

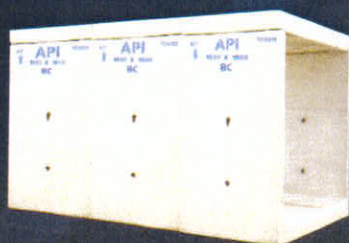
API[®]

Partners Gether From
 $\alpha \Pi \Omega$

PRECAST CONCRETE U-SHAPE DRAIN, BOX CULVERT, ARCH



API - PRODUCT CATALOGUE



www.api.com.my

FACTORY:

SUNGAI PETANI

RASA

RAWANG

ULU YAM

BESUT

KULAI

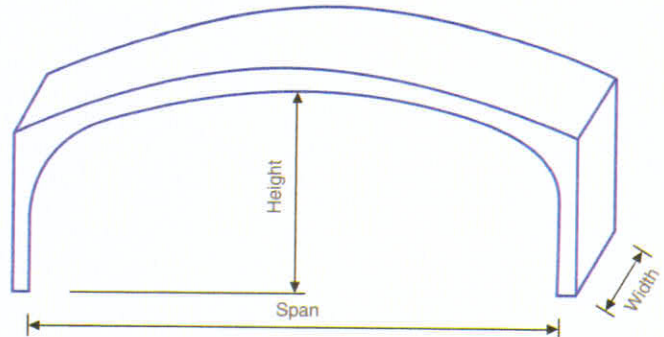
In moving forward to an ecofriendly carbon emission footprint, API uses **GREEN** cements in our concrete products. Products with blended cements have enhanced workability, long term strength gain and durability in marine conditions, sewerage applications and other aggressive environments.

► PRECAST CONCRETE ARCH

Application

API Precast concrete arch is commonly being used as bridge structure over waterway. The arch become ideal replacement for conventional culvert crossing, enhance on aesthetic view and free way for water flow.

Span (mm)	Height (mm)	Width (mm)	Weight (tonne)
6514	2500	1200	8.2
6522	3000	1200	8.8
6530	3500	1200	9.4
8000	2500	1200	10.3
8015	3000	1200	11.0
8030	3500	1200	11.7
9500	2500	1200	12.6
9515	3000	1200	13.3
9530	3500	1200	14.0

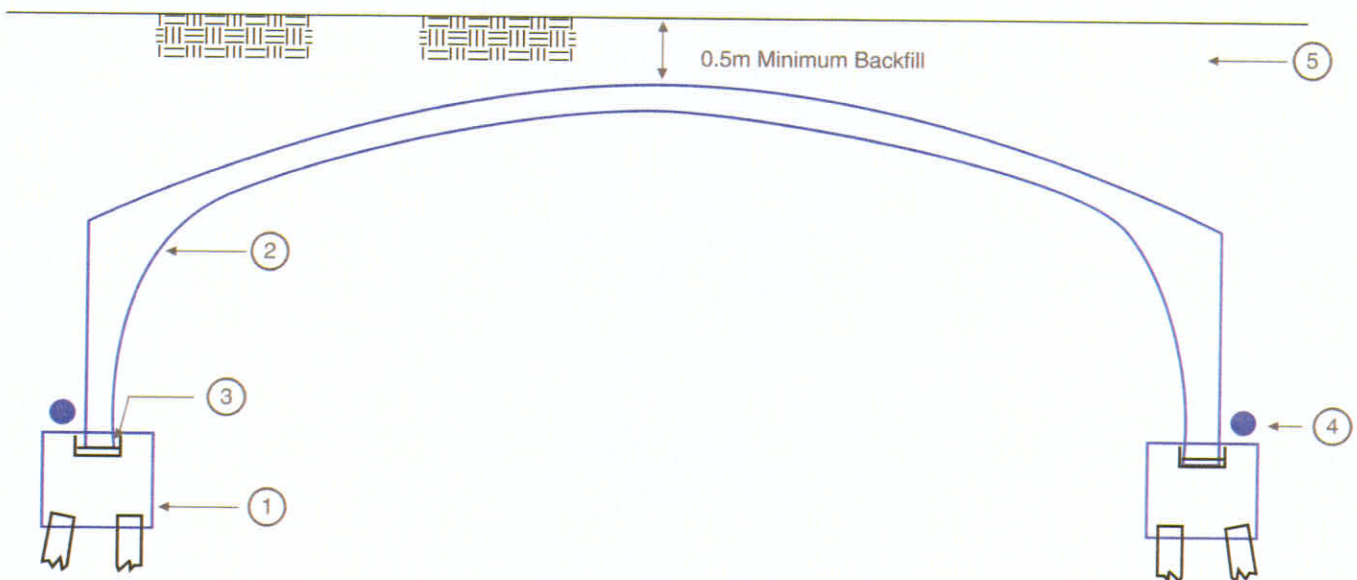


Production

API Precast concrete arch is produced under factory controlled condition that are certified to MS ISO 9001:2015 by SIRIM. The arch is manufactured in rigid and dimensionally accurate mould to facilitate the accurate fixing of steel reinforcement cage.

Construction Sequence

1. Construct pile foundation, with mortar levelling pad on top of footing.
2. Install precast concrete arch into its final position.
3. Grouting of pocket keyway and sealing of joint between arch.
4. Laying drainage pipe along earth side near soffit of arch.
5. Backfilling arch with suitable material.



Design Consideration

1. The design of precast concrete arch is in accordance with
 - (a) Structural Use of Concrete - BS 8110 : Part 1.
 - (b) Loads For Highway Bridges - BD 31/O1.
2. Concrete 28 days characteristic strength of 40 N/mm².
3. Hydrostatic pressure is eliminated by provision of drainage system along earth side near soffit of arch.
4. Precast arch is supplied with plain butt joint. Nominal gap between arch to be filled with mortar.
5. Backfill over crown of arch from 0.5m to 2m, any other backfill height would be customized design.
6. The backfill adjacent to arch should be of granular material, angle of internal friction 30°.
7. Maximum difference level of backfill at back of arch during construction stage must not exceed 0.6m.

► PRECAST R.C. BOX CULVERT

Features of API Precast R.C. Box Culvert

API Box Culverts are available in both Standard Size (for nominal width between 600mm and 1800mm) and Super Size (for nominal width between 2100mm and 3600mm) in length of 1 metre as shown in the Table 1, 2 and 3. API Box Culverts are available in both WITH and WITHOUT Dry Weather Flow (DWF) channels.

Design Considerations

1. Design loading requirements for API Box Culvert are in accordance with:
 - a) BS 5400: Part 2 modified by (b)
 - b) Department Standard BD 31/01 Buried Concrete Box Type Structure issued by Department of Transport (UK) - Highway and Traffic
 - c) JKR LTAL (Long Term Axle Load) and SV (Special Vehicle) requirements.
2. The design of Precast Reinforced Concrete Box Culvert is in accordance with BS 5400 : Part 4.
3. API Box Culverts are made from high strength concrete with a 28 days characteristic strength of 40 N/mm^2 .
4. Concrete cover to reinforcement for:
 - Standard Size Box Culverts = 25mm
 - Super Size Box Culverts = 30mm
5. Coefficient of the earth lateral pressure at rest = 0.6 and bulk density of soil = 19 kN/m^3 .
6. API Standard Size Box Culverts also comply with proof load test of 112.5kN over an area of 320mm x 320mm placed at any position on the Culvert Lid in accordance with MS 1293:Part 1.
7. Hydrostatic pressure is eliminated by provision of 50mm diameter weepholes placed along the centerline of the invert wall.
8. The prepared bedding or piled foundation by others shall be adequate which would not cause any adverse effect to the culvert.
9. The backfill material adjacent to wall should be granular type of soil.
10. Standard supply of API Standard Size Box Culverts (Not Exceeding 1800mm width and height) and Super Size Box Culverts (Exceeding 1800mm width and height) are designed to cater for backfill superimposed dead load NOT EXCEEDING 2.0 meter plus 45 units HB vehicle primary live loads.
11. For Box Culverts (Standard Size and Super Size) to cater for backfill MORE than 2.0 meter or NO backfill (direct impact), kindly refer to our Technical or Marketing Department.
12. For other loading conditions or sizes not shown in the tables here, please contact our Technical or Marketing Department for a special design.

Stacking

All inverts should be stacked uniformly on leveled ground. Lids should be supported with timber bearers at both end.

Handling

Lifting holes (weepholes) are provided at the box culvert wall and lifting hooks are provided at both ends of lids for handling. It is recommended that a spreader beam to be used when slinging the inverts to avoid cracking at the wall base joint.

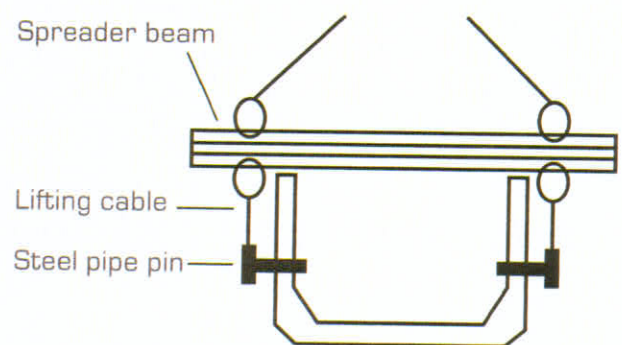
Jointing

API Box Culverts are supplied with plain butt joints. Cement mortar is normally used to fill the gap between box culverts.

Laying Procedure

API Box Culverts should be laid on the prepared bedding (preferable compacted sand bedding). However, on bad ground, it may be necessary to excavate deeper or provide with piled foundation (by others) and place a layer of hardcore before placing the sand bedding in accordance to the engineer's (or s.o) specifications and details. Backfilling around culvert units should be done after the lid of the culvert has been installed and it should be carried out in even layers on both sides simultaneously.

For direct impact condition, the backfilling work has to be carried out together with proper compaction method to prevent ground settlement. Different level between the lid and ground will cause the horizontal force during passing by vehicle, which will damage the invert of the culvert.



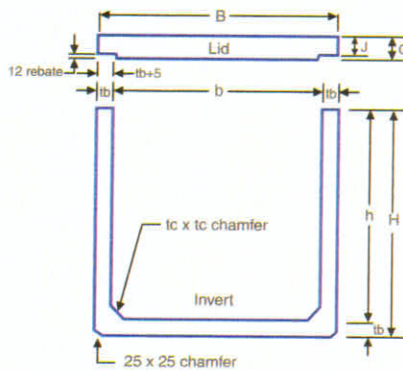
SMALL SIZE BOX CULVERT

Small Size Box Culvert Dimensions & Properties

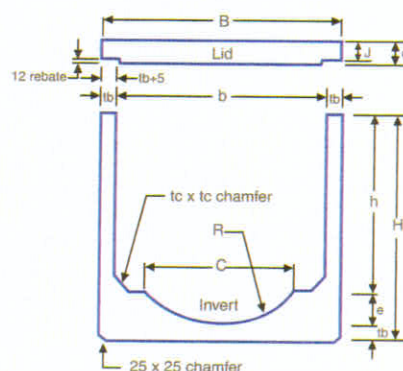
Nominal Size (mm x mm)	B (mm)	bt (mm)	bb (mm)	h (mm)	H1 (mm)	H2 (mm)	C (mm)	t (mm)	tt (mm)	tb (mm)	e (mm)	R (mm)	G (mm)	Weight (tonnes)		
														Lid	Invert	
															W/O DWF	C/W DWF
300 x 300	420	300	290	300	360	430	60	60	60	65	70	185	80	0.11	0.20	0.26
300 x 450	425	305	290	450	510	580	60	60	60	67	70	185	80	0.11	0.26	0.32
300 x 600	430	310	290	600	665	735	60	65	60	70	70	185	80	0.11	0.33	0.39
375 x 375	495	375	365	375	435	515	60	60	60	65	80	248	80	0.12	0.24	0.30
375 x 450	500	380	365	450	510	590	60	60	60	67	80	248	80	0.12	0.27	0.33
375 x 600	505	385	365	600	665	745	60	65	60	70	80	248	80	0.12	0.34	0.40
450 x 450	575	455	440	450	510	610	60	60	60	67	100	292	100	0.18	0.29	0.39
450 x 600	580	460	440	600	665	765	60	65	60	70	100	292	100	0.18	0.36	0.46

NOTE: Standard Length is 1.2m

STANDARD SIZE BOX CULVERT



Without Dry Weather Flow (BC)

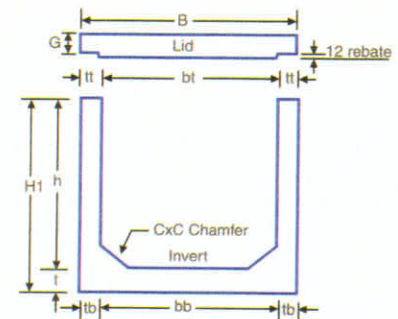


With Dry Weather Flow (BF)

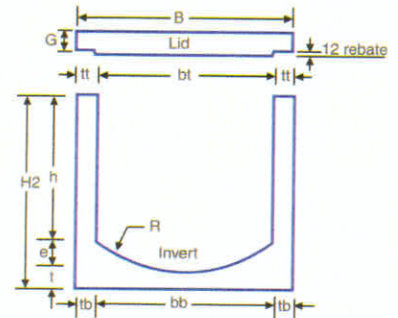
Table 1 (BC)

Normal Size (mm)		Dimension (mm)						Weight (tonnes)	
b	h	B	H	tb	tc	G	J	Lid	Invert
600	300	740	370	70	70	140	128	0.26	0.24
	450	740	520	70	70	140	128	0.26	0.30
	600	740	670	70	70	140	128	0.26	0.35
750	450	910	530	80	80	140	128	0.32	0.37
	600	910	680	80	80	140	128	0.32	0.43
	750	910	830	80	80	140	128	0.32	0.49
900	450	1060	530	80	80	140	128	0.37	0.40
	600	1060	680	80	80	140	128	0.37	0.46
	750	1060	830	80	80	140	128	0.37	0.52
	900	1060	980	80	80	140	128	0.37	0.58
1200	600	1390	695	95	50	150	138	0.51	0.61
	750	1390	845	95	50	150	138	0.51	0.68
	900	1390	995	95	50	150	138	0.51	0.75
	1050	1390	1145	95	50	150	138	0.51	0.82
	1200	1390	1295	95	50	150	138	0.51	0.89
1500	750	1700	850	100	100	175	163	0.73	0.81
	900	1700	1000	100	100	175	163	0.73	0.88
	1050	1700	1150	100	100	175	163	0.73	0.96
	1200	1700	1300	100	100	175	163	0.73	1.03
	1350	1700	1450	100	100	175	163	0.73	1.10
	1500	1700	1600	100	100	175	163	0.73	1.18
1800	900	2030	1015	115	115	175	163	0.87	1.11
	1050	2030	1165	115	115	175	163	0.87	1.20
	1200	2030	1315	115	115	175	163	0.87	1.28
	1350	2030	1465	115	115	175	163	0.87	1.37
	1500	2030	1615	115	115	175	163	0.87	1.45
	1650	2030	1765	115	115	175	163	0.87	1.54
	1800	2030	1915	115	115	175	163	0.87	1.62

NOTE: Standard Length is 1.0m



Without Dry Weather Flow (BC)

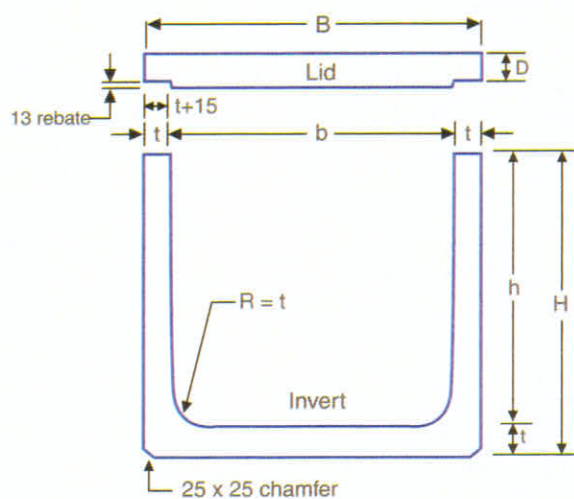


With Dry Weather Flow (BF)

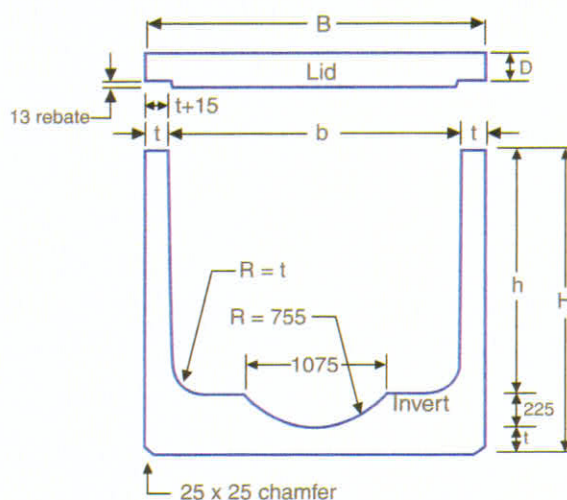
Table 2 (BF)

Normal Size (mm)		Dimension (mm)						Weight (tonnes)	
b	h	B	H	tb	C	e	R	Lid	Invert
600	300	740	440	70	300	70	195	0.26	0.34
	450	740	590	70	300	70	195	0.26	0.39
	600	740	740	70	300	70	195	0.26	0.44
750	450	910	610	80	450	80	356	0.32	0.49
	600	910	760	80	450	80	356	0.32	0.55
	750	910	910	80	450	80	356	0.32	0.61
900	450	1060	610	80	450	80	356	0.37	0.55
	600	1060	760	80	450	80	356	0.37	0.61
	750	1060	910	80	450	80	356	0.37	0.67
	900	1060	1060	80	450	80	356	0.37	0.73
	600	1390	920	95	1075	225	755	0.51	0.97
1200	750	1390	1070	95	1075	225	755	0.51	1.04
	900	1390	1220	95	1075	225	755	0.51	1.11
	1050	1390	1370	95	1075	225	755	0.51	1.18
	1200	1390	1520	95	1075	225	755	0.51	1.25
	750	1700	1075	100	1075	225	755	0.73	1.34
1500	900	1700	1225	100	1075	225	755	0.73	1.41
	1050	1700	1375	100	1075	225	755	0.73	1.49
	1200	1700	1525	100	1075	225	755	0.73	1.56
	1350	1700	1675	100	1075	225	755	0.73	1.63
	1500	1700	1825	100	1075	225	755	0.73	1.71
1800	900	2030	1240	115	1075	225	755	0.87	1.82
	1050	2030	1390	115	1075	225	755	0.87	1.91
	1200	2030	1540	115	1075	225	755	0.87	1.99
	1350	2030	1690	115	1075	225	755	0.87	2.08
	1500	2030	1840	115	1075	225	755	0.87	2.16
	1650	2030	1990	115	1075	225	755	0.87	2.24
	1800	2030	2140	115	1075	225	755	0.87	2.33

SUPER SIZE BOX CULVERT



Without Dry Weather Flow [BC]



With Dry Weather Flow [BF]

Super Size Box Culvert Dimensions & Properties

Nominal Size (mm)	Dimension (mm)						Weight (tonnes)			
	b	h	B	D	t	H	Lid	Invert		
								W/O DWF	C/W DWF	
2100 x 1200	2100	1200	2400	255	150	1350	1.58	1.79	2.70	
2100 x 1500	2100	1500	2400	255	150	1650	1.58	2.01	2.92	
2100 x 1800	2100	1800	2400	255	150	1950	1.58	2.23	3.14	
2100 x 2100	2100	2100	2400	255	150	2250	1.58	2.45	3.36	
2400 x 1200	2400	1200	2700	255	150	1350	1.78	1.90	2.98	
2400 x 1500	2400	1500	2700	255	150	1650	1.78	2.12	3.20	
2400 x 1800	2400	1800	2700	255	150	1950	1.78	2.34	3.42	
2400 x 2100	2400	2100	2700	255	150	2250	1.78	2.56	3.64	
2400 x 2400	2400	2400	2700	255	150	2550	1.78	2.78	3.86	
2700 x 1500	2700	1500	3060	255	180	1680	2.01	2.71	3.98	
2700 x 1800	2700	1800	3060	255	180	1980	2.01	2.97	4.25	
2700 x 2100	2700	2100	3060	255	180	2280	2.01	3.24	4.51	
2700 x 2400	2700	2400	3060	255	180	2580	2.01	3.50	4.78	
2700 x 2700	2700	2700	3060	255	180	2880	2.01	3.76	5.04	
3000 x 1500	3000	1500	3400	255	200	1700	2.23	3.18	4.64	
3000 x 1800	3000	1800	3400	255	200	2000	2.23	3.47	4.94	
3000 x 2100	3000	2100	3400	255	200	2300	2.23	3.77	5.23	
3000 x 2400	3000	2400	3400	255	200	2600	2.23	4.06	5.52	
3000 x 2700	3000	2700	3400	255	200	2900	2.23	4.35	5.82	
3000 x 3000	3000	3000	3400	255	200	3200	2.23	4.65	6.11	
3300 x 1500	3300	1500	3700	255	200	1700	2.43	3.33	4.95	
3300 x 1800	3300	1800	3700	255	200	2000	2.43	3.62	5.25	
3300 x 2100	3300	2100	3700	255	200	2300	2.43	3.91	5.54	
3300 x 2400	3300	2400	3700	255	200	2600	2.43	4.21	5.83	
3300 x 2700	3300	2700	3700	255	200	2900	2.43	4.50	6.13	
3300 x 3000	3300	3000	3700	255	200	3200	2.43	4.79	6.42	
3600 x 1800	3600	1800	4000	255	200	2000	2.63	3.77	5.80	
3600 x 2100	3600	2100	4000	255	200	2300	2.63	4.06	6.10	
3600 x 2400	3600	2400	4000	255	200	2600	2.63	4.35	6.15	
3600 x 2700	3600	2700	4000	255	200	2900	2.63	4.65	6.44	
3600 x 3000	3600	3000	4000	255	200	3200	2.63	4.94	6.73	

► API PRECAST R.C. U-SHAPE DRAIN

Features of API Precast R.C. U-Shape Drain

API U-Drain is available in both Standard Size (for nominal width between 600mm and 1800mm) and Super Size (for nominal width between 2100mm and 3600mm) in length of 1 metre as shown in the tables. As for Small Size, API U-Drain is available (for nominal width between 300mm and 450mm) in length of 1.2 metre.

API U-Drain is available in both WITH and WITHOUT Dry Weather Flow (DWF) Channels.

Easy in handling and laying. API U-Drain allows for fast construction of waterways/ open drains in using high quality factory cast units with a minimum of wet concrete works.

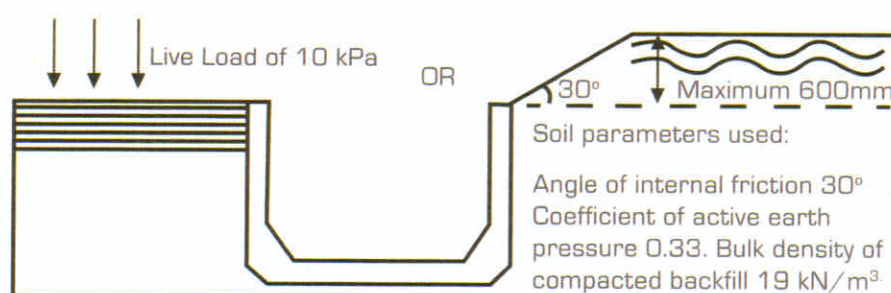
Design Considerations

1. API U-Drain is designed in accordance with the requirement of BS 8110 with the following concrete cover to reinforcement:

- a) Small Size U-Drain : 25mm
- b) Standard Size U-Drain : 25mm
- c) Super Size U-Drain : 30mm

2. API U-Drain is made from high strength concrete with a 28 days characteristic strength of 40 N/mm².

3. API U-Drain is designed for the standard loading conditions as shown below:



4. 50mm diameter weepholes are provided for drainage of the retained soil which, when combined with the butt jointed units, prevent the build up of hydrostatic pressures. As such, the design does not take into consideration of hydrostatic pressures. The backfill material adjacent to wall should be granular type of soil.

5. For the other loading conditions or U-Drain sizes not shown in the tables here, please contact our Technical or Marketing for a special design.

6. Our standard design is catered for a maximum height of 150mm in-situ capping.

Stacking

All units should be stacked uniformly on leveled ground.

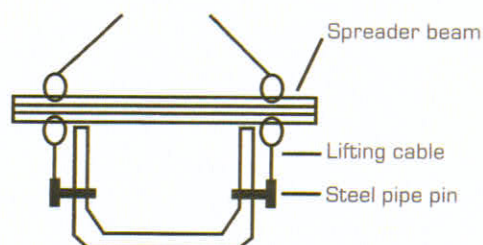
Jointing

API U-Drain is supplied with plain butt joints in standard length.

Cement mortar is normally used to fill gap between U-Drain units.

Handling

The weepholes provided in the U-Drain units double up as lifting holes for handling. A spreader beam should be used when slinging the units to avoid crack in the legs. (See figure on below)



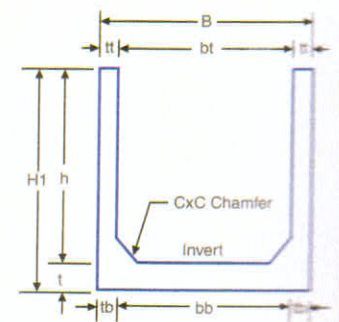
Laying

API U-Drain should be laid on the prepared bedding (preferable compacted sand bedding). However, in bad ground condition, it may be necessary to excavate deeper and place with a layer of hardcore before placing the sand bedding or provide with piled foundation (by others) as according to the engineer's (or s.o) specification and details.

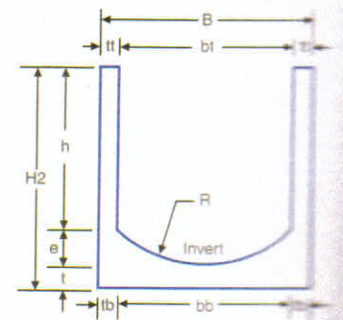
Small Size U-Drain Dimensions & Properties

Nominal Size (mm x mm)	B (mm)	bt (mm)	bb (mm)	h (mm)	H1 (mm)	H2 (mm)	C (mm)	t (mm)	tt (mm)	tb (mm)	e (mm)	R (mm)	Weight (tonnes)	
													W/O DWF	C/W DWF
300 x 300	420	300	290	300	360	430	60	60	60	65	70	185	0.20	0.26
300 x 450	425	305	290	450	510	580	60	60	60	67	70	185	0.26	0.32
300 x 600	430	310	290	600	665	735	60	65	60	70	70	185	0.33	0.39
375 x 375	495	375	365	375	435	515	60	60	60	65	80	248	0.24	0.30
375 x 450	500	380	365	450	510	590	60	60	60	67	80	248	0.27	0.33
375 x 600	505	385	365	600	665	745	60	65	60	70	80	248	0.34	0.40
450 x 450	575	455	440	450	510	610	60	60	60	67	100	292	0.29	0.39
450 x 600	580	460	440	600	665	765	60	65	60	70	100	292	0.36	0.46

NOTE: Standard Length is 1.2m

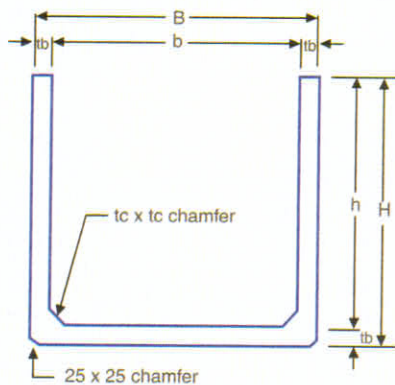


Without Dry Weather Flow [UD]

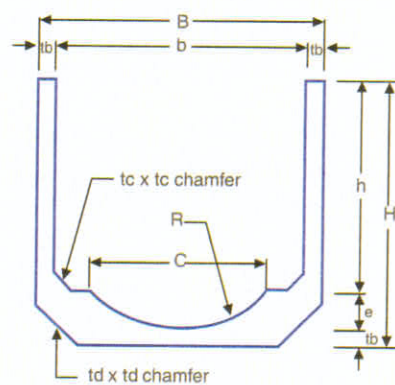


With Dry Weather Flow [UF]

STANDARD SIZE U-DRAIN



Without Dry Weather Flow [UD]



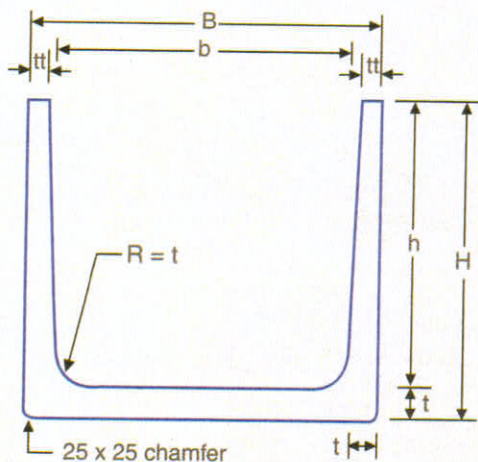
With Dry Weather Flow [UF]

Standard Size U-Drain Dimensions & Properties

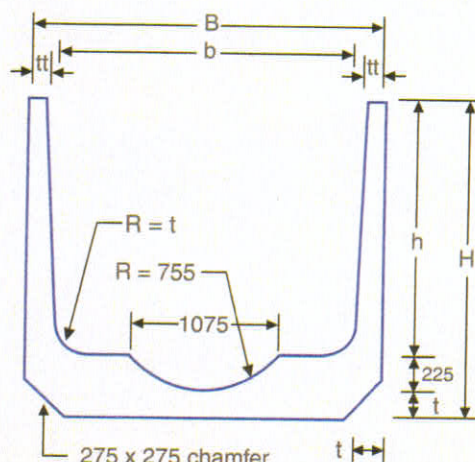
						UD		UF						
Nominal Size (mm x mm)	B (mm)	b (mm)	h (mm)	tb (mm)	tc (mm)	H (mm)	Weight (tonnes)	e (mm)	C (mm)	R (mm)	td (mm)	H (mm)	Weight (tonnes)	
600 x 300	740	600	300	70	70	370	0.24	70	300	195	25	440	0.34	
600 x 450	740	600	450	70	70	520	0.30	70	300	195	25	590	0.39	
600 x 600	740	600	600	70	70	670	0.35	70	300	195	25	740	0.44	
750 x 300	910	750	300	80	80	380	0.31	80	450	356	25	460	0.43	
750 x 450	910	750	450	80	80	530	0.37	80	450	356	25	610	0.48	
750 x 600	910	750	600	80	80	680	0.43	80	450	356	25	760	0.53	
750 x 750	910	750	750	80	80	830	0.49	80	450	356	25	910	0.59	
900 x 300	1060	900	300	80	80	380	0.34	80	450	356	25	460	0.48	
900 x 450	1060	900	450	80	80	530	0.40	80	450	356	25	610	0.55	
900 x 600	1060	900	600	80	80	680	0.46	80	450	356	25	760	0.61	
900 x 750	1060	900	750	80	80	830	0.52	80	450	356	25	910	0.67	
900 x 900	1060	900	900	80	80	980	0.58	225	450	356	25	1060	0.73	
1200 x 300	1390	1200	300	95	50	395	0.47	225	1075	755	250	620	0.66	
1200 x 450	1390	1200	450	95	50	545	0.54	225	1075	755	250	770	0.75	
1200 x 600	1390	1200	600	95	50	695	0.61	225	1075	755	250	920	0.82	
1200 x 750	1390	1200	750	95	50	845	0.68	225	1075	755	250	1070	0.95	
1200 x 900	1390	1200	900	95	50	995	0.75	225	1075	755	250	1220	1.06	
1200 x 1050	1390	1200	1050	95	50	1145	0.82	225	1075	755	250	1370	1.19	
1200 x 1200	1390	1200	1200	95	50	1295	0.89	225	1075	755	250	1520	1.32	
1500 x 600	1700	1500	600	100	100	700	0.74	225	1075	755	250	925	1.11	
1500 x 900	1700	1500	900	100	100	1000	0.88	225	1075	755	250	1225	1.28	
1500 x 1200	1700	1500	1200	100	100	1300	1.03	225	1075	755	250	1525	1.41	
1500 x 1500	1700	1500	1500	100	100	1600	1.18	225	1075	755	250	1825	1.55	
1800 x 600	2030	1800	600	115	115	715	0.94	225	1075	755	250	940	1.30	
1800 x 900	2030	1800	900	115	115	1015	1.11	225	1075	755	250	1240	1.57	
1800 x 1200	2030	1800	1200	115	115	1315	1.28	225	1075	755	250	1540	1.84	
1800 x 1500	2030	1800	1500	115	115	1615	1.45	225	1075	755	250	1840	2.07	
1800 x 1800	2030	1800	1800	115	115	1915	1.62	225	1075	755	250	2140	2.38	

NOTE: Standard Length is 1.0m

SUPER SIZE U-DRAIN



Without Dry Weather Flow (UD)



With Dry Weather Flow (FF)

Super Size U-Drain Dimensions & Properties

Nominal Size (mm)	B (mm)	b (mm)	h (mm)	t (mm)	tt (mm)	U-Drain w/o DWF		U-Drain c/w DWF	
						H (mm)	Weight tonnes	H (mm)	Weight tonnes
2100 x 1200	2400	2100	1200	150	122	1350	1.71	1575	2.44
2100 x 1500	2400	2100	1500	150	114	1650	1.88	1875	2.61
2100 x 1800	2400	2100	1800	150	106	1950	2.04	2175	2.77
2100 x 2100	2400	2100	2100	150	98	2250	2.18	2475	2.91
2400 x 1200	2700	2400	1200	150	122	1350	1.82	1575	2.71
2400 x 1500	2700	2400	1500	150	114	1650	1.99	1875	2.88
2400 x 1800	2700	2400	1800	150	106	1950	2.15	2175	3.04
2400 x 2100	2700	2400	2100	150	98	2250	2.29	2475	3.19
2400 x 2400	2700	2400	2400	150	90	2550	2.43	2775	3.32
2700 x 1500	3060	2700	1500	180	133	1680	2.54	1905	3.63
2700 x 1800	3060	2700	1800	180	122	1980	2.72	2205	3.81
2700 x 2100	3060	2700	2100	180	111	2280	2.88	2505	3.97
2700 x 2400	3060	2700	2400	180	101	2580	3.04	2805	4.13
2700 x 2700	3060	2700	2700	180	90	2880	3.17	3105	4.26
3000 x 1500	3400	3000	1500	200	142	1700	2.97	1925	4.24
3000 x 1800	3400	3000	1800	200	133	2000	3.18	2225	4.46
3000 x 2100	3400	3000	2100	200	124	2300	3.38	2525	4.65
3000 x 2400	3400	3000	2400	200	115	2600	3.56	2825	4.84
3000 x 2700	3400	3000	2700	200	106	2900	3.73	3125	5.01
3000 x 3000	3400	3000	3000	200	98	3200	3.90	3425	5.18
3300 x 1500	3700	3300	1500	200	142	1700	3.11	1925	4.56
3300 x 1800	3700	3300	1800	200	133	2000	3.32	2225	4.77
3300 x 2100	3700	3300	2100	200	124	2300	3.52	2525	4.97
3300 x 2400	3700	3300	2400	200	115	2600	3.71	2825	5.15
3300 x 2700	3700	3300	2700	200	106	2900	3.88	3125	5.32
3300 x 3000	3700	3300	3000	200	98	3200	4.04	3425	5.49
3600 x 1800	4000	3600	1800	200	133	2000	3.47	2225	5.08
3600 x 2100	4000	3600	2100	200	124	2300	3.67	2525	5.28
3600 x 2400	4000	3600	2400	200	115	2600	3.85	2825	5.46
3600 x 2700	4000	3600	2700	200	106	2900	4.03	3125	5.63
3600 x 3000	4000	3600	3000	200	98	3200	4.19	3425	5.80

API Precast Marketing Sdn. Bhd. [770700-A]

Northern Region Sales Office

81-A, Jalan Perai Jaya 4, Bandar Perai Jaya, Seberang Perai Tengah, 13600 Prai, Penang.

Tel: 604-399 9689

Fax: 604-390 4689

Email: info@api.com.my

Central, Eastern & Southern Region Sales Office

Lot 9022, Jalan Sungai Buaya, Kg Koskan, 48200 Rawang, Selangor Darul Ehsan.

Tel: 6017-262 7469, 6012-421 2517

Fax: 603-6028 4018

Email: apisb@api.com.my

It is our policy to continuously review and improve our products and design. Information in this leaflet is therefore subject to change without prior notice. Please call us for more information on our customized products.