

TYPICAL SET OUT TABLES & MEMBER CALCULATIONS FOR MODIFIED WINGWALLS AND TRAVERSABLE GRATE - MAX SPAN OF 4m

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**TABLE 1: RCP CULVERT - 1V:4H**  
(WINGWALL ANGLES  $\alpha = 5^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	735	2140	190	W + 380	720	940	980	1110	725	870	720
600	900	2800	250	W + 500	1050	1155	1200	1385	1055	1200	1050
750	1065	3460	310	W + 620	1380	1385	1430	1670	1390	1530	1380
900	1230	4120	370	W + 740	1710	1600	1645	1945	1720	1860	1710
1050	1395	4780	420	W + 840	2040	1830	1875	2230	2050	2190	2040
1200	1560	5440	480	W + 960	2370	2045	2090	2505	2380	2520	2370

**TABLE 2: RCP CULVERT - 1V:4H**  
(WINGWALL ANGLES  $\alpha = 10^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	735	2140	380	W + 760	720	1135	1225	1480	735	870	720
600	900	2800	500	W + 1000	1050	1415	1500	1870	1070	1200	1050
750	1065	3460	620	W + 1240	1380	1700	1790	2275	1405	1530	1380
900	1230	4120	730	W + 1460	1710	1975	2065	2670	1740	1860	1710
1050	1395	4780	850	W + 1700	2040	2265	2350	3070	2075	2190	2040
1200	1560	5440	960	W + 1920	2370	2540	2630	3465	2410	2520	2370

**TABLE 3: RCP CULVERT - 1V:4H**  
(WINGWALL ANGLES  $\alpha = 15^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	735	2140	580	W + 1160	720	1345	1475	1865	750	870	720
600	900	2800	760	W + 1520	1050	1680	1815	2375	1090	1200	1050
750	1065	3460	930	W + 1860	1380	2025	2160	2900	1430	1530	1380
900	1230	4120	1110	W + 2220	1710	2365	2495	3415	1775	1860	1710
1050	1395	4780	1290	W + 2580	2040	2710	2845	3935	2115	2190	2040
1200	1560	5440	1460	W + 2920							REFER NOTE 3

**TABLE 4: RCP CULVERT - 1V:6H**  
(WINGWALL ANGLES  $\alpha = 5^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	735	3210	290	W + 580	1180	1020	1065	1270	1185	1330	1180
600	900	4190	370	W + 740	1670	1265	1315	1600	1680	1820	1670
750	1065	5190	460	W + 920	2170	1520	1575	1945	2180	2320	2170
900	1230	6180	550	W + 1100	2665	1770	1820	2280	2680	2815	2665
1050	1395	7170	630	W + 1260	3160	2025	2080	2620	3175	3310	3160
1200	1560	8160	720	W + 1440	3655	2270	2325	2955	3670	3805	3655

**TABLE 5: RCP CULVERT - 1V:6H**  
(WINGWALL ANGLES  $\alpha = 10^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	735	3210	570	W + 1140	1180	1300	1390	1805	1200	1330	1180
600	900	4190	740	W + 1480	1670	1630	1720	2310	1700	1820	1670
750	1065	5190	920	W + 1840	2170	1980	2065	2830	2205	2320	2170
900	1230	6180	1090	W + 2180	2665	2315	2400	3340	2710	2815	2665
1050	1395	7170	1270	W + 2540	3160	2660	2745	3860	3210	3310	3160
1200	1560	8160	1440	W + 2880							REFER NOTE 3

**TABLE 6: RCP CULVERT - 1V:6H**  
(WINGWALL ANGLES  $\alpha = 15^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	735	3210	870	W + 1740	1180	1590	1725	2355	1225	1330	1180
600	900	4190	1130	W + 2260	1670	2010	2145	3040	1730	1820	1670
750	1065	5190	1400	W + 2800	2170	2450	2585	3745	2250	2320	2170
900	1230	6180	1660	W + 3320							REFER NOTE 3
1050	1395	7170	1930	W + 3860							REFER NOTE 3
1200	1560	8160	2190	W + 4380							REFER NOTE 3

**TABLE 7: RCBC CULVERT - 1V:4H**  
(WINGWALL ANGLES  $\alpha = 5^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	830	2520	230	W + 460	910	1430	1475	1635	915	1060	910
600	980	3120	280	W + 560	1210	1485	1530	1740	1215	1360	1210
750	1130	3720	330	W + 660	1510	1535	1580	1845	1520	1660	1510
900	1280	4320	380	W + 760	1810	1590	1635	1950	1820	1960	1810
1050	1430	4920	440	W + 880	2110	1640	1685	2055	2120	2260	2110
1200	1580	5520	490	W + 980	2410	1695	1740	2160	2420	2560	2410

**TABLE 8: RCBC CULVERT - 1V:4H**  
(WINGWALL ANGLES  $\alpha = 10^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	830	2520	450	W + 900	910	1665	1755	2075	925	1060	910
600	980	3120	560	W + 1120	1210	1770	1860	2285	1230	1360	1210
750	1130	3720	660	W + 1320	1510	1875	1965	2495	1535	1660	1510
900	1280	4320	770	W + 1540	1810	1980	2070	2710	1840	1960	1810
1050	1430	4920	870	W + 1740	2110	2090	2175	2920	2145	2260	2110
1200	1580	5520	980	W + 1960	2410	2195	2280	3130	2450	2560	2410

**TABLE 9: RCBC CULVERT - 1V:4H**  
(WINGWALL ANGLES  $\alpha = 15^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	735	2140	680	W + 1360	910	1905	2040	2525	945	1060	910
600	900	2800	840	W + 1680	1210	2065	2200	2850	1255	1360	1210
750	1065	3460	1000	W + 2000	1510	2225	2360	3170	1565	1660	1510
900	1230	4120	1160	W + 2320	1810	2385	2520	3490	1875	1960	1810
1050	1395	4780	1320	W + 2640	2110	2550	2680	3810	2185	2260	2110
1200	1560	5440	1480	W + 2960							REFER NOTE 3

**TABLE 10: RCBC CULVERT - 1V:6H**  
(WINGWALL ANGLES  $\alpha = 5^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	830	3780	340	W + 680	1465	1530	1575	1830	1475	1615	1465
600	980	4680	410	W + 820	1915	1610	1650	1985	1925	2065	1915
750	1130	5580	490	W + 960	2365	1685	1730	2145	2375	2515	2365
900	1280	6480	570	W + 1140	2815	1765	1810	2300	2830	2965	2815
1050	1430	7380	650	W + 1300	3265	1845	1890	2460	3280	3415	3265
1200	1580	8280	730	W + 1460	3715	1925	1965	2615	3730	3865	3715

**TABLE 11: RCBC CULVERT - 1V:6H**  
(WINGWALL ANGLES  $\alpha = 10^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	830	3780	670	W + 1340	1465	1860	1950	2465	1490	1615	1465
600	980	4680	830	W + 1660	1915	2020	2105	2780	1945	2065	1915
750	1130	5580	990	W + 1980	2365	2180	2265	3100	2405	2515	2365
900	1280	6480	1150	W + 2300	2815	2335	2425	3415	2860	2965	2815
1050	1430	7380	1310	W + 2620	3265	2495	2585	3735	3320	3415	3265
1200	1580	8280	1460	W + 2920	3715	2655	2740	4050	3775	3865	3715

**TABLE 12: RCBC CULVERT - 1V:6H**  
(WINGWALL ANGLES  $\alpha = 15^\circ$ )

SETOUT DIMENSIONS					GRATE SETOUT DIMENSIONS						
D	H	A	B	C	#	M <sub>A1</sub>	M <sub>A2</sub>	M <sub>A3</sub>	M <sub>B</sub>	M <sub>C1</sub>	M <sub>C2</sub>
450	735	3780	1020	W + 2040	1465	2200	2335	3120	1520	1615	1465
600	900	4680	1260	W + 2520	1915	2445	2575	3605	1985	2065	1915
750	1065	5580	1500	W + 3000							REFER NOTE 3
900	1230	6480	1740	W + 3480							REFER NOTE 3
1050	1395	7380	1980	W + 3960							REFER NOTE 3
1200	1560	8280	2220	W + 4440							REFER NOTE 3

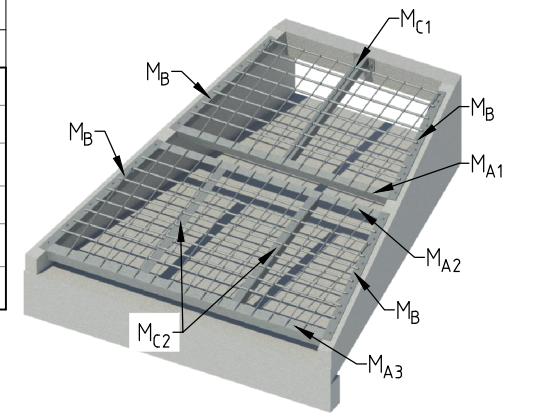
- NOTES:**
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
  - THIS STANDARD DRAWING IS PROVIDED TO ASSIST SETOUT AND QUANTITIES FOR CULVERTS WHICH WILL FEATURE MODIFIED WINGWALLS AND A TRAVERSABLE GRATE UP TO A MAXIMUM SPAN OF 4m. THE BELOW STANDARD DRAWING SHOULD BE READ IN CONJUNCTION WITH THIS SHEET:
    - CS3127 & CS3128 - QUANTITY CALCULATIONS FOR RCP CULVERTS
    - CS3129 & CS3130 - QUANTITY CALCULATIONS FOR RCP CULVERTS
    - CS3133 - NOTE 1 - USE OF THE GRATE
    - CS3133 - WINGWALLS SETOUT & DIMENSION REFERENCES [H], [D], [A], [B], [C]
    - CS3136 - TRAVERSABLE GRATE MAX 4m SPAN & 1V:4H BATTER
    - CS3137 - TRAVERSABLE GRATE MAX 4m SPAN & 1V:6H BATTER
    - CS3138 - GRATE SETOUT REFERENCES [#], [M<sub>A1</sub>], [M<sub>A2</sub>], [M<sub>A3</sub>], [M<sub>B</sub>], [M<sub>C1</sub>], [M<sub>C2</sub>].
  - SETOUT DIMENSIONS ARE NOT PROVIDED AS THE MAXIMUM SPAN WILL EXCEED 4m AND A TRAFFICABLE GRATE SHALL NOT BE INSTALLED. REFER TO THE BELOW STANDARD DRAWINGS FOR CULVERT SETOUT INSTEAD:
    - CS3100 - CULVERT GENERAL NOTES, APRON DETAILS & BASE SLAB EXTENSIONS
    - CS3103 - CS3106 - RCP CULVERT SETOUT, HEADWALL & WINGWALL DETAILS
    - CS3107 - CS3113 - RCBC CULVERT SETOUT, HEADWALL, WINGWALLS AND BASE SLAB DETAILS

TYPICAL GRATE SETOUT DIMENSIONS ARE PROVIDED ON THE FOLLOWING:  
 RCP - 1 RCP CELL OF [D] DIAMETER  
 RCBC - 1 RCBC CULVERT CELL OF 1200mm WIDTH AND (D) DEPTH.

REFER BELOW CALCULATIONS FOR SETOUT OF WINGWALL GRATE FOR MULTIPLE RCP CELLS / RCBC FOR A SPECIFIC WIDTH [W]:

# =  $\frac{([A] - 700\text{mm})}{2}$  [FOR 1V:4H]  
 =  $\frac{([A] - 850\text{mm})}{2}$  [FOR 1V:6H]  
 M<sub>A1</sub> =  $[W] + (2 \times ([\#] + 400\text{mm})) \times \text{TAN}[\alpha]$   
 M<sub>A2</sub> =  $[W] + (2 \times ([\#] + 650\text{mm})) \times \text{TAN}[\alpha]$   
 M<sub>A3</sub> =  $[W] + (2 \times ([2 \times \#] + 650\text{mm})) \times \text{TAN}[\alpha]$   
 M<sub>B</sub> =  $[\#] / \text{COS}[\alpha]$   
 M<sub>C1</sub> =  $[\#] + 150\text{mm}$   
 M<sub>C2</sub> =  $[\#]$

WHERE THE CALCULATED VALUE OF M<sub>A3</sub> EXCEEDS 4m, THE GRATE CANNOT BE INSTALLED, REFER NOTE 3.



3D VISUALISATION - WINGWALL & GRATE  
NOT TO SCALE