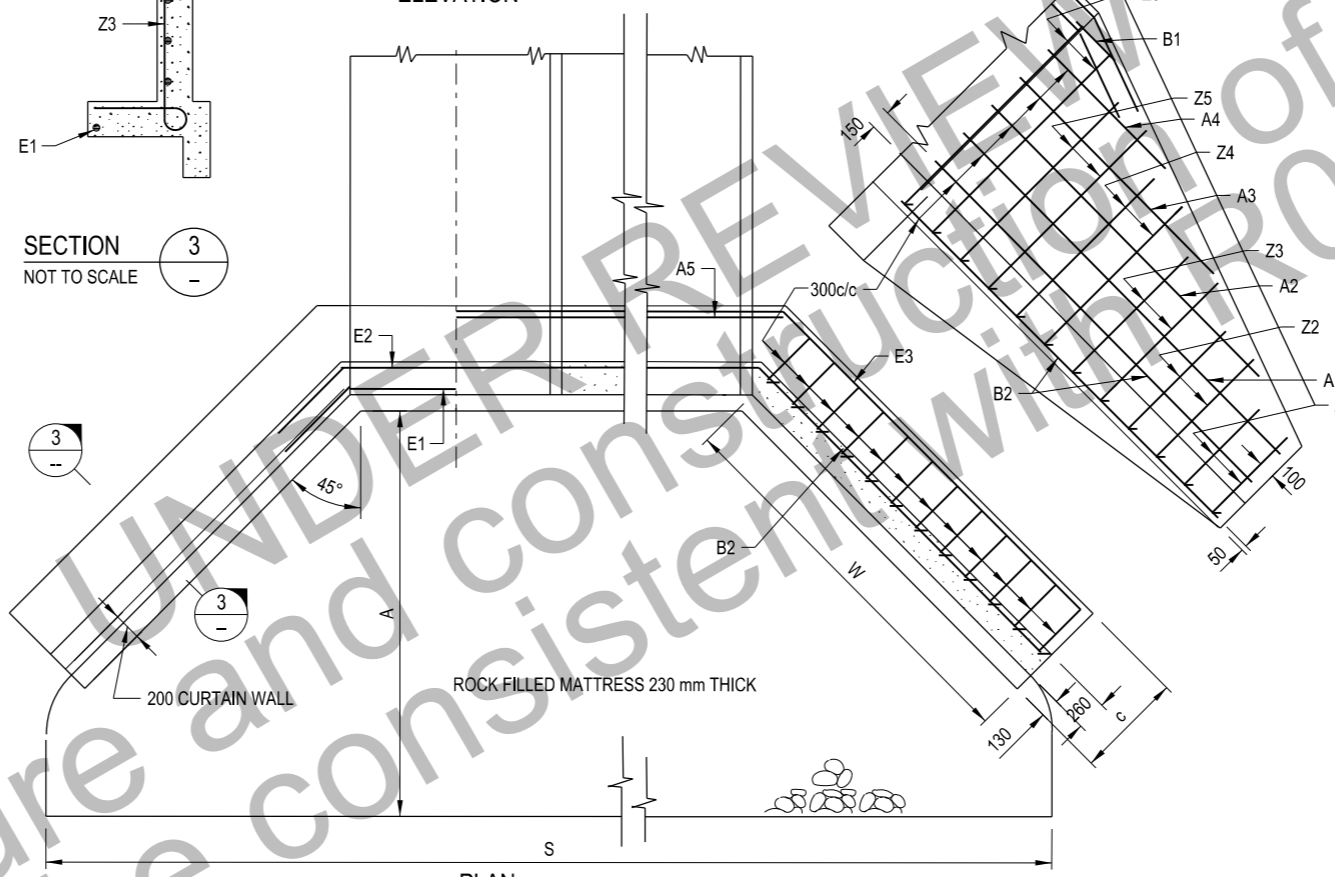
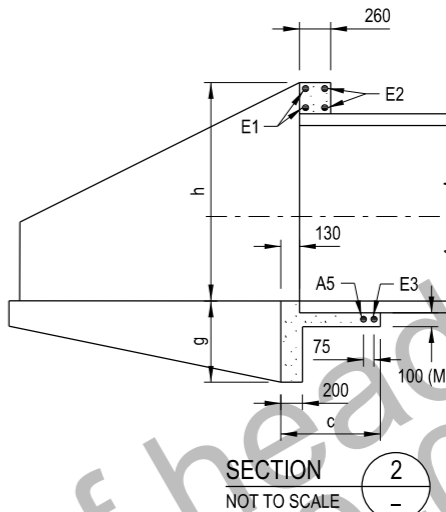
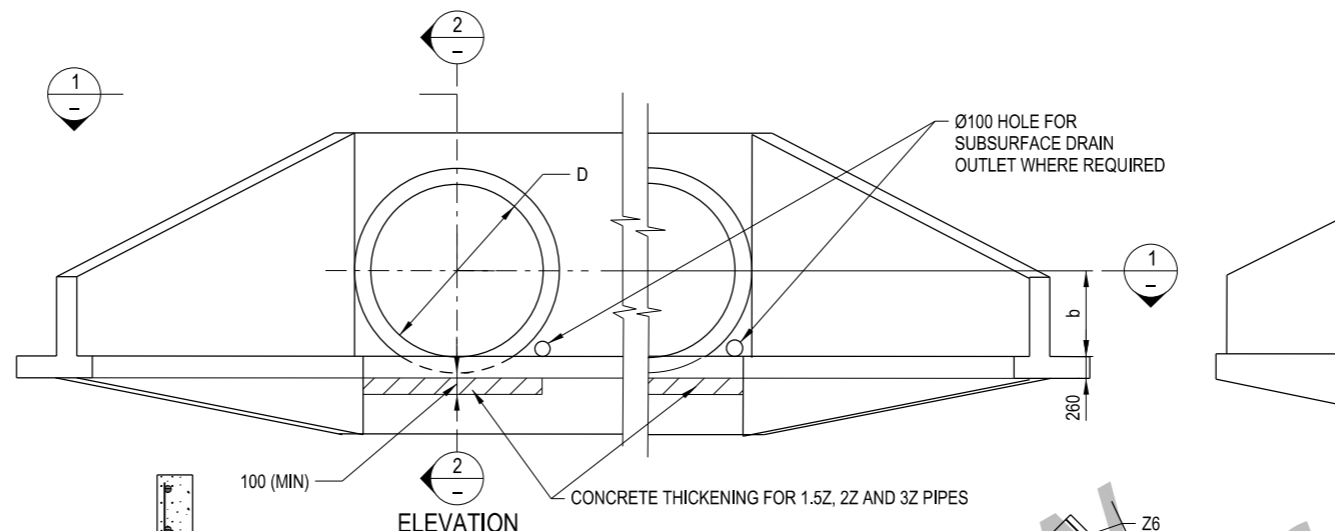


REINFORCEMENT FOR 2 HEADWALLS

| SHAPE | MARK | DIA mm | PIPE DIA mm | L1 mm | L LENGTH mm | No. REQ'D | TOTAL LENGTH m | MASS kg |
|-------|------|--------|-------------|--------|-------------|-----------|----------------|---------|
| | A1 | 12 | 1 050 | 1 850 | 1 850 | 4 | 7.40 | 6.57 |
| | | | 1 200 | 2 250 | 2 250 | 4 | 9.00 | 7.99 |
| | | | 1 350 | 2 400 | 2 400 | 4 | 9.60 | 8.52 |
| | | | 1 500 | 2 800 | 2 800 | 4 | 11.20 | 9.95 |
| | | | 1 800 | 3 300 | 3 300 | 4 | 13.20 | 11.72 |
| | A2 | 12 | 1 050 | 1 200 | 1 200 | 4 | 4.80 | 4.26 |
| | | | 1 200 | 1 550 | 1 550 | 4 | 6.20 | 5.51 |
| | | | 1 350 | 1 900 | 1 900 | 4 | 7.60 | 6.75 |
| | | | 1 500 | 2 350 | 2 350 | 4 | 9.40 | 8.35 |
| | A3 | 12 | 1 800 | 2 950 | 2 950 | 4 | 11.80 | 10.48 |
| | | | 1 350 | 1 250 | 1 250 | 4 | 5.00 | 4.44 |
| | | | 1 500 | 1 700 | 1 700 | 4 | 6.80 | 6.04 |
| | A4 | 12 | 1 800 | 2 350 | 2 350 | 4 | 9.40 | 8.35 |
| | | | 1 800 | 1 750 | 1 750 | 4 | 7.00 | 6.22 |
| | A5 | 12 | 1 350 | 9 860 | 9 860 | 2 | 19.72 | 17.51 |
| 1 500 | | | 10 310 | 10 310 | 2 | 20.62 | 18.31 | |
| 1 800 | | | 11 660 | 11 660 | 2 | 23.32 | 20.71 | |
| | B1 | 12 | 1 050 | 650 | 950 | 4 | 3.80 | 3.37 |
| | | | 1 200 | 1 000 | 1 300 | 4 | 5.20 | 4.62 |
| | | | 1 350 | 700 | 1 000 | 4 | 4.00 | 3.55 |
| | | | 1 500 | 1 100 | 1 400 | 4 | 5.60 | 4.97 |
| | | | 1 800 | 1 100 | 1 400 | 4 | 5.60 | 4.97 |
| B2 | 12 | 1 050 | 1 950 | 2 250 | 8 | 18.00 | 15.98 | |
| | | 1 200 | 2 350 | 2 650 | 8 | 21.20 | 18.83 | |
| | | 1 350 | 2 525 | 2 825 | 8 | 22.60 | 20.08 | |
| | | 1 500 | 2 850 | 3 150 | 8 | 25.20 | 22.38 | |
| E1 | 12 | 1 800 | 3 450 | 3 750 | 8 | 30.00 | 26.64 | |
| | | 1 050 | 8 075 | 9 575 | 4 | 38.30 | 34.01 | |
| | | 1 200 | 8 740 | 10 240 | 4 | 40.96 | 36.37 | |
| E2 | 12 | 1 350 | 9 400 | 10 900 | 4 | 43.60 | 38.72 | |
| | | 1 500 | 10 000 | 11 500 | 4 | 46.00 | 40.85 | |
| | | 1 800 | 11 325 | 12 825 | 4 | 51.30 | 45.55 | |
| | | 1 050 | 8 275 | 9 775 | 4 | 39.10 | 34.72 | |
| E3 | 12 | 1 200 | 8 940 | 10 440 | 4 | 41.76 | 37.08 | |
| | | 1 350 | 9 600 | 11 100 | 4 | 44.40 | 39.43 | |
| | | 1 500 | 10 200 | 11 700 | 4 | 46.80 | 41.56 | |
| | | 1 800 | 11 525 | 13 025 | 4 | 52.10 | 46.26 | |
| Z1 | 12 | 1 050 | 8 500 | 12 700 | 2 | 25.40 | 22.56 | |
| | | 1 200 | 9 170 | 13 970 | 2 | 27.94 | 24.81 | |
| | | 1 350 | 9 825 | 15 225 | 2 | 30.45 | 27.04 | |
| | | 1 500 | 10 580 | 16 580 | 2 | 33.16 | 29.45 | |
| Z2 | 12 | 1 800 | 11 900 | 19 100 | 2 | 38.20 | 33.92 | |
| | | 1 050 | 580 | 1 340 | 4 | 5.36 | 4.76 | |
| | | 1 200 | 600 | 1 360 | 8 | 10.88 | 9.66 | |
| | | 1 350 | 700 | 1 450 | 8 | 11.60 | 10.30 | |
| Z3 | 12 | 1 500 | 650 | 1 650 | 8 | 13.20 | 11.72 | |
| | | 1 800 | 650 | 1 650 | 8 | 13.20 | 11.72 | |
| | | 1 050 | 740 | 1 520 | 8 | 12.16 | 10.88 | |
| | | 1 200 | 900 | 1 650 | 8 | 13.20 | 11.72 | |
| Z4 | 12 | 1 350 | 1 000 | 1 750 | 8 | 14.00 | 12.43 | |
| | | 1 500 | 950 | 1 950 | 8 | 15.60 | 13.85 | |
| | | 1 800 | 1 000 | 2 000 | 8 | 16.00 | 14.21 | |
| | | 1 050 | 1 010 | 1 790 | 8 | 14.32 | 12.72 | |
| Z5 | 12 | 1 200 | 1 200 | 1 950 | 8 | 15.60 | 13.85 | |
| | | 1 350 | 1 300 | 2 050 | 8 | 16.40 | 14.56 | |
| | | 1 500 | 1 200 | 2 200 | 8 | 17.60 | 15.63 | |
| | | 1 800 | 1 250 | 2 250 | 8 | 18.00 | 15.98 | |
| Z6 | 12 | 1 050 | 1 320 | 2 100 | 8 | 16.80 | 14.92 | |
| | | 1 200 | 1 500 | 2 250 | 8 | 18.00 | 15.98 | |
| | | 1 350 | 1 575 | 2 350 | 8 | 18.60 | 16.52 | |
| | | 1 500 | 1 500 | 2 500 | 8 | 20.00 | 17.76 | |
| Z5 | 12 | 1 800 | 1 600 | 2 600 | 8 | 20.80 | 18.47 | |
| | | 1 500 | 1 800 | 2 800 | 8 | 22.40 | 19.89 | |
| Z6 | 12 | 1 800 | 1 850 | 2 850 | 8 | 22.80 | 20.25 | |
| | | 1 800 | 2 150 | 3 150 | 8 | 25.20 | 22.38 | |



| | | | | | | |
|-------|----------------------------------|-------|-------|-------|-------|-------|
| D | NOMINAL PIPE DIAMETER (mm) | 1 050 | 1 200 | 1 350 | 1 500 | 1 800 |
| h | HEADWALL HEIGHT (mm) | 1 380 | 1 550 | 1 700 | 1 900 | 2 270 |
| g | CURTAIN WALL DEPTH (mm) | 600 | 600 | 700 | 700 | 750 |
| c | CURTAIN WALL WIDTH (mm) | 700 | 700 | 700 | 900 | 900 |
| b | WINGWALL HEIGHT (mm) | 450 | 450 | 530 | 530 | 600 |
| W | WINGWALL LENGTH (mm) | 1 930 | 2 300 | 2 490 | 2 850 | 3 400 |
| CONC. | IN 2 HEADWALLS (m ²) | 10.2 | 13.0 | 14.7 | 17.9 | 22.4 |
| A | APRON WIDTH (m) | 5.5 | 6.1 | 6.7 | 7.3 | 8.5 |
| S | APRON LENGTH (m) | 11.5 | 12.6 | 13.5 | 14.4 | 16.6 |

- NOTES**
- CONCRETE STRENGTH GRADES SHOWN ARE FOR EXPOSURE CLASSIFICATION A2. REFER TO AS3600-2009, FOR CONCRETE STRENGTH GRADE, COVER TO REINFORCEMENT AND FOR OTHER EXPOSURE CLASSIFICATIONS.
 - CLEAR COVER TO OUTER FACE OF REINFORCEMENT 50 mm UNLESS OTHERWISE SHOWN.
 - CONCRETE GRADE N25.
 - ALL BARS TO BE GRADE 400Y TO AS4671-2001.
 - SPACING FOR MULTIPLE PIPES AS SPECIFIED IN R0240-01.

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

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|---------|-----------------------------|---------|-----------------|----------------------------------|---|--|--|---|--------------------------------------|--|--|----------------------------------|
| QR CODE | SCAN TO CHECK DOCUMENT VER. | REV | DATE | AMENDMENT / REVISION DESCRIPTION | WVR No. | APPROVAL | ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN | CONTACT DETAILS | ISSUED | Transport Roads & Maritime Services | STANDARD DRAWING ROAD DESIGN ENGINEERING R0210 STORMWATER DRAINAGE SERIES - HEADWALLS CONCRETE HEADWALLS FOUR CELL Ø1050 mm TO Ø1800 mm WITH ROCK MATTRESS PROTECTION (2 TO 1 BATTER OR STEEPER) SHEET 1 OF 1 | A3 |
| | 1 | 9/10/17 | Added Watermark | SFR | SEND FEEDBACK ON THIS STANDARD DRAWING TO : technologystandards@rms.nsw.gov.au | MANAGER ROAD POLICY, SPECIFICATIONS & TECHNOLOGY | DATE 20.01.17 | PREPARED BY ENGINEERING SERVICES ROAD POLICY, SPECIFICATIONS AND TECHNOLOGY | STANDARD DRAWING No. R0210-12 | | | |
| | | | | | | | | | | STATUS ISSUED | EDMS No. DS2014/005800 | ORIGINAL ISSUE DATE JANUARY 2017 |