



BOX CULVERT

Precast Concrete Product



SVC
SVC®

TIAN FUNG
TRADING SDN BHD
Sirim Certified MS 1293 : PT.1 : 1992



BOX CULVERT

Features

TIAN FUNG [SVC] provides an extensive range of precast reinforced concrete box culverts from nominal width of 300mm to 3600mm, which are further categorized in accordance to the width of culverts as follow:

- 1** Mini Size Box Culvert : Width 450mm
- 2** Standard Size Box Culvert : Width from 600mm to 1800mm
- 3** Super Size Box Culvert : Width from 2100mm to 3600mm

TIAN FUNG [SVC] box culverts are available in both WITH and WITHOUT dry weather flow (DWF) channels.

Design Consideration

- 1** Design loading requirement of TIAN FUNG [SVC] box culverts are in accordance to:
 - (i) BS 5400: Part 2 modified by (ii)
 - (ii) Department Standard BD 31/01 Buried Concrete Box Type Structure issued by Departmental of Transport (UK)- Highway and Traffic
 - (iii) JKR LTAL (Long Term Axle Load) and SV (Special Vehicle) requirements
- 2** The design of Precast Reinforced Concrete Box Culverts is in accordance with BS 5400 : Part 4
- 3** TIAN FUNG [SVC] box culverts are made from high strength concrete with a 28 days characteristic strength from 35 to 40 N/mm²
- 4** Concrete cover to reinforcements for:-

Mini Size Box Culvert	= 25mm
Standard Size Box Culvert	= 25mm
Super Size Box Culvert	= 30mm
- 5** Coefficient of the earth lateral pressure at rest = 0.5 and bulk density of soil = 19kN/ m³
- 6** TIAN FUNG [SVC] Mini Size, Standard Size Box Culverts (not exceeding 1800mm width and height) & 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.
- 7** TIAN FUNG [SVC] 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's Lid.
- 8** Hydrostatic pressure are eliminated by the provision of 50mm diameter weepholes placed along the centreline of the invert wall.
- 9** The prepared bedding or piled foundation by others shall be adequate which would not cause any adverse effect to the culvert.
- 10** The backfill material adjacent to wall should be granular type of soil.
- 11** Kindly refer to our Technical Personnel for assistance if special design as following are required:
 - (i) Backfill more than 2.0 meter;
 - (ii) No backfill (Direct Loading);
 - (iii) Other loading conditions;
 - (iv) Sizes not shown in the tables

BOX CULVERT

Guide



Handling

A spreader beam is recommended to be used with steel pins and lifting cables when handling culverts or when slinging the units to avoid cracking at junction of side wall and base slab.

Stacking

Box culverts' invert and lid are to be stacked on level and stable ground or timber bearer to avoid cracking due to undesired localized load.

Kindly refer to Handling & Stacking Guide Diagram at Page 4.

Jointing

TIAN FUNG [SVC] Box Culverts are manufactured with straight butt joints. Cement mortar is normally used to fill the gap between the box culverts.

Laying/ Installation

When soft ground conditions are encountered, soft soil should be removed and replaced with a suitable compacted material (preferred compacted sand bedding). However, on a bad ground, it maybe necessary to excavate deeper or provide with piled foundation and place a layer of hardcore before placing the sand bedding in accordance to the engineer's (or s.o) specifications.

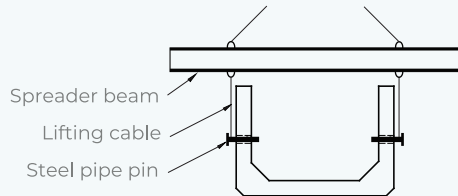
Before backfilling works commence, the culvert's Lid must be installed. Backfilling should be carried out on both sides of the culverts simultaneously, suitable filter material should be provided at the weep holes behind the wall, free draining granular is to be provided.

For direct loading 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.

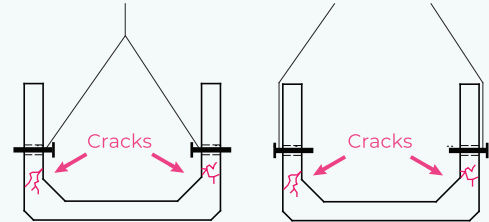
BOX CULVERT

Guide

LIFTING

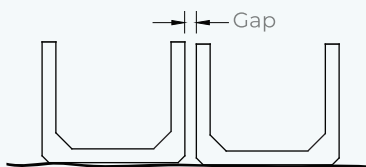


Correct

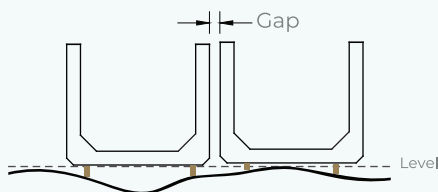


Wrong

STACKING

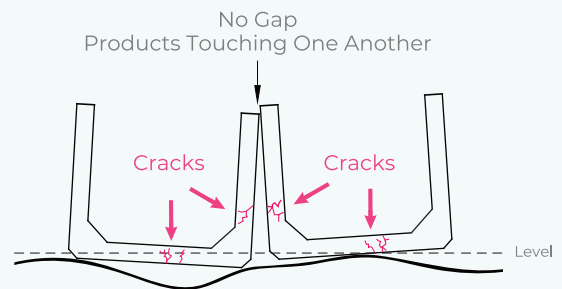


Box Culvert's Drain stacked on level & stable ground with gaps in between the products



Box Culvert's Drain stacked with timber bearer to avoid cracking due to undesired localized load

Correct



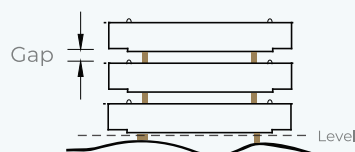
Box Culvert's Drain stacked on uneven ground with products leaning against each others

Wrong

STACKING

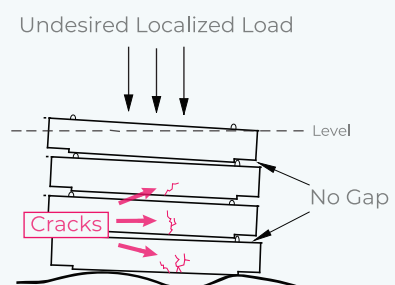


Lid stacked on level & stable ground with gaps in between the products



Lid stacked with timber bearer to avoid cracking due to undesired localized load

Correct

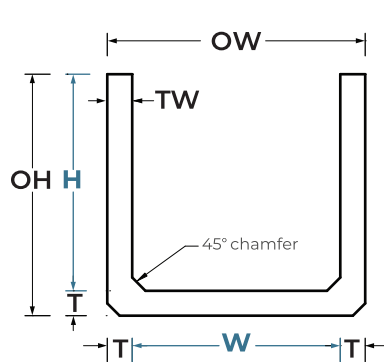


Lid stacked on uneven ground without any gap in each others causing cracking due to undesired localized load

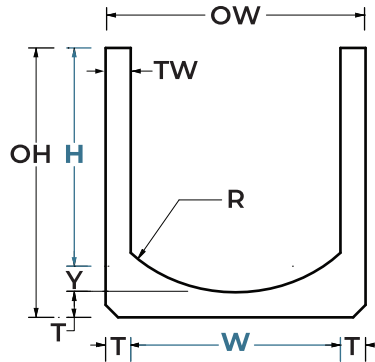
Wrong

BOX CULVERT

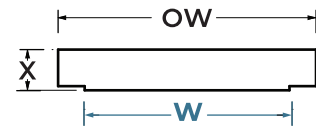
MINI SIZE *Series*



BC



BF



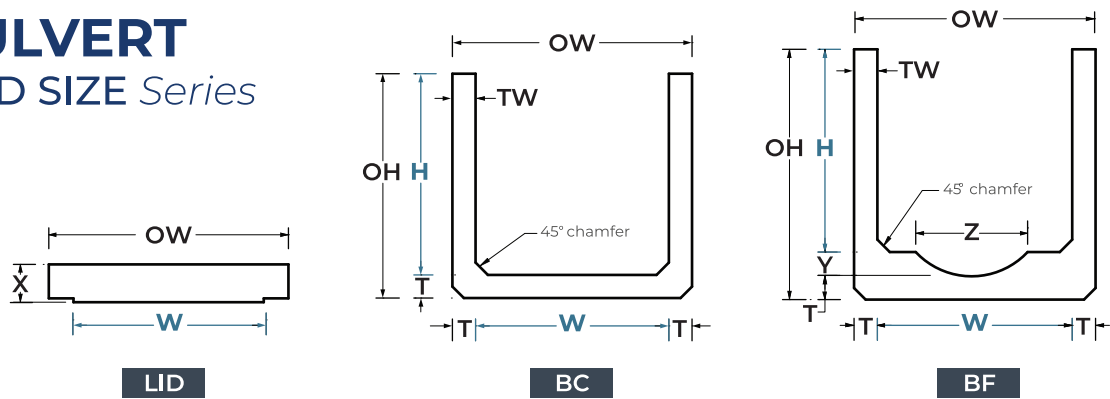
LID

NOMINAL SIZE					INVERT W/O DWF (BC)		INVERT C/W DWF (BF)				LID	
W mm	x mm	H mm	T mm	OW mm	OH mm	Weight tonnes	Y mm	R mm	OH mm	Weight tonnes	X mm	Weight tonnes
300	x	300	65	430	365	0.16	n/a	n/a	n/a	n/a	125	0.12
		450			515	0.21	n/a	n/a	n/a	n/a		
		600			665	0.26	n/a	n/a	n/a	n/a		
450	x	300	65	580	365	0.19	100	315	465	0.25	125	0.16
		450			515	0.23			615	0.29		
		600			665	0.28			765	0.34		

W/O DWF: Without Dry Weather Flow
C/W DWF: Comes With Dry Weather Flow

BOX CULVERT

STANDARD SIZE *Series*

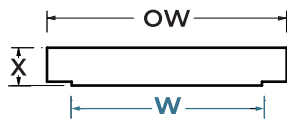


NOMINAL SIZE					INVERT W/O DWF (BC)		INVERT C/W DWF (BF)				LID	
W mm	x	H mm	T mm	OW mm	OH mm	Weight tonnes	Y mm	Z mm	OH mm	Weight tonnes	X mm	Weight tonnes
600	x	300	70	740	370	0.24	70	300	440	0.33	150	0.26
		450			520	0.29			590	0.38		
		600			670	0.34			740	0.43		
750	x	450	80	910	530	0.36	80	450	610	0.48	150	0.31
		600			680	0.42			760	0.53		
		750			830	0.48			910	0.59		
900	x	450	80	1060	530	0.39	80	450	610	0.53	150	0.37
		600			680	0.48			760	0.59		
		750			830	0.50			910	0.65		
		900			980	0.56			1060	0.71		
1200	x	600	80	1360	680	0.50	80	450	760	0.71	150	0.48
		750			830	0.56			910	0.76		
		900			980	0.62			1060	0.82		
		1050			1130	0.68			1210	0.88		
		1200			1280	0.73			1360	0.94		
1500	x	750	100	1700	850	0.79	225	1075	1075	1.31	180	0.73
		900			1000	0.86			1225	1.38		
		1050			1150	0.93			1375	1.45		
		1200			1300	1.00			1625	1.52		
		1350			1450	1.08			1675	1.60		
		1500			1600	1.15			1825	1.67		
1800	x	900	115	2030	1015	1.09	225	1075	1240	1.78	180	0.87
		1050			1165	1.17			1390	1.87		
		1200			1315	1.25			1540	1.95		
		1350			1465	1.33			1690	2.03		
		1500			1615	1.42			1840	2.11		
		1650			1765	1.50			1990	2.20		
		1800			1915	1.58			2140	2.28		

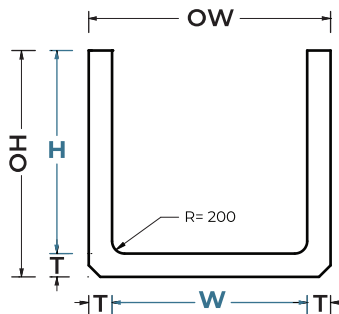
W/O DWF: Without Dry Weather Flow
 C/W DWF: Comes With Dry Weather Flow

BOX CULVERT

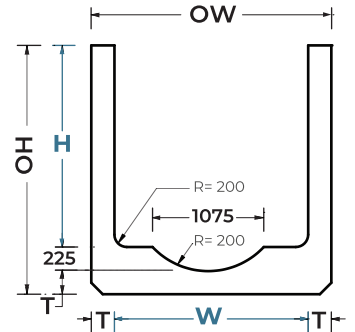
SUPER SIZE *Series*



LID



BC



BF

NOMINAL SIZE					INVERT W/O DWF (BC)		INVERT C/W DWF (BF)		LID	
W mm	x	H mm	T mm	OW mm	OH mm	Weight tonnes	OH mm	Weight tonnes	X mm	Weight tonnes
2100	x	1200	150	2400	1350	1.78	1575	2.68	215	1.22
		1500			1650	2.00	1875	2.87		
		1800			1950	2.21	2175	3.09		
		2100			2250	2.43	2475	3.30		
2400	x	1200	150	2700	1350	1.87	1575	2.92	255	1.64
		1500			1650	2.08	1875	3.14		
		1800			1950	2.30	2175	3.36		
		2100			2250	2.51	2475	3.57		
		2400			2550	2.73	2775	3.79		
2700	x	1500	180	3060	1680	2.65	1905	4.16	255	1.85
		1800			1980	2.91	2205	4.42		
		2100			2280	3.17	2505	4.61		
		2400			2580	3.43	2805	4.87		
		2700			2880	3.68	3105	5.13		
3000	x	1500	180	3360	1680	2.78	1905	4.19	255	2.03
		1800			1980	3.04	2205	4.45		
		2100			2280	3.30	2505	4.71		
		2400			2580	3.56	2805	4.97		
		2700			2880	3.81	3105	5.23		
		3000			3180	4.07	3405	5.49		
3300	x	1800	200	3700	2000	3.53	2225	5.13	255	2.24
		2100			2300	3.82	2525	5.42		
		2400			2600	4.11	2825	5.71		
		2700			2900	4.40	3125	6.00		
		3000			3200	4.69	3425	6.28		
		3300			3500	4.97	3725	6.57		
3600	x	1800	200	4000	2000	3.68	2225	5.44	300	2.84
		2100			2300	3.97	2525	5.73		
		2400			2600	4.25	2825	6.01		
		2700			2900	4.54	3125	6.30		
		3000			3200	4.83	3425	6.59		
		3300			3500	5.12	3725	6.88		
		3600			3800	5.41	4025	7.17		



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