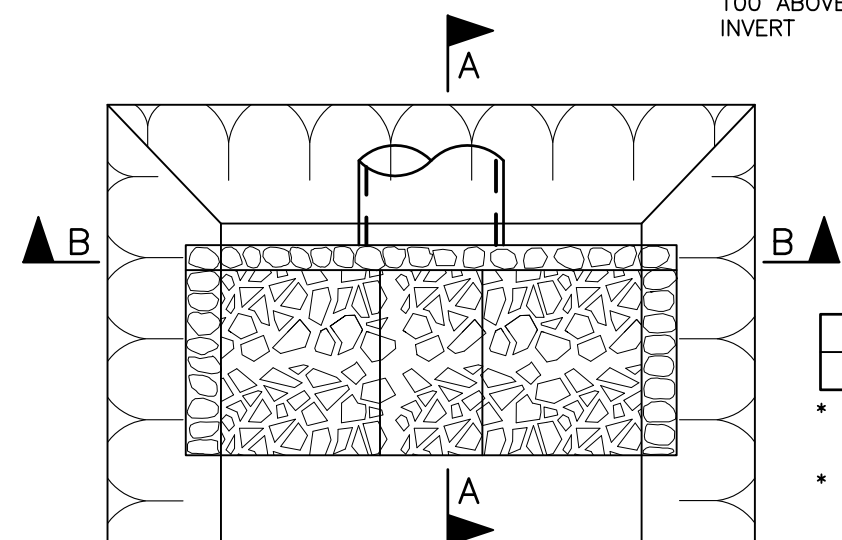
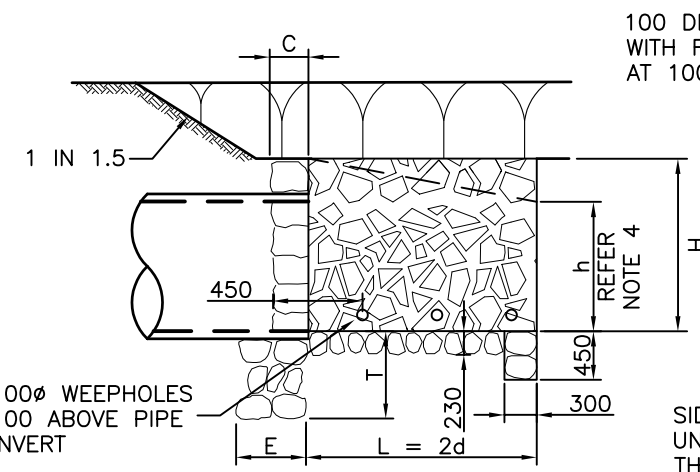


SECTION B-B



TYPE A PLAN



SECTION A-A

| PIPE SKEW | 5°-15° | 16°-25° | 26°-35° | 36°-45° |
|-------------|--------|---------|---------|---------|
| SKEW FACTOR | 1.02 | 1.07 | 1.16 | 1.32 |

* FOR SKEWED PIPES - MULTIPLY W1 BY THE SKEW FACTOR.
 * FOR MULTIPLE PIPES - INCREASE W1 BY DIMENSION 'X' FOR EACH ADDITIONAL PIPE ('X' BEING THE DISTANCE FROM PIPE ϕ TO PIPE ϕ).

MULTIPLE/SKEW PIPES

| DIMENSION | PIPE DIAMETER 'd' | | | | | | | | | | | | | |
|-----------|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 300 | 375 | 450 | 525 | 600 | 675 | 750 | 900 | 1050 | 1200 | 1350 | 1500 | 1650 | 1800 |
| W1* | 1095 | 1285 | 1485 | 1820 | 2015 | 2200 | 2550 | 2720 | 3300 | 3685 | 4065 | 4450 | 4810 | 5175 |
| C | 150 | 150 | 150 | 230 | 230 | 230 | 300 | 300 | 300 | 300 | 300 | 300 | 300 | 300 |
| E | 450 | 450 | 450 | 450 | 450 | 450 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| H | 485 | 565 | 650 | 800 | 885 | 960 | 1120 | 1275 | 1435 | 1595 | 1755 | 1905 | 2065 | 2215 |
| T | 450 | 450 | 450 | 450 | 450 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 |
| 'X' | 510 | 595 | 685 | 765 | 850 | 935 | 1015 | 1180 | 1345 | 1510 | 1675 | 1835 | 2000 | 2165 |

DIMENSIONS

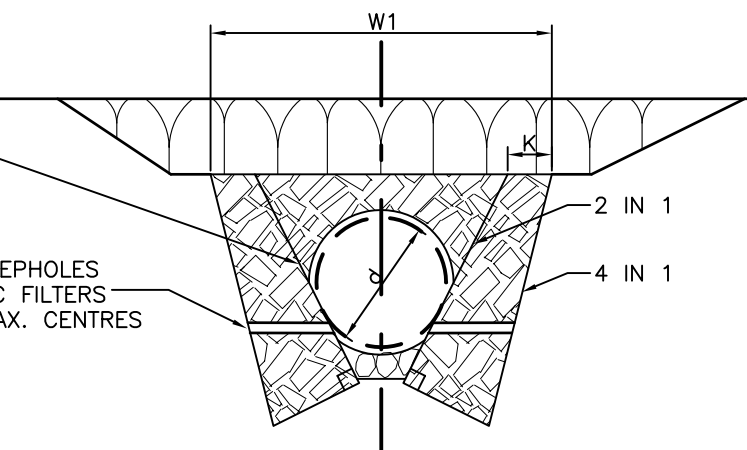
TYPE A INLET FOR d = 300 TO 1200
TYPE A OUTLET FOR d = 300 TO 1800

SIDEWALLS TO DECREASE UNIFORMLY TO 230 THICK AND BATTER FROM 2 IN 1 TO 1 IN 1

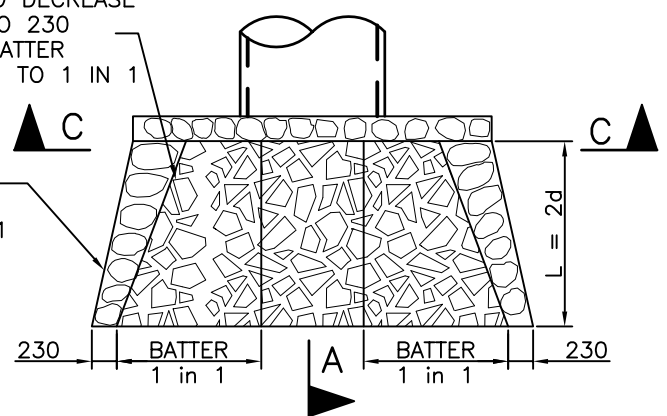
100 DIA WEEPHOLES WITH FABRIC FILTERS AT 1000 MAX. CENTRES

SIDEWALLS TO DECREASE UNIFORMLY TO 230 THICK AND BATTER FROM 2 IN 1 TO 1 IN 1

SIDEWALLS TO DECREASE UNIFORMLY TO 230 THICK AND BATTER FROM 2 IN 1 TO 1 IN 1



SECTION C-C



TYPE B PLAN

| DIMENSION | PIPE DIAMETER 'd' | | | |
|-----------|-------------------|------|------|------|
| | 1350 | 1500 | 1650 | 1800 |
| W1* | 2960 | 3200 | 3755 | 4000 |
| B | 760 | 840 | 915 | 990 |
| C | 300 | 300 | 300 | 300 |
| E | 600 | 600 | 600 | 600 |
| H | 1755 | 1905 | 2065 | 2220 |
| T | 450 | 450 | 450 | 450 |
| K | 300 | 300 | 450 | 450 |
| X | 1675 | 1835 | 2000 | 2165 |

DIMENSIONS

TYPE B INLET AND OUTLET FOR d = 1350 TO 1800

NOTES:

- DESIGN ALLOWABLE BEARING PRESSURE 75 KPa. WHERE THIS BEARING PRESSURE CANNOT BE OBTAINED, THE SUPERINTENDENT MAY DIRECT THAT A WIDER FOOTING BE USED.
- UNREINFORCED CONCRETE CLASS 20 MPa/20. REINFORCED CONCRETE CLASS 32 MPa/20. CONCRETE COVER TO 50 UNLESS SHOWN OTHERWISE.
- IN TIDAL AREAS WHERE MESH REINFORCEMENT IS SPECIFIED, CONCRETE IS TO BE SULPHATE RESISTANT GRADE S40.
- IN EMBANKMENT SITUATIONS, THE HEIGHT OF THE WING WALL AT THE TOE SHOULD BE REDUCED TO "h" SO THAT THE SLOPE OF THE TOP OF THE WING WALL EQUALS THE ADJACENT EMBANKMENT BATTER. (REFER TO PROJECT DRAWINGS FOR VALUE OF "h").
- SEE PROJECT DRAWINGS FOR THE FOLLOWING: NUMBER AND DIAMETER OF PIPES; SKEW ANGLES OF PIPES, IF APPLICABLE; INVERT LEVELS OF PIPES; HEIGHT OF WING WALL "h" AT TOE IF APPLICABLE.
- FOR QUANTITIES REFER UMS 371.
- SCOUR PROTECTION IS GENERALLY REQUIRED DOWNSTREAM OF THE APRON UNDER ANY ONE OF THE FOLLOWING CONDITIONS:
 - AVERAGE OUTLET VELOCITY EXCEEDS THE NON-EROSIVE VELOCITY.
 - AVERAGE OUTLET VELOCITY EXCEEDS 2m/s.
 - OUTLET JET IS EXPECTED TO STRIKE AN UNPROTECTED CHANNEL BANK WITHIN A DISTANCE OF 10 TIMES THE PIPE DIAMETER.
- BED SCOUR MAY BE CONTROLLED BY THE FOLLOWING METHODS:
 - REDUCING THE OUTLET VELOCITY BY INSTALLING AN EXPANSION CHAMBER.
 - INSTALLING AN ENERGY DISSIPATOR.
 - ARMOURING THE BED WITH ROCK, USUALLY OVER A MAXIMUM DISTANCE OF 8 TIMES THE PIPE DIAMETER.
- PREFERRED POSITIONING OF STORMWATER PIPE OUTLET:
 - SETBACK FOR MORE THAN A DISTANCE OF 3 TIMES THE BANK HEIGHT MEASURED FROM THE TOE OF THE WATERCOURSE BANK.
 - FOR 'NARROW' RECEIVING WATERCOURSE, ANGLE THE OUTLET PIPE IN THE DIRECTION OF THE MAIN FLOW. AN APPROACH ANGLE IN THE RANGE OF 45° TO 60° MEASURED FROM THE BANK IS RECOMMENDED.
 - LIMIT THE MAXIMUM HEIGHT BETWEEN THE OUTLET INVERT AND THE RECEIVING CHANNEL INVERT OR EXPECTED WATER LEVEL TO $0.247/d^{0.5}$ WHERE d IS THE OUTLET PIPE DIAMETER IN METRES.
- WHERE DIRECTED, INSTALL 1200 HIGH FENCE ALONG HEADWALL AND WINGWALLS:
 - FOR 1000-1500 DROP HEIGHT, PROVIDE GALVANISED TUBULAR HANDRAIL IN ACCORDANCE WITH UMS 241, GALVANISED WELD MESH FENCING IN ACCORDANCE WITH UMS 242 OR PEDESTRIAN SAFETY FENCING IN ACCORDANCE WITH UMS 243.
 - FOR >1500 DROP HEIGHT, PROVIDE POWDER COATED STEEL FENCING (HUNTER ROD TOP OR APPROVED EQUIVALENT) INSTALLED USING VANDAL PROOF FIXINGS. DESIGN TO RESIST A MINIMUM STATIC LOAD OF 1.5 kN/m AS PER CLAUSE 3.6 OF AS 1170-2002.
- USE OF EQUIVALENT PRECAST PRODUCTS IS PERMITTED.
- DIMENSIONS IN MILLIMETRES (U.N.O.).

| ISSUE | AMENDMENT | DRAWN DATE | CHK'D DATE | APPR'D DATE |
|-------|------------------|------------|------------|-------------|
| B | Note 10 Modified | DJL 07/07 | BH 08/07 | BH 08/07 |
| A | ORIGINAL ISSUE | April '01 | May '01 | June '01 |

| | | | | |
|---|------------------|--------------------|------|-----------|
| DESIGN AUTHORIZED FOR ISSUE B. BALL SIGNATURE ON ORIGINAL DATED 29/6/01 | DESIGN | STD DWG GROUP | DATE | April '01 |
| MANAGER ASSET SUPPORT - R.P.E.O. 3.8.5.2 | DRAWN | CITY DESIGN | DATE | April '01 |
| DESIGN APPROVED B. HANSEN SIGNATURE ON ORIGINAL DATED 27/6/01 | CHECKED | M. STEER | DATE | May '01 |
| PRINCIPAL ASSET OFFICER ROADS & DRAINAGE | DRAWING FILENAME | UMS 342 | | |
| | ASSOCIATED PLANS | SUPERSEDES WS 53-2 | | |



BRISBANE CITY COUNCIL - URBAN MANAGEMENT DIVISION

INLETS AND OUTLETS (STONEPITCHED) STORMWATER DRAINS

SCALE: NOT TO SCALE
 DWG No. **UMS 342**
 ORIGINAL SIZE: A3 REVISION: B