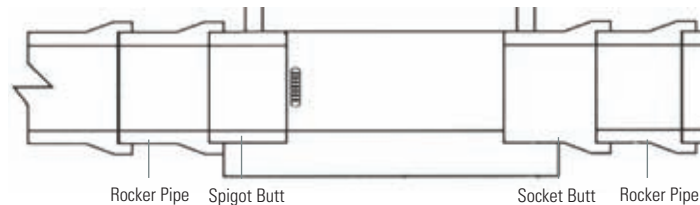
Nominal Size	Pipe Dimensions				Delivery Details			Minimum Crushing Load Class 120 kN/m
	Effective Length	External Diameter		Wall Thickness	Approx. Weight of Pipe		Pipes Per Normal 24T Full Load	
		Socket	Barrel		Full Length	Rocker		
DN	'A' mm	'B' mm	'C' mm	'D' mm	kg	kg		
1600	2500	1980	1920	160	5580	2830	4	192
1800	2500	2220	2160	180	7100	3600	3	216
2000	2400	2460	2400	200	8700	-	3	240
2200	2320	2640	2640	220	10400	-	2	264
2400	2400	2840	2840	220	11200	-	2	288



Rocker and Butt Pipes

There may be ground settlement after construction. This is commonly known as 'differential settlement' and can result in the shear fracture of pipes joining a manhole. To ensure this does not occur, the pipes are rigidly jointed at the manhole with a short length butt pipe, followed by a further flexible jointed short length rocker pipe.

Although this is particularly important with circular manholes, it is also relevant to inspection chambers where differential settlement is anticipated.



Rocker and Butt Pipes

Nominal Size of Pipe DN	Effective Length	
	Rocker Pipe m	Butt Pipe m
300-600	0.6	0.6
675-1200	1.0	1.25
1350-1800	1.25	1.25

All dimensions are approximate. Rocker pipes above DN 1800 are not recommended due to potential over-deflection of the pipe joint under settlement.

Concrete Pipe Junctions

Junctions can be supplied either as a fixed clay or concrete branch junction at 45° or 90°, on full length pipes or as a half length or full length universal junction.

- Fixed branch junctions are provided with DN 100, 150 and 225 clay branches to BS EN 295 or with concrete socket or spigot branches for DN 300 and above
- Branches are fitted to full length pipes using cementitious or resin mortars

An alternative to full length fixed branch junction pipes, the universal junction provides users with 3 major benefits:

- Easier installation
- Increased damage resistance
- Greater flexibility

With the universal junction, SuperSleve DN 150 clay branches fit directly. Densleeve DN 150 clay branches and branches in other materials can be fitted with a suitable adaptor. The universal seal can accommodate either straight pipes or a full range of fittings.

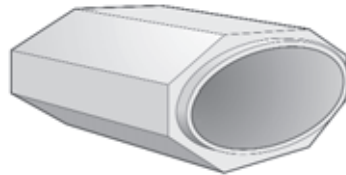
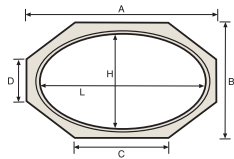
Fixed branch junctions and universal junctions are not designed as load bearing structures and should be encased in a suitably designed in-situ concrete surround.

Elliptical Pipes

Elliptical pipes are used for foul and surface water drainage applications, stream diversions, culverting and attenuation storage tanks.

The pipe's elliptical internal profile is hydraulically efficient and the external polygonal profile is structurally efficient. Together they provide a unique and highly cost-effective reinforced concrete drainage product.

This system may offer advantages over others by providing superior hydraulic performance and a fully watertight elastomeric captive gasket joint.



Elliptical Pipes

Internal Dimensions 'L x H' mm	External Dimensions 'A x B' mm	End Face Lengths		Effective Length mm	Approx Product Weight kg
		'C' mm	'D' mm		
1000 x 650	1250 x 900	520	370	2.40	2600
1150 x 750	1400 x 1000	600	430	2.40	3000
1650 x 1000	1930 x 1280	850	500	2.40	4600
1950 x 1150	2270 x 1470	1020	570	2.40	6300
2350 x 1350	2710 x 1710	1230	670	2.40	8600
2650 x 1500	3050 x 1900	1450	740	2.40	10800

All dimensions and weights are approximate, customers should ensure that lifting equipment has sufficient capacity to allow for variations.

Delivering Outstanding Service

Keyline is known for its civils and drainage expertise, offering you a total solution to all your requirements. With branches across the country, Keyline will provide the specialist civils products you need directly from stock.

- Branches nationwide
- A huge range and depth of materials always in stock
- Our staff are helpful, friendly and knowledgeable
- We provide a speedy, efficient and accurate service
- We get it right first time

