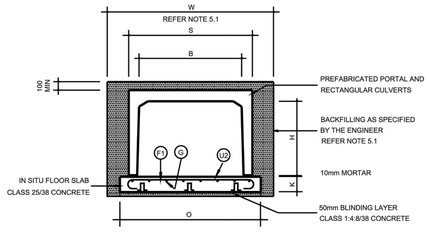
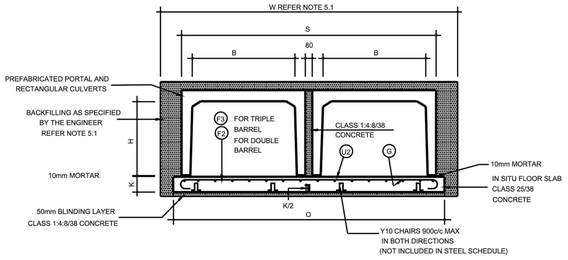
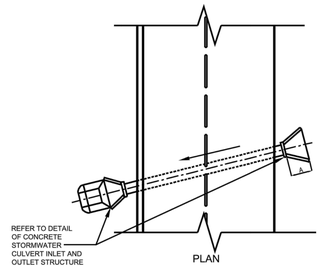



CROSS SECTION: SINGLE BARREL

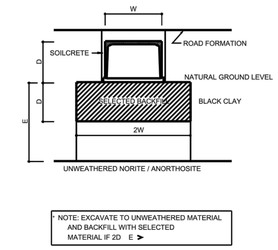



CROSS SECTION: MULTI-BARREL



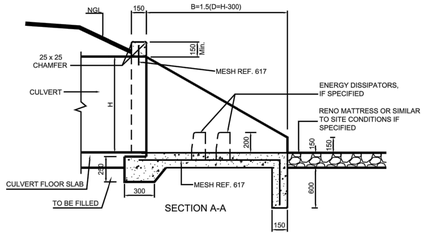

PLAN

TYPICAL DETAIL OF A STORMWATER CULVERT CROSSING THE ROAD

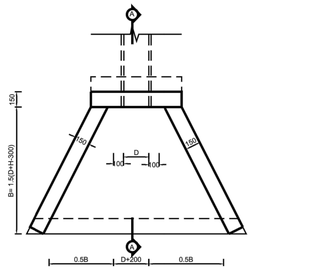



* NOTE: EXCAVATE TO UNWEATHERED MATERIAL AND BACKFILL WITH SELECTED MATERIAL IF 2D ≥ E

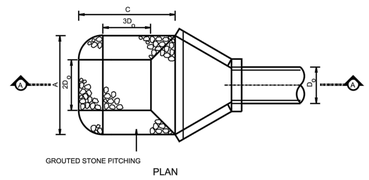
TREATMENT OF DRAINAGE CULVERTS IN BLACK CLAY AREAS




SECTION A-A



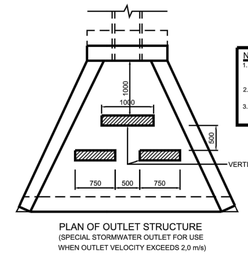

PLAN OF INLET AND OUTLET STRUCTURE




PLAN

NOTES

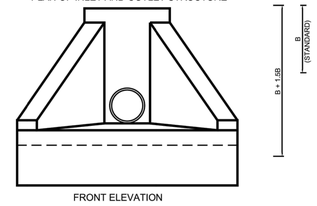
1. REFER TO DRG. JRA-SD-S018 OR JRA-SD-S026 FOR DETAILS OF THE OUTLET STRUCTURE.
2. GROUTED STONE PITCHING TO BE DONE ACCORDING TO THE SABS 1200 STANDARDIZED SPECIFICATIONS.
3. Do = HEIGHT OF OUTLET PIPE CULVERT/BOX CULVERT.



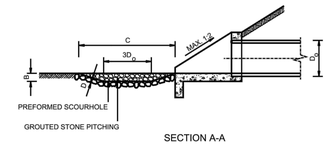

PLAN OF OUTLET STRUCTURE
(SPECIAL STORMWATER OUTLET FOR USE WHEN OUTLET VELOCITY EXCEEDS 2,0 m/s)

NOTES:

1. ALL CONCRETE IN INLET AND OUTLET STRUCTURE TO BE CLASS 20/19 WITH A WOOD FLOAT FINISH WITH 25 x 25 CHAMFER ON ALL EXPOSED EDGES.
2. MINIMUM COVER TO REINFORCEMENT = 25mm OR 40mm ON THE GROUND.
3. ALL ROAD WORKS TO COMPLY WITH SABS 1200 SPECIFICATIONS.




FRONT ELEVATION

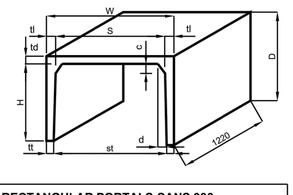



SECTION A-A

| DIMENSIONS | | |
|---|---|---|
| FOR SHALLOW STILLING BASIN (SEE NOTE) | DIMENSIONS | FOR DEEP STILLING BASIN (SEE NOTE) |
| $\frac{0{,}0552\ (Q^{1{,}333})}{D_o^{2{,}333}}$ (m) | $D_{50}$ | $\frac{0{,}0382\ (Q^{1{,}333})}{D_o^{2{,}333}}$ (m) |
| $5D_o$ (m) | A | $8D_o$ (m) |
| $0{,}5\ D_o$ (m) | B | $D_o$ (m) |
| $6D_o$ (m) | C | $9D_o$ (m) |
| $2D_{50}$ (m) | D | $2D_{50}$ (m) |

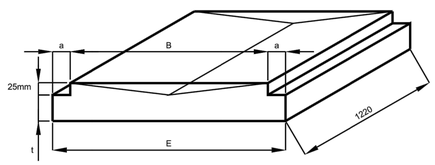
NOTE: REFER TO THE "NATIONAL TRANSPORT COMMISSION HANDBOOK FOR ROAD DRAINAGE" FOR THE APPLICABILITY OF THE VARIOUS TYPES OF EROSION PROTECTION

DETAIL OF CONCRETE STORMWATER CULVERT INLET AND OUTLET STRUCTURE



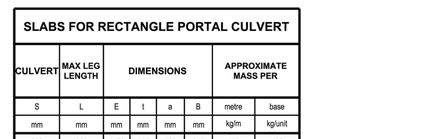

| RECTANGULAR PORTALS-SANS 986 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal Size | | Dimensions | | | | | | | | Water way area | Approximate mass |
| S x H | | W | D | St | td | tl | tt | c | d | per m | per unit |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | $m^2$ | kg/m | kg/unit |
| 900 x | 300 | 1100 | 400 | 920 | 100 | 100 | 90 | 50 | 100 | 0.26 | 444 | 451 |
| 900 x | 450 | 1100 | 550 | 930 | 100 | 100 | 85 | 50 | 100 | 0.40 | 511 | 624 |
| 1200 x | 450 | 1440 | 570 | 1230 | 120 | 120 | 105 | 50 | 100 | 0.53 | 720 | 878 |
| 900 x | 600 | 1100 | 700 | 940 | 100 | 100 | 80 | 50 | 100 | 0.54 | 575 | 702 |
| 750 x | 750 | 920 | 840 | 800 | 90 | 85 | 60 | 50 | 100 | 0.57 | 507 | 619 |
| 1200 x | 600 | 1440 | 720 | 1240 | 120 | 120 | 100 | 50 | 100 | 0.72 | 799 | 975 |
| 1800 x | 1200 | 2100 | 1350 | 1880 | 150 | 150 | 110 | 100 | 300 | 2.19 | 1695 | 2068 |
| 1200 x | 1200 | 1440 | 1320 | 1280 | 120 | 120 | 80 | 50 | 100 | 1.47 | 1078 | 1315 |

PRECAST CONCRETE PORTAL CULVERTS: STANDARD DIMENSIONS

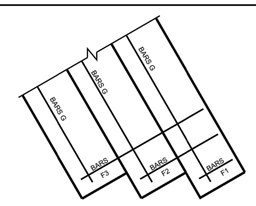



| SLABS FOR RECTANGLE PORTAL CULVERT | | | | | | | |
|---|---|---|---|---|---|---|---|
| CULVERT | MAX LEG LENGTH | DIMENSIONS | | | | APPROXIMATE MASS PER | |
| S | L | E | t | a | B | metre | base |
| mm | mm | mm | mm | mm | mm | kg/m | kg/unit |
| 900 | 900 | 1150 | 115 | 120 | 910 | 400 | 488 |
| 1200 | 1200 | 1480 | 130 | 5 | 1210 | 574 | 701 |

PRECAST CONCRETE SLABS FOR PORTAL CULVERTS




LONGITUDINAL JOINT IN FLOOR SLAB




REINFORCEMENT IN SKEWED MULTI-BARREL CULVERTS

CAST IN SITU FLOOR SLABS FOR PREFABRICATED BOX CULVERTS

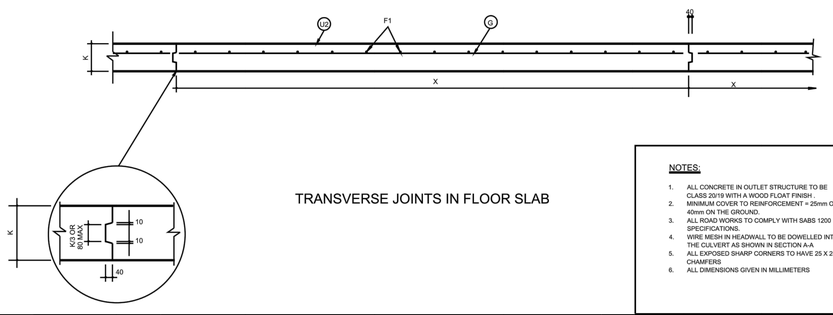
STEEL SCHEDULE

| DIMENSIONS | | | | | REINFORCEMENT | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ** | | | |
| B | H | * S | * O | K | BARS F | L | CUT LENGTH | BENDING | BAR G | BENDING |
| 1 x 600 | 300 | 775 | 980 | 130 | Y12-225 | 900 | 1100 | | 4Y10-250 | |
| 2 x 600 | 450 | 1630 | 1840 | 130 | Y12-225 | 1760 | 1950 | | 8Y10-250 | |
| 3 x 600 | 600 | 2480 | 2690 | 130 | Y12-225 | 2610 | 2800 | | 11Y10-250 | |
| 1 x 750 | 300 | 940 | 1150 | 130 | Y12-180 | 1060 | 1250 | | 5Y10-250 | |
| 2 x 750 | 450 | 1960 | 2170 | 130 | Y12-180 | 2080 | 2300 | | 8Y10-250 | |
| 3 x 750 | 600 | 2980 | 3190 | 130 | Y12-180 | 3110 | 3300 | | 12Y10-250 | |
| 1 x 900 | 300 | 1100 | 1310 | 150 | Y12-160 | 1230 | 1450 | | 5Y10-250 | |
| 2 x 900 | 450 600 | 2280 | 2490 | 150 | Y12-160 | 2410 | 2600 | | 10Y10-250 | |
| 3 x 900 | 900 | 3460 | 3670 | 150 | Y12-160 | 3590 | 3800 | | 15Y10-250 | |
| 1 x 1200 | 450 600 | 1420 | 1630 | 175 | Y12-160 | 1550 | 1750 | | 8Y10-200 | |
| 2 x 1200 | 900 | 2920 | 3130 | 175 | Y12-160 | 3050 | 3150 | | 15Y10-200 | |
| 3 x 1200 | 1200 | 4420 | 4630 | 175 | Y12-160 | 4550 | 4750 | | 22Y10-200 | |
| 1 x 1500 | 600 | 1770 | 1980 | 175 | Y12-130 | 1900 | 2100 | | 6Y10-200 | |
| 2 x 1500 | 900 1200 | 3620 | 3830 | 175 | Y12-130 | 3750 | 3950 | | 18Y10-200 | |
| 3 x 1500 | 1500 | 5470 | 5680 | 175 | Y12-130 | 5600 | 5800 | | 27Y10-200 | |
| 1 x 1800 | 600- | 2080 | 2290 | 200 | Y12-125 | 2210 | 2450 | | 13Y10-180 | |
| 2 x 1800 | 1800 | 4230 | 4440 | 200 | Y12-125 | 4360 | 4600 | | 28Y10-150 | |
| 1 x 2400 | 900- | 2710 | 2920 | 225 | Y16-170 | 2840 | 3200 | | 19Y10-150 | |
| 2 x 2400 | 2400 | 5500 | 5710 | 225 | Y16-170 | 5630 | 6000 | | 37Y10-150 | |
| 1 x 3000 | 900- 3000 | 3320 | 3530 | 250 | Y16-150 | 3450 | 3800 | | 23Y10-150 | |

PLACE HOOK AT ALTERNATIVE ENDS

LENGTH VARIES WITH CULVERT LENGTH UNIT LENGTH NOT TO EXCEED 10 000

** REFER TO NOTE 4.3 * REFER TO NOTE 4.2




TRANSVERSE JOINTS IN FLOOR SLAB

NOTES:

1. ALL CONCRETE IN OUTLET STRUCTURE TO BE CLASS 20/19 WITH A WOOD FLOAT FINISH .
2. MINIMUM COVER TO REINFORCEMENT = 25mm OR 40mm ON THE GROUND.
3. ALL ROAD WORKS TO COMPLY WITH SABS 1200 SPECIFICATIONS.
4. WIRE MESH IN HEADWALL TO BE DOWELLED INTO THE CULVERT AS SHOWN IN SECTION A-A
5. ALL EXPOSED SHARP CORNERS TO HAVE 25 X 25 CHAMFERS
6. ALL DIMENSIONS GIVEN IN MILLIMETERS

| No. | DATE | AMENDMENTS |
|---|---|---|
| | | |

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CHECKED BY
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SIGNATURE:
DATE:

DIRECTOR APPROVAL:
NAME: TFV NDOU
Pr Tech No: 20043215
SIGNATURE:
DATE:

EMPLOYER:
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P.O. BOX 1293
SENWABARWANA
0790
TEL: (015) 5007100
TEM: (015) 505 0568

UPGRADING OF AVON INTERNAL ROADS AND STORM WATER (PHASE III)

PORTAL CULVERT DETAILS

| SCALE | DRAWING No | VER No |
|---|---|---|
| AS SHOWN | T1508DD04CD01 | V01 |
| ON A0 | | SHEET 1 OF 2 |