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<th>DRAWING No.</th>
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<tr>
<td>SEQ-SEW-1308-1</td>
<td>TYPICAL MAINTENANCE COVER AND SURROUND DETAIL</td>
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<td>SEQ-SEW-1308-3</td>
<td>MAINTENANCE HOLE COVER SEWER - CLASS B - CONCRETE INFILL</td>
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<tr>
<td>SEQ-SEW-1308-5</td>
<td>MAINTENANCE HOLE COVER SEWER - CLASS B - BOLT DOWN</td>
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<td>MAINTENANCE HOLE COVER SEWER - CLASS B - BOLT DOWN</td>
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<td>&quot;Y&quot; TYPE MAINTENANCE HOLE SEWERS DN600 AND DN750</td>
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<td>SEQ-SEW-1310-1</td>
<td>&quot;Z1&quot; TYPE NON-TRAFFICABLE TYPICAL GRP MH OPTION DN1200</td>
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<td>SEQ-SEW-1311-1</td>
<td>&quot;Z2&quot; TYPE TYPICAL TUNNEL JACKING SHAFT - CAISSON OPTION</td>
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<td>SEQ-SEW-1312-1</td>
<td>&quot;Z3&quot; TYPE TYPICAL TUNNEL RECEIVAL SHAFT MANHOLE OPTION</td>
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<td>SEQ-SEW-1313-1</td>
<td>MAINTENANCE HOLES SEWER CONNECTION DETAILS</td>
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<td>SEQ-SEW-1314-1</td>
<td>MAINTENANCE STRUCTURES FOR DN225 AND SMALLER RIGS</td>
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<td>SEQ-SEW-1315-1</td>
<td>PE NUSEWERS TYPICAL MAINTENANCE SHAFT AND TERMINAL ENTRY POINT</td>
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<td>SEQ-SEW-1316-1</td>
<td>PE NUSEWERS TYPICAL MAINTENANCE STRUCTURE COVER FRAME AND SUPPORT DETAILS</td>
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<td>SEQ-SEW-1400-1</td>
<td>BURIED CROSSINGS TYPICAL SIPHON ARRANGEMENT</td>
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<td>SEQ-SEW-1401-1</td>
<td>BURIED CROSSINGS RAILWAYS</td>
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<td>SEQ-SEW-1402-1</td>
<td>BURIED CROSSINGS TYPICAL MAINTENANCE HOLES RAILWAYS</td>
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<td>SEQ-SEW-1403-1</td>
<td>BURIED CROSSINGS BORED AND JACkED ENCASING PIPE DETAILS</td>
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<td>SEQ-SEW-1404-1</td>
<td>AERIAL CROSSINGS AERUIC</td>
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<td>SEQ-SEW-1405-1</td>
<td>AERIAL CROSSINGS AERIAL PROTECTION GRILLE</td>
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<td>SEQ-SEW-1407-1</td>
<td>VENTILATION SYSTEMS INDUCT VENT</td>
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<td>SEQ-SEW-1408-1</td>
<td>WATER SEAL ARRANGEMENTS TYPICAL MAINTENANCE HOLES TYPE</td>
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<td>SEQ-SEW-1412-1</td>
<td>OVERFLOW DETAILS FROM PUMP WELL OR MANHOLE SHIELDED OUTLET</td>
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<tr>
<td>SEQ-SEW-1412-2</td>
<td>OVERFLOW DETAIL SHIELDED OUTLET</td>
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<tr>
<td>SEQ-SEW-1500-1</td>
<td>INSERTIONS AND REPAIR SYSTEMS TYPICAL OVERFLOW ARRANGEMENT WITH SCREENED OUTLET</td>
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<td>SEQ-SEW-1501-1</td>
<td>INSERTIONS AND REPAIR SYSTEMS TYPICAL INSERTION OF JUNCTIONS</td>
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<tr>
<td>SEQ-SEW-1502-1</td>
<td>INSERTIONS AND REPAIR SYSTEMS TYPICAL MAINTENANCE STRUCTURES</td>
<td>A</td>
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</tbody>
</table>
SITE PLAN
SCALE 1 : 500

PROPERTY CONNECTIONS HAVE BEEN DESIGNED TO
CONTROL THE REQUIRED SERVICE AREA OF EACH
LOT AT A GRADE OF 1:60 AND A MAXIMUM DEPTH
OF PROPERTY CONNECTION AT 1.5 m. UNLESS
OTHERWISE STATED. FOR JUNCTION DETAILS
REFER SEQ-SEW-1106-1 TO SEQ-SEW-1106-7

SEWER DISUSED

SEWAGE STANDARD DRAWING

DESIGN LAYOUT
NUSEWERS
TYPICAL LOCALITY & SITE PLAN

REV. No. DESCRIPTION

DATE

AUTHE

NOT TO SCALE
NOTES:
1. ALL LEVELS, CHAINAGES & DISTANCES IN METRES.
2. REFER SEQ-SEW-1200 SERIES FOR BEDDING & BACKFILL REQUIREMENTS.
3. REFER SEQ-SEW-1300 SERIES FOR MAINTENANCE STRUCTURE TYPES AND DROPS AND FOR NUSEWERS (PE).
4. PIPE MATERIAL TO BE SPECIFIED AS REQUIRED BY NUSEWERS (PE).
5. REFER SEQ-SEW-1106 SERIES FOR PROPERTY CONNECTION TYPES.
6. DETAILS OF COMPOUND BENDS ARE TO BE SHOWN ON DESIGN DRAWINGS.
7. REFER TO SEQ-SEW-1206-1 FOR BULKHEADS AND TRENCHSTOP DETAILS.
8. FOR SPACING REQUIREMENTS REFER TABLE 8.1 OF SEWERAGE CODE.
ENVIRONMENTAL CONDITIONS
PLACE ON YOUR DRAWING NOTES AS RECEIVED IN YOUR APPROVAL LETTER FROM THE ENVIRONMENTAL REGULATOR OR MANAGER. IF NOTES RELEVANT TO THIS ESTATE ARE NOT SPECIFIED IN YOUR APPROVAL LETTER, TYPICAL NOTES AS FOLLOWS SHALL BE PLACED ON ALL DRAWINGS.

VEGETATION PROTECTION
A. TREES LOCATED ALONG THE FOOTPATH SHALL BE, TRANSPLANTED PRIOR TO CONSTRUCTION, OR REPLACED IF DESTROYED.
B. WHEN WORKING WITHIN 4 m OF TREES, RUBBER OR HARDWOOD GIRDLES SHALL BE CONSTRUCTED WITH 1.8 m BATTENS CLOSELY SPACED AND ARRANGED VERTICALLY FROM GROUND LEVEL. GIRDLES SHALL BE STRAPPED TO TREES PRIOR TO CONSTRUCTION AND REMAIN UNTIL COMPLETION.
C. TREE ROOTS SHALL BE TUNNELLED UNDER, RATHER THAN SEVERED.
D. ANY TREE LOPPING REQUIRED SHOULD BE UNDERTAKEN BY AN APPROVED ARBORIST.

SOIL
A. TOPSOIL AND SUBSOIL SHALL BE STOCKPILED SEPARATELY.
B. CARE SHALL BE TAKEN TO PREVENT SEDIMENT FROM ENTERING THE STORMWATER SYSTEM. THIS MAY INVOLVE PLACING APPROPRIATE SEDIMENT CONTROLS AROUND STOCKPILES.
C. ACID SULPHATE SOILS EXIST IN THE WORKS AREA. THE OUTPUTS FROM THE RISK ASSESSMENT BASED ON THE QUEENSLAND ACID SULPHATE SOIL TECHNICAL MANUAL REQUIRE THAT ACID SULPHATE SOILS BE MANAGED AS FOLLOWS: (DELETE IF NO ACID SULPHATE SOILS)

CREEK CROSSINGS
A. SILTATION CONTROL MEASURES SHALL BE PLACED DOWNSTREAM OF ANY EXCAVATION WORK.
B. APPROPRIATE SEDIMENT CONTROLS SHALL BE USED TO PREVENT SEDIMENT FROM ENTERING THE CREEK.
C. NO SOIL SHALL BE STOCKPILED WITHIN 5 m OF THE CREEK.

REHABILITATION
A. PREDISTURBANCE SOIL PROFILES AND COMPACTION LEVELS SHALL BE REINSTATED.
B. PREDISTURBANCE VEGETATION PATTERNS SHALL BE RESTORED.

SAFETY
A. THE DESIGN AND CONSTRUCTION OF THE WORKS SHALL COMPLY WITH ALL QUEENSLAND LEGISLATION.

GENERAL NOTES
1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE SPECIFICATIONS AND STANDARDS.
2. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
3. THE CONSTRUCTION OF THE SEWERAGE WORK SHOWN ON THIS DRAWING SHALL BE SUPERVISED BY AN ENGINEER WHO HAS RPEQ REGISTRATION. SEWERAGE WORKS NOT COMPLYING WITH THIS REQUIREMENT WILL NOT BE PERMITTED TO CONNECT INTO THE SEQ SERVICE PROVIDER SEWERAGE SYSTEM.
4. ALL WORK ASSOCIATED WITH LIVE SEWERS OR MAINTENANCE HOLES SHALL BE CARRIED OUT BY THE SEQ SERVICE PROVIDER AT THE DEVELOPER’S COST.
5. ALL PIPES AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE “ACCEPTED PRODUCTS AND MATERIALS” LIST.
6. EACH ALLOTMENT SHALL BE SERVED BY A DN110 PE (OR DN100 PVC) PROPERTY CONNECTION. FOR ALLOTMENTS OTHER THAN SINGLE RESIDENTIAL, A DN160 PE (OR DN150 PVC) PROPERTY CONNECTION SHALL BE PROVIDED.
7. PROPERTY CONNECTIONS SHALL BE LOCATED WITHIN THE PROPERTY AS SHOWN IN THE DRAWINGS.
8. PROPERTY CONNECTION BRANCHES SHALL EXTEND INTO THE PROPERTY A MINIMUM OF 300 mm AND A MAXIMUM OF 750 mm. UNITYWATER REQUIRES MINIMUM EXTENSION OF 500 mm INTO PROPERTY.
9. WHERE PIPES ARE LAID IN FILL, THE FILLING SHALL BE CARRIED OUT IN LAYERS NOT EXCEEDING 300 mm (LOOSE) IN DEPTH AND SHALL BE COMPACTED UNTIL THE COMPACTION IS NOT LESS THAN 95% OF THE MATERIALS MAXIMUM COMPACTION WHEN TESTED IN ACCORDANCE WITH A.S. 1289 (MODIFIED COMPACITION). TESTING SHALL BE CARRIED OUT AFTER EACH ALTERNATE LAYER. IN ALL SUCH CASES APPROVAL OF CONSTRUCTED SEWERS WILL NOT BE ISSUED BY THE SEQ SERVICE PROVIDER UNLESS CERTIFICATES ARE PRODUCED CERTIFYING THAT THE REQUIRED COMPACTION HAS BEEN ACHIEVED.
10. WHERE SEWERS HAVE A GRADE OF 1 IN 20 OR STEEPER, BULKHEADS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SEQ SEWER CODE.
11. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF EXISTING SERVICES WITH RELEVANT AUTHORITIES BEFORE COMMENCING WORKS.
12. SEWERS SHALL BE DISUSED /ABANDONED IN ACCORDANCE WITH PROCEDURES SET OUT IN THE SEQ SEWER CODE.
13. BENCH MARK AND LEVELS TO AHD.
14. THE EXISTING DWELLING ON LOT 3, REFER SEQ-SEW-1100, SERVED BY A SEPTIC SYSTEM, SHALL BE CONNECTED TO THE NEW SEWER BY A LICENCED PLUMBER IN ACCORDANCE WITH THE RELEVANT STATUTORY AND COUNCIL REQUIREMENTS. THE SEPTIC SYSTEM, INCLUDING TRENCHES, SHALL BE REMOVED AT THE DEVELOPER’S COST. ALL FIXTURES SHALL BE UPGRADED IF REQUIRED BY PLUMBING CODE.
15. EXISTING ALLOTMENTS REQUIRING A PROPERTY CONNECTION FROM EXISTING SEwers SHALL BE PROVIDED BY THE SEQ SERVICE PROVIDER AT THE DEVELOPERS COST.

NAME OF ESTATE SUNRISE ESTATE
SUBDIVIDER JOPET PTY LTD
APPLICATION No. 253/50/5-C20/95
SP DELEGATE 7.12.94
APPROVAL DATE DRAWING/PLAN No.
No. OF ALLOTMENTS 26
AREA IN Ha. 2.828
LENGTH OF SEwers 100 mm 40.000
150 mm 327.100

SEQ WATER SERVICE PROVIDERS
SEWERAGE STANDARD DRAWING
SEWERAGE RETICULATION
TYPICAL ESTATE DETAILS AND NOTES
GCCC LCC RCC QUU UW
DRAWING No. SEQ-SEW-1101-3
VERSION A
ORG DATE: 1/1/2013
NOT TO SCALE
SERVICE PROVIDER AND CONSTRUCTOR LIVE SEWER WORKS - TYPICAL SCHEDULE

No. | DESCRIPTION (SOME WORKS LISTED ARE NOT SHOWN ON SEQ-SEW-1100-1 & 1100-2) | DIA. MH/MS TYPE COVER TYPE | MH NO. | MH/MSS COVER TYPE | LOT NO. | F.S.L. | E.S.L. | I.L. | DEPTH TO INVERT
--- | --- | --- | --- | --- | --- | --- | --- | --- | ---
1(A) | AGENCY TO BREAK INTO EXISTING MAINTENANCE HOLE 5/1 AND CONSTRUCT A 150 mm STUB (TEMPORARILY END CAPPED) PRIOR TO START OF CONSTRUCTION. | 150 | P2 | 1/1 | 51.227 | 61.227 | 59.530 | 1.697
1(B) | 0.5m FROM STUB END CAP, CONSTRUCTOR TO LAY NEW LINE 5. AFTER CLEANSING, TESTING AND INSPECTING, NOTIFY AGENCY. | 150 | P2 | 3/13 | 55.015 | 54.728 | 53.420 | 1.795
1(C) | AGENCY TO REMOVE TEMPORARY END CAPS ON STUB & LINE 5 AND MAKE LIVE CONNECTIONS AFTER SUCCESSFUL "ON MAINTENANCE" INSPECTION. | 150 | P2 | 3/13 | 55.015 | 54.728 | 53.420 | 1.795
2(A) | AGENCY TO BREAK INTO EXISTING MAINTENANCE HOLE 3/13 AND CONSTRUCT 2/150 mm STUBS (TEMPORARILY END CAPPED) PRIOR TO START OF CONSTRUCTION. | 225 | P2 | 3/13 | 55.015 | 54.728 | 53.420 | 1.795
2(B) | CONSTRUCTOR TO LAY NEW LINES 1 AND 4. AFTER CLEANSING, TESTING AND INSPECTING, NOTIFY AGENCY. | 150 | P2 | 3/13 | 55.015 | 54.728 | 53.420 | 1.795
2(C) | AGENCY TO REMOVE TEMPORARY END CAPS ON STUBS & LINES 1 & 4 AND MAKE LIVE CONNECTIONS AFTER SUCCESSFUL "ON MAINTENANCE" INSPECTION. | 150 | P2 | 3/13 | 55.015 | 54.728 | 53.420 | 1.795
2(D) | AGENCY TO RAISE EXISTING MAINTENANCE HOLE 3/13 BY 0.287 m AND TO REPLACE TOP SLAB, COVER AND FRAME WITH A TRAFFICABLE ARRANGEMENT. | 225 | P2 | 3/13 | 55.015 | 54.728 | 53.420 | 1.795
3(A) | CONSTRUCTOR TO CONSTRUCT NEW MAINTENANCE HOLE 1A/13 OVER EXISTING SEWER AND BENCH AND RENDER UP TO PIPE BUT NOT REMOVE CROWN OF PIPE. | 225 | P2 | 1A/13 | 54.580 | 54.580 | 53.028 | 1.552
3(B) | CONSTRUCTOR TO LAY LINE 5 AND INSTALL HOUSE CONNECTIONS. | 150 | P2 | 1A/13 | 54.580 | 54.580 | 53.028 | 1.552
3(C) | AGENCY TO REMOVE CROWN OF PIPE AND COMPLETE BENCHING AFTER SUCCESSFUL "ON MAINTENANCE" INSPECTION OF LINE 5. | 225 | P2 | 1A/13 | 54.580 | 54.580 | 53.028 | 1.552
4(A) | AGENCY TO BREAK INTO EXISTING MAINTENANCE HOLE 2 AND CONSTRUCT 2/150 mm STUBS (TEMPORARILY END CAPPED) PRIOR TO START OF CONSTRUCTION. | 150 | C2 | 2 | 58.913 | 58.913 | 57.293 | 1.620
4(B) | CONSTRUCTOR TO LAY NEW LINE 8 AND 9. AFTER CLEANSING AND TESTING, NOTIFY AGENCY. | 150 | C2 | 2 | 58.913 | 58.913 | 57.293 | 1.620
4(C) | AGENCY TO REMOVE TEMPORARY END CAPS ON STUBS & LINES 8 & 9 AND MAKE LIVE CONNECTIONS AFTER SUCCESSFUL "ON MAINTENANCE" INSPECTION. | 150 | C2 | 2 | 58.913 | 58.913 | 57.293 | 1.620
5(A) | AGENCY TO SEAL THE EXISTING 1500 INLET IN EXISTING MAINTENANCE HOLE 2 AND 1500 OUTLET IN THE EXISTING MAINTENANCE HOLE 1/1 (ADJACENT TO LOT 20) TO ABANDON THIS SECTION OF SEWER AFTER SUCCESSFUL "ON MAINTENANCE" INSPECTION. | 150 | D1 | 2 | 58.913 | 58.913 | 57.293 | 1.620
5(B) | CONSTRUCTOR TO REMOVE ABANDONED SEWER AND REINSTATE GROUND. | 150 | D1 | 1/1 | 61.227 | 61.227 | 59.530 | 1.697
6 | AGENCY TO PROVIDE NEW HOUSE CONNECTION. | 100 | | 1 | 55.750 | 54.250 | 54.250 | 1.300
7 | AGENCY TO RAISE EXISTING MAINTENANCE HOLE 1/13 IN WOODS STREET BY 0.160 m TO SUIT NEW FOOTWAY LEVEL. | 225 | C2 | 1/13 | 54.410 | 54.250 | 53.028 | 1.552

*AGENCY MEANS GOLD COAST CITY COUNCIL OR LOGAN CITY COUNCIL OR REDLAND CITY COUNCIL OR QUEENSLAND URBAN UTILITIES OR UNITYWATER (APPROVAL VALID FOR 12 MONTHS FROM DATE SHOWN) WITH ALL AGENCY WORK TO BE PAID FOR BY DEVELOPER VIA QUOTATION APPLICATION. AGENCY MAY PERMIT CONTRACTORS TO CARRY OUT ALL OR PART OF THE LIVE WORKS, REFER TO SEQ-SP CONNECTION POLICY FOR DETAILS.

SEQ WATER SERVICE PROVIDERS

SEWERAGE STANDARD DRAWING

DESIGN LAYOUTS

CONNECTION TO EXISTING SEWER

TYPICAL SCHEDULE OF WORKS

NOT TO SCALE
TYPICAL RIGSS RETICULATION SEWER

BRANCH/TRUNK SEWER MH
(SEE SEQ-SEW-1307-1 TO 1312-1)

WATER AGENCY DIRECTED WATER SEAL OR WATER SEAL MH
(SEE SEQ-SEW-1408-1 & 1408-2)

CAST IN-SITU OR PRECAST FACTORY BENCH MAINTENANCE HOLE (MH)
(SEE SEQ-SEW-1300 SET)

INTERSECTION POINT (PEG)

PROPERTY CONNECTIONS (SEE SEQ-SEW-1104-1 AND 1105-1)

MS AND VARIABLE HORIZONTAL BENDS (SEE SEQ-SEW-1314-1 TO 1316-1 SET)

DEEP JUNCTION TYPE 'D'
PROPERTY CONNECTIONS AT DIFFERENT LEVELS
(SEE SEQ-SEW-1105-1)

'X' DROP (SEE SEQ-SEW-1303-1)

LONG RADIUS DN150 VERTICAL BENDS
(SEE SEQ-SEW-1314 SET)

TERMINAL MS
(SEE SEQ-SEW-1314-1)

WATER SEAL

1. GRADE SEWER EVENLY BETWEEN MH/MS TO LEVELS SHOWN IN DESIGN DRAWINGS.
2. LAY PIPES AND FITTINGS WITH SOCKETS UPSTREAM WHEREVER PRACTICABLE.

NOT TO SCALE

TYPICAL RIGSS RETICULATION SEWER INTO BRANCH OR TRUNK SEWER WITH WATER SEAL

SEQUENCE OF WATER SERVICE PROVIDERS

DRAWING No.

NOT TO SCALE

SEWERAGE STANDARD DRAWING

RIGSS PIPELAYING

TYPICAL ARRANGEMENTS

SEQ-SEW-1103-1

A
NOTES:

1. GRADE SEWER EVENLY BETWEEN MH/MS TO LEVELS SHOWN IN DESIGN DRAWINGS.
2. LAY PIPES AND FITTINGS WITH E-F COUPLINGS OR BUTT WELDING.

TYPICAL NU SEWER RETICULATION SEWER

PROPERTY CONNECTIONS AT DIFFERENT LEVELS (SEE SEQ-SEW-1106-1 TO 1106-7)

MS AND VARIABLE BENDS (SEE SEQ-SEW-1315-1)

FACTORY MADE SHORT RADIUS BEND (750 mm RADIUS) MAX 45°

FIELD MADE LONG RADIUS VERTICAL BEND

PE STUB MAINTENANCE HOLE (MH) (SEE SEQ-SEW-1301 SET)

FIELD MADE LONG RADIUS BEND (DN160 AT 5.0 m RADIUS)

TYPICAL NU SEWER RETICULATION SEWER INTO BRANCH OR TRUNK SEWER

PROPERTY CONNECTIONS AT DIFFERENT LEVELS (SEE SEQ-SEW-1106-1 TO 1106-7)

BRANCH/TRUNK SEWER MH (SEE SEQ-SEW-1301 SET)

SULPHIDE CONTROL MAINTENANCE HOLE (SEE SEQ-SEW-1307-2)

PE/PVC ADAPTOR MIN SOCKET DEPTH 180 mm

MIN 300 mm MAX 750 mm

PVC SOCKET WITH CAP SEE NOTE 5 ON SEQ-SEW-1106-2

PROPERTY CONNECTIONS AT DIFFERENT LEVELS (SEE SEQ-SEW-1106-1 TO 1106-7)

PROPERTY CONNECTIONS AT DIFFERENT LEVELS (SEE SEQ-SEW-1106-1 TO 1106-7)

TERMINAL MS (SEE SEQ-SEW-1315-1)

UNITYWATER REQUIRES INSPECTION WYE AT PROPERTY CONNECTION POINTS REFER SEQ-SEW-1106-7

1. GRADE SEWER EVENLY BETWEEN MH/MS TO LEVELS SHOWN IN DESIGN DRAWINGS.
2. LAY PIPES AND FITTINGS WITH E-F COUPLINGS OR BUTT WELDING.

PROPERTY CONNECTIONS AT DIFFERENT LEVELS (SEE SEQ-SEW-1106-1 TO 1106-7)

BRANCH/TRUNK SEWER MH (SEE SEQ-SEW-1301 SET)

SULPHIDE CONTROL MAINTENANCE HOLE (SEE SEQ-SEW-1307-2)

PE/PVC ADAPTOR MIN SOCKET DEPTH 180 mm

MIN 300 mm MAX 750 mm

PVC SOCKET WITH CAP SEE NOTE 5 ON SEQ-SEW-1106-2
NOTES:

1. ALL HOUSE CONNECTION BRANCHES SHALL HAVE A MINIMUM GRADE OF 1 IN 60 FOR D100 AND 1 IN 100 FOR D150.

2. LIMIT OF WORKS - ALL HOUSE CONNECTION BRANCHES SHALL FINISH WITH AN INSPECTION TEE WITH THE END AND INSPECTION OPENING SCREW CAPPED. INSPECTION TEE INSTALLED TO THE INVERT LEVEL SHOWN ON THE DRAWINGS.

3. ALL HOUSE CONNECTION BRANCHES CROSSING ROADS SHOULD CONNECT INTO MAINTENANCE STRUCTURE WHERE POSSIBLE (FOR UW REFER SEQ-SEW-1104-2).

4. ALL HOUSE CONNECTION BRANCH FITTINGS SUCH AS MOLDED OBLIQUE JUNCTIONS AND BENDS, SHALL BE FIBREGLASS REINFORCED AS DETAILED FOR THE TYPE 'D' JUNCTION WITHIN STD DRG SEQ-SEW-1105-1 OR MAY BE APPROVED G.R.P JUNCTIONS AND BENDS. BEDDING MATERIAL SHALL COMPLY WITH THE REQUIREMENTS OF THE SPECIFICATION.

5. ALL PIPE JOINTS SHALL CONFORM WITH CODE SPECIFICATION AND THE MANUFACTURERS RECOMMENDATIONS.

6. FOR RESPONSIBILITY LIMITS OF CONSTRUCTED WORKS, REFER STD DRG SEQ-SEW-1105-1.

7. DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.

SP DUAL HOUSE CONNECTION OUTSIDE PRIVATE PROPERTY

NOT TO SCALE

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL, HEALTH & SAFETY LEGISLATION

SEQ SEWAGE HOUSE CONNECTION TYPICAL CONSTRUCTION DETAILS RIGSS - SHEET 1

SEQ Water Service Providers

Sewerage Standard Drawing

Not applicable to Unitywater. Refer drawing SEQ-SEW-1104-2 for UW Requirements
NOTES:

1. ALL HOUSE CONNECTION BRANCHES SHALL HAVE A MINIMUM GRADE OF 1 IN 60 FOR 100 DIA AND 1 IN 80 FOR 150 DIA.

2. LIMIT OF WORKS - ALL HOUSE CONNECTION BRANCHES SHALL FINISH WITH AN INSPECTION TEE WITH SCREWED CAP.

3. ALL HOUSE CONNECTION BRANCH FITTINGS INCLUDING THE I.O. SHALL BE FIBRE GLASS REINFORCED.

4. ALL PIPE JOINTS SHALL BE RUBBER RING.

ONLY TYPE A CONNECTION SHOWN HERE. REFER DWG. SEQ-SEW-1104-1 & SEQ-SEW-1105-1 FOR TYPE B AND C CONNECTIONS.
1. BEDDING MATERIAL AND GENERAL COMPONENTY SHALL COMPLY WITH THE REQUIREMENTS OF THE CODE SPECIFICATION AND ANY ADDENDUMS.

2. TYPE "D" JUNCTION FITTINGS SHALL BE FACTORY ASSEMBLED AND CERTIFIED uPVC SEWER FITTINGS COMPLYING WITH AS/NZS 1260 THAT HAVE BEEN ASSEMBLED AND REINFORCED WITH FIBREGLASS AS SHOWN IN THE DRAWING. OBLIQUE JOINTS AND 45° BENDS SHALL BE REINFORCED WITH FIBREGLASS AS SHOWN FOR A TYPE D JUNCTION OR MAY BE APPROVED G.R.P JUNCTIONS AND BENDS.

3. THE SLIP COUPLING COMPONENT OF TYPE "D" JUNCTION FITTING SHALL BE MARKED TO IDENTIFY THE INSTALLATION REQUIREMENTS OF THE FITTING AND THE VERTICAL RISER PIPE, SEE TABLE ABOVE.

4. THREADED LOCK DOWN QUICK RELEASE END CAPS SHALL BE SEALED BY A RUBBER RING, SCREW DOWN CAPS THAT UTILISE STAINLESS STEEL SCREWS ARE NOT PERMITTED.

5. FOR TYPICAL INSTALLATION DETAILS FOR HOUSE CONNECTION OPTIONS AND FOR THE HOUSE CONNECTION INSPECTION TEE AND FOR THE CONNECTION POINT DEPTH CONTROL, REFER SEQ-SEW-1104-1.

6. DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.

OPTIONS

<table>
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<tr>
<th>OPTIONS</th>
<th>BEND</th>
<th>SEWER GRADE</th>
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<tbody>
<tr>
<td>D-1</td>
<td>45°</td>
<td>1:150 TO 1:20</td>
</tr>
<tr>
<td>D-2</td>
<td>40°</td>
<td>1:20 TO 1:10</td>
</tr>
<tr>
<td>D-3</td>
<td>35°</td>
<td>1:10 TO 1:6</td>
</tr>
<tr>
<td>D-4</td>
<td>AS REQUIRED</td>
<td>1:5 TO 1:1</td>
</tr>
</tbody>
</table>

NOTES:

- PROVIDE 150 MIN OF RISER PIPE FUTURE SLIPAGE
- FOR BEND DETAILS REFER TYPE 'D' JUNCTION TABLE
- 3 x COATS OF 300g CHOPPED STRAND MAT WITH A VINYLESTER RESIN AND 2 x VINYLESTER FLOW COATING TOP COATS.
- 10 mm THICK uPVC GUSSET WELDED IN PLACE.

RUBBER RING JOINT (RRJ)
SLIP COUPLING
WELDED JOINT
45° OBLIQUE JOINT
FLOW
SHORT PIPE 500 MAX EACH END OF FITTINGS

RUBBER RING JOINT (RRJ)
SLIP COUPLING
WELDED JOINT
45° OBLIQUE JOINT
FLOW
SHORT PIPE 500 MAX EACH END OF FITTINGS

SEQ WATER SERVICE PROVIDERS

SEWERAGE STANDARD DRAWING

SEWERAGE HOUSE CONNECTION
TYPICAL CONSTRUCTION DETAILS
RIGSS - SHEET 2

SEQ-SEW-1105-1

NOT TO SCALE
NOTES

1. MAXIMUM DEPTH TO PROPERTY CONNECTION INVERT SHALL BE 1500 mm.
2. CONCRETE SHALL BE CLASS N20 TO WSA PS-357 EXCEPT FOR MAINTENANCE HOLES WHICH ARE SPECIAL CLASS TO WSA PS-358.
3. EACH SINGLE RESIDENTIAL ALLOTMENT SHALL BE SERVED BY A MINIMUM DN110 PROPERTY CONNECTION. FOR OTHER PREMISES, THE DIAMETER OF PROPERTY CONNECTIONS SHALL BE PROVIDED AS SPECIFIED IN THIS CODE.
4. PROPERTY CONNECTION JUNCTIONS SHALL BE LOCATED 1.2 m FROM THE DOWNSTREAM ALIGNMENT. IF THIS IS NOT POSSIBLE PROPERTY CONNECTION JUNCTIONS SHALL NOT BE GREATER THAN 3.5 m FROM THE DOWNSTREAM ALIGNMENT.
5. THE CENTRE OF THE OPENING OF PROPERTY CONNECTION BRANCHES SHALL EXTEND INTO THE PROPERTY A MINIMUM OF 300 mm AND A MAXIMUM OF 750 mm. UNITYWATER REQUIRES MINIMUM EXTENSION OF 500 mm INTO PROPERTY AS SHOWN ON SEQ-SEW-1106-7.
6. PROPERTY CONNECTION BRANCHES OF DN110 SHALL BE GRADED AT A MIN OF 1 IN 60. FOR DN160 PC BRANCHES THE GRADE SHALL BE MIN 1 IN 100.
8. ALL PIPES, FITTINGS AND CONCRETE SHALL HAVE A MINIMUM COVER OF 1150 mm IN FOOTPATHS AND ROADWAYS.
9. LOCATE SEWERS AND PROPERTY CONNECTIONS AS SHOWN ON THE DRAWINGS.
10. REFER DRAWING No SEQ-SEW-1106-2 TO SEQ-SEW-1106-7 FOR PROPERTY CONNECTION DETAILS.

LEGEND

- PE/PVC ADAPTOR
- VERTICAL RISER
- CUSTOMER’S HOUSE DRAIN - INSPECTION SHAFT RISER TO COMPLY WITH AS/NZS 3500.2
NOTES

1. ALL PROPERTY CONNECTION SEWERS SHALL HAVE A PE/PVC ADAPTOR.

2. ORANGE PVC CONDUIT AND HARDWOOD STAKE SHALL BE INSTALLED AT THE END OF EACH PROPERTY CONNECTION AS SHOWN.

3. PROVIDE MIN150 CONCRETE CLASS N20 SURROUND TO JUNCTIONS WHERE SHOWN ON DRAWINGS. THE CONCRETE SURROUND SHALL BE MIN 450 IN LENGTH OR TO SUIT THE JUNCTION LENGTH

4. FOR MORE NOTES REFER DRAWING SEQ-SEW-1106-1.

5. A PVC SOCKET WITH RUBBER SEALED SCREWED CAP IS REQUIRED BEFORE HOUSE DRAIN PLUMBING IS CONNECTED INTO THE PE/PVC ADAPTOR.

6. FOR RADIUS OF A SWEEP BEND REFER TO CLAUSE 4.3.7 OF SEWERAGE CODE.

7. AN 88° SWEEP JUNCTION MAY BE USED IN LIEU OF A 45° JUNCTION AND 45° SWEEP BEND.

1. ALL PROPERTY CONNECTION SEWERS SHALL HAVE A PE/PVC ADAPTOR.

2. ORANGE PVC CONDUIT AND HARDWOOD STAKE SHALL BE INSTALLED AT THE END OF EACH PROPERTY CONNECTION AS SHOWN.

3. PROVIDE MIN150 CONCRETE CLASS N20 SURROUND TO JUNCTIONS WHERE SHOWN ON DRAWINGS. THE CONCRETE SURROUND SHALL BE MIN 450 IN LENGTH OR TO SUIT THE JUNCTION LENGTH

4. FOR MORE NOTES REFER DRAWING SEQ-SEW-1106-1.

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7. AN 88° SWEEP JUNCTION MAY BE USED IN LIEU OF A 45° JUNCTION AND 45° SWEEP BEND.
ELEVATION - TYPE A3

CUSTOME'S HOUSE DRAIN

PROPERTY CONNECTION SEWER

FLOW

50x25 H.W. STAKE 600 LONG

ORANGE PVC CONDUIT 400 SECURELY TAPED TO H.W. STAKE 2000 TOTAL HEIGHT

PVC SOCKET WITH CAP SEE NOTE 5 OF SEQ-SEW-1106-2

PE/PVC ADAPTOR MIN SOCKET DEPTH 180 mm

ELEVATION - TYPE A4

CUSTOME'S HOUSE DRAIN

PROPERTY CONNECTION SEWER

FLOW

GRADE MIN 1 IN 60 FOR DN110
GRADE MIN 1 IN 100 FOR DN160

50x25 H.W. STAKE 600 LONG

PE/PVC ADAPTOR MIN SOCKET DEPTH 180 mm

ORANGE PVC CONDUIT 400 SECURELY TAPED TO H.W. STAKE 2000 TOTAL HEIGHT

PVC SOCKET WITH CAP SEE NOTE 5 OF SEQ-SEW-1106-2

PROPERTY CONNECTION TABLE

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3**</th>
<th>4**</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>A</td>
<td>A</td>
<td>MH</td>
<td>MH</td>
</tr>
<tr>
<td>FULL</td>
<td>DEPTH</td>
<td>SEWER DEPTH</td>
<td>&lt;1500</td>
<td></td>
</tr>
<tr>
<td>(MIN)</td>
<td>(MIN)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* PB STANDS FOR PROPERTY BOUNDARY.
** THIS DRAWING SHALL BE USED IN CONJUNCTION WITH SEQ-SEW-1301-2 & 4 AND SEQ-SEW-1315-1 FOR TYPES A3 & A4.

NOTES

1. REFER DWG No SEQ-SEW-1106-1 & 2 FOR NOTES.
**PROPERTY CONNECTION TABLE**

<table>
<thead>
<tr>
<th>TYPE B</th>
<th>1**</th>
<th>2**</th>
<th>3***</th>
<th>4***</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLOPED CONNECTION</td>
<td>MH</td>
<td>MH</td>
<td>MIN 300</td>
<td>MAX 750</td>
</tr>
<tr>
<td>SEWER DEPTH &gt; 1500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTES**

1. REFER DRAWING No. SEQ-SEW-1106-1 & 2 FOR NOTES.

* PB STANDS FOR PROPERTY BOUNDARY.
** TYPES B1 & B2 MAY ONLY BE USED FOR SEWER DEPTHS UP TO 3 METRES.
*** THIS DRAWING SHALL BE USED IN CONJUNCTION WITH SEQ-SEW-1301-2 & 4 AND SEQ-SEW-1315-1 FOR TYPES B3 & B4.

**PROPERTY CONNECTION SEWER**

- CUSTOMER’S HOUSE DRAIN

- PVC SOCKET WITH CAP SEE NOTE 5 OF SEQ-SEW-1106-2
- PE/PVC ADAPTOR MIN SOCKET DEPTH 180 mm

**PLAN - TYPE B2**

(B1 SIMILAR)

- ORANGE PVC CONDUIT 400 SECURELY TAPED TO H.W. STAKE
- 45° SWEEP BEND
- JUNCTION OR APPROVED SADDLE (OR 88° SWEEP JUNCTION)

**ELEVATION - TYPE B4**

(B3 SIMILAR)

- SWEEP BEND DEGREE TO SUIT
- REFER TO CODE FOR BULKHEAD AND TRENCHSTOP REQUIREMENTS

- GRADE MIN 1 IN 60 FOR DN110
- GRADE MIN 1 IN 100 FOR DN160

- PE/PVC ADAPTOR MIN SOCKET DEPTH 180 mm

**ELEVATION - TYPE B2**

(B1 SIMILAR)

- SWEEP BEND DEGREE TO SUIT
- REFER TO CODE FOR BULKHEAD OR TRENCHSTOP REQUIREMENTS

- GRADE MIN 1 IN 60 FOR DN110
- GRADE MIN 1 IN 100 FOR DN160

- CLASS N20 CONCRETE

**SEWERAGE STANDARD DRAWING**

SEQ-SEW-1106-4

**NOT TO SCALE**
**PROPERTY CONNECTION SEWER**

**CUSTOMER'S HOUSE DRAIN**

**PE/PVC ADAPTOR MIN SOCKET DEPTH 180 mm**

**PROPERTY CONNECTION TABLE**

<table>
<thead>
<tr>
<th><strong>TYPE C</strong></th>
<th><strong>1</strong></th>
<th><strong>2</strong></th>
<th><strong>3</strong></th>
<th><strong>4</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VERTICAL RISER</strong></td>
<td><strong>PB</strong></td>
<td><strong>MH</strong></td>
<td><strong>MS</strong></td>
<td><strong>PB</strong></td>
</tr>
<tr>
<td><strong>AND MH/MS DROP</strong></td>
<td><strong>MIN</strong></td>
<td><strong>500</strong></td>
<td><strong>750</strong></td>
<td><strong>MIN</strong></td>
</tr>
<tr>
<td><strong>SEWER DEPTH &gt; 1500</strong></td>
<td><strong>MAX 750</strong></td>
<td><strong>MIN 100</strong></td>
<td><strong>MIN 150</strong></td>
<td><strong>MIN 150</strong></td>
</tr>
</tbody>
</table>

* PB STANDS FOR PROPERTY BOUNDARY.
** TYPES C1 & C2 MAY ONLY BE USED FOR SEWER DEPTHS UP TO 3 METRES.
*** THIS DRAWING SHALL BE USED IN CONJUNCTION WITH SEQ-SEW-1301-2 & 4 AND SEQ-SEW-1315-1 FOR TYPES C3 & C4.

**PLAN - TYPE C1 AND C2**

**ELEVATION - TYPE C1 AND C2**

**VERTICAL RISER SINGLE OR DOUBLE CONNECTIONS**

**SECTION - TYPE C4**

(C3 SIMILAR)

**NOTES:**

1. MAX. 2 DN110 CONNECTIONS OR 1 DN160 CONNECTION FOR EACH VERTICAL RISER OR MAINTENANCE SHAFT.
2. REFER SEQ-SEW-1106-1 & 2 FOR MORE NOTES.
3. DIAMETER OF RISER IS NOT TO BE LESS THAN THE LARGEST CONNECTED PROPERTY SEWER.

**UNITYWATER REQUIRES**

INSPECTION TEE AT PROPERTY CONNECTION POINTS, REFER SEQ-SEW-1106-7

**PE/PVC ADAPTOR MIN SOCKET DEPTH 180 mm**

**PVC SOCKET WITH CAP SEE NOTE 5 OF SEQ-SEW-1106-2**

**MIN 150 EMBEDMENT SURROUND IN 150 LAYERS**

**RISER TO BE DN110 OR DN160 REFER NOTE 3**

**45° SWEEP BEND**

**45° JUNCTION OR APPROVED SADDLE (OR 88° SWEEP JUNCTION)**

**CLASS N20 CONCRETE**

**DN160 ~ DN315**

**MIN 300**

**MAX 750**

**ORG DATE:**

1/1/2013

**DRAWING NO.**

SEQ-SEW-1106-5

**DESCRIPTION:**

TYPICAL PROPERTY CONNECTION TYPE C1 TO C4 VERTICAL RISER

**AUTH:**

19/06/15 REMOVE SEDIMENT TRAPS. CHANGES TO NOTES & TABLE.

**DATE:**

1/1/2013
Plan:

- 45° DN110 sweep bend
- DN110
- 45° DN110 sweep bend
- 45° junction or approved saddle
- Min. 300
- Max. 750

Note 5 of SEQ-SEW-1106-2

Elevation:

- Orange PVC conduit 400
- Securely taped to H.W. stake
- Grade min 1 in 60 for DN110 property connections
- Grade min 1 in 100 for DN160 property connections
- 50x25 H.W. stake 600 long
- PE/PVC adaptor min socket depth 180 mm

Twin property connections:

1. For notes refer drawing SEQ-SEW-1106-1 & 2.
1. FOR GENERAL NOTES REFER DRAWING SEQ-SEW-1106-2
2. PROVIDE 2 m LONG ORANGE PVC CONDUIT AND H.W STAKE TO MARK CONNECTION AS SHOWN IN SEQ-SEW-1106-2

ONLY TYPE A CONNECTION SHOWN HERE. REFER DWG. SEQ-SEW-1106-4 & SEQ-SEW-1106-5 FOR TYPE B AND C CONNECTIONS.

NOTES:

1. FOR GENERAL NOTES REFER DRAWING SEQ-SEW-1106-2
2. PROVIDE 2 m LONG ORANGE PVC CONDUIT AND H.W STAKE TO MARK CONNECTION AS SHOWN IN SEQ-SEW-1106-2
PREPARING THE TEST AREA:
Conduct all native soil identification tests on a freshly exposed, damp, hand trimmed area of the trench wall in the pipe zone. Take care that the soil in the exposed test area is not compacted or loosened during trench excavation. If the soil in the trench floor and wall is very dry at the time the trench is opened then flood the test area and allow time for the water to be absorbed by the soil before it is trimmed and tested.

IDENTIFYING CLAY SOILS:
A lump of clay soil will be difficult to break when dry. It will be sticky and need some effort to mould with the fingers when wet. Clay will not wash off easily. Individual clay particles are hard to see.

TESTING CLAY SOILS:
Clay soils are best tested in the wall of the trench. The fist, the thumb or the thumbnail are used to determine the consistency (strength) of the clay (see table.)

IDENTIFYING CLEAN SAND SOILS:
The individual grains of sand will be visible to the eye. A lump of clean sand, if it can be picked up at all, will crumble with very little effort. Clean sand washes off easily.

TESTING CLEAN SAND SOILS:
Clean sand soils are best tested in the floor of the trench by pushing with the whole body weight on one foot. The depth of the depression left by the boot is related to the density of the sand (see table). Take care to ensure that the sand in the trench floor was not compacted or loosened during the excavation of the trench or the trimming of the test area.

TESTING ROCK:
The recommended field identification tests for rock rely on observing the ease with which the rock can be dug with a pick, and estimating the spacing of the joints in the rock. (Joints are commonly called cracks or breaks). The spacing between joints is important because the allowable bearing pressure on rock is usually controlled by the joints in it, rather than the inherent strength of the block of rock. Joints may be tightly closed (like hairline cracks), but can also be open (filled with air) or filled with soft clay or other soil.

SOIL CLASSIFICATION

<table>
<thead>
<tr>
<th>SOIL CLASSIFICATION</th>
<th>FIELD IDENTIFICATION TEST</th>
<th>▲AHBP kPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERY SOFT</td>
<td>EASILY PENETRATED 40 mm WITH FIST.</td>
<td>&lt; 50 *</td>
</tr>
<tr>
<td>SOFT</td>
<td>EASILY PENETRATED 40 mm WITH THUMB.</td>
<td>&lt; 50 *</td>
</tr>
<tr>
<td>FIRM</td>
<td>MODERATE EFFORT NEEDED TO PENETRATE 30 mm WITH THUMB.</td>
<td>&lt; 50 *</td>
</tr>
<tr>
<td>STIFF</td>
<td>READILY INDENTED WITH THUMB BUT PENETRATED ONLY WITH GREAT Effort.</td>
<td>50</td>
</tr>
<tr>
<td>VERY STIFF</td>
<td>READILY INDENTED WITH THUMBNAIL.</td>
<td>100</td>
</tr>
<tr>
<td>HARD</td>
<td>INDENTED WITH DIFFICULTY BY THUMBNAIL.</td>
<td>200</td>
</tr>
<tr>
<td>LOOSE CLEAN SAND</td>
<td>TAKES FOOTPRINT MORE THAN 10 mm DEEP.</td>
<td>&lt; 50 *</td>
</tr>
<tr>
<td>MEDIUM-DENSE CLEAN SAND</td>
<td>TAKES FOOTPRINT 3 mm TO 10 mm DEEP.</td>
<td>50</td>
</tr>
<tr>
<td>DENSE CLEAN SAND OR GRAVEL</td>
<td>TAKES FOOTPRINT LESS THAN 3 mm DEEP.</td>
<td>100</td>
</tr>
<tr>
<td>BROKEN OR DECOMPOSED ROCK</td>
<td>DIGGABLE. HAMMER BLOW &quot;THUDS&quot;. JOINTS (BREAKS IN ROCK) SPACED AT LESS THAN 300 mm APART.</td>
<td>100</td>
</tr>
<tr>
<td>SOUND ROCK</td>
<td>DIGGABLE. HAMMER BLOW &quot;THUDS&quot;. JOINTS (BREAK IN ROCK) SPACED AT MORE THAN 300 mm APART.</td>
<td>200</td>
</tr>
<tr>
<td>UNCOMPACTED FILL</td>
<td>OBSERVATION AND KNOWLEDGE OF THE SITE HISTORY.</td>
<td>&lt; 50 *</td>
</tr>
</tbody>
</table>

LEGEND

▲ AHBP ALLOWABLE HORIZONTAL BEARING PRESSURE FOR:
- 10 mm MOVEMENT.
- CENTRE OF THRUST 800 mm BELOW THE NATURAL SURFACE LEVEL.
(EXCLUDES ENGINEERED FILL AND DISTURBED GROUND AND GROUND WITH HIGH WATER TABLE)

* SPECIAL GEOTECHNICAL ASSESSMENT REQUIRED
### NOTES

1. **ALL DIMENSIONS IN MILLIMETRES.**
2. **BEDDING** - SPECIAL BEDDING SHALL BE SPECIFIED TO SUIT THE CONDITIONS IF THE TRENCH FLOOR HAS:
   - IRREGULAR OUTCROPS OF ROCK.
   - AHP OF <50 kPa (SEE SEQ-WAT-1200-01), OR
   - UNCONTROLLED GROUND WATER HAS DISTURBED THE FLOOR OF THE TRENCH.
3. **EMBEDMENT, TRENCH FILL AND COMPACTION TO MEET THE REQUIREMENTS OF WSA-02 PART 3 AND THE RELEVANT SEQ-SP.**
4. **SIDES OF EXCAVATION TO BE KEPT VERTICAL TO AT LEAST 150 ABOVE THE PIPE.**
5. **DESIGNER TO CHECK ON RELEVANT ROAD AUTHORITIES REQUIREMENTS.**
6. **ADDITIONAL INFORMATION PROVIDED IN SEQ-WAT-1200 SERIES COMMENTARY.**

### VEHICULAR LOADING

**LEGEND:**

# SPECIFIED BY THE DESIGNER IN DESIGN DRAWINGS

**NOTES**

1. **PRIVATE RESIDENTIAL PROPERTY AND PUBLIC LAND NOT SUBJECT TO VEHICULAR LOADING**
   - 600 - NEW DEVELOPMENTS
   - 450 - EXISTING DEVELOPMENTS
2. **PRIVATE RESIDENTIAL PROPERTY SUBJECT TO VEHICULAR LOADING**
   - 750
3. **FOOTWAYS, NATURE STRIPS, INDUSTRIAL PROPERTY, SEALED ROAD PAVEMENTS OTHER THAN ARTERIAL ROADS SUBJECT TO VEHICULAR LOADING**
   - 900
   - (1150 FOR QUU)
4. **SEWER IN A FOOTWAY CONTAINING A DN225 TO DN300 WATER MAIN**
   - 900
   - (1650 FOR QUU)
5. **UNSEALED ROAD CARRIAGeways**
   - 1200
6. **ARTERIAL ROAD CARRIAGeways**
   - 1200
7. **FUTURE ROAD, RAIL AND TRAM PAVEMENTS**
   - 1200

### SPRING LINE TRENCH CLEARANCE

<table>
<thead>
<tr>
<th>NOMINAL DIAMETER (DN)</th>
<th>MINIMUM CLEARANCE &quot;Lc&quot; TO AS/NZS 2566.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤300</td>
<td>150</td>
</tr>
<tr>
<td>&gt;300–≤450</td>
<td>200</td>
</tr>
<tr>
<td>&gt;450–≤900</td>
<td>300</td>
</tr>
<tr>
<td>&gt;900–≤1500</td>
<td>350</td>
</tr>
</tbody>
</table>

**PIPE JOINT BEDDING POCKETS**

FOR JOINT PROJECTIONS (SOCKETS, FLANGES ETC)

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

### SEWERAGE STANDARD DRAWING

SEQ WATER SERVICE PROVIDERS

SEQ-SEW-1200-2

EMBEDMENT & TRENCHFILL

TYPICAL ARRANGEMENT

NOT TO SCALE
NOTES

1. ALL DIMENSIONS IN MILLIMETRES.

2. THIS DRAWING TO BE READ IN CONJUNCTION WITH SEQ-SEW-1200 SERIES DRAWINGS.

3. PIPE CLASSIFICATION
   (a) RIGID PIPES: VC AND RC
   (b) FLEXIBLE PIPES: PVC, GRP, STEEL, DI AND PE.

4. PLACEMENT OF EMBEDMENT, TRENCHFILL & COMPACTION TO MEET THE REQUIREMENTS OF THE CODE.

5. EXCAVATE OR COMPACT TRENCH FLOOR TO PROVIDE A FLAT FIRM BASE TO SUPPORT BEDDING MATERIAL AND MINIMISE PIPELINE SETTLEMENT. WHEN EXCAVATED, REPLACE WITH GRANULAR MATERIAL AS SPECIFIED FOR BEDDING OR ADOPT TYPE 5, 6, 7 OR 8 SUPPORT AS REQUIRED.

6. ENSURE BEDDING IS DEEP ENOUGH THAT PIPE JOINT PROJECTIONS (SOCKETS, FLANGES) DO NOT TOUCH TRENCH FLOOR.

7A. GEOTEXTILE TO BE USED WHERE TRENCH FILL IS A MIGRATORY NATIVE SOIL OR SAND OR FINE CLAY MATERIAL.

7B. TYPE 4 SUPPORT TO BE USED WHERE MIGRATORY NATIVE SOILS (SANDS & CLAYS) ARE ENCOUNTERED ADJACENT TO THE EMBEDMENT ZONE AND SINGLE SIZE AGGREGATE IS USED:

8. LAY GEOTEXTILE FILTER FABRIC AGAINST TRENCH FLOOR AND WALLS SUCH THAT IT FULLY ENCASES THE EMBEDMENT.
   - PRESS FABRIC INTO THE VOIDS BEFORE INSTALLING EMBEDMENT TO PREVENT FABRIC TEARING.
   - PROVIDE A MINIMUM OF 250 OVERLAP AT ALL FABRIC JOINTS.


10. DETECTABLE MARKER TAPE SHALL BE PROVIDED EITHER ABOVE THE EMBEDMENT ZONE OR 1000 BELOW THE F.S.L, WHICHEVER IS CLOSEST TO F.S.L.

11. EMBEDMENT TYPES TO BE SPECIFIED IN DESIGN DRAWINGS.
EMBEDMENT TYPES TO BE SPECIFIED IN DESIGN DRAWINGS

NOTES

1. ALL DIMENSIONS IN MILLIMETRES.
2. USE THESE SUPPORT TYPES ONLY WHERE SPECIFIED BY THE DESIGNER. DETAILS TO BE PROVIDED IN DESIGN DRAWINGS.
3. LAY GEOTEXTILE FILTER FABRIC AGAINST THE TRENCH FLOOR AND WALL SUCH THAT IT FULLY ENCASES THE FOUNDATION MATERIAL IN THE OVER EXCAVATION. EMBEDMENT (IF REQUIRED) ENCASE SEPARATELY. PROVIDE A MINIMUM OF 250 LAP AT ALL FILTER FABRIC JOINTS. REFER SEQ-SEW-1201-1 FOR GEOTEXTILE SYSTEM DETAILS.
4. UNREINFORCED CONCRETE TO BE CLASS N20, AND REINFORCED CONCRETE N25. FOR AGGRESSIVE CONDITIONS USE SPECIAL CLASS CONCRETE.
5. MINIMUM STEEL REINFORCEMENT OF 0.4% OF CONCRETE CROSS SECTION PLACED CENTRALLY AND WITH 65 MINIMUM COVER TO EXTERNAL FACE. REINFORCEMENT DETAILS FOR THE APPLICABLE LOADING TO BE INCLUDED IN THE DESIGN DRAWINGS.
6. BEDDING TO BE DEEP ENOUGH TO ENSURE PIPE JOINT PROJECTIONS (SOCKETS, FLANGES) DO NOT TOUCH FOUNDATION.
7. GEOTEXTILE FILTER FABRIC IS REQUIRED FOR AGGREGATE EMBEDMENT. (IE SINGLE SIZED GRANULAR FILL ≥ 5 mm).
8. PURCHASE SPECIFICATIONS FOR EMBEDMENT MATERIAL ARE DETAILED IN THE SEQ CODE ACCEPTED PRODUCTS AND MATERIALS LIST. TRENCH FILL SHALL COMPLY WITH SEQ-SEW-1200-2.
9. DETECTABLE MARKER TAPE, REFER NOTE 10 ON SEQ-SEW-1201-01.

SEQ WATER SERVICE PROVIDERS

SEWERAGE STANDARD DRAWING

Typical Special Embedment
Inadequate Foundations Requiring Over Excavation and Replacement

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION
EMBEDMENT TYPES TO BE SPECIFIED IN DESIGN DRAWINGS

TYPE 9 SUPPORT
UTILISING CONCRETE EMBEDMENT
(RIGID & FLEXIBLE PIPES)

TYPE 10 SUPPORT
UTILISING CEMENT STABILISED EMBEDMENT
(RIGID & FLEXIBLE PIPES)

NOTES
1. ALL DIMENSIONS IN MILLIMETRES.
2. USE THESE SUPPORT SYSTEMS WHERE SPECIFIED BY DESIGNER. DETAILS TO BE PROVIDED IN DESIGN DRAWINGS, REFER NOTE 9.
3. USE UNREINFORCED CONCRETE CLASS N20 MIN, AND REINFORCED CONCRETE N25 MIN. FOR AGGRESSIVE CONDITIONS USE SPECIAL CLASS CONCRETE.
4. PLASTIC PIPES SHALL BE MANAGED FOR THERMAL REVERSION AND FLOATATION.
5. WHERE SPECIFIED MINIMUM STEEL REINFORCEMENT OF 0.4% CONCRETE CROSS SECTION PLACED CENTRALLY AND WITH 65 MINIMUM COVER TO EXTERNAL FACE. SPECIFY REINFORCEMENT FOR THE APPLICABLE LOADING IN DESIGN DRAWINGS.
6. CEMENT STABILISED SAND OR WELL GRADED CRUSHED ROCK TO BE 25:1 SAND:CEMENT (PLACED DRY).
7. DURING THE ENCASEMENT PROCESS PIPES WILL REQUIRE A RESTRAINT SYSTEM TO PREVENT PIPE MOVEMENT AND/OR FLOTATION AND/OR THERMAL REVERSION.
8. PROVIDE DOWEL PINS, AS DETAILED IN DESIGN DRAWINGS AT EACH CONCRETE ENCASEMENT JOINT TO PREVENT PIPE DAMAGE.
9. THE USE OF TYPE 9 AND 10 TO BE APPROVED BY SEQ-SP.
10. DETECTABLE MARKER TAPE, REFER NOTE 10 ON SEQ-SEW-1201.

DOWEL PINS
(REFER NOTE 7)

SEAL JOINT WITH FABRIC OR TAPE TO PREVENT CONCRETE ENTERING JOINT

PROVIDE 12 THICK COMPRESSIBLE AND DURABLE MEMBRANE AT EACH FLEXIBLE JOINT

MARKER TAPE

CEMENT STABILISED SAND (REFER NOTE 5)

TRENCH DRAIN (SEE NOTE 8)

CONCRETE ENCASEMENT JOINT DETAILS

150 MIN LAP
75 MIN CLEARANCE
150 MIN
200 MIN
150 MIN

MARKER TAPE

REINFORCEMENT AS SPECIFIED (REFER NOTE 4)

CONCRETE (REFER NOTE 3)

TRENCH FILL

PIPE EMBEDMENT

MARKER TAPE

DETECTABLE MARKER TAPE, REFER NOTE 10 ON SEQ-SEW-1201.

DOWEL PINS
(REFER NOTE 7)

MARKER TAPE

CEMENT STABILISED SAND (REFER NOTE 5)

TRENCH DRAIN (SEE NOTE 8)

CONCRETE ENCASEMENT JOINT DETAILS

150 MIN LAP
75 MIN CLEARANCE
150 MIN
200 MIN
150 MIN

MARKER TAPE

REINFORCEMENT AS SPECIFIED (REFER NOTE 4)

CONCRETE (REFER NOTE 3)

TRENCH FILL

PIPE EMBEDMENT

MARKER TAPE

DETACHABLE MARKER TAPE, REFER NOTE 10 ON SEQ-SEW-1201.
EMBEDMENT TYPES TO BE SPECIFIED IN DESIGN DRAWINGS

TYPE 11 SUPPORT
ALL PIPE TYPES (DI PREFERRED)
≤DN 375 SINGLE PILE
>DN 375 TWIN PILE

TYPE 12 SUPPORT
(ALL PIPE TYPES)
≤DN 300 SINGLE PILE
>DN 300 TWIN PILE

TYPE 13 SUPPORT
(ALL PIPE TYPES)
≤DN 375 SINGLE PILE
>DN 375 TWIN PILE

MARKER TAPE
GRANULAR MATERIAL AS SPECIFIED
GEOTEXTILE FILTER FABRIC (SEE NOTE 3)
PILES TO BE HARDWOOD, CONCRETE OR OTHER APPROVED MATERIALS 150 DIA OR 150x150 MIN. (SEE NOTE 2)

HARDWOOD OR CONCRETE HEADSTOCK 200x100 MIN SHAPED TO FIT BARREL OF PIPE
COMPRRESSIVE MEMBRANE BETWEEN CRADLE AND PIPE

TRENCH DRAINAGE
(SEE NOTE 6)

PILES TO BE HARDWOOD, CONCRETE OR OTHER APPROVED MATERIALS 150 DIA OR 150x150 MIN. (SEE NOTE 2)

NOTES
1. ALL DIMENSIONS IN MILLIMETRES.
2. USE THESE SUPPORT TYPES WHERE SPECIFIED BY DESIGNER AND WHERE APPROVED BY SEQ-SP. PIPE DETAILS AND SPACINGS TO BE AS SHOWN IN DESIGN DRAWINGS.
3. LAY GEOTEXTILE FILTER FABRIC AGAINST THE TRENCH FLOOR AND WALL SUCH THAT IT FULLY ENCASES THE EMBEDMENT. PROVIDE MINIMUM 250 LAP AT ALL FILTER FABRIC JOINTS.
4. USE UNREINFORCED CONCRETE CLASS N20 MIN, AND REINFORCED CONCRETE N25 MIN. FOR AGGRESSIVE CONDITIONS USE SPECIAL CLASS CONCRETE. PLASTIC PIPES SHALL BE MANAGED FOR THERMAL REVERSION AND FLOATATION.
5. MINIMUM STEEL REINFORCEMENT OF 0.4% OF CONCRETE CROSS SECTION PLACED CENTRADLY AND WITH 65 MINIMUM COVER TO EXTERNAL FACE. SPECIFY REINFORCEMENT FOR THE APPLICABLE LOADING IN DESIGN DRAWINGS.
6. SEE SEQ-SEW-1207-1 IF CONTINUOUS TRENCH DRAINAGE REQUIRED.
7. SEE CODE FOR TABLES DETAILING SOIL CHARACTERISTICS, PIPE DETAILS AND LOADS.
8. DESIGN PILES IN ACCORDANCE WITH AS 2159.
9. DETECTABLE MARKER TAPE, REFER NOTE 10 ON SEQ-SEW-1201-1.
NOTES

1. FOR EXCAVATION, BEDDING AND TRENCH FILL REQUIREMENTS REFER SEQ CODES. FOR PAVEMENT AND WEARING SURFACE AND SUB-BASE OR SUBGRADE DETAILS REFER TO THE RELEVANT ROAD AUTHORITIES SPECIFICATION.

2. A GEOTEXTILE BARRIER SHALL BE PROVIDED AT THE INTERFACE OF EMBEDMENT ZONE AND TRENCH FILL ZONE.

3. THE SLAB USED IN TYPE 14 CONSTRUCTION SHALL BE GRADE N15 CONCRETE WITH ZERO SLUMP AND PLACED AND COMPACTED IN 100MM THICK LAYERS.

4. THE ALIGNMENT OF ALL PIPES SHALL BE DEFINED BY A MARKER TAPE PLACED AS SHOWN AT TOP OF EMBEDMENT. THE TAPE SHALL CONTAIN A CONTINUOUS METAL STRIP AND BE COLOURED AND PROVIDED WITH A DESCRIPTION OF THE SEWAGE PRODUCT WITHIN.

5. DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. CONSTRUCT CONCRETE BULKHEADS AND TRENCH STOPS AT LOCATIONS SPECIFIED IN DESIGN DRAWINGS AND BASED ON THE SPACINGS IN TABLE 8.1 OF THE SEQ SEWERAGE CODE.
3. CONSTRUCT ROAD CROSSING BULKHEAD ADJACENT TO KERB AND GUTTER WHERE ROAD FORMATION REQUIRES SUPPORT DUE TO PIPE GRADIENT OR GROUND CONDITIONS.
4. LOCATE BULKHEAD AT A DEVELOPMENTS RETAINING WALL UNDER THE WALL.
5. KEY CONCRETE BULKHEADS INTO SIDES AND BOTTOM OF TRENCH AGAINST A BEARING SURFACE OF UNDISTURBED SOIL.
6. CONCRETE TO BE CLASS N25.
7. DO NOT DEFORM PIPES DURING PLACEMENT OF CONCRETE.
8. SEAL BAGS TO PREVENT LEAKAGE OF CONTAINED MATERIAL.
9. PROVIDE CONTINUOUS DRAINAGE PATH
   - THROUGH BULKHEADS AND TRENCHSTOPS
   - AROUND MAINTENANCE HOLES
   - IN TRENCH EXCAVATIONS ACROSS ROADWAYS.
   TRENCH DRAINAGE TO BE IN ACCORDANCE WITH SEQ-SEW-1207-1.
10. COMPRESSIBLE MEMBRANE AROUND PIPE TO BE 10 THICK POLYSTYRENE FOR BULKHEADS ADJACENT TO KERBS AND 3 MIN THICK RUBBER FOR BULKHEADS AND TRENCHSTOPS ON SLOPES.
11. TRENCH STOPS AND BULKHEADS ARE TO BE USED TO PREVENT OR IMPEDE THE MOVEMENT OF SURFACE AND GROUND WATER THAT WILL DAMAGE THE PIPE TRENCH OR THE PIPE EMBEDMENT.
12. TOP OF BULKHEADS AND TRENCHSTOPS TO BE IN THE RANGE 50MM ABOVE THE PIPE EMBEDMENT MATERIAL AND 300 mm BELOW FSL AS DETERMINED BY THE DESIGNER TO SUIT LOCAL GOVERNMENT CONDITIONS
**ELEVATION**

**CONCRETE BULKHEAD** (SEE SEW-1206)

**GEOTEXTILE FILTER**

**10 SINGLE SIZE COARSE AGGREGATE**

**DRAINAGE PIPE** (SEE NOTE 2)

**GEOTEXTILE WRAPPING** (SEE NOTE 3)

**SECTION**

**CONCRETE BULKHEAD**

**GEOTEXTILE WRAPPING** (SEE NOTE 3)

**GRANULAR EMBEDMENT MATERIAL**

**FLOW**

**PVC DRAINAGE PIPE** (MIN DN 100) TO OUTLET (SEE NOTE 2)

**NOTES**

1. ALL DIMENSIONS IN MILLIMETRES.
2. DRAINAGE PIPES TO DISCHARGE INTO AUTHORISED WATER DISCHARGE AREAS AS DETAILED IN DESIGN DRAWINGS. LAY GEOTEXTILE FILTER FABRIC IN TRENCH
3. TO FULLY ENCAPSULATE THE DRAINAGE MATERIAL (GRANULAR EMBEDMENT). PROVIDE MINIMUM OF 250 LAP AT ALL FILTER FABRIC JOINTS. USE DRAINAGE SYSTEMS AS SPECIFIED WHERE SEWER IS LAID AT A GRADE OF >16%
4. PROVIDE CONTINUOUS DRAINAGE PATH - THROUGH BULKHEADS - AROUND MAINTENANCE STRUCTURES - IN TRENCH EXCAVATIONS ACROSS ROADWAYS

**TYPICAL DISCHARGE SYSTEM FOR PIPE TRENCHES**

**DRAINAGE SYSTEM WITH BULKHEADS**

**DRAINAGE SYSTEM WITHOUT BULKHEADS**

**TRENCH DRAINAGE FOR CONCRETE ENCASEMENT/STABILISATION**

**DRAINAGE PAST MAINTENANCE HOLES**

**GRANULAR FILL AS SPECIFIED**

**CONCRETE OR CEMENT STABILISED FILL AGAINST UNDISTURBED GROUND**

**PIPE DRAIN WHERE TRENCHES REQUIRE CONTINUOUS DRAINAGE** (MIN DN 100 BOTH SIDES)

**ALTERNATIVE LOCATION IF BASE Poured AGAINST TRENCH WALL (MIN DN 100)**

**GRANULAR MATERIAL AS USED FOR ADJACENT PIPELINE SUPPORT**

**GEOTEXTILE FILTER FABRIC**

**PIPE DRAIN REQUIRED WHEN GRADE IS STEEPER THAN 16% (MIN DN 75 ONE OR BOTH SIDES)**

**ALTERNATIVE LOCATION IF BASE Poured AGAINST TRENCH WALL (MIN DN 100)**

**DRAINAGE PIPE** (SEE NOTE 2)

**10 SINGLE SIZE COARSE AGGREGATE**

**DRAINAGE PIPE** (SEE NOTE 2)

**GEOTEXTILE WRAPPING** (SEE NOTE 3)
1. Diversion pipes and fittings to be Ø100 slotted polyethylene class 400 to A.S.2439.
2. For embedment material requirements (Grade 5/7) refer to SEQ sewerage code.
3. Diversion drains shall be fitted with a filter sleeve/sock.
4. 0.5 thick Visqueen ecomembrane or similar to be laid under the limits of the manhole.
5. Locate the diversion pipe centrally in trench 50 above trench floor. Provide end caps at all pipe ends.
6. Dimensions are in millimetres unless shown otherwise.
DI COVER
DI FRAME
SQUAT CONE
MATTIC OR RUBBER RING TO ALL (SEE NOTE 2)
SHAFT SECTION
FSL
DN1000 OR DN1200
OR AS SPECIFIED
SHAFT SECTION
(SEE NOTE 4)
CAST IN-SITU BASE (SEE NOTE 8)
CAST IN-SITU CONCRETE SHALL BE GRADE N32 150 THICK FOR MANHOLE TO 2 m DEPTH 300 THICK FOR MANHOLE GREATER THAN 2 m DEPTH.
MAINTENANCE HOLE TYPE P2
(SEE NOTE 10, 13 AND 14)
MAINTENANCE HOLE TYPE P3 PRE-CAST BASE
(SEE NOTE 10, 13 AND 14)
CONVERSION SLAB
(SEE NOTE 14)
MAINTENANCE HOLE TYPE P1
(SEE NOTE 10, 13 AND 14)
SQUAT CONE
SHAFT SECTION
CAST IN-SITU BASE (SEE NOTE 8)
CAST IN-SITU CONCRETE SHALL BE GRADE N32 150 THICK FOR MANHOLE TO 2 m DEPTH 300 THICK FOR MANHOLE GREATER THAN 2 m DEPTH.
MAINTENANCE HOLE TYPE P2
(SEE NOTE 10, 13 AND 14)
MAINTENANCE HOLE TYPE P3 PRE-CAST BASE
(SEE NOTE 10, 13 AND 14)

NOTES
1. ALL PRE CAST MANHOLES TO BE MAX 6 m.
2. PROVIDE ROUNDED NOSING ON INLET AND OUTLET PIPE TO PREVENT DAMAGE TO JETTING EQUIPMENT AND CCTV GUIDES AND CABLES.
3. CONSTRUCTION MAY BE A COMBINATION OF PRECAST AND IN-SITU TO SUIT APPLICATION. TYPE P3 PREFERRED. REFER NOTE 13.
4. LOCATION OF FIRST SHAFT SECTION FOR CAST IN-SITU BASE:
   a) FIRST SHAFT SECTION TO BE BETWEEN 300-600 LONG TO ALLOW FORMING OF CHANNEL AND BENCH.
   b) PLACE HYDROPHILIC SEAL WITH 100 COVER FOR CAST IN-SITU CONCRETE BASE.
   c) PRIME COMPONENT 200 FROM BOTTOM WITH CEMENT SLURRY. EMBED SHAFT SECTION 50 INTO WET CONCRETE BUILD UP OUTSIDE FILLET TO 150.
5. MAKE-UP RINGS:
   a) USE MINIMUM OF ONE MAKE-UP RING (PREFERABLY 100 OR 150) PER MH DURING CONSTRUCTION TO ALLOW FOR FUTURE SURFACE ADJUSTMENT WITHOUT AFFECTING THE SHAFT SECTIONS.
   b) USE TAPERED MAKE UP RING OR TAPERED SPACERS ON SLOPING GROUND.
6. BACKFILL AROUND MH
   a) THE METHOD OF BACKFILL AND COMPACTION AROUND MH TO BE AS FOR PIPE EMBEDMENT.
   b) TAKE CARE TO RAISE BACKFILL EQUALLY ALL AROUND THE MH TO AVOID UNBALANCED LATERAL LOADING
7. FOR ALL MH’S, STEP IRONS OR LADDERS ARE PROHIBITED.
8. CAST IN-SITU CONCRETE BASE TO BE N32.
9. IN WATER CHARGED GROUND OR WHERE THERE IS SIGNIFICANT RISK OF SURCHARGE USE ONLY FULL CAST IN-SITU MH.
10. FOR PIPE CONNECTIONS TO MH SEE SEQ-SEW-1302-1.
11. ALL JOINTS WITHIN 1200 OF SURFACE TO HAVE EXTERNALLY APPLIED AT FOUR LOCATIONS AROUND THE JOINT A 100 LONG APPLICATION OF MEGAPOXY INTO THE JOINT. ALL JOINTS 1000 BELOW SURFACE OR DEEPER TO HAVE EXTERNALLY APPLIED A 150 WIDE BITUMASTIC SEAL TAPE THAT INCLUDES PRIMING THE CONCRETE SURFACE. INTERNAL JOINTS ARE NOT TO BE BAGGED OR MEGAPOXIED.
12. FOR MH COVER CLASS SELECTION AND FINISHED LEVELS SEE SEQ-SEW-1308-1.
13. GCCC ONLY PERMIT SQUAT CONE OR STRAIGHT BACK TAPIERS AND PRE-CAST BASES.
14. UNITY WATER PERMIT STRAIGHT BACK TAPER OR CONVERSION SLAB ONLY.

REV. No. DATE DESCRIPTION AUTH.

GCCC LCC RCC DM RC UW

SEQ-SEW-1300-1 B

NOT TO SCALE
1. All work and materials shall be in accordance with current SEQ Code specifications and standards.
2. Unless specified otherwise all materials and work shall comply with the relevant Australian standards.
3. All castings shall be service provider approved.
4A. Anchor brackets shall be used with all bolt down covers.
4B. GCCC only approves the use of the top slab anchor bracket, to be used as shown on SEQ-SEW-1307-1 and SEQ-SEW-1308-1.
5. All concrete shall be Class N20 except maintenance holes which are special Class to WSA PS-358 with calcareous aggregates.
6. All dimensions are in millimetres.
7. Cover frame to match finished surface level profile.
8. Where bolt down lids are required the frame shall be fixed to the top slab with 4 - M16 x 100 masonry anchors and the top slab fixed down with three evenly spaced anchor brackets.
STRAIGHT THROUGH SEWER
TYPE "A"

HYDROPHYLIC SEAL
(TYPICAL)
SEE NOTE 4

PE THRUST FLANGE
12 mm x (O/D.+140).

OLIQUE BACKDROP
TYPE "C"

NOTE:
SEWERS CHANGING DIAMETER SHALL BE GRADED OBVERT TO OBVERT.

DIMENSION 'A' TABLE

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* MINIMUM FALL ACROSS MAINTENANCE HOLE AS TABLED.

PLAN
EXTERNAL BACKDROP
TYPE "D"

NOTES
1. FOR PE SEWER NOTES REFER DRG. NO. SEQ-SEW-1315-1.
2. FOR SIZE, DEPTH, TOP SLAB AND OTHER DETAILS OF MH REFER DRG. NO. SEQ-SEW-1303-3.
3. MH CONNECTORS INCLUDING HYDROPHILIC SEALS & PUDDLE FLANGES TO BE PRE-FABRICATED TYPE.
4. MH CONNECTORS SHALL COMPLY WITH THE DETAILS ON DWG.
5. STEP IRONS AND LADDERS SHALL NOT BE PROVIDED FOR UNITYWATER MANHOLES.
6. REFER SEQ-SEW-1301-1 FOR TOP SLAB AND COPING INSTALLATION DETAILS.
7. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SEQ-SPS SPECIFICATIONS AND STANDARDS.
8. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
9. CONCRETE SHALL BE SPECIAL CLASS TO WSA PS-358 WITH CALCAREOUS AGGREGATE.
10. WHERE DEPTH TO BENCH FROM TOP OF COPING IS GREATER THAN 850 mm STEP IRONS ARE REQUIRED. STEP IRONS SHALL NOT BE PLACED CLOSER THAN 150mm FROM THE BENCHING.
11. TOP SLAB THICKNESS SHALL BE INCREASED FROM 115 mm TO 150 mm WHERE CLASS 'D' COVERS ARE SPECIFIED FOR TRAFFICABLE LOCATIONS.
12. ALL CONCRETE SHALL BE VIBRATED.
13. THIS STANDARD DRAWING APPLIES FOR ALL RETICULATION SEWERS UP TO DN250 DIAMETER NUSEWERS.
14. DEPTH OF CHANNEL SHALL BE MAXIMUM 2 x DIAMETER FOR DN110 & DN160 DIAMETER SEWERS AND EQUAL TO DIAMETER FOR DN250 DIAMETER SEWERS.
15. ABBREVIATIONS C.J.—CONSTRUCTION JOINT
16. MAINTENANCE HOLE FRAME & COVER SHALL SUIT APPLICATION. REFER STANDARD DRAWING SEQ-SEW-1308-2 TO SEQ-SEW-1308 FOR DETAILS.
17. INTERNAL DROPS ARE NOT PERMITTED IN 'G' TYPE MAINTENANCE HOLES.
18. ENDS OF SEWERS SHALL FINISH FLUSH WITH INSIDE FACE OF MAINTENANCE HOLE WALL.
19. THE OBVERT LEVEL OF THE UPSTREAM SEWER SHALL NOT BE LOWER THAN THE OBVERT LEVEL OF THE DOWNSWERM MAINTENANCE HOLE.
20. MAINTENANCE HOLES SHALL BE LOCATED CENTRAALLY OVER SEWERS.
21. MAINTENANCE HOLE BENCHING SHALL BE CONSTRUCTED TO PROVIDE A SMOOTH, NON-TURBULENT FLOW.
22. BENCHING SHALL BE FINISHED WITH AN EQUAL PARTS SAND AND CEMENT TOPPING.
REFER DWG SEQ-SEW-1301-2 FOR NOTES

SLAB REINFORCEMENT

190 115 115 CLASS B COVER

75 WELDED LAP

PLAN

"G" TYPE M.H. TOP SLAB STEEL LIST

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<th>BAR NO</th>
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DESIGN INPUT BY RPEQ REQUIRED FOR TRAFFIC LOADS, STRUCTURAL STEEL DESIGN AND NATIVE SOIL CONDITIONS

PRIVATE PROPERTY/ROAD RESERVE LENGTH

TOTAL 9930

TYPICAL DOWEL DETAILS AT CONSTRUCTION JOINTS

6-N12 BARS WITH STANDARD HOOK EVENLY SPACED AT EACH C.J.

SEE NOTES 5 AND 10 ON SEQ-SEW-1301-2

STEP IRON ARRANGEMENT

STEP IRONS SHALL NOT BE PROVIDED FOR UNITY WATER MANHOLES

SLAB REINFORCEMENT

DN110 AND DN160=2xDN
DN250=1xDN

10 mm CEMENT/MORTAR OR EPOXY MORTAR (Eg MEGAPOXY OR EQUIVALENT) AS REQUIRED BY SEQ-SP

CAST INSITU MAINTENANCE HOLE FOR ROADWAY, PRIVATE PROPERTY AND FOOTPATH LOCATIONS. DEPTHS TO 3.000 m MAXIMUM.

NOTES

1. ALL CONSTRUCTION JOINTS SHALL INCLUDE EITHER PVC WATER STOPS OR HYDROPHILIC SEALS TO MANUFACTURERS REQUIREMENTS.

"G" TYPE M.H. TOP SLAB STEEL LIST

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PRIVATE PROPERTY/ROAD RESERVE LENGTH

TOTAL 9930

TYPICAL DOWEL DETAILS AT CONSTRUCTION JOINTS

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DN110 AND DN160=2xDN
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10 mm CEMENT/MORTAR OR EPOXY MORTAR (Eg MEGAPOXY OR EQUIVALENT) AS REQUIRED BY SEQ-SP

CAST INSITU MAINTENANCE HOLE FOR ROADWAY, PRIVATE PROPERTY AND FOOTPATH LOCATIONS. DEPTHS TO 3.000 m MAXIMUM.

NOTES

1. ALL CONSTRUCTION JOINTS SHALL INCLUDE EITHER PVC WATER STOPS OR HYDROPHILIC SEALS TO MANUFACTURERS REQUIREMENTS.
**ELEVATION**

HYDROPHILIC SEAL (TYPICAL) SEE NOTE 4

FLOW 250

PE THRUST FLANGE 12 mm x (O/D.+140).

STRAIGHT THROUGH SEWER TYPE "A"

PE TEE SECTION CUT TO SUIT (110 x 110, 160 x 160, 250 x 160 OR 315 x 160)

SEE SEQ-SEW-1307-4 FOR CONCRETE CUT DETAILS

SS316 BRACKET AT SOCKET

DN100 OR DN150 PVC DROP PIPE SBN TO AS1260 SEE NOTE 19

MINIMUM OF 2 x BRACKETS AT MAXIMUM 1500 CTS. REFER SEQ-SEW-1303-4

NOTE:

SEWERS CHANGING DIAMETER SHALL BE GRADED OBVERT TO OBVERT.

**INTERNAL DROP EXISTING MH ONLY** (REFER NOTE 23)

1. FOR PE SEWER NOTES REFER DRG. NO. SEQ-SEW-1315-1.
2. FOR SIZE, DEPTH, TOP SLAB AND OTHER DETAILS OF MH REFER DRG. NO. SEQ-SEW-1301-5.
3. MH CONNECTORS INCLUDING HYDROPHILIC SEALS & PUDDLE FLANGES TO BE PRE-FABRICATED TYPE.
4. MH CONNECTORS SHALL COMPLY WITH THE DETAILS ON DWG. SEQ-SEW-1313-1.
5. STEP IRONS AND LADDERS SHALL NOT BE PROVIDED FOR UNITY WATER MAINTENANCE HOLES.
6. REFER SEQ-SEW-1301-1 FOR TOP SLAB AND COPING INSTALLATION DETAILS.
7. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SEQ-SPS SPECIFICATIONS AND STANDARDS.
8. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
9. CONCRETE SHALL BE SPECIAL CLASS TO WSA PS-358 WITH CALCAREOUS AGGREGATES.
10. WHERE DEPTH TO BENCH FROM TOP OF COPING IS GREATER THAN 850 mm STEP IRONS ARE REQUIRED. STEP IRONS SHALL NOT BE PLACED CLOSER THAN 150 mm FROM THE BENCHING. STEP IRONS SHALL BE PLACED OVER DOWNSWERM OUTLET.
11. TOP SLAB THICKNESS SHALL BE INCREASED FROM 115 mm TO 150 mm WHERE CLASS "D" COVERS ARE SPECIFIED FOR TRAFFICABLE LOCATIONS.
12. ALL CONCRETE SHALL BE VIBRATED.
13. THIS STANDARD DRAWING APPLIES FOR ALL RETICULATION SEWERS UP TO DN315 DIAMETER NUSEWERS.
14. DEPTH OF CHANNEL SHALL BE MAXIMUM 2 x DIAMETER DN110 & DN160 DIAMETER SEWERS AND EQUAL TO DIAMETER DN250 & DN315 DIAMETER SEWERS.
15. ABBREVIATIONS: C.J. - CONSTRUCTION JOINT
16. MAINTENANCE HOLE FRAME & COVER SHALL SUIT APPLICATION. REFER STANDARD DRAWING SEQ-SEW-1308-1 TO SEQ-SEW-1308-
17. ENDS OF SEWERS SHALL FINISH FLUSH WITH INSIDE FACE OF MAINTENANCE HOLE WALL.
18. THE OBVERT LEVEL OF THE UPSTREAM SEWER SHALL NOT BE LOWER THAN THE OBVERT LEVEL OF THE DOWNSTREAM SEWER.
19. ONE INTERNAL DROP ONLY PERMITTED IN "F" TYPE MAINTENANCE HOLE.
20. MAINTENANCE HOLES SHALL BE LOCATED CENTRALLY OVER SEWERS.
21. MAINTENANCE HOLE BENCHING SHALL BE CONSTRUCTED TO PROVIDE A SMOOTH, NON-TURBULENT FLOW.
22. BENCHING SHALL BE FINISHED WITH AN EQUAL PARTS SAND AND CEMENT TOPPING.
23. EXISTING MH CUT IN CONCRETE AND REINFORCING BAR DETAILS SHOWN IN SEQ-SEW-1307-4.

**INTERNAL DROP ARRANGEMENT** (REFER NOTES 5 & 10)

ANYMOO OR APPROVED EQUIVALENT STEP IRONS (.238 mm WIDE) TO AUSTRALIAN STANDARD 1657. SEE NOTE 5

**NORMAL ANGLE DROP**

(TYPICAL) SEE NOTE 4

PE TEE SECTION CUT TO SUIT (110 x 110, 160 x 160, 250 x 160 OR 315 x 160)

SEE SEQ-SEW-1307-4 FOR CONCRETE CUT DETAILS

SS316 BRACKET AT SOCKET

DN100 OR DN150 PVC DROP PIPE SBN TO AS1260 SEE NOTE 19

MINIMUM OF 2 x BRACKETS AT MAXIMUM 1500 CTS. REFER SEQ-SEW-1303-4

NOTE:

SEWERS CHANGING DIAMETER SHALL BE GRADED OBVERT TO OBVERT.

**INTERNAL DROP EXISTING MH ONLY** (REFER NOTE 23)

1. FOR PE SEWER NOTES REFER DRG. NO. SEQ-SEW-1315-1.
2. FOR SIZE, DEPTH, TOP SLAB AND OTHER DETAILS OF MH REFER DRG. NO. SEQ-SEW-1301-5.
3. MH CONNECTORS INCLUDING HYDROPHILIC SEALS & PUDDLE FLANGES TO BE PRE-FABRICATED TYPE.
4. MH CONNECTORS SHALL COMPLY WITH THE DETAILS ON DWG. SEQ-SEW-1313-1.
5. STEP IRONS AND LADDERS SHALL NOT BE PROVIDED FOR UNITY WATER MAINTENANCE HOLES.
6. REFER SEQ-SEW-1301-1 FOR TOP SLAB AND COPING INSTALLATION DETAILS.
7. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SEQ-SPS SPECIFICATIONS AND STANDARDS.
8. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
9. CONCRETE SHALL BE SPECIAL CLASS TO WSA PS-358 WITH CALCAREOUS AGGREGATES.
10. WHERE DEPTH TO BENCH FROM TOP OF COPING IS GREATER THAN 850 mm STEP IRONS ARE REQUIRED. STEP IRONS SHALL NOT BE PLACED CLOSER THAN 150 mm FROM THE BENCHING. STEP IRONS SHALL BE PLACED OVER DOWNSWERM OUTLET.
11. TOP SLAB THICKNESS SHALL BE INCREASED FROM 115 mm TO 150 mm WHERE CLASS "D" COVERS ARE SPECIFIED FOR TRAFFICABLE LOCATIONS.
12. ALL CONCRETE SHALL BE VIBRATED.
13. THIS STANDARD DRAWING APPLIES FOR ALL RETICULATION SEWERS UP TO DN315 DIAMETER NUSEWERS.
14. DEPTH OF CHANNEL SHALL BE MAXIMUM 2 x DIAMETER DN110 & DN160 DIAMETER SEWERS AND EQUAL TO DIAMETER DN250 & DN315 DIAMETER SEWERS.
15. ABBREVIATIONS: C.J. - CONSTRUCTION JOINT
16. MAINTENANCE HOLE FRAME & COVER SHALL SUIT APPLICATION. REFER STANDARD DRAWING SEQ-SEW-1308-1 TO SEQ-SEW-1308-
17. ENDS OF SEWERS SHALL FINISH FLUSH WITH INSIDE FACE OF MAINTENANCE HOLE WALL.
18. THE OBVERT LEVEL OF THE UPSTREAM SEWER SHALL NOT BE LOWER THAN THE OBVERT LEVEL OF THE DOWNSTREAM SEWER.
19. ONE INTERNAL DROP ONLY PERMITTED IN "F" TYPE MAINTENANCE HOLE.
20. MAINTENANCE HOLES SHALL BE LOCATED CENTRALLY OVER SEWERS.
21. MAINTENANCE HOLE BENCHING SHALL BE CONSTRUCTED TO PROVIDE A SMOOTH, NON-TURBULENT FLOW.
22. BENCHING SHALL BE FINISHED WITH AN EQUAL PARTS SAND AND CEMENT TOPPING.
23. EXISTING MH CUT IN CONCRETE AND REINFORCING BAR DETAILS SHOWN IN SEQ-SEW-1307-4.

**INTERNAL DROP ARRANGEMENT** (REFER NOTES 5 & 10)

ANYMOO OR APPROVED EQUIVALENT STEP IRONS (.238 mm WIDE) TO AUSTRALIAN STANDARD 1657. SEE NOTE 5

**NORMAL ANGLE DROP**

(TYPICAL) SEE NOTE 4

PE TEE SECTION CUT TO SUIT (110 x 110, 160 x 160, 250 x 160 OR 315 x 160)

SEE SEQ-SEW-1307-4 FOR CONCRETE CUT DETAILS

SS316 BRACKET AT SOCKET

DN100 OR DN150 PVC DROP PIPE SBN TO AS1260 SEE NOTE 19

MINIMUM OF 2 x BRACKETS AT MAXIMUM 1500 CTS. REFER SEQ-SEW-1303-4

NOTE:

SEWERS CHANGING DIAMETER SHALL BE GRADED OBVERT TO OBVERT.

**INTERNAL DROP EXISTING MH ONLY** (REFER NOTE 23)

1. FOR PE SEWER NOTES REFER DRG. NO. SEQ-SEW-1315-1.
2. FOR SIZE, DEPTH, TOP SLAB AND OTHER DETAILS OF MH REFER DRG. NO. SEQ-SEW-1301-5.
3. MH CONNECTORS INCLUDING HYDROPHILIC SEALS & PUDDLE FLANGES TO BE PRE-FABRICATED TYPE.
4. MH CONNECTORS SHALL COMPLY WITH THE DETAILS ON DWG. SEQ-SEW-1313-1.
5. STEP IRONS AND LADDERS SHALL NOT BE PROVIDED FOR UNITY WATER MAINTENANCE HOLES.
6. REFER SEQ-SEW-1301-1 FOR TOP SLAB AND COPING INSTALLATION DETAILS.
7. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SEQ-SPS SPECIFICATIONS AND STANDARDS.
8. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
9. CONCRETE SHALL BE SPECIAL CLASS TO WSA PS-358 WITH CALCAREOUS AGGREGATES.
10. WHERE DEPTH TO BENCH FROM TOP OF COPING IS GREATER THAN 850 mm STEP IRONS ARE REQUIRED. STEP IRONS SHALL NOT BE PLACED CLOSER THAN 150 mm FROM THE BENCHING. STEP IRONS SHALL BE PLACED OVER DOWNSWERM OUTLET.
11. TOP SLAB THICKNESS SHALL BE INCREASED FROM 115 mm TO 150 mm WHERE CLASS "D" COVERS ARE SPECIFIED FOR TRAFFICABLE LOCATIONS.
12. ALL CONCRETE SHALL BE VIBRATED.
13. THIS STANDARD DRAWING APPLIES FOR ALL RETICULATION SEWERS UP TO DN315 DIAMETER NUSEWERS.
14. DEPTH OF CHANNEL SHALL BE MAXIMUM 2 x DIAMETER DN110 & DN160 DIAMETER SEWERS AND EQUAL TO DIAMETER DN250 & DN315 DIAMETER SEWERS.
15. ABBREVIATIONS: C.J. - CONSTRUCTION JOINT
16. MAINTENANCE HOLE FRAME & COVER SHALL SUIT APPLICATION. REFER STANDARD DRAWING SEQ-SEW-1308-1 TO SEQ-SEW-1308-
17. ENDS OF SEWERS SHALL FINISH FLUSH WITH INSIDE FACE OF MAINTENANCE HOLE WALL.
18. THE OBVERT LEVEL OF THE UPSTREAM SEWER SHALL NOT BE LOWER THAN THE OBVERT LEVEL OF THE DOWNSTREAM SEWER.
19. ONE INTERNAL DROP ONLY PERMITTED IN "F" TYPE MAINTENANCE HOLE.
20. MAINTENANCE HOLES SHALL BE LOCATED CENTRALLY OVER SEWERS.
21. MAINTENANCE HOLE BENCHING SHALL BE CONSTRUCTED TO PROVIDE A SMOOTH, NON-TURBULENT FLOW.
22. BENCHING SHALL BE FINISHED WITH AN EQUAL PARTS SAND AND CEMENT TOPPING.
23. EXISTING MH CUT IN CONCRETE AND REINFORCING BAR DETAILS SHOWN IN SEQ-SEW-1307-4.
TYPICAL DOWEL DETAILS
AT CONSTRUCTION JOINTS

STEP IRON ARRANGEMENT
STEP IRONS SHALL NOT BE PROVIDED FOR UNITYWATER MANHOLES

SEE NOTES 5 AND 10 ON SEQ-SEW-1301-4

SHEET

PLATE

SEE NOTES 5 AND 10 ON SEQ-SEW-1301-4

STEP IRONS SHALL NOT BE PROVIDED FOR UNITYWATER MANHOLES

DRAWING No. VERSION

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

DRAWING No.

NOT TO SCALE

"F" TYPE M.H. TOP SLAB STEEL LIST

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DESIGN INPUT BY RPEQ REQUIRED FOR TRAFFIC LOADS, STRUCTURAL STEEL DESIGN AND NATIVE SOIL CONDITIONS.

CAST INSITU MAINTENANCE HOLE FOR ROADWAY, PRIVATE PROPERTY AND FOOTPATH LOCATIONS. DEPTHS <= 4.250 m.

NOTES
1. ALL CONSTRUCTION JOINTS SHALL INCLUDE EITHER PVC WATER STOPS OR HYDROPHILIC SEALS TO MANUFACTURERS REQUIREMENTS.

"F" TYPE - PE NUSEWERS
TYPICAL MAINTENANCE HOLE AND SLAB DETAILS

SEQ WATER SERVICE PROVIDERS

DRAWING No. VERSION

DRAWING No.

NOT TO SCALE
SECTIONAL ELEVATION
PIPES Ø600 OR LESS

DESIGN INPUT BY RPEQ REQUIRED FOR TRAFFIC LOADS, STRUCTURAL STEEL DESIGN AND NATIVE SOIL CONDITIONS

CAST IN SITU MAINTENANCE HOLE FOR ROADWAY AND PRIVATE PROPERTY LOCATIONS. DEPTHS > 4.25m. NOT TO BE USED IN FOOTPATH LOCATIONS.

SECTIONAL ELEVATION
Ø1200 PIPE

NOTES
1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SEQ SERVICE PROVIDER CODE AND SPECIFICATIONS AND STANDARDS.
2. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
3. REFER SEQ-SEW-1301-7 FOR TYPICAL STEEL AND SET-OUT DETAIL. CLEAR COVER ON ALL REINFORCEMENT SHALL BE 75mm UNLESS NOTED OTHERWISE.
4. WHENEVER SEWER WALL THICKNESS IS GREATER THAN MINIMUM WALL THICKNESS OF THE CHAMBER, THEN THE WALL THICKNESS OF THE CHAMBER SHALL BE MADE EQUAL TO THAT OF THE SEWER.
5. ALL CONCRETE SHALL BE SPECIAL CLASS TO WSA PS-358 WITH CALCAREOUS AGGREGATE.
6. WHERE MORE THAN ONE SIDE BRANCH ENTERS A MAINTENANCE HOLE, SEPARATE DROPS MAY BE UTILISED WHEN THE MAIN SEWER IS 600mm DIAMETER AND LESS. FOR A MAIN SEWER WITH DIAMETER GREATER THAN 675mm, THE RETICULATION LAYOUT IS TO BE REDESIGNED TO ARRANGE FOR ONE DROP ONLY FOR EACH MAINTENANCE HOLE.
7. ANCHORAGE POINTS FOR SAFETY CHAINS SHALL BE INSTALLED BY THE CONTRACTOR AS PER DETAIL. SAFETY CHAIN SHALL BE SUPPLIED AND INSTALLED BY SEQ SERVICE PROVIDER MAINTENANCE STAFF. (SAFETY CHAIN ONLY APPLICABLE TO SEWERS 750mm DIAMETER AND OVER.)
8. SAFETY CHAIN AND BOLT SHALL BE STAINLESS STEEL TYPE 316.
9. CHAINS, EYE BOLTS AND HOOKS OF AN APPROVED PATTERN MAY BE USED IN LIEU OF THOSE SHOWN.
10. STEP IRONS SHALL BE PLACED DIRECTLY UNDER THE LADDER FOR CONTINUATION TO FOOTHOLE.
11. TOP SLAB THICKNESS SHALL BE INCREASED FROM 115mm TO 150mm WHERE LOCATED IN TRAFFICABLE LOCATION.
12. LADDERS TO STANDARD DRAWING SEQ-SEW-1301-12. SHALL BE PLACED OVER DOWNSTREAM OUTLET OF MAINTENANCE HOLES WITH 600 DIAMETER OR LESS SEWERS AND AT SIDE OF MAINTENANCE HOLES WITH SEWERS LARGER THAN 600 DIAMETER.
14. ENDS OF SEWERS SHALL FINISH FLUSH WITH INSIDE FACE OF MAINTENANCE HOLE WALL.
15. THE OBVERT LEVEL OF THE UPSTREAM SEWER SHALL NOT BE LOWER THAN THE OBVERT LEVEL OF THE DOWNSTREAM SEWER.
16. PROPERTY CONNECTION JUNCTIONS SHALL NOT BE CONSTRUCTED ON SHORT PIPES AT MAINTENANCE HOLES OR BULKHEADS.
17. MAINTENANCE HOLE BENCHING SHALL BE CONSTRUCTED TO PROVIDE A SMOOTH NON-TURBULENT FLOW.
18. STEP IRONS SHALL NOT BE LOCATED WITHIN THE DIAMETER OF THE SEWER. ALTERNATIVELY, FOOTHOLES SHALL BE USED AS DETAILED.
19. MINIMUM 6-N12 BARS WITH STANDARD HOOKS EVENLY SPACED AT EACH CONSTRUCTION JOINT (C.C.).
SECTIONAL ELEVATION

3N16 TRIMMER T.F. BARS TYPICAL (150 CRS.)

2N16 TRIMMER T.F. BARS TYPICAL (150 CRS.)

3N16 TRIMMER T.F. BARS TYPICAL (150 CRS.)

STEEL A

STEEL C

PLAN

SPECIAL CLASS CONCRETE TO WSA PS-358

STEEL B

DETACHABLE SAFETY CHAIN DOWNSTREAM (REFER NOTES 7, 8 AND 9, AND SEQ-SEW-1301-9)

150 SQUARE FOOTHOLE

STEEL C

150 SQUARE FOOTHOLE

STEEL A

AYMROO OR APPROVED EQUIVALENT STEP IRONS (238mm WIDE) TO AUSTRALIAN STANDARD 1657

SECTIONAL ELEVATION CHAMBER FOR PIPES OVER Ø1200

1. REFER SEQ-SEW-1301-6 FOR NOTES INCLUDING BOXED NOTES

NOTES

"X" TYPE DEEP MAINTENANCE HOLE TYPICAL ARRANGEMENT SEWER > Ø1200

STEEL FOR M.H. CHAMBERS

<table>
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<tr>
<th>DEPTH (M)</th>
<th>STEEL &quot;A&quot;</th>
<th>STEEL &quot;B&quot;</th>
<th>STEEL &quot;C&quot;</th>
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</thead>
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<tr>
<td>0-5</td>
<td>2XN12 BARS @ 150 CRS.</td>
<td>N12 BARS @ 150 CRS.</td>
<td>N12 BARS CRS AS SHOWN.</td>
</tr>
<tr>
<td>5-10</td>
<td>2XN12 BARS @ 150 CRS.</td>
<td>Y16 BARS @ 150 CRS.</td>
<td>Y16 BARS CRS AS SHOWN.</td>
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<tr>
<td>10-20</td>
<td>2XN12 BARS @ 150 CRS.</td>
<td>Y16 BARS @ 150 CRS.</td>
<td>Y16 BARS CRS AS SHOWN.</td>
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SHORT PIPES REQUIRED AT MAINTENANCE HOLES

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<tr>
<td>VITRIFIED CLAY</td>
<td>1st PIPE 2nd PIPE</td>
<td>300 - 300 600 - 600</td>
</tr>
<tr>
<td>UPVC</td>
<td>1st PIPE 2nd PIPE</td>
<td>600 - 600</td>
</tr>
<tr>
<td>DICL</td>
<td>1st PIPE 2nd PIPE</td>
<td>UP TO FULL PIPE</td>
</tr>
<tr>
<td>PE</td>
<td>SHORT PIPES ARE NOT REQUIRED. PE SYSTEM SHALL BE FULLY WELDED.</td>
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</table>

INTERNAL DROP PIPE WITH EXISTING MH ONLY
MAIN SEWERS Ø600 OR LESS

SEQ WATER SERVICE PROVIDERS

SEWERAGE STANDARD DRAWING

"X" TYPE
DEEP MAINTENANCE HOLE
TYPICAL ARRANGEMENT
SEWER ≤ Ø600 WITH DROP PIPE

NOT TO SCALE

SEE NOTE 13
SEQ-SEW-1301-6
INTERNAL DROP PIPE WITH EXISTING MH ONLY
PIES Ø675 TO Ø9000

SEWER < Ø1200
SEE NOTE 2

SEWER ≥ Ø1200

SAFETY CHAIN AND EYE BOLT DETAIL

NOTES
1. REFER SEQ-SEW-1301-6 FOR NOTES INCLUDING BOXED NOTES.
2. A SS316 BOX MAY BE REQUIRED FOR THE RECESS WHERE PIPE IS LESS THAN DN1200
**DESIGN OF JUNCTIONS**

All sewers of varying diameter shall be graded obvert to obvert when the sewers are in line.

**SIDE BRANCHES:**

**CASE 1.** When \( D-d \) is equal to or less than \( D/3 \) ie. 
\[
(D-d \leq D/3) \text{ THEN the obvert of the side branch shall be graded to the obvert of the main sewer.}
\]

**CASE 2.** When \( D-d \) is equal to or less than \( D/3 + 230 \), but greater than \( D/3 \) ie. 
\[
(D/3 + 230 \geq D-d > D/3), \text{ then the obvert of the side branch shall be graded to the obvert of the main sewer up to the maintenance hole wall and then the channel through the benching shall be graded to D/3 of the main sewer.}
\]

**SIDE BRANCH UP TO Ø230**

**CASE 3.** When \((D-d) - D/3\) is greater than 230, the obvert of the side branch shall be graded to the obvert of the main sewer and a backdrop junction shall be used to bring the side branch flow into the main sewer at D/3.

**SIDE BRANCH GREATER THAN Ø230**

**CASE 4.** When \((D-d) - D/3\) is greater than 230, the side branch shall first be graded to meet the main sewer at obvert level, then:

(a) That section of the incoming line from the first branch sewer maintenance hole to the main sewer shall be regraded so that the side branch sewer has an entrance depth of D/3 or:

(b) That section of the incoming line from the first branch sewer maintenance hole to the main sewer shall be regraded so that E.L of water surface in the side branch is equal to E.L of water surface in main sewer for average daily dry weather flows.

---

**TYPICAL SECTION PLANS FOR JUNCTIONS**

**CASE 1**

**CASE 2**

**CASE 3**

**CASE 4(a)**

**CASE 4(b)**

---

**SEWERAGE STANDARD DRAWING**

"X" TYPE

DEEP MAINTENANCE HOLE

TYPICAL JUNCTION DETAILS
**"X" TYPE M.H. TOP SLAB STEEL LIST**

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<tr>
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</table>

**SLAB REINFORCEMENT**

**ACCESS OPENING**

**75 WELD LAP**

**PRIVATE PROPERTY/ROADWAY**

**150 CRS**

**PLAN**

**SECTION A**

**TOTAL 20410**

**NOT TO SCALE**

**SEQ WATER SERVICE PROVIDERS**

**SEWERAGE STANDARD DRAWING**

**"X" TYPE DEEP MAINTENANCE HOLE TYPICAL TOP SLAB DETAILS**

**SEE NOTE 11 SEQ-SEW-1301-6**

**DESIGN INPUT BY RPEQ REQUIRED FOR TRAFFIC LOADS, STRUCTURAL STEEL DESIGN AND NATIVE SOIL CONDITIONS**

**REFER SEQ-SEW-1301-6 FOR NOTES**

**WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION**
**NOTES**

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SEQ CODE, SPECIFICATIONS AND STANDARDS.

2. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.

3A. ALL STEELWORK, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE HOT DIPPED GALVANISED TO AS/NZS 4680. AFTER ASSEMBLY, ANY ITEMS REQUIRING PAINTWORK SHALL BE PAINTED WITH AN APPROVED BITUMASTIC ENAMEL.

3B. WHERE A STAINLESS STEEL LADDER IS REQUIRED, REPLACE ALL MILD STEEL ITEMS, INCLUDING BOLT SETS WITH STAINLESS STEEL TYPE 316. STAINLESS STEEL ITEMS SHOWN WITH BRACKETS (F.S.S.)

4. WASHER SHALL BE INSTALLED UNDER BOLT HEADS AND NUTS.

5. LADDERS SHALL BE USED FOR "CAST IN SITU MAINTENANCE HOLES" ONLY.

6. LADDERS SHALL BE USED IN ALL MAINTENANCE HOLES WHERE DEPTH FROM GROUND LEVEL TO INVERT OF SEWER EXCEEDS 4.200 m.

7. THIS DRAWINGS COMPLIES WITH SPECIFICATIONS OF A.S. 1657 "FIXED PLATFORMS, WALKWAYS, STAIRWAYS AND LADDERS - DESIGN, CONSTRUCTION AND INSTALLATION."

8. FOR LADDERS IN MAINTENANCE HOLES, CAGES, EXTENDABLE HANDRAILS AND PLATFORMS ARE NOT REQUIRED.

9. LADDER BRACKETS SHALL BE FABRICATED IN ONE PIECE WITH NO WELDS.
1. All dimensions in millimetres.
2. Pipe connection details apply to precast and cast in-situ MH (see SEQ-SEW-1300-1 & SEQ-SEW-1303-1).
3. Form rounded nosing on inlet & outlet pipes to prevent damage to jetting equipment, CCTV guides and cables.
5. PVC, ABS & GRP MH connectors to have hydrophilic seal and to be sanded. Refer detail SEQ-SEW-1313-1.
6. Use RRJ rocker pipes as shown.
7. The use of precast concrete bases including connection details will be in accordance with service provider approvals.
8. Benching and channel shall be finished with a 2:1 sand-cement mortar render 15 thick, Class 3 finish.
**NOTES**

1. ALL DIMENSIONS IN MILLIMETRES.
2. THIS DRAWING APPLICABLE TO PRECAST AND IN-SITU MH.
3. ALL CONNECTION TYPES SHOWN IN THIS DRAWING ARE APPLICABLE TO VC, PVC RUBBER RING (RRJ), PP & GRP PIPES, UNLESS OTHERWISE SPECIFIED.
4. TO ENSURE BONDING COAT PVC AND GRP PIPES CAST INTO MH WALL AND BASE WITH RESIN/SOLVENT & SAND OR ABRASIVE FOR THE LENGTH OF WALL PENETRATION IN ADDITION TO HYDROPHYLIC SEAL.
5. ROCKER PIPE LENGTHS AND CONNECTION SYSTEMS TO BE AS SHOWN IN SEQ-SEW-1302-1.
6. Ø1200 MAHONELS SHALL BE USED WHERE MORE THAN ONE (1) TYPE 'X' DROP ENTERS A MAHOLE OR WHERE SHOWN ON THE DRAWINGS.
7. FLEXIBLE JOINTS SHALL BE CLEAR OF ALL CONCRETE.
8. MAHOLE DROP TYPES 'V', 'W', 'X' AND 'Y' SHALL ONLY BE USED IN SEWERS OF DEPTHS > 6000.
9. DETAILS SHOWN ARE LIMITED TO DEPTHS OF 6000. FOR DEPTHS > 6000 REFER TO STRUCTURAL DESIGN DRAWINGS.
10. INTERNAL DROPS ARE NOT PERMITTED WITHOUT THE USE OF AN EXTERNAL L.R BEND WHERE THE SEWER GRADIENT EXCEEDS 1 IN 10 (10%).
11. FOR UNITYWATER, DI FITTING SHALL BE REPLACED WITH uPVC FITTING RRJ.

**DI Fitting**

- SS 316 CLIPS & BRACKETS WITH M10 SS 316 ANCHORS. MIN OF 2 BRACKETS AT 20X5 MIN SS316 FLAT BAR AND AT MAX. 1500 SPACING

**For Unitywater**

- DI FITTING SHALL BE REPLACED WITH uPVC FITTING RRJ.

**For Logan City Council**

- This fitting may be DI or uPVC

**MH Coupling Detail**

- See SEQ-SEW-1302-1 and SEQ-SEW-1313-1

**Typical Changes in Level Details**

- Corehole 150 CLEAR OF WALL JOINT AND FIX AND REPAIR WITH MEGAPOXY. HYDROPHYLIC SEAL TO BE FIXED TO FITTING WITH 100 OVERLAP IN CONTACT WITH SELF

**Flow**

- Cut out to allow maintenance access

**SMC**

- Monolithic Concrete

**Drop Junction**

- Type 'V', Type 'W', Type 'X', Type 'Y'

**Flow**

- For Internal Drop Benching Refer SEQ-SEW-1306-1

**M10**

- SS 316 Flat Bar

**Corehole**

- 150 CLEAR OF WALL JOINT AND FIX AND REPAIR WITH MEGAPOXY. HYDROPHYLIC SEAL TO BE FIXED TO FITTING WITH 100 OVERLAP IN CONTACT WITH SELF

**Flow**

- Cut out to allow maintenance access

**SMC**

- Monolithic Concrete

**Drop Junction**

- Type 'V', Type 'W', Type 'X', Type 'Y'

**Flow**

- For Internal Drop Benching Refer SEQ-SEW-1306-1

**M10**

- SS 316 Flat Bar
DI SMALL RADII SHALL BE 5.
DI FITTINGS FOR USE WITH u.P.V.C. SEWERS AND DROP PIPES SHALL BE RUBBER RING JOINTED.
ALL FITTINGS SHALL BE CAST SPHEROIDAL GRAPHITE IRON GRADE 500/320/7 TO COMPLY WITH AS.1831.
INSPECTION OPENING COVERS SHALL BE 3 THICK u.P.V.C SHEET WITH M10 NYLON NUTS & BOLTS TO SUIT.
DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.

SEQ WATER SERVICE PROVIDERS

SEWERAGE STANDARD DRAWING

IRON INSPECTION BENDS FOR TYPICAL INTERNAL DROP PIPES IN SEWERAGE MANHOLES

SEQ-SEW-1303-2

NOT TO SCALE

1/1/2013
NEOPRENE GASKET 50x3 STRIP 'CLARK RUBBER' OR EQUIVALENT

PART A

50 NOM. 100 MAX.

50 NOM. 100 MAX.

 maintenance hole wall reinforcement

4 M16 S.S. threaded rods with clamping and fixing nuts and 4mm thick S.S. plate washers. Coat all exposed threads with 'DENSO' or equivalent system.

S.S. female threaded ferrules 60 min. embedment - weld to reinforcement if directed by superintendent. (90 min. embedment if welded).

PE liner penetration to be sealed with '3M DP-805' adhesive or equivalent. Refer notes 12 and 13.

M12 S.S. Bolt, 20 long with nuts and washers. Do not overtighten nuts. Tighten nuts sufficiently to lightly compress the neoprene gasket only.

NOTE: Glue the neoprene gasket to the bracket using a suitable contact cement. Similarly glue any additional neoprene gaskets required to the gasket already installed.

PLAN

ELEVATION

BRACKET ASSEMBLY - OPTION 'A' BASE

SECTION A

DIA. 14 hole
6 thick S.S. plate

DIA. 36 S.S. round bar or M40 S.S. bolt or threaded rod

6 thick S.S. plate

50 min. embedment - for 230 wall

100 square S.S. baseplate 16 thick

20 max. precision grout direct to concrete

DIA. 20 oversize hole for M12 S.S. bolt with 4mm thick plate washer

DIRECT CHEMICAL GROUTING IN CORED HOLE OR CAST INTO WALL. REFER NOTE 9.

NOTE: GENERAL

1. BRACKETS TO BE INSTALLED AT MAXIMUM 1500 CENTRES BUT AT LEAST ONE AT TOP AND ONE AT BOTTOM OF DROP PIPE.

STAINLESS STEEL

2. STAINLESS STEEL WORK SHALL COMPLY TO AS1554.6-1994 OR APPROVED EQUIVALENT.

3. STAINLESS STEEL MATERIALS SHALL BE SUPPLIED TO MIN. ASTM GRADE 316 OR EQUIVALENT.

4. WELDING SHALL COMPLY TO AUSTRALIAN WELDING RESEARCH ASSOCIATION TECHNICAL NOTE 16 - WELDING STAINLESS STEELS.

5. WELDS SHALL BE 6mm CONTINUOUS FILLET WELDS (AWS AS 9 ELECTRODE (2205) UNLESS NOTED OTHERWISE.

6. ALL STORAGE, FABRICATION AND WELDING OF STAINLESS STEEL SHALL BE CARRIED OUT IN AN AREA SPECIFICALLY DEDICATED TO THE PARTICULAR GRADE OF STAINLESS STEEL BEING USED.

7. WELD SURFACE FINISH TO BE:

(a) INTERNAL WELDS 16, 2 (200#)

(b) EXTERNAL WELDS 1B, I (200#)

7. WELD SURFACE FINISH TO BE:

(a) INTERNAL WELDS 16, 2 (200#)

(b) EXTERNAL WELDS 1B, I (200#)

8. USE OVERSIZE WASHERS AS REQUIRED FOR OVERSIZE HOLES.

9. ALL SHAFTS FOR OPTION 'B' AND AT LEAST ONE FERRULE FOR OPTION 'A' SHALL BE WELDED TO REINFORCEMENT WHERE BRACKETS ARE INSTALLED WITHIN 60 METRES OF HIGH VOLTAGE ELECTRICAL POWER TRANSMISSION TOWERS OR AS DIRECTED BY THE AUTHORITY.

BASE DEAL

OPTION 'A' BASE IS APPLICABLE FOR PE-LINED MAINTENANCE HOLES.

OPTION 'B' BASE IS APPLICABLE TO EXISTING OR NEW MAINTENANCE HOLES NOT REQUIRING PE LINING.

PE LINER


12. OPERATORS SHOULD NOTE THAT '3M DP-805 ADHESIVE HAS A VERY SHORT WORKING LIFE (3 TO 4 MINUTES).

SEQ WATER SERVICE PROVIDERS

TYPICAL STAINLESS STEEL BRACKETS FOR DN100 AND DN150 uPVC DROP PIPES

NOT TO SCALE
CHANGE IN DIAMETER OF SEWER CHANNEL TO MATCH LARGER DIAMETER PIPE (SEE NOTE 3)

NOTES

1. ALL DIMENSIONS IN MILLIMETRES.
2. WHERE NECESSARY PULL MH OFF CENTRELINE OF SEWER (MAX 200) TO IMPROVE FLOW AND ACCESSIBILITY PROVIDED THE FOLLOWING CONDITIONS ARE MET:
   - ALL TANGENT POINTS TO BE CONTAINED WITHIN MH.
   - MAINTENANCE EQUIPMENT CAN BE USED IN ALL MAINS.
   - OFFSET AS SPECIFIED.
3. INVERT LEVELS TO BE AS SHOWN IN DESIGN DRAWINGS.
4. FOR CHANNEL INTERSECTION AND OFFSET DETAILS SEE SEQ-SEW-1305-1.
5. FOR INLET - OUTLET CHANGES IN LEVEL REQUIREMENTS SEE SEQ-SEW-1301-2, SEQ-SEW-1301-4 AND SEQ-SEW-1303-1.
6. FOR SEwers ON STEEP GRADES OR WHERE THE INTERSECTION ANGLE IS <45° USE DROP CHAMBER AS SHOWN ON SEQ-SEW-1306-1. QUU DOES NOT PERMIT THE USE OF THIS DROP CHAMBER.

LEGEND

- INTERSECTION POINT
- CENTRELINE OF MH

INCOMING SEWERS HAVING EXTERNAL DROP

SEQ WATER SERVICE PROVIDERS

SEWERAGE STANDARD DRAWING

MAINTENANCE HOLES
SEWERS ≤ DN300
TYPICAL CHANNEL ARRANGEMENTS

DRAWING No. SEW-1304-1
NOT TO SCALE

REV. No. DATE DESCRIPTION

ORIG DATE: 1/1/2013

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

GCCC LCC RCC QUU UW VER.
NOTES

1. ALL DIMENSIONS IN MILLIMETRES.
2. AREAS SHOWN SHADED INDICATE WHERE THE SIDE OF THE CHANNEL APPROACHES VERTICAL ON OUTSIDE OF CURVE
3. CHANNELS SHOWN ARE FOR DN 150 & DN 225 PIPES IN STANDARD DN 1050 MH.
4. SHAPES ARE OPTIMUM HYdraulically, ALTERNATIVES BY APPROVED DESIGN DETAIL.
5. WHERE INCOMING SEWERS EXCEED 10% GRADE DESIGNER TO USE LONG RADIUS BENDS AS ROCKER PIPES.
6. ACUTE ANGLE ENTRY MAY BE APPROVED FOR LOW FLOWS OR MAY BE ACCOMMODATED BY EXTERNAL DROP JUNCTION OR DROP CHAMBER SEE SEQ-SEW-1304-1 & SEQ-SEW-1306-1.
7. OFFSET DIMENSIONS SHOWN ARE MINIMUMS.

TYPICAL CHANNEL DETAILS

SIDE OF CHANNEL MAY APPROACH VERTICAL ON OUTSIDE OF CURVE (AS SHOWN SHADEd)

CENTRE OF MH

OFFSET 175

OFFSET 100

FLOW

INTERSECTION POINT (PEG)

INTERSECTION POINT (PEG)

CENTRE OF MH

CENTRE OF MH

OFFSET 100

OFFSET 175

OFFSET 100

OFFSET 100

1 IN 8 NOM SLOPE ON BENCH

1 IN 5

25 NOM RADIUS

HEIGHT AT INLET

HEIGHT AT OUTLET

1. SEQUENTIAL CHANNEL DETAILS

2. LARGER MAIN LINE WITH BEND & 2 x SMALLER 90° OPPOSING INLETS

3. STRAIGHT THROUGH & 90° INLET

4. 90° BEND

5. OPPOSING INLETS 90° OUTLET

NOT TO SCALE

SEQ-WATER SERVICE PROVIDERS

MAINTENANCE HOLES

TYPICAL CHANNEL DETAILS

SEWERAGE STANDARD DRAWING

DRAWING NO. SEQ-SEW-1305-1

VERSION A

DATE 1/1/2013
NOTES

1. ALL DIMENSIONS IN MILLIMETRES.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH SEQ-SEW-1300-1 & SEQ-SEW-1303-1.
3. DISCHARGE PIPE AND CHANNEL PLACEMENT TO DIRECT SEWAGE IN DIRECTION OF MAIN FLOW.
   SEE SEQ-SEW-1304-1 AND SEQ-SEW-1305-1.
4. DN 1200 MH TO BE USED WHERE DROP PIPE >DN 150 OR MORE THAN TWO x DN 150 INTERNAL DROPS ARE USED.

EXISTING MANHOLE INSTALLATION DETAIL
(WHERE AUTHORISED)

TYPICAL INTERNAL DROP
SUITABLE FOR IN-SITU AND PRECAST MH

TYPICAL DROP CHAMBER
(EXTERNAL DROP)

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEQWATER SERVICE PROVIDERS

SEQ-SEW-1306-1
NOT TO SCALE
NOTES:

1. All dimensions are in millimetres.
2. All in-situ concrete shall be grade N32.
3. Reinforcing bars to be to AS/NZS 4671:2001 with 50 cover bottom face.
4. Rectangular maintenance holes shall be considered where depth of maintenance hole is less than 1200.
5. DN300 to DN600 sewers shall use DN1500 maintenance holes.
6. Maintenance holes over 6000 deep shall be designed for the specific installation depth.
7. Dimension 'A', refer table on SEQ-SEW-1303-1. Only 'V' drops or approved internal vortex drops permitted for DN300 and larger sewers. Type 'V' drops with pipe DN changes shall be graded obvert to obvert.
8. DN1500 maintenance holes shall be provided with a H2S resistant coating as specified in the code. The coating shall protect the concrete of the neck, converter slab and walls. The coating shall be rebated at it's terminations and it shall bridge construction joints to the manufacturer's requirements.
9. All cast construction joints shall include either PVC waterstops or hydrophilic seal installed to manufacturer's requirements. Prior to the next cast, scabble the existing surface and prime with bondcrete.

SEQ WATER SERVICE PROVIDERS

DN1050 TO DN1500 CAST IN-SITU MAINTENANCE HOLE DETAIL

DN1050 - 175 THICK
CONVERTER SLAB REINFORCEMENT FOR ≥ DN1000 TO DN1200
MAINTENANCE HOLE DETAIL ALL LOCATIONS

DN1200 - 200 THICK

DN1500 - 225 THICK CONVERTER SLAB REINFORCEMENT
ALL REINFORCEMENT TO BE 12 DIA. GRADE 410Y DEFORMED BAR ALL REINFORCEMENT TO HAVE HOOKED ENDS UNLESS NOTED OTHERWISE

TYPICAL MAINTENANCE HOLE
(DN1500 SHOWN)
A SULPHIDE CONTROL MH SHALL BE USED WHERE:

a. A TRUNK SEWER REQUIRES A DROP INTO A DOWNSTREAM SEWER, OR
b. A RETICULATION SEWER REQUIRES A DROP INTO A DOWNSTREAM SEWER AND HAS A PUMP STATION WITHIN ITS UPSTREAM CATCHMENT, OR
c. SULPHIDE CONTROL IS REQUIRED.

DN160 PE100 PN16 PIPE FIXED TO WALL WITH SS BRACKETS AT 1500 CRS. FIRST BRACKET TO BE NOT MORE THAN 600mm FROM TOP OF COVER SLAB

450 x 450 CONCRETE ARRIS (NTS) 2X45° SWEEP BENDS

AIR LINE TO DISCHARGE INTO SUCTION CLEANING PIPE

BY DESIGN

BY DESIGN

FINISHED SURFACE LEVEL

SEE NOTE 15 ON SEQ-SEW-1307-4

SUCTION HOSE ADAPTOR FOR 'KAISER' JET RODDER WITH TABLE 'C' FLANGE.

SS BRACKET SEE SEQ-SEW-1303-4 FOR DN150 uPVC

REFERENCE DRAWING SEQ-SPS-1405-2 FOR VENT POLE DETAILS

TYPICAL VENT POLE SECTIONAL ELEVATION

REFER SEQ-SEW-1307-4 FOR NOTES
CONTRACTOR TO EXCAVATE ADJACENT TO EXISTING MAINTENANCE HOLE AND PROVIDE SAFE SHORING.

TO DRILL PILOT HOLE FROM INSIDE EXISTING MAINTENANCE HOLE TO OBVERT OF NEW SEWER.

CONTRACTOR SHALL CONFIRM PILOT HOLE HAS PENETRATED INTO THEIR EXCAVATION.

CONTRACTOR TO OBTAIN FROM COUNCIL A MEASUREMENT OF THE MAINTENANCE HOLE WALL THICKNESS.

TO PLUG PILOT HOLE.

CONTRACTOR TO REMOVE CONCRETE FROM MAINTENANCE HOLE WALL TO LEAVE A 100mm SKIN.

CONTRACTOR TO TIE A MINIMUM OF THREE R6 LIGATURES AT 100mm CENTRES TO DEFORMED BARS.

CONTRACTOR TO LAY PE STUB WITH WEEP FLANGE ATTACHED, CAST INTO WALL AS SHOWN. (SEE DETAIL)

1(A) CONTRACTOR TO EXCAVATE ADJACENT TO EXISTING MAINTENANCE HOLE AND PROVIDE SAFE SHORING.
1(B) TO DRILL PILOT HOLE FROM INSIDE EXISTING MAINTENANCE HOLE TO OBVERT OF NEW SEWER.
1(C) CONTRACTOR SHALL CONFIRM PILOT HOLE HAS PENETRATED INTO THEIR EXCAVATION.
1(D) CONTRACTOR TO OBTAIN FROM COUNCIL A MEASUREMENT OF THE MAINTENANCE HOLE WALL THICKNESS.
1(E) TO PLUG PILOT HOLE.
1(F) CONTRACTOR TO REMOVE CONCRETE FROM MAINTENANCE HOLE WALL TO LEAVE A 100mm SKIN.
1(G) CONTRACTOR TO DRILL 6 EVENLY SPACED HOLES AROUND PROPOSED INLET TO TAKE N12 BARS.
HOLES TO BE A MINIMUM OF 100mm FROM EDGE OF EXISTING CONCRETE AROUND INLET OPENING.
1(H) CONTRACTOR TO TIE A MINIMUM OF THREE R6 LIGATURES AT 100mm CENTRES TO DEFORMED BARS.
1(I) CONTRACTOR TO LAY PE STUB WITH WEEP FLANGE ATTACHED, CAST INTO WALL AS SHOWN. (SEE DETAIL)
1(J) FOLLOWING A SUCCESSFUL ‘ON MAINTENANCE’ INSPECTION, SEQ-SPS WILL COMPLETE THE CONNECTION FROM INSIDE THE MAINTENANCE HOLE.

CONTRACTOR TO REQUIRE LIVE WORKS PRIOR TO COMMENCEMENT OF CONSTRUCTION IF REQUIRED.

CONTRACTOR TO CONFIRM SEWER WORK START DATE AND BOOK INSPECTION TIMES (MIN.TWO [2] WORKING DAYS NOTICE REQUIRED.)

CONTRACTOR TO CONSTRUCT SEWER WORKS AND ARRANGE INSPECTIONS AS REQUIRED. A FIELD INSPECTION REPORT WILL BE ISSUED UPON SUCCESSFUL "ON MAINTENANCE" INSPECTION AND COLLECTION OF "AS CONSTRUCTED" INFORMATION BY THE MINOR SEWER WORKS INSPECTION UNIT.

CONTRACTOR IS REQUIRED TO FORWARD A COPY OF THE FIELD INSPECTION REPORT TO SEQ-SPS TO CONFIRM SEWER WORKS ARE ACCEPTABLE AND REQUEST LIVE WORKS TO COMPLETE SEWER WORKS.

LIVE WORKS: DRS
INSPECTION: SEQ-SPS

INSPECTION: SEQ-SPS
LIVE WORKS: SEQ-SPS

SEQ WATER SERVICE PROVIDERS
SEWERAGE STANDARD DRAWING
SULPHIDE CONTROL
SEWER MAINTENANCE HOLE - PE LINED CUT-INS

NOT TO SCALE
DIMENSION 'H'

FINISHED LEVELS OF MH COVERS

LOCATION       H

UNDEVELOPED AREAS  300
NEW SUBDIVISIONS  50
ROADS, LANE WAYS, FOOTWAYS & DRIVEWAYS  FLUSH
EXISTING DEVELOPED AREAS  25
OTHER AS SPECIFIED (EG ABOVE Q100 FLOOD LEVEL)

PRECAST ALLOTMENT INSTALLATION

CAST IN-SITU PAVED INSTALLATION

TRAFFICABLE MAINTENANCE AND RODDING SHAFT SURROUND DETAILS

NON-TRAFFICABLE MAINTENANCE AND RODDING SHAFT SURROUND DETAILS

SELECTION OF DN600 MH COVERS

ALL COVERS TO BE WATER TIGHT, SEE NOTE 6

NOTES:
1. ALL DIMENSIONS IN MILLIMETERS.
2. SEALING METHODS FOR COVER-FRAME SURROUND TO WALLS
   (a) MAKE JOINTS BETWEEN SHAFT TOP/MAKE-UP RING
       AND COVER SUPPORT RING USING BUTYL-MASTIC OR RUBBER RING.
   (b) APPLY BUTYL-MASTIC OR RING IN ACCORDANCE
       WITH MANUFACTURERS SPECIFICATION.
   (c) FOLLOWING (b) ABOVE, APPLY EXTERNALLY 4X100 LONG SECTIONS OF 'MEGAPOXY P1' OR EQUAL TO PRECAST SURROUND/RING JOINT TO REINFORCE JOINT.
3. IN AREAS SUBJECT TO Q100 FLOODING AND SURCHARGE, USE CAST IN-SITU MH WITH ANCHOR BRACKETS SO THAT SEPARATION DURING SURCHARGE IS PREVENTED. SEE SEQ-SEW-1307-1.
4. MAXIMUM PERMISSIBLE SLOPE OF COVERS:
   CLASS "B"  1 IN 4
   CLASS "D"  1 IN 10
5. COVERS AND FRAMES, REFER CODE.
6. CAST IN-SITU AND ALL CLASS D COVERS AND FRAMES SHALL BE TYPE 'd' WATERSEALED SOLID TOP IN ACCORDANCE WITH CLAUSE 1.5.3.1 OF AS3996.
7. a.) STORMWATER PRECAST SURROUND, FRAME & LID MAY BE USED FOR ALL NON CARRIAGEWAY LOCATIONS EXCEPT THAT THE DI COVER SHALL BE MARKED FOR SEWERAGE PURPOSES.
   b.) SMARTSTREAM TOP HAT OR WEBFORGE CLASS 'B' COVER #DCC3B22 ALTERNATIVES TO SHROUD PIPE SYSTEM FOR NON TRAFFICABLE.
   c.) DUCTILE IRON COVERS SHALL BE EITHER 600 mm OR 430 mm DIAMETER AT CLASS "D" FOR ROAD CARRIAGE WAY INSTALLATION AND AT CLASS "B" FOR ALL OTHER LOCATIONS.
8. LOCK DOWN QUICK RELEASE END CAPS ARE SUW FIXED TO THE RISER AND ARE RUBBER RING SEALED BETWEEN THE CAP AND ITS FRAME AND OPEN WITH LESS THAN A 15 DEGREE TURN. ALL MS CAPS SHALL BE PROVIDED WITH 20-25 mm DIAMETER. RUBBER BUNGS IN A 20 mm DRILL HOLE. CONTRACTOR TO DRILL HOLE AND FIT BUNG FOLLOWING PRESSURE TEST PASS.
**NOTES**

1. ALL EDGES TO BE SQUARE.
2. ALL EDGES TO BE ARRISED UNLESS SHOWN OTHERWISE.
3. ALL FILLETS TO BE 5mm RADIUS UNLESS SHOWN OTHERWISE.
4. CASTING TO BE FREE OF BURRS AND PITS.
5. MACHINE SURFACE SYMBOL 3.2
6. MATERIAL: GREY CAST IRON (AS1830)
   TENSILE STRENGTH: ISO 185/JL/225
   HARDNESS: 145 - 215 (HB)
   ULTIMATE DESIGN LOAD: 210 KN (AS3996)
7. TOLERANCES:
   - CAST DIMENSIONS ±1.00mm
   - ANGLE PROFILE ±0.25°
   - MACHINED DIMENSIONS ±0.125mm
   - OVERALL MAJOR DIAMETER OF COVER ±0.25mm
   - DFT OF COATING 50um
8. ALL MACHINED SURFACES SHALL HAVE A COATING APPROVED AS FIT FOR THE PURPOSE OF PROVIDING A RUST PROOF, NON-STICK AND GAS/WATER PROOF JOINT.
9. ALL NON MACHINED SURFACES TO BE BITUMINOUS COATED IN ACCORDANCE WITH AS 3750-4.
10. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT QUEENSLAND CODE, SPECIFICATIONS AND STANDARDS.
11. COVERS AND FRAMES TO BE SUPPLIED ASSEMBLED.
12. CERTIFICATION OF COMPLIANCE TO A.S. 3996 TO BE SUPPLIED FOR EACH CASTING.

**TYPICAL SECTION**

**PLAN**

**SECTIONAL ELEVATION**

MAINTENANCE HOLE FRAME

MASS: 59.5KG

FOR USE IN NON TRAFFICABLE LOCATIONS

SEQ WATER SERVICE PROVIDERS

SEWERAGE STANDARD DRAWING

MAINTENANCE HOLE COVER

SEWER - CLASS B - CONCRETE INFILL

TYPICAL FRAME DETAILS

NOT TO SCALE
NOTES
1. ALL EDGES TO BE SQUARE.
2. ALL EDGES TO BE ARRISHED UNLESS SHOWN OTHERWISE.
3. ALL FILLETS TO BE 5mm RADIUS.
4. CASTING TO BE FREE OF BURRS AND PITS.
5. MACHINE SURFACE SYMBOL 3.2

6. MATERIAL: DUCTILE CAST IRON
   TENSILE STRENGTH: ISO 1083/JS/600-3/S (AS1831)  HARDNESS: 190 - 270 (HB)
   ULTIMATE DESIGN LOAD: 80 KN (AS3996)

7. TOLERANCES:
   CAST DIMENSIONS  ±1.00mm
   ANGLE PROFILE  ±0.25°
   MACHINED DIMENSIONS  ±0.125mm
   OVERALL MAJOR DIAMETER OF COVER  +0 -0.25mm
   DFT OF COATING  50um

8. ALL MACHINED SURFACES SHALL HAVE A COATING APPROVED AS FIT FOR THE PURPOSE OF PROVIDING A RUST PROOF, NON-STICK AND GAS/WATER PROOF JOINT.

9. ALL NON MACHINED SURFACES TO BE BITUMINOUS COATED IN ACCORDANCE WITH AS 3750-4.

10. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT QUEENSLAND CODE, SPECIFICATIONS AND STANDARDS.

11. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT QUEENSLAND CODE, SPECIFICATIONS AND STANDARDS.

12. COVERS AND FRAMES TO BE SUPPLIED ASSEMBLED.

13. CERTIFICATION OF COMPLIANCE TO A.S. 3996 TO BE SUPPLIED FOR EACH CASTING.
PLAN

RECESS FOR CONCRETE BONDING

SECTION A

3mm CHAMFER

SECTION B

KEYHOLE DETAIL

FOR USE IN NON TRAFFICABLE LOCATIONS

REFER SEQ-SEW-1308-3 FOR NOTES

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEQ WATER SERVICE PROVIDERS

SEQ-SEW-1308-4 A

NOT TO SCALE
**NOTES**

1. ALL EDGES TO BE SQUARE.
2. ALL EDGES TO BE ARRISED UNLESS SHOWN OTHERWISE.
3. ALL FILLETS TO BE 5mm RADIUS UNLESS SHOWN OTHERWISE.
4. CASTING TO BE FREE OF BURRS AND PITS.
5. MACHINE SURFACE SYMBOL 3.2
6. MATERIAL: GREY CAST IRON (AS1830)
   TENSILE STRENGTH: ISO 185/3L/225
   HARDNESS: 145 - 215 (HB)
   ULTIMATE DESIGN LOAD: 210 KN (AS3996)
7. TOLERANCES:
   CAST DIMENSIONS ±1.00mm
   ANGLE PROFILE ±0.25°
   MACHINED DIMENSIONS ±0.125mm
   OVERALL MAJOR DIAMETER OF COVER +0 -0.25mm
   DFT OF COATING 50um
8. ALL MACHINED SURFACES SHALL HAVE A COATING APPROVED AS FIT FOR THE PURPOSE OF PROVIDING A RUST PROOF, NON-STICK AND GAS/WATER PROOF JOINT.
9. ALL NON MACHINED SURFACES TO BE BITUMINOUS COATED IN ACCORDANCE WITH AS 3750-4.
10. FRAME FIXED TO TOP SLAB WITH 4-M16 HEAVILY GALVANISED MASONRY ANCHORS. AFTER ASSEMBLY ALL STEELWORK TO BE PAINTED WITH AN APPROVED BITUMASTIC ENAMEL.
11. FOR SURCHARGE AREAS AND FOR OVERLAND FLOW AREAS AND WHERE SPECIFIED IN THE DESIGN DRAWINGS, COVERS AND FRAMES TO BE SUPPLIED WITH 4-M8 COARSE THREADED 316 SS BOLTS 45mm LONG WITH NYLON WASHERS.
12. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT QUEENSLAND CODE, SPECIFICATIONS AND STANDARDS.
13. COVERS AND FRAMES TO BE SUPPLIED ASSEMBLED.
14. CERTIFICATION OF COMPLIANCE TO A.S. 3996 TO BE SUPPLIED FOR EACH CASTING.

**WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION**

**SEQUENCE OF DRAWING**

<table>
<thead>
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<th>GCCC</th>
<th>LCC</th>
<th>RCC</th>
<th>QUU</th>
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**MAINTENANCE HOLE COVER**
**SEWER - CLASS B - BOLT DOWN**
**TYPICAL FRAME DETAILS**

**PLAN**

**SECTIONAL ELEVATION**

**MAINTENANCE HOLE FRAME**
MASS: 59.5KG

**Gauge shall be used to check PCD and clearance hole position**

**For use in non trafficable locations**

**Hold-down slot 4 places - for M-16 masonry anchors**

**Stiffener rib 4 places**

**Stiffener rib R5 fillet to top edges**

**M8 tapped hole metric coarse thread**

**620 PCD**

**Jig drilled and tap 4-M8 metric coarse thread**

**670 PCD**

**800 PCD**

**850 PCD**

**Unity Water and GCCC and Logan Water accepts all Class B covers and frames with certification to AS 3996 as detailed in clause 3.2 for seals and registers.**

**Mass: 59.5kg**

**NOT TO SCALE**

**Drawing Date:** 1/1/2013

**SEQ WATER SERVICE PROVIDERS**
6. MATERIAL: DUCTILE CAST IRON
   TENSILE STRENGTH: ISO 1083/JS/600-3/S (AS1831)
   HARDNESS: 190 - 270 (HB)
   ULTIMATE DESIGN LOAD: 80 KN (AS3996)

7. TOLERANCES:
   CAST DIMENSIONS: ± 1.00mm
   ANGLE PROFILE: ± 0.25°
   MACHINED DIMENSIONS: ± 0.125mm
   OVERALL MAJOR DIAMETER: +0 -0.25mm
   DPT OF COVER: 50μm

8. ALL MACHINED SURFACES SHALL HAVE A COATING APPROVED AS FIT FOR THE PURPOSE OF PROVIDING A RUST PROOF, NON-STICK AND GAS/WATER PROOF JOINT.
9. ALL NON MACHINED SURFACES TO BE BITUMINOUS COATED IN ACCORDANCE WITH AS 3750-4.
10. FRAME FIXED TO TOP SLAB WITH 4-M16 HEAVILY GALVANISED MASONRY ANCHORS OR CAST IN-SITU AS SHOWN IN DRAWINGS. AFTER ASSEMBLY ALL STEELWORK TO BE PAINTED WITH AN APPROVED BITUMASTIC ENAMEL.
11. FOR SURCHARGE AREAS AND FOR OVERLAND FLOW AREAS AND WHERE SPECIFIED IN THE DESIGN DRAWINGS, COVERS AND FRAMES TO BE SUPPLIED WITH 4-M8 COARSE THREADED 316 SS BOLTS 45mm LONG.
12. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT QUEENSLAND CODE, SPECIFICATIONS AND STANDARDS.
13. COVERS AND FRAMES TO BE SUPPLIED ASSEMBLED.
14. CERTIFICATION OF COMPLIANCE TO A.S. 3996 TO BE SUPPLIED FOR EACH CASTING.

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL, HEALTH & SAFETY LEGISLATION

REVIEWED 1/1/2013

UNITYWATER AND GCCC AND LOGAN WATER AND REDLAND WATER ACCEPTS ALL CLASS B COVERS AND FRAMES WITH CERTIFICATION TO AS 3996 AS DETAILED IN CLAUSE 3.2 FOR SEALS AND REGISTERS.
SEQ WATER
SERVICE PROVIDERS

SEWERAGE STANDARD DRAWING
MAINTENANCE HOLE COVER
SEWER - CLASS B - BOLT DOWN
TYPICAL COVER DETAILS

FOR USE IN NON TRAFFICABLE LOCATIONS

REFER SEQ-SEW-1308-6 FOR NOTES

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE
OCCUPATIONAL HEALTH & SAFETY LEGISLATION

REV. No. DATE DESCRIPTION AUTO

SEQ-SEW-1308-7 A

ORG DATE: 1/1/2013

DRAWING No.

GCCC LCC RCC QUU UW

NOT TO SCALE
STIFFENER RIB
4 PLACES

HOLD-DOWN SLOT
4 PLACES

55
20

60
40

800 PCD

M8 TAPPED HOLE
METRIC COARSE THREAD

STIFFENER RIB
R5 FILLET TO
TOP FACE EDGES

55

3.2

3.2

620 PCD

JIG DRILLED AND TAP 4-M8
METRIC COARSE THREAD

UNITYWATER AND GCCC AND LOGAN WATER AND REDLAND WATER ONLY
ACCEPTS THIS CLASS D FRAME, RISER AND COVER SYSTEM OR EQUAL WITH CERTIFICATION TO AS 3996.

FOR USE IN TRAFFICABLE ROADWAY LOCATIONS. THIS BASE FRAME SHALL BE USED WITH THE 60 RISER RING SHOWN IN SEQ-SEW-1308-9.

NOTES
1. ALL EDGES TO BE SQUARE.
2. ALL EDGES TO BE ARRISED UNLESS SHOWN OTHERWISE.
3. ALL FILLETS TO BE 5mm RADIUS UNLESS SHOWN OTHERWISE.
4. CASTING TO BE FREE OF BURRS AND PITS.
5. MACHINE SURFACE SYMBOL 3.2 /
6. MATERIAL: GREY CAST IRON (AS1830)
   TENSILE STRENGTH: ISO 185/J1/225
   HARDNESS: 145 - 215 (HB)
   ULTIMATE DESIGN LOAD: 210 KN (AS3996)
7. TOLERANCES:
   CAST DIMENSIONS                       1.00mm
   MACHINED DIMENSIONS             0.125mm
   OVERALL MAJOR DIAMETER OF COVER              +0 -0.25mm
   DFT OF COATING                              50um
8. ALL MACHINED SURFACES SHALL HAVE A COATING APPROVED AS FIT FOR THE PURPOSE OF PROVIDING A RUST PROOF, NON-STICK AND GAS/WATER PROOF JOINT.
9. ALL NON MACHINED SURFACES TO BE BITUMINOUS COATED IN ACCORDANCE WITH AS 3750-4.
10. COVERS, FRAMES AND 60mm RISER RINGS TO BE SUPPLIED ASSEMBLED.
11. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT QUEENSLAND CODE, SPECIFICATIONS AND STANDARD DRAWINGS.
12. CERTIFICATION OF COMPLIANCE TO A.S. 3996 TO BE SUPPLIED FOR EACH CASTING.
UNITYWATER and GCCC and Logan Water and Redland Water only accepts this Class D Frame, Riser and Cover System or equal with certification to AS 3996. See SEQ-SEW-1308-8

Provide 4 additional bolt holes and recess for bolt down covers with a M8 metric coarse thread. See Note 13 on SEQ-SEW-1308-10

Gauge shall be used to check PCD and clearance hole position

M8 coarse thread 316 SS bolts

4 x bolts: 60mm long for 35mm riser
100mm long for 75mm riser
115mm long for 90mm riser

Additional bolts see Note 13 on SEQ-SEW-1308-10

Refer to 35mm riser for typical dimensions to all risers.

Frame (see SEQ-SEW-1308-8 for details)

Plan of Bolt Recess

Refer SEQ-SEW-1308-10 for notes

SEQ WATER SERVICE PROVIDERS

MAINTENANCE HOLE COVER SEWER - CLASS D - BOLT DOWN TYPICAL RISER RING DETAILS

NOT TO SCALE
NOTES

1. ALL EDGES TO BE SQUARE.
2. ALL EDGES TO BE ARRISSED UNLESS SHOWN OTHERWISE.
3. ALL FILLETS TO BE 5mm RADIUS UNLESS SHOWN OTHERWISE.
4. CASTING TO BE FREE OF BURRS AND PITS.
5. MACHINE SURFACE SYMBOL 3.2
6. MATERIAL: DUCTILE CAST IRON (AS1831)
   TENSILE STRENGTH: ISO 1083/35/600-3/S
   HARDNESS: 190 - 270 (HB)
   ULTIMATE DESIGN LOAD: 210 KN (AS3996)
7. TOLERANCES:
   CAST DIMENSIONS ± 1.00mm
   ANGLE PROFILE ± 0.25°
   MACHINED DIMENSIONS ± 0.125mm
   OVERALL MAJOR DIAMETER OF COVER +0 -0.25mm
   DFT OF COATING 50um
8. ALL MACHINED SURFACES SHALL HAVE A COATING APPROVED AS FIT FOR THE PURPOSE OF PROVIDING A RUST PROOF, NON-STICK AND GAS/WATER PROOF JOINT.
9. ALL NON MACHINED SURFACES TO BE BITUMINOUS COATED IN ACCORDANCE WITH AS 3750-4.
10. COVERS, FRAMES AND 60mm RISER RINGS TO BE SUPPLIED ASSEMBLED.
11. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT QUEENSLAND CODE, SPECIFICATIONS AND STANDARD DRAWINGS.
12. CERTIFICATION OF COMPLIANCE TO A.S. 3996 TO BE SUPPLIED FOR EACH CASTING.
13. FOR SURCHARGE AREAS AND FOR OVERLAND FLOW AREAS AND WHERE SPECIFIED IN THE DESIGN DRAWINGS, COVERS AND FRAMES TO BE SUPPLIED WITH 4-M8 COARSE THREADED 316 SS BOLTS 45mm LONG WITH NYLON WASHERS.

UNITYWATER AND GCCC AND LOGAN WATER AND REDLAND WATER ONLY ACCEPTS THIS CLASS D FRAME, RISER AND COVER SYSTEM OR EQUAL WITH CERTIFICATION TO AS 3996, SEE SEQ-SEW-1308-8

FOR USE IN TRAFFICABLE ROADWAY LOCATIONS.

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEQ WATER SERVICE PROVIDERS
KEYHOLE DETAIL

SECTION A

BOLT RECESS DETAIL

SECTION C

PLAN

SECTION B

TYPICAL EDGE DETAIL

UNITYWATER AND GCCC AND LOGAN WATER AND REDLAND WATER ONLY ACCEPTS THIS CLASS D FRAME, RISER AND COVER SYSTEM OR EQUAL WITH CERTIFICATION TO AS 3996 SEE SEQ-SEW-1308-8

FOR USE IN TRAFFICABLE ROADWAY LOCATIONS.

REFER SEQ-SEW-1308-10 FOR NOTES

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEQ WATER SERVICE PROVIDERS

MAINTENANCE HOLE COVER SEWER - CLASS D - BOLT DOWN TYPICAL COVER DETAILS

SEQ-SEW-1308-11 A
NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. CONCRETE TO BE S40 MIN
3. SLAB AND BASE REINFORCEMENT AS PER STRUCTURAL DESIGN WITH 65 MINIMUM COVER.
4. INSIDE SURFACE OF MH AND UNDERSIDE OF ROOF AND OPENING TO HAVE EPOXY COATING, PVC LINING OR PE LINING AS SPECIFIED IN THE CODE. BENCH TO BE STANDARD MORTAR, REFER SEQ-SEW-1302-1.
5. ALTERNATIVELY INCORPORATE VERTICAL DROP FOR HIGH LEVEL SEWERS SEE SEQ-SEW-1306-1.
6. WALL THICKNESS TO BE 250 MIN AT S40 WHERE LOCATED IN AGGRESSIVE SOILS, HIGH WATER TABLE AND SALINE ENVIRONMENTS. PROVIDE 0.2 THICK SOLVENT FREE EPOXY COATING TO OUTSIDE FACE OF WALLS.
7. FORMAT SHOWN BASED ON > 100KPa ALLOWABLE BEARING PRESSURE OF NATIVE SOIL.
8. BOTTOM ANCHOR BRACKET 12x75 SS316 PLATE 300 LONG WITH Ø18 BOLT HOLES 40 FROM ENDS AND FIXED AS SHOWN ON SEQ-SEW-1301-1. BRACKET ANGLE TO SUIT BUILT FORM OF PRECAST WALL AND CAST BASE JOINT.

MAXIMUM DEFLECTION (SEE TABLE)

FLOW PLAN

CAST SURROUND ONTO CONVERTER SLAB (SEE SEQ-SEW-1301-1 AND SEQ-SEW-1308-1).

COVER & SURROUND (SEE SEQ-SEW-1308 SET).

250 MIN (SEE NOTE 6)

4 ANCHOR BRACKETS EQUALLY SPACED REFER SEQ-SEW-1301-1

4 ANCHOR BRACKETS EQUALLY SPACED SEE NOTE 8

END OF WALL SECTION TO BE EPOXY COATED & SEALED WITH HYDROPHILIC GASKET AS SHOWN IN SEQ-SEW-1312-1

OBVERT CONNECTION POINT (SEE NOTE 5)

FOR TYPICAL BENCH DETAILS REFER SEQ-SEW-1302-1

PROTECT SURFACES AGAINST CHEMICAL ATTACK (SEE NOTE 4)

MANHOLE COUPLING DETAIL (SEE SEQ-SEW-1302-1 AND SEQ-SEW-1313-1).
1. MANHOLE SHAFT TO BE SUITABLE TO SUPPORT DESIGN TRAFFIC LOAD.
2. COVER SLAB TO BE DESIGNED AND SUPPLIED BY MANHOLE MANUFACTURER.
3. ALL MATERIALS REQUIRED FOR MANHOLE INSTALLATION TO BE SUPPLIED BY MANHOLE SUPPLIER WITH EXCEPTION OF BACKFILL MATERIALS AND IN-SITU CONCRETE.
4. VARIATIONS TO DESIGN SUBJECT TO APPROVAL BY SEQ-SP.
5. SUPPLIER TO SPECIFY EXTENTS, LOCATION AND VOLUME OF CONCRETE REQUIRED FOR PREVENTING FLOTATION. NO CONCRETE ALLOWED OVER FLEXIBLE JOINTS.
6. ALL INTERNAL EXPOSED SURFACES TO BE CORROSION RESISTANT.
7. MANUFACTURER TO PROVIDE DETAIL DRAWINGS FOR APPROVAL PRIOR TO MANUFACTURE.
8. ALL GRP TEES, BENDS AND RISER COMPONENTS SHALL BE MINIMUM STIFFNESS OF SN10,000.
SEQ WATER SERVICE PROVIDERS

SEWERAGE STANDARD DRAWING

"ZZ" TYPE TYPICAL TUNNEL
JACKING SHAFT - CAISSON OPTION

NOT TO SCALE

ORD DATE: 1/1/2013

DRAWING No. SEQ-SEW-1311-1

A

NOTES:

1. TYPICAL DETAILS SHOWN. PERMANENT WORKS SHAFTS SHALL BE INDIVIDUALLY DESIGNED FOR TRAFFIC LOADS, STRUCTURAL STEEL DESIGN AND NATIVE SOIL CONDITIONS, REFER NOTES.

2. REINFORCEMENT AS PER STRUCTURAL DESIGN. CONCRETE SHALL BE S40 MINIMUM WITH 75 COVER WITH ALL INTERNAL SURFACES TO BE PROVIDED WITH A PE PROTECTIVE COATING IN ACCORDANCE WITH THE CODE.

3. SHAFTS SHALL HAVE A MINIMUM DESIGN LIFE OF 100 YEARS.

4. KNIFE GATE DETAILS AS PER THE CODE REQUIRED ONLY FOR COLLECTION MANHOLE LOCATED IMMEDIATELY UPSTREAM OF PUMP STATION.

5. SHAFT DETAILS ARE SUBJECT TO CONFIRMATION BY SUB-CONTRACTOR AND APPROVAL BY SERVICE PROVIDER PRIOR TO WORKS COMMENCING.

6. FOR BENCHING DETAILS REFER SEQ-SEW-1309-1.

7. ALL STAINLESS STEEL TO BE GRADE 316.

8. WHERE LOCATED IN AGGRESSIVE SOILS, HIGH WATER TABLE AND SALINE ENVIRONMENTS, PROVIDE 0.3 THICK SOLVENT FREE EPOXY COATING TO OUTSIDE FACE OF WALL.

9. ALL DIMENSIONS ARE IN MILLIMETRES.
NOTES:
1. TYPICAL DETAILS SHOWN, PERMANENT WORKS SHAFTS SHALL BE INDIVIDUALLY DESIGNED FOR TRAFFIC LOADING, JACKING FORCES, SHAFT TOE DESIGN FOR SOIL CONDITIONS, REINFORCING STEEL & VENTILATION.
2. FORMAT SHOWN FOR USE WHERE DEPTH IS 8.0M AND TEMPORARY WORKS (SHEETPILE) USED. FLOATATION CONTROL SHALL BE DESIGNED FOR EACH STRUCTURE.
3. 'MEGAPOXY' OR APPROVED MASTIC SEALANT IS TO BE PLACED BETWEEN ALL SHAFT JOINTS. ALL JOINTS ARE TO BE POINTED INTERNALLY.
4. EXTERNAL STRAPPING TO BE SS316 FOR ALL COMPONENTS.
5. KNIFE GATE DETAILS REFER TO CODE. REQUIRED ONLY FOR COLLECTION MANHOLE LOCATED IMMEDIATELY UP STREAM OF PUMP STATION.
6. ALL CAST IN-SITU CONCRETE S40 WITH 75mm COVER TO REINFORCEMENT.
7. ALL DIMENSIONS ARE IN MILLIMETRES.
NOTES:

1. FOR CONNECTIONS TO OTHER PIPE MATERIALS SEE SEQ-SEW-1302-1.
   HYDROPHILIC SEALS TO ALL PIPE MATERIALS.
2. FORM ROUNDED NOSING ON INLET AND OUTLET PIPES TO PREVENT
   DAMAGE TO JETTING EQUIPMENT, CCTV CABLES AND GUIDES.
3. HYDROPHILIC RUBBER SEALS SHALL BE MINIMUM OF 6x25 AND SHALL
   FULLY ENCIRCLE THE PIPE FITTING WITH A MINIMUM 50 OVERLAP
   THAT IS IN CONTACT WITH ITSELF.
4. FIX AND MAKE CONTINUOUS THE HYDROPHILIC RUBBER SEAL WITH
   GUN GRADE HYDROPHILIC WATERSTOP MASTIC BEAD.

CONNECTION PVC - PVC
(SEE NOTE 1)

CONNECTION PE - PE
(SEE NOTE 1)

PVC MANHOLE COUPLING
(SEE NOTE 1)

PVC SHORT PIPE
(500 MAX)

STANDARD SEAL
FOR PVC AS/NZS
1260 - BELL END

HYDROPHILIC RUBBER SEAL CENTRAL
TO MANHOLE WALL AND ENCIRCLING
COUPLING. REFER NOTES 3 AND 4

SEE NOTE 2

PE MH CONNECTOR

HYDROPHILIC RUBBER SEAL,
SEE NOTES 3 AND 4

PE PIPE

CONNECTION  PE - PE
(SEE NOTE 1)

PE PIPE
CONNECTION  PE - PE
(SEE NOTE 1)

PUDDLE FLANGE

HYDROPHILIC SEAL,
SEE NOTES 3 AND 4

ELECTROFUSION (SHOWN)
OR BUTT JOINT

SEE NOTE 2

SEE NOTE 2

ORG DATE: 1/1/2013

REV. No. DATE DESCRIPTION AUTH.
A
B 20/07/15 AMENDED NOTE 3 AND 4

REV. No. DATE DESCRIPTION AUTH.

SEWERAGE STANDARD DRAWING
MAINTENANCE HOLE
SEWER CONNECTION DETAILS
ALL PIPE MATERIALS

SEQ WATER
SERVICE PROVIDERS

SEQ-SEW-1313-1

NOT TO SCALE
ELEVATION END CHAMBER
END ELEVATION
45 OBLIQUE JUNCTION REFER SEQ-SEW-1104-1 HOUSE CONNECTION NOT SHOWN

MAINTENANCE SHAFT DEPTH TABLE

<table>
<thead>
<tr>
<th>WATER AGENCY</th>
<th>MAXIMUM DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCCC</td>
<td>4000</td>
</tr>
<tr>
<td>LCC, RCC AND UNITYWATER</td>
<td>2000</td>
</tr>
</tbody>
</table>

ELEVATION TERMINAL MAINTENANCE SHAFT
(TYPE 'G'-6 & 'N'-1)

MAINTENANCE SHAFT DROP TABLE
DIMENSION 'A'

<table>
<thead>
<tr>
<th>TYPE 'K' &amp; 'L'</th>
<th>TYPE 'Q'</th>
<th>TYPE 'H'</th>
<th>TYPE 'J'</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN.</td>
<td>MAX.</td>
<td>MIN.</td>
<td>MAX.</td>
</tr>
<tr>
<td>TYPE 'Z'</td>
<td>650</td>
<td>3000</td>
<td>700</td>
</tr>
<tr>
<td>TYPE 'V'</td>
<td>REFS SEW-1303-1</td>
<td>00</td>
<td>30</td>
</tr>
</tbody>
</table>

NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH STANDARD DRAWINGS SEQ-SEW-1308-1 AND SEQ-SEW-1314-2.

2. ALL MAINTENANCE SHAFT RISERS MAY UTILISE TYPE 'Z' DROP JUNCTIONS TO EFFECT HIGH LEVEL ENTRIES, REFER MAINTENANCE SHAFT DROP TABLE FOR DIMENSION 'A' MINIMUMS. RISERS MAY HAVE TWO SEPARATE DROP JUNCTION FITTINGS AS SHOWN OR A SINGLE TWIN FABRICATED FITTING WITH A MINIMUM OF 80° HORIZONTAL CENTRELINE OF SEWER SEPARATION.

3. REFER STD DWG SEQ-SEW-1200 SET FOR EMBEDMENT DETAILS AND SEQ-SEW-1207-1 FOR TRENCH DRAINAGE.

4. DN150 RODDING END SHOWN FOR DEPTHS BETWEEN 800 AND 2500. DEPTHS OF 600 TO 800 USE MOLDED 88° BEND WITH RRJ SP-SOC FORMAT WITH AN ACCESS COUPLING WITH SCREW ON CAP - IPLEX #DR0315088 AND #058150 OR EQUAL.

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

CONCRETE

POLY-ETHYLENE

DROP JN'S

ALL

SEQ WATER SERVICE PROVIDERS

MAINTENANCE STRUCTURES FOR DN225 AND SMALLER RIGS

TYPICAL ARRANGEMENT DETAILS
NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH STANDARD DRAWINGS SEQ-SEW-1308-1 AND SEQ-SEW-1314-1.
2. DIMENSION 'A' SHOWN ON SEQ-SEW-1314-1.
3. DIMENSION 'H' SHOWN ON SEQ-SEW-1308-1.
4. ALL MAINTENANCE SHAFTS SHALL HAVE 600 LONG ROCKER PIPES PROVIDED UPSTREAM AND DOWNSTREAM. LONG RADIUS BEND USE NEGATES THIS REQUIREMENT.
5. POLYPROPYLENE (PP) SDR26 DN160 STUB WELDED BOTH SIDES AT SUPPLIERS FACTORY.
6. STUB FACE ON INSIDE OF STUB SHALL BE AT 15° ANGLE WITH 60 MINIMUM PROTRUDING INTERNALLY AND 150 MINIMUM EXTERNALLY.
7. POLYETHYLENE (PE) SDR17 STUB WELDED BOTH SIDES AT SUPPLIERS FACTORY. STUB FACTORY FITTED WITH UPVC DWV COUPLING.
8. REFER TO MAINTENANCE SHAFT MAXIMUM DEPTH TABLE ON SEQ-SEW-1314-1.
NOTES:

1. IN-LINE, LONG RADIUS FORMED BENDS IN SN8 uPVC AT 3000 RADIUS ARE ONLY PERMITTED FOR DN150 AND DN225 SEWERS. ALL FORMING AND FABRICATION OF BENDS TO BE CERTIFIED TO AS/NZS 1260.

2. FORMED BENDS ARE MADE FROM CONTINUOUS PIPE THAT HAS BEEN HEATED AND MANDREL FORMED TO THE BEND RADIUS. MOULDED uPVC BENDS ARE NOT PERMITTED.

3. FOR DN150 SEWERS, TWO IN-LINE BENDS ARE PERMITTED BETWEEN ACCESS STRUCTURES TO EFFECT A CHANGE IN GRADE AND DIRECTION. VERGE ALLOCATION SHOWN WITH SIMILAR CONCEPTS APPLIED WITHIN ALLOTMENTS WITH 300 CENTRELINE OFFSET PERMITTED.

4. FOR DN225 SEWERS, ONLY ONE IN-LINE BEND IS PERMITTED BETWEEN ACCESS STRUCTURES TO EFFECT A CHANGE IN GRADE AND DIRECTION. VERGE ALLOCATION SHOWN WITH SIMILAR CONCEPTS APPLIED WITHIN ALLOTMENTS WHERE 300 CENTRELINE OFFSET PERMITTED.

5. THE GRADE OF THE SEWER THROUGH BEND SHALL BE EITHER MAINTAINED OR PREFERABLY INCREASED IN GRADE THROUGH THE BEND.

6. FABRICATED uPVC BENDS MAY BE PERMITTED TO 45°. THE MAXIMUM CUT ANGLE SHALL BE 7.5°. EACH SEGMENT SHALL HAVE A LENGTH OF 300 TO 400 WITH THE COMPLETE BEND FIBREGLASS WRAPPED TO THE DETAILS IN SEQ-SEW-1104-1. FINISH WRAPPING 200 BEFORE SPIGOT. FOR COMPLIANCE TEST USE PVC SIZED ROUND BALL.

7. ALL DIMENSIONS ARE IN MILLIMETERS.
NOTES:

1. The drawing indicates a particular manufacturers MS product. Alternative PE MS's may be submitted for approval.
2. MS's shall be manufactured from PE with a material grade suitable to be welded to PE sewer pipe.
3. NUSEWERS PE pipe shall be manufactured from PE100 material with a MIN. SDR of 21 and a white internal surface.
4. All PE/PE connections shall be welded. PE pipes shall be joined by butt welding or E-F couplings using Plasmon "Lightfit" couplings or similar approved.
5. The invert of inlet connection to the MS shall be 20 mm above the base of the MS. Where the outlet sewer is larger than the inlet connection, the obvert levels shall be common.
6. MS may have a maximum of 3 inlet connections (including sewers and property connections) connecting into the base. Only one DN160 inlet connection or MAX 2 DN110 inlet connections to the riser at different levels are permitted. In this case, MAX 2 INLET connections may connect into the base.
7. The riser cap shall comprise a PVC bayonet cap with a RRJ seal and a PVC pipe RRJ socket.
8. The concrete base slab to M.S. frame shall be placed on 250 mm compacted road base material.
9. Maximum depth to invert for a MS shall be 5.0 m.
10. MH covers, frames & supports shall comply with DRG. No. SEQ-SEW-1316-1.

INLET CONNECTION TO RISER

<table>
<thead>
<tr>
<th>INLET CONNECTION</th>
<th>ALLOWABLE DEFLECTION 120° MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE INLET</td>
<td>MULTIPLE INLET</td>
</tr>
<tr>
<td>FLOW ≤ 12L/s</td>
<td>ALLOWABLE ANGLE BETWEEN ANY</td>
</tr>
<tr>
<td>FLOW &gt; 12L/s</td>
<td>TWO ADJACENT INLET:</td>
</tr>
<tr>
<td></td>
<td>DN160/160 ≥ 45°; DN250/DN250</td>
</tr>
<tr>
<td></td>
<td>OR DN250/DN160 ≥ 55°</td>
</tr>
<tr>
<td>0 ≤ b ≤ 90°</td>
<td>60 &lt; b ≤ 90°</td>
</tr>
<tr>
<td>0 ≤ b ≤ 60°</td>
<td>60 &lt; b ≤ 90°</td>
</tr>
</tbody>
</table>

INLET CONNECTION TO BASE

| INLET CONNECTION | ALLOWABLE ANGLE BETWEEN ANY   |
|------------------| TWO ADJACENT INLET:           |
|                  | DN160/160 ≥ 45°; DN250/DN250  |
|                  | OR DN250/DN160 ≥ 55°         |
| 60 b ≤ 90°       |                              |
NOTES:
1. CONCRETE SHALL BE GRADE N40 TO WSA PS-357.
2. STEEL REINFORCEMENT SHALL BE DEFORMED GRADE 500.
3. DETAILS OF MAINTENANCE STRUCTURE COVERS AND FRAMES REFER TO DRG.No. SEQ-SEW-1308 SET.
NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. NUMBER AND DIAMETER OF SIPHON PIPES AS SPECIFIED IN DESIGN DRAWINGS.
3. DIMENSION "H" AS SHOWN IN DESIGN DRAWINGS.
4. PROVIDE MAINTENANCE STRUCTURES EITHER SIDE OF SIPHON.
5. CONCRETE TO BE SPECIAL CLASS FOR MAINTENANCE STRUCTURES AND N25 FOR ENCASEMENT.
6. 75 MIN CLEAR CONCRETE COVER TO REINFORCEMENT. PLACE CONCRETE ENCASEMENT ONLY AFTER WELDING AND TESTING OF PE JOINTS HAS BEEN COMPLETED.
7. 75 MIN CLEAR CONCRETE COVER TO REINFORCEMENT. PLACE CONCRETE ENCASEMENT ONLY AFTER WELDING AND TESTING OF PE JOINTS HAS BEEN COMPLETED.
8. STEEL REINFORCEMENT SHALL BE PROVIDED FOR ENCASED PIPES. CONTRACTOR TO CONTROL THERMAL REVERSION AND FLOATATION OF PE PIPE DURING ENCASEMENT POUR AND CURE.
9. PROVIDE SILT TRAP MANHOLE ADJOINING SIPHON MH1 WHERE DIRECTED BY SEQ-SP.
10. POSITION OF SIPHON PIPE MAY VARY IF DIRECTIONAL BORING UTILISED.
11. CEMENT STABILISED EMBEDMENT TO COMPLY WITH CODE.
12. FIRST PIPE TO SERVE PDWF WITH SECOND PIPE TO SERVE FLOWS UP TO PWWF.
13. SPECIFIC SEQ-SP APPROVAL REQUIRED FOR USE OF SIPHON ARRANGEMENT.

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION.
ENCASING PIPE & SEWER ARRANGEMENTS

TYPICAL SECTION

SEAL OPEN ENDS WITH FOAM FILL OR EQUIVALENT

CONCRETE ENCASED METHOD - TRENCHING
FOR INSTALLATIONS PRIOR TO TRACK CONSTRUCTION

MINIMUM ENCASEMENT LENGTH

TOE OF EMBANKMENT

1200 MIN (SEE NOTE 11)
2000 MIN TO TOP OF TIMBER IF TUNNELLLED
3000 MIN

CONNECTION TO SUIT

MARKER ON BOUNDARY FENCE (SEE NOTE 8)

ROCKER PIPE

FLOW

FLOW

MARKER ON BOUNDARY FENCE (SEE NOTE 8)

1000 MIN

1500 MIN

1500 MIN

600 MIN

600 MIN

100 MIN

300 MIN

MIN GRADE AS SPECIFIED

BORED OR JACKED ENCASING PIPE METHOD
FOR INSTALLATIONS AFTER TRACK CONSTRUCTION

(SEE SEQ-SEW-1403-1)

MARKER ON BOUNDARY FENCE (SEE NOTE 8)

1000 MIN

1500 MIN

1500 MIN

600 MIN

600 MIN

100 MIN

300 MIN

MIN GRADE AS SPECIFIED

TYPICAL SECTION
ENCASING PIPE & SEWER ARRANGEMENTS

BORED & JACKED ENCASING/SEWER PIPE SIZES

<table>
<thead>
<tr>
<th>SEWER PIPE (DN)</th>
<th>100</th>
<th>150</th>
<th>225</th>
<th>300</th>
<th>375</th>
<th>400</th>
<th>500</th>
<th>550</th>
<th>650</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td>BORED ENCASING PIPE MIN (DN)</td>
<td>300</td>
<td>375</td>
<td>425</td>
<td>500</td>
<td>575</td>
<td>600</td>
<td>700</td>
<td>750</td>
<td>850</td>
<td>1000</td>
</tr>
<tr>
<td>JACKED ENCASING PIPE (DN)</td>
<td>N/A</td>
<td>1200 MIN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

600 MIN COVER

GROUT ANNULUS
(SEE NOTE 13)

GROUT
(SEE SEQ-SEW-1403-1)

CARRIER PIPE
(SEE NOTES 2, 3 & TABLE)

ENCASING PIPE
(SEE NOTES 2, 3 & TABLE)

SEPARATORS TO KEEP SEWER PIPE IN POSITION

SPACERS TO KEEP SEWER PIPE IN POSITION

600 MIN COVER

SEWER PIPE <DN 150 CAN BE DIRECTIONALLY BORED USING PE PIPE.

PLACE MARKERS ABOVE PIPELINE AT THE POINTS WHERE IT ENTERS AND LEAVES THE PROPERTY.

PROVIDE CATHODIC PROTECTION AS DIRECTED BY RAILWAY AUTHORITY FOR IRON BASED PIPES. PROVIDE ELECTRICAL CONTINUITY AND INSULATION AS SPECIFIED IN DESIGN DRAWINGS.

DESIGN TO BE IN ACCORDANCE WITH AS 4799 - RAILWAY REQUIREMENTS.

MINIMUM COVER FOR ALL PIPELINES BELOW RAILWAY LINES:

- NOT LESS THAN 1200 BELOW RAIL LEVEL
- NOT LESS THAN 600 BELOW FORMATION LEVEL ie THE GROUND LEVEL IMMEDIATELY BELOW THE RAILWAY BALLAST
- NOT LESS THAN 2000 BELOW RAIL LEVEL TO TOP OF TIMBER FOR TUNNELS.

FOR ELECTRIFIED RAILWAY SYSTEMS PREFERENCE SHOULD BE GIVEN TO USE OF NON-METALLIC PIPES.

THE ANNULUS SHALL BE GROUTED AS SHOWN IN SEQ-SEW-1403-1. PLASTIC PIPE MATERIALS SHALL BE CONTROLLED FOR FLOATATION AND THERMAL REVERSION.
NOTES:

1. ALL DIMENSIONS IN MILLIMETRES.
2. METHODS OF INSTALLATION TO BE AS SHOWN IN DESIGN DRAWINGS OR AS DIRECTED BY THE WATER AGENCY OR ROAD OWNER. DIFFICULT CONDITIONS MAY REQUIRE SPECIAL ARRANGEMENTS.
3. HORIZONTAL BORING ENCASING PIPE
   - REINFORCED CONCRETE CLASS 4 OR
   - STEEL (BARE) PIPE, WALL THICKNESS TO BE AS SPECIFIED IN THE DESIGN DRAWINGS OR
   - GRP PIPE
   SEWER PIPE
   - DI WITH POLYMERIC LINING CLASS PN 35
   - PVC CLASS SN 8
   - PE CLASS PN 12.5 MIN
   - GRP CLASS SN 10000 MIN.
4. JACKING ENCASING PIPE
   - REINFORCED CONCRETE CLASS 4 BUTT JOINTED WITH STEEL LOCATING BANDS OR GRP JACKING PIPE
   SEWER PIPE
   - DI WITH POLYMERIC LINING CLASS PN 35
   - PVC CLASS SN 8
   - PE CLASS PN 12.5 MIN
   - GRP CLASS SN 10000 MIN.
5. CONCRETE ENCASED
   - THE PIPE MATERIAL TO BE:
     - STEEL WITH FIRE INTERNAL COATING AND LINING
     - PE CLASS PN 12.5 MIN
     - PVC (SWJ) CLASS SN 8
     - PE CLASS PN 12.5 MIN
     - GRP CLASS SN 10000 MIN.
   - NO SERVICE CONNECTIONS TO BE MADE TO ENCASED SECTION OF PIPELINE.
   - ENCASING AS SHOWN ON SEQ-SEW-1203-1 FOR TYPE 9
   - NO EXTERNAL COATING REQUIRED ON CONCRETE ENCASED WELDED STEEL PIPELINE.
6. MH OR MS TO BE LOCATED AT LEAST 6000 FROM ENDS OF ENCASEMENT.
7. CONSTRUCTION TO BE IN ACCORDANCE WITH DESIGN DRAWINGS.
8. DIMENSIONS "X1" AND "X2" AND LOCATION OF BULKHEADS AND REINFORCING TO BE SHOWN IN DESIGN DRAWINGS.
9. FILL VOID BETWEEN BORED HOLE AND CASING PIPE WITH GROUT AS SHOWN ON SEQ-SEW-1403-1.
10. DIRECTIONAL BORING TO INSTALL PE PIPE IS ALSO ACCEPTABLE. GRADE TO BE INCREASED TO ENSURE A POSITIVE GRADE THROUGHOUT PIPE SECTION.
11. DURING GROUT PLACEMENT, PLASTIC PIPE MATERIALS SHALL BE CONTROLLED FOR FLOATATION AND THERMAL REVERSION.
**Bored Encasing Pipe System**

**Steps 1, 2 & 3 as shown.**

**Typical Buried Crossings**

Bored and Jacked Encasing Pipe Details

---

**Notes:**

1. All dimensions in millimetres.
2. Pipe materials and 'D' & 'd' to be as specified in design drawing.
3. Fully butt welded steel encasing pipes preferred.
4. Bored hole to encasing pipe grout mix by weight is 0.67 water : 1.0 cement : 1.0 sand with the sand to be well rounded sand and Eq-SP approved plasticisers may be used.
5. Encasing pipe to sewer pipe grout mix is a flowable 03D0,±1,080*5287:,7+$/2:+($72)+<'5$7,21 with aggregate being a fine well rounded sand and plasticisers may be used. The mix design shall be appropriate for the specific pipe materials and site conditions and shall be approved by the superintendent.
NOTES:
1. ALL DIMENSIONS IN MILLIMETRES.
2. DI PIPE WITH POLYMERIC LINING SHOWN. STEEL SINTALINED RRJ PIPE MAY BE USED AS AN ALTERNATIVE. AN EXPANSION JOINT IS REQUIRED FOR STEEL PIPE.
3. MINIMUM SIZE OF PIPE AS AQUEDUCT TO BE DN 150.
4. MAXIMUM HEIGHT "H" OF CONCRETE PIER:
   - IN FLOOD CONDITIONS, SEE TABLE FOR MAXIMUM HEIGHT.
   - IN NO FLOOD CONDITIONS, 5000 MAXIMUM.
   - WHERE AQUEDUCT NEEDS TO BE HIGHER, SPECIFIC DESIGN CALCULATIONS NEED TO BE CARRIED OUT.
5. CONCRETE TO BE N25 FOR PIERS.
6. REINFORCEMENT AND CONCRETE DETAILS FOR PIERS SHALL BE SPECIFIED IN DESIGN DRAWINGS WITH RPEQ SIGN OFF.
7. STRAPS TO BE GRADE 316 STAINLESS STEEL. PLACE A 3 THICK x 100 WIDE EPDM RUBBER INSERTION AROUND THE PIPE WHERE IN CONTACT WITH THE STRAP. USE NEOPRENE PADS AND NYLON WASHERS ON ALL DISSIMILAR METAL CONTACTS.
8. AS SPECIFIED IN THE DESIGN DRAWINGS, NO ADDITIONAL PROTECTION/COATING TO BE PROVIDED TO MAKE AQUEDUCT PIPES MORE ENVIRONMENTALLY ACCEPTABLE, REFER NOTE 8A ON SEQ-SEW-1406-1.
9. CYLINDRICAL PIERS (5600 MIN) OR EQUIVALENT ARE AN ACCEPTABLE ALTERNATIVE.
10. PIERS IN SOIL: SPECIFY DEPTH OF PIER IN SOIL IN DESIGN DRAWINGS, BUT NOT LESS THAN 900. SPECIFY TYPE AND SIZE OF FOOTING TO BE USED IN DESIGN DRAWINGS. CONSTRUCT PIERS WITHOUT FOOTINGS TO THE DEPTHS SPECIFIED IN DESIGN DRAWINGS.
11. ASSEMBLE JOINTS WITH THE SPIGOT END WITHDRAWN 5 TO 10 FROM BACK OF THE SOCKET TO ACCOMMODATE EXPANSION AND CONTRACTION RESULTING FROM TEMPERATURE FLUCTUATIONS.
12. PROVIDE STEEL GRILLES WHERE THE VERTICAL DISTANCE 'G' EXCEEDS 1800. GRILLE TO BE CLAMPED ON TO PIPELINE TO PREVENT MOVEMENT SEE SEW-1405.
13. % GRADES "X", "Y" & "Z" TO BE SHOWN IN DESIGN DRAWINGS.
1. All dimensions in millimetres.
2. All items to be steel and hot dip galvanised after fabrication.
3. Place 3 thick rubber insertion between clamps and pipeline.
4. Include sign "DANGER KEEP OFF" where specified by water agency.
5. Steel to be Grade 250 to AS/NZS 3679.1.
1. ALL DIMENSIONS IN MILLimetres.
2. OPTION 1 IS PREFERRED OPTION. OPTION 2 IS FOR DRY CREEKS.
3. FOR GENERAL SERVICE, STEEL SUPPORT TO AS/NZS 3679.1 GRADE 250 AND HOT DIPPED GALVANISED.
4A. IN CORROSiVE ENViRONMENTS (WITHIN 1km OF COAST LINE) USE STAiNLESS STEAL MIN GRADE 316 FOR SUPPORT BEAMS, TiE RODS, CRADLE SUPPORTS, CLAMPS, BOLTS, NUTS AND WASHERS.

4B. PROVIDE NEOPRENE PADS AND NYLON WASHERS ON ALL DISSiMILAR METAL CONTACTS.
5. PROVIDE PIPE EXPANSION JOINTS AT EACH END OF BRIDGE.
6. SCL PIPE ONLY FOR OPTION 1, JUSTIFY FOR OPTIONS 2 AND 3.
7. DI TO BE USED FOR OPTION 2. MATERIAL TYPE DEPENDS ON ENVIRONMENTAL CONDITIONS.
8A. ALL DI PIPES SHALL BE PROVIDED WITH A COLOURED EPOXY COATING AT 500 MICRONS THiCK, PIPE COLOUR TO SUiT LOCAL ENVIRONMENT WITH PRODUCT MARKERS AT EACH SOCKET.
8B. ALL FLANGE JOINTS SHALL BE PROTECTED BY A DENSO 400 STEELCOAT SYSTeM OR EQUAL.
9. ALL APPERTENANCES SHALL BE ACCESSiBLE VIA PLATFORMS AND HANDRAILS TO AS 1657.
10. ALL SUPPORTS SHALL MANAGE ALL TEST AND OPERATIONAL THRUSTS AT FULL PIPE LOADS.
NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. LOCATE INDUCT AND EDUCT VENTS AS SPECIFIED IN DESIGN DRAWINGS.
3. PHYSICAL POSITION AND SIZE TO BE IN ACCORDANCE WITH WATER AGENCY REQUIREMENTS. POSITION PREFERENCE IS 300 FROM BOUNDARY SUBJECT TO ELECTRICITY AND TELCO SERVICE LOCATIONS.
4. VENTS TO BE SUITABLE FOR INSTALLED LOCATION, SEE SEQ-SEW-1307-3 OR SEQ-SPS-1405-2 FOR TYPICAL EDUCT.
5. STUDOR AIR ADMITTANCE VALVE/S WITHIN BEIGE COLOURED MODIFIED ELECTRICAL PILLAR WITH VENT LOUVERS FITTED.
NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. INSTALL WATER SEALS ONLY WHEN SPECIFIED IN DESIGN DRAWINGS, DN150 SHOWN.
3. LENGTH OF PIPEWORK BETWEEN MAINTENANCE STRUCTURES TO BE SHORT ENOUGH TO FACILITATE ACCESS FOR MAINTENANCE EQUIPMENT.
WATER SEAL ARRANGEMENTS
TYPICAL MAINTENANCE HOLE SYSTEM

NOTES:
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. PROVIDE WATER SEALS ONLY WHERE SHOWN IN DESIGN DRAWINGS.
3. FOR CHANNEL DETAILS SEE SEQ-SEW-1304-1 AND 1305-1.
1. All work and materials shall be in accordance with current Queensland Code specifications and standards.
2. Unless specified otherwise all materials and work shall comply with the relevant Australian Standards.
3. All flap valve chambers shall be fitted with maintenance hole frame, cover and coping to suit application. Refer standard drawing SEQ-SEW-1301-1 and SEQ-SEW-1308-2 to SEQ-SEW-1308-11 for details.
4. Top slab thickness shall be increased from 115mm to 150mm where located in trafficable location, see SEQ-SEW-1409-2.
5. A 375mm diameter pipe (min) may be used instead of 460 x 230 box culvert for the outlet pipe, as long as flow volume and control levels at the maintenance hole can be maintained. This alternative is only applicable to the conduit downstream of the overflow structure containing the flap valve.
6. If the length for a box culvert between M.H. and F.V.C. is greater than 1200mm (length of one unit) the joints of the units shall be concrete surrounded (150mm) with a 600 wide strip of SL82 mesh placed centrally in the surround.
7. The overflow drawing shall specify:
   A. Overflow size between M.H. and F.V.C.
   B. Overflow size leaving F.V.C.
   C. Flap valve type.
   D. I.L. of O.F. at manhole.
   E. I.L. of O.F. at F.V.C. in.
   F. I.L. of O.F. at F.V.C. out.
   G. S.L. of F.V.C.
   H. I.L. of O.F. at discharge point.
   I. Length between M.H. and F.V.C.
   J. Length between F.V.C. and outlet.
   K. Type of screen if necessary.
   L. Concrete bulkhead location on outlet pipe.
8. All mild steel work shall be hot dipped galvanised.
9. 36mm diameter S.S. washers shall be trimmed if necessary to fit inside the 460 x 230 box culvert opening.
10. All dimensions are in millimetres.
FLAP DETAILS

75mm WELDED LAP

STEEL REINFORCEMENT N16 STEEL BARS PITCH 150mm BOTH WAYS TACK WELDED AT ALL INTERSECTIONS. MINIMUM COVER - 50mm.

PLAN

SLAB REINFORCEMENT

SEE NOTE 4 (SEQ-SEW-1409-1)

REFERENCES

REFER SEQ-SEW-1409-1 FOR NOTES
NOTES

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT QUEENSLAND CODE SPECIFICATIONS AND STANDARDS.

2. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.

3. ALL FLAP VALVE CHAMBERS SHALL BE FITTED WITH MAINTENANCE HOLE FRAME, COVER AND COPING TO SUIT APPLICATION. REFER STANDARD DRAWING SEQ-SEW-1301-1 AND SEQ-SEW-1308-2 TO SEQ-SEW-1308-11 FOR DETAILS.

4. TOP SLAB THICKNESS SHALL BE INCREASED FROM 115mm TO 150mm WHERE LOCATED IN TRAFFICABLE LOCATION, SEE SEQ-SEW-1409-2.

5. A 600mm DIAMETER PIPE (MIN) MAY BE USED INSTEAD OF 610 x 380 BOX CULVERT FOR THE OUTLET PIPE, AS LONG AS FLOW VOLUME AND CONTROL LEVELS AT THE MAINTENANCE HOLE CAN BE MAINTAINED. THIS ALTERNATIVE IS ONLY APPLICABLE TO THE CONDUIT DOWNSTREAM OF THE OVERFLOW STRUCTURE CONTAINING THE FLAP VALVE.

6. IF THE LENGTH FOR A BOX CULVERT BETWEEN M.H. AND F.V.C IS GREATER THAN 1200mm (LENGTH OF ONE UNIT) THE JOINTS OF THE UNITS SHALL BE CONCRETE SURROUNDED (150mm) WITH A 600 WIDE STRIP OF SL82 MESH PLACED CENTRALLY IN THE SURROUND.

7. THE OVERFLOW DRAWING SHALL SPECIFY:
   A. OVERFLOW SIZE BETWEEN M.H. AND F.V.C.
   B. OVERFLOW SIZE LEAVING F.V.C.
   C. FLAP VALVE TYPE.
   D. I.L. OF O.F. AT MANHOLE.
   E. I.L. OF O.F. AT F.V.C IN.
   F. I.L. OF O.F. AT F.V.C. OUT.
   G. S.L. OF F.V.C.
   H. I.L. OF O.F. AT DISCHARGE POINT.
   I. LENGTH BETWEEN M.H. AND F.V.C.
   J. LENGTH BETWEEN F.V.C. AND OUTLET.
   K. TYPE OF SCREEN IF NECESSARY.
   L. CONCRETE BULKHEAD LOCATION ON OUTLET PIPE.

8. ALL MILD STEEL WORK SHALL BE HOT DIPPED GALVANISED.

9. 36mm DIAMETER S.S. WASHERS SHALL BE TRIMMED IF NECESSARY TO FIT INSIDE THE 610 x 380 BOX CULVERT OPENING.

10. ALL DIMENSIONS ARE IN MILLIMETRES.

11. STEP IRONS SHALL BE LOCATED TO ALLOW FLAP VALVE TO FULLY OPERATE.
PLAN
SLAB REINFORCEMENT

STEEL REINFORCEMENT N16
STEEL BARS PITCH 150mm
BOTH WAYS TACK WELDED AT
ALL INTERSECTIONS.
MINIMUM COVER - 50mm.

FLAP DETAILS

700 × 50 C/12 GALVANISED M.S.
PLATE.
635 × 420 C/5 GALVANISED M.S.
PLATE.
610 × 380 BOX CULVERT
700 × 560 C/6 NEOPRENE SHEET
OR APPROVED EQUIVALENT 60
HARDNESS
18-M6 PAN HEAD 316 SS BOLTS
AND NUTS, WITH TWO Ø36mm
S.S. WASHERS SEE NOTE 9
(SEQ-SEW-1409-1)

DETAIL OF M.S. PLATE

36 x 16 SLOTTED
HOLES
5/12 C/12 MASONRY ANCHORS, OR
APPROVED EQUIVALENT
700 × 50 × 12 G.M.S. PLATE.
635 × 420 × 5 G.M.S. PLATE
610 × 380 BOX CULVERT
700 × 560 C/6 NEOPRENE SHEET
OR APPROVED EQUIVALENT 60
HARDNESS

SECTION

10mm CLEAR COVER
10mm CEMENT MORTAR
30 CLEAR COVER

REFER SEQ-SEW-1409-1 FOR NOTES

SEQ WATER SERVICE PROVIDERS

REFER SEQ-SEW-1409-1 FOR NOTES

TEXAS ENGINEERING BOARD
TEXAS LICENSE NO. 22191

NOT TO SCALE

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE
OCCUPATIONAL HEALTH & SAFETY LEGISLATION

REV. No. DATE DESCRIPTION AUTL.

SEQ-SEW-1410-2

SEWERAGE STANDARD DRAWING

STANDARD OVERFLOW FLAP VALVE
CHAMBER - TYPE 2
TYPICAL TOP SLAB AND FLAP DETAILS

DRAWING NO. SCALE QC REV.

A

DRAW DATE: 1/1/2013
NOTES

1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT QUEENSLAND CODE SPECIFICATIONS AND STANDARDS.
2. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
3. ALL FLAP VALVE CHAMBERS SHALL BE FITTED WITH MAINTENANCE HOLE FRAME, COVER AND COPING TO SUIT APPLICATION. REFER STANDARD DRAWING SEQ-SEW-1301-1 AND SEQ-SEW-1308-2 TO SEQ-SEW-1308-11 FOR DETAILS.
4. TOP SLAB THICKNESS SHALL BE INCREASED FROM 115 mm TO 150 mm WHERE LOCATED IN TRAFFICABLE LOCATION, SEE SEQ-SEW-1411-2.
5. A 675 mm DIAMETER PIPE (MIN) MAY BE USED INSTEAD OF 760 x 460 BOX CULVERT FOR THE OUTLET PIPE, AS LONG AS FLOW VOLUME AND CONTROL LEVELS AT THE MAINTENANCE HOLE CAN BE MAINTAINED. THIS ALTERNATIVE IS ONLY APPLICABLE TO THE CONDUIT DOWNSTREAM OF THE OVERFLOW STRUCTURE CONTAINING THE FLAP VALVE.
6. IF THE LENGTH FOR A BOX CULVERT BETWEEN M.H. AND F.V.C. IS GREATER THAN 1200 mm (LENGTH OF ONE UNIT) THE JOINTS OF THE UNITS SHALL BE CONCRETE SURROUNDED (150 mm) WITH A 600 WIDE STRIP OF SL82 MESH PLACED CENTRALLY IN THE SURROUND.
7. THE OVERFLOW DRAWING SHALL SPECIFY:
   A. OVERFLOW SIZE BETWEEN M.H. AND F.V.C.
   B. OVERFLOW SIZE LEAVING F.V.C.
   C. FLAP VALVE TYPE.
   D. I.L. OF O.F. AT MANHOLE.
   E. I.L. OF O.F. AT F.V.C IN.
   F. I.L. OF O.F. AT F.V.C. OUT.
   G. S.L. OF F.V.C.
   H. I.L. OF O.F. AT DISCHARGE POINT.
   I. LENGTH BETWEEN M.H. AND F.V.C.
   J. LENGTH BETWEEN F.V.C. AND OUTLET.
   K. TYPE OF SCREEN IF NECESSARY.
   L. CONCRETE BULKHEAD LOCATION ON OUTLET PIPE.
8. ALL MILD STEEL WORK SHALL BE HOT DIPPED GALVANISED.
9. 36 mm DIAMETER S.S. WASHERS SHALL BE TRIMMED IF NECESSARY TO FIT INSIDE THE 610 x 380 BOX CULVERT OPENING.
10. ALL DIMENSIONS ARE IN MILLIMETRES.
11. STEP IRONS SHALL BE LOCATED TO ALLOW FLAP VALVE TO FULLY OPERATE.
890 x 50 x 12 GALVANISED M.S. PLATE.
810 x 500 x 5 GALVANISED M.S. PLATE.
760 x 460 BOX CULVERT
890 x 650 x 6 NEOPRENE SHEET OR APPROVED EQUIVALENT 60 HARDNESS
18-M6 PAN HEAD 316 SS BOLTS AND NUTS, WITH TWO Ø36mm S.S. WASHERS SEE NOTE 9 (SEQ-SEW-1411-1)

FLAP DETAILS

PLAN
SLAB REINFORCEMENT

SEWERAGE STANDARD DRAWING
STANDARD OVERFLOW FLAP VALVE CHAMBER - TYPE 3
TYPICAL TOP SLAB AND FLAP DETAILS

SEQ WATER SERVICE PROVIDERS

DETAIL OF M.S. PLATE

SECTION A

SECTION B

STEEL REINFORCEMENT N16 STEEL BARS PITCH 150mm BOTH WAYS TACK WELDED AT ALL INTERSECTIONS.
MINIMUM COVER - 50mm.

SEE NOTE 4 (SEQ-SEW-1411-1)

REFER SEQ-SEW-1411-1 FOR NOTES

NOT TO SCALE

DRAWING NO. VERSION
SEQ-SEW-1411-2 A

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

ORD DATE: 1/1/2013

REV. NO. DATE DESCRIPTION AUTHT.

36 x 16 SLOTTED HOLES

5/12mm MASONRY ANCHORS, OR APPROVED EQUIVALENT

890 x 50 x 12 G.M.S. PLATE
810 x 500 x 5 G.M.S. PLATE
890 x 650 x 6 NEOPRENE SHEET OR APPROVED EQUIVALENT 60 HARDINESS

100mm CEMENT MORTAR
NOTES:

1. FOR OVERFLOW SHIELD DETAILS REFER SEQ-SEW-1412-2.
2. THE OVERFLOW LEVEL SHALL BE:
   (a) AT LEAST 300 BELOW UNDERSIDE OF PUMP WELL
       ROOF SLAB.
   (b) THE SURFACE LEVEL OF THE LOWEST MANHOLE IN
       THE SYSTEM.
   (c) THE LOWEST FLOOR SLAB OR RELIEF GULLY TRAP
       (WHICHEVER IS THE LOWER OF (a), (b) OR (c).
   (d) MARKED BY A BRASS PLATE ENGRAVED WITH THE
       DEPTH TO OVERFLOW AND ATTACHED TO TOPSIDE
       OF PUMP WELL ROOF SLAB, AND
   (e) SUBJECT TO THE LEVEL, VISIBLY MARKED BY EITHER
       A SIMILAR DN ORANGE COLOURED PLASTIC
       CONDUIT, SPLIT AND ATTACHED TO THE PIPEWORK
       RISERS BY 316 SS CLAMPS ATTACHED AT 500 CRS
       OR BY A DN 100 ORANGE COLOURED PLASTIC
       CONDUIT ATTACHED TO THE WALL OF THE WET
       WELL, IN A VISIBLE LOCATION, WITH THE BASE OF
       EITHER CONDUIT AT OVERFLOW LEVEL.
3. FLAP VALVE SHALL BE ALUMINIUM ALLOY 6061-T6 OR
   FIBREGLASS.
4. DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN
   OTHERWISE.
NOTES:
1. OVERFLOW SHIELD SHALL BE 10mm HDPE FABRICATED.
2. DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.

RADIUS TO BE 2 x OVERFLOW PIPE DIA

HDPE CURVED RADIUS TO SUIT

OVERFLOW PIPE

GREATER OF 500 OR 2 x OVERFLOW PIPE

CENTRES ON FACE OF CONCRETE

REINSTATE PROTECTIVE COATING

R10

4 STAINLESS STEEL GRADE 316 HEX. HEAD BOLTS M16x115. CHEM SET IN CONCRETE.
SHANKS TO PROJECT 45. USE 3mm 316 WASHERS.

OVERFLOW SHIELD

DETAIL OF SLOTS

SEWAGE STANDARD DRAWING
TYPICAL OVERFLOW SHIELD SHIELDED OUTLET

SEQ WATER SERVICE PROVIDERS

SEQ-SEW-1412-2

NOT TO SCALE

ORG DATE: 1/1/2013
**NOTES:**

1. PIPES SHOWN ARE DIAGRAMMATIC ONLY, REFER PROJECT DRAWINGS FOR LAYOUT, LEVELS, AND PIPE SIZES.
2. CONCRETE 532 IN ACCORDANCE WITH AS 1379 AND AS 3600.
3. ALL STEELWORK TO BE EITHER ALUMINIUM OR STAINLESS STEEL.
4. ALL BOLTS, NUTS AND WASHERS SHALL BE GRADE AS 2837/316 STAINLESS STEEL WITH APPROVED ANTI-GALLING COMPOUND.
5. ALL WELDS TO AS 1554. ALL WELDING SYMBOLS TO COMPLY WITH AS 1101.3.
6. THE COVERS SHALL BE GAS TIGHT. ALL COMPONENTS OF ACCESS COVERS AND FRAMES SHALL BE FABRICATED FROM ALUMINIUM ALLOY 6061-T6, TO AS 2848. ALL EMBEDDED SURFACES SHALL BE PAINTED WITH 2 COATS OF ALKALI RESISTANT BITUMINOUS PAINT. THE COVERS SHALL BE DESIGNED AS A PLATFORM IN ACCORDANCE WITH AS 1657. FABRICATION DETAILS SHALL BE SUBMITTED TO THE SUPERINTENDENT FOR APPROVAL PRIOR TO MANUFACTURE.
7. IF COVERS ARE SUBJECT TO VEHICULAR LOADING, USE APPROPRIATELY RATED D.I. COVERS.
8. ALL DIMENSIONS IN MILLIMETRES.

**SCREEN GUIDE RAIL**

* A 'COMB SEPARATOR' IS THE PREFERRED SCREEN. CONTACT UNITYWATER TO OBTAIN DETAILS OF COMB SEPARATORS.

**PLAN**

- **OUTLET**
- **OVERFLOW CHAMBER**
- **RECEIVING ACCESS CHAMBER**

**SECTIONAL ELEVATION**

**SCREEN DETAIL**

- **SCREEN HEIGHT = OVERFLOW PIPE DIA. (MIN.) + 60mm**
- **76 X 38 CHANNEL FIXED TO WALL WITH M10 FLAT HEAD SS MASONRY ANCHORS AT 300 CTR COUNTERSUNK INTO CHANNEL**

**NOT TO SCALE**

**SEWERAGE STANDARD DRAWING**

**SEQ-SEW-1413-1**

**SEQ WATER SERVICE PROVIDERS**

**SEWAGE OVERFLOW ARRANGEMENT**

**TYPICAL OVERFLOW WITH SCREENED OUTLET**

**WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION**

---

**REV. No.** | **DATE** | **DESCRIPTION** | **AUTH.**
--- | --- | --- | ---
2 | 29/07/15 | COMB SEPARATOR DETAILS ADDED & SCREEN HEIGHT AMENDED | DF
FLEXIBLE COUPLING METHOD

STAINLESS STEEL REPAIR CLAMP METHOD

SLIP COUPLING METHOD

NOTES

1. FOR SEQ WATER SERVICE PROVIDER USE ONLY.
2. PLACE EMBEDMENT UNDER AND AROUND ALL INSTALLED PIPE
   SECTIONS AND SPACERS AND COMPACT TO MAINTAIN GRADE AND
   MINIMISE SETTLEMENT.
3. FLEXIBLE COUPLINGS TO HAVE GRADE 316 SS CLAMPS & SHEAR BANDS
   AND BE IN ACCORDANCE WITH AS 4327.
4. SLIP COUPLINGS TO BE AS SPECIFIED BY PIPE MANUFACTURER OR
   WATER AGENCY.
5. A SINGLE REPAIR CLAMP MAY BE USED FOR REPAIR OF SMALL CRACKS
   OR HOLES. MINIMUM CLAMP LENGTH EITHER SIDE OF THE DAMAGE TO
   BE AS SHOWN ON THE TABLE.
6. FLEXIBLE COUPLINGS AND STAINLESS REPAIR CLAMPS ARE NOT
   APPLICABLE TO RIBBED PIPE.
7. USE THESE METHODS FOR JUNCTION INSERTION OR MAINTENANCE
   STRUCTURE CUT-IN, SEE SEQ-SEW-1501-1 AND SEQ-SEW-1502-1.
8. THOROUGHLY CLEAN SURFACE OF EXISTING PIPE BEFORE INSTALLING
   CLAMPS OR COUPLINGS.
9. ALL DIMENSIONS IN MILLIMETRES.

PE ELECTROFUSION METHOD

SS WRAP AROUND CLAMPS

<table>
<thead>
<tr>
<th>DN</th>
<th>MIN CLAMP LENGTH EITHER SIDE OF PIPE CUT OR DAMAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 - 200</td>
<td>75</td>
</tr>
<tr>
<td>&gt;200 - 300</td>
<td>100</td>
</tr>
<tr>
<td>&gt;300 - 600</td>
<td>150</td>
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</table>

SEQ WATER SERVICE PROVIDERS

SEWERAGE STANDARD DRAWING

INSERTIONS AND REPAIR SYSTEMS

TYPICAL PIPE CUT-IN METHODS

DRAWING No. SEQ-SEW-1500-1

NOT TO SCALE

ORG DATE: 1/1/2013

A
JOINTING TECHNIQUE:
USE SLIP COUPLING OR OTHER COUPLING/CLAMP AS APPLICABLE
(SEE SEQ-SEW-1500-1)

PROPERTY CONNECTION DETAILS SEE SEQ-SEW-1106-1 TO SEQ-SEW-1106-6

JOINTING TECHNIQUE:
USE SLIP COUPLING OR OTHER COUPLING/CLAMP AS APPLICABLE
(SEE SEQ-SEW-1500-1)

NOTE 1: ALL DIMENSIONS IN MILLIMETRES.
NOTE 2: PLACE EMBEDMENT UNDER AND AROUND ALL INSTALLED PIPE SECTIONS AND SPACERS AND COMPACT TO MAINTAIN GRADE AND MINIMISE SETTLEMENT.
NOTE 3: ENSURE MINIMUM GRADE REQUIREMENTS ARE MET WHEN HOUSE CONNECTION BRANCH LAID NEAR HORIZONTAL SEE SEQ-SEW-1106-1.
NOTE 4: WHERE AVAILABLE A SP-SP JUNCTION MAY BE INSERTED DIRECTLY INTO EXISTING SEWER AND COUPLED USING ANY OF THE CUT-IN METHODS SHOWN IN SEQ-SEW-1500-1.
NOTE 5: THOROUGHLY CLEAN SURFACES OF EXISTING PIPES BEFORE CONNECTING CLAMPS OR COUPLINGS.
NOTE 6: PLACE CLAMP-ON BRANCH ON PIPE AND MARK THE INSIDE SHAPE OF THE JUNCTION BRANCH ON MAIN PIPE.
NOTE 7: REMOVE CLAMP AND CUT HOLE USING APPROPRIATE TYPE OF SAW AND CLEAN AND DE-BURR HOLE EDGES.
NOTE 8: ALIGN JUNCTION BRANCH WITH CUT HOLE. POSITION CLAMPS AND TIGHTEN TO REQUIRED TORQUE.

45° OR 90° JUNCTION AS REQUIRED. JUNCTION BRANCH MAY BE AT ANY ANGLE FROM 15° TO VERTICAL (TYPE 'D' SHOWN-SEQ-SEW-1105-1) (SEE NOTES 4 & 5)

45° ELECTROFUSION SADDLE INSTALLED TO MANUFACTURE DETAILS

SS SEWER JUNCTION WITH 45° OR 90° BRANCH (BRANCH TO SUIT CONNECTING PIPE MATERIAL)

FLOW

EXISTING SEWER

EXISTING PE SEWER

FLOW

EXISTING SEWER

REINSTATE BEDDING
(SEE NOTE 2)

600 NOM

600 NOM

600 NOM

REINSTATE BEDDING
(SEE NOTE 2)

CONNECTION OF SS SEWER JUNCTION TO EXISTING SEWER

PLAIN WALL

(SEE NOTES 6 TO 8)

ELECTROFUSION JUNCTION ONTO EXISTING PE SEWER

INSERTION OF JUNCTION INTO EXISTING SEWER

(DEEP JUNCTION FORMAT SHOWN)
INSTALLATION PROCEDURE FOR MANHOLE

IN STABLE SOILS
1. WHERE NECESSARY ESTABLISH A TEMPORARY BY-PASS SYSTEM.
2. DIG 200 DEEP UNDER AND AROUND EXISTING SEWER TO PROVIDE A BASE APPROX 1700 IN DIAMETER.
3. CLEAN AND ABRACE EXTERNAL PIPE SURFACE AND COAT WITH RESIN/SOLVENT AND SAND AND APPLY HYDROPHILIC SEAL.
4. POUR CONCRETE TO 150 ABOVE TOP OF PIPE.
5. EITHER INSTALL FIRST SECTION OF PRE-CAST SHAFT SECTIONS SHOWN OR MAKE CONSTRUCTION JOINT FOR CAST IN-SITU (SEE SEQ-SEW-1300 SERIES).
6. FORM GULLET TO SPRING LINE OF PIPE AND FULL LENGTH OF INSIDE OF MH.
7. WHEN CONCRETE IS SET, CUT OR BREAK OUT THE TOP HALF OF THE EXISTING SEWER FOR THE FULL LENGTH INSIDE THE MH.
8. PATCH BENCHING/PIPE SECTIONS TO REMOVE SHARP OBSTRUCTIONS, GAPS ETC USING 2:1 SAND:CEMENT MORTAR.
9. COMPLETE THE REMAINDER OF MH IN ACCORDANCE WITH SEQ-SEW-SERIES.

IN REACTIVE SOILS (SOIL BEARING PRESSURE <100 kPa)
1. WHERE NECESSARY ESTABLISH A TEMPORARY BY-PASS SYSTEM.
3. COMPLETE INSTALLATION OF MH IN ACCORDANCE WITH STEPS 2 TO 9 ABOVE.

NOTES:
1. ALL DIMENSIONS IN MILLIMETRES.
2. CARRY OUT INSTALLATION OF MAINTENANCE STRUCTURE ONLY AT PERIODS OF LOW SEWAGE FLOW OR WHEN BYPASSING SEWAGE FLOWS.
3. FOR MH IN SEWERS INSTALLED ON SLOPES >16% LAY TWIN DRAINAGE PIPES THROUGH THE CONCRETE BASE IN ACCORDANCE WITH SEQ-SEW-1200 SERIES.
4. PLACE EMBEDMENT UNDER AND AROUND ALL INSTALLED MS, SURROUNDING PIPES AND COUPLINGS. COMPACT TO MAINTAIN GRADE AND MINIMISE SETTLEMENT.
5. FOR PVC OR GRP PIPE OR FITTINGS TO BE CAST INTO BASE, COAT WITH RESIN/SOLVENT & SAND OR ABRADED TO ENSURE BONDING AND APPLY HYDROPHILIC SEAL.
6. FOR INTERNAL DROP SYSTEM SEE SEQ-SEW-1300 SERIES.