

SWP CONCRETE SOLUTIONS **BOX CULVERTS**



WHY SWP

SWP Concrete Solutions Ltd manufacture and supply a range of high quality precast concrete products, either reinforced or prestressed, for the Civil Engineering, Construction and Agricultural markets.

With the manufacture of precast concrete there is no substitute for experience to ensure innovation, quality and on time delivery to not only meet but surpass client's expectations and requirements.

SWP Concrete Solutions has over 20 years experience in the precast concrete and construction sectors, and are ensuring that, as the business grows, it maintains its core values of:

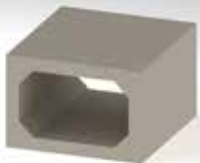
- **Producing precast concrete solutions and products of the Highest Quality**
- **Understanding and Achieving Customer Requirements**
- **Right first time – on time**
- **Innovating for Excellence**
- **Complete Customer Satisfaction**

WHY BOX CULVERTS

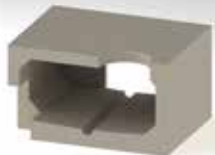
Box culverts can be manufactured in many different internal dimension configurations to best suit site and design requirements. Most common uses for Box culverts:

- Water Course Diversions
- Attenuation Tanks
- Pedestrian Subways
- Service Tunnels
- Road and Access crossings
- Balancing tanks
- CSO's
- Animal/wildlife shelters

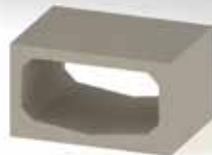
STANDARD



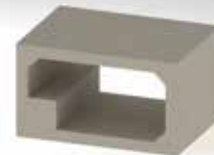
SPECIAL WITH END WALL



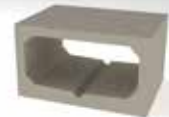
SHALLOW V



MAMMAL LEDGE



DWF



SERVICES / PRODUCTS OFFERED

- Full design and Detailing package available on all projects.
- Wide and flexible variety of internal width and height dimensions are available with our Steel mould system.
- Box culverts can be supplied with several types of Mammal ledges.
- **SWP** can offer Dry weather flow and shallow V invert channels, central and to the sides of the Box culvert invert.
- Special units with Access holes, Pipe openings and drainage connections can be manufactured.
- Bolt on end walls can be supplied pre installed to Box Culvert or loose to aid with site installation and lifting capacity. (full fitting kit supplied)
- Jointing material and lifting tackle is supplied on the first delivery.
- Box culverts can be supplied with Skewed ends.
- Tapered joints can be incorporated into casting the Box culverts to achieve bends and changes in direction of a culvert run.
- Cast in sockets and bars, starter boxes and projecting steel can be cast into our units to allow for insitu tie-in for parapets, upstands, wingwalls, chambers etc.
- Parapets, wingwalls and upstands can also be supplied to complement our Box culverts.

ADVANTAGES OF BOX CULVERTS

- Box culverts require less depth of excavation to achieve the same discharge rate as circular pipes. This saves costs and time during installation on site. See [fig 1](#).
- Concrete's proven strength and durability allows for exceptional load bearing capabilities and structural stability.
- Smooth internal finish of concrete improves the flow of water through box culverts.
- Box culverts do not require additional treatments to prolong life or improve performance in comparison to steel structures, which are prone to rust.
- Box culverts are ideally suited to sites where headroom or depth is restricted, with many internal configurations available discharge rates can be achieved using width and/or height changes to suit site restrictions. See [fig 2](#).

Fig 1

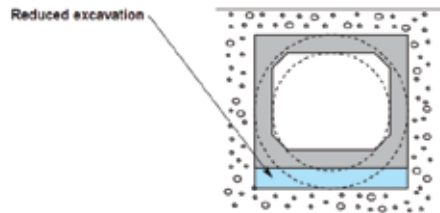
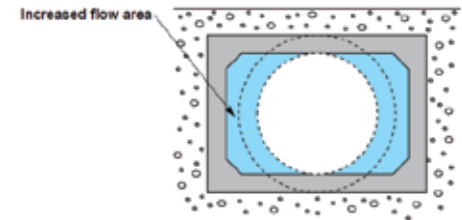


Fig 2



	1200	1500	1800		2100	2400															
600	064 063	082 085	100 106																		
800	088 098	112 132	136 166		160 200	184 235				2700	3000										
1000	112 136	142 183	172 231		202 279	232 328				262 378	292 428				3300	3600					
1200	136 175	172 236	208 299		244 363	280 428				316 494	352 560			378 611		414 678				4200	
1500		217 320	262 407		307 497	352 588				397 680	442 773			477 852		522 946				612 1137	
			1800		316 520	370 637				424 756	478 877			532 999		576 1108				630 1233	738 1485
				2100	433 782	496 930				559 1082	622 1236			675 1378		738 1535				864 1854	
							2400			568 1110	640 1293			712 1480		774 1657				846 1849	990 2238
								2700		721 1510	802 1731			873 1944		954 2173				1116 2636	
									3000					892 1988		972 2239				1062 2505	1242 3045

Key
 Figures in BLUE = Flow area (m²)
 Figures in BLACK = Discharge rate (m³/s)
 Height and width dimensions are for internal sizes in mm

Example
 For a culvert with internal dimensions of 2400 x 1800mm laid at a gradient of 1 in 700 and with an assumed roughness coefficient of 0.6mm, the discharge rate is given by:- $7.56 \times 1.2 \times 0.93 = 8.44 \text{ m}^3/\text{s}$

BOX CULVERTS FLOW CHART

1. Flow chart is indicative of the vast flexible range of Box Culverts SWP can manufacture. Please contact Sales to discuss sizes other than those stated on the chart.
2. Flow area chart is based on flat bottomed units. SWP can produce Box Culverts with various benched invert styles, mammal ledges, special internal profiles and Dry weather flow channels.
3. For cross sectional area / flow area on Box Culvert units with Dry weather flow channels please contact Sales.

4800	5400	6000
832 17.13	940 19.70	
976 21.50	1102 24.75	1228 28.02
1120 26.08	1264 30.07	1408 34.09
1264 30.83	1426 35.60	1588 40.41
1408 35.73	1588 41.32	1768 46.96

Roughness Multiplier	
Roughness Coefficient k_s (mm)	Multiplier
0.06	1.11
0.15	1.05
0.3	1.00
0.6	0.93
1.5	0.85

Gradient Multiplier	
Gradient	Multiplier
1 in 1000	1.0
1 in 800	1.1
1 in 700	1.2
1 in 600	1.3
1 in 500	1.4
1 in 400	1.6
1 in 300	1.8
1 in 250	2.0

SUSTAINABILITY OF BOX CULVERTS



Box culverts are a *Green* product. Manufacture of Box culverts has been identified as a low energy intense process. Using a combination of recycled waste, locally sourced materials and responsibly sourced aggregates, box culverts benefit with a low carbon foot print.

Box Culvert sustainability advantages:

- Reduced energy consumption during the production process.
- Use recycled materials and responsibly sourced aggregates.
- Are manufactured to order, minimising waste.
- Have a long service life for its designed application.

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- C O M P L E T E C U S T O M E R S A T I S F A C T I O N -