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THE INFORMATION SHOWN HEREWITH IS COMPILED TO CONFORM WITH AUSSPEC. ANY REFERENCES TO WSA INFORMATION SHOULD BE CONSISTENT WITH THE AUSSPEC DOCUMENTATION
CONCRETE BULKHEAD DETAIL

SEAL WOVEN POLYETHYLENE BAGS Mn. 0.25 THICK FILLED WITH CLAY OR OTHER IMPERMEABLE MATERIAL KEYED IN MIN. 150mm TO SIDE WALLS OF TRENCH.

PACK BAGS TIGHTLY TOGETHER

COMRESSIBLE MEMBRANE AROUND PIPE

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETRES.
2. CONSTRUCT CONCRETE BULKHEADS AND TRENCH STOPS AT LOCATIONS SPECIFIED IN DESIGN DRAWINGS.
3. BULKHEAD AT A RETAINING WALL TO BE UNDER THE WALL.
4. KEY CONCRETE BULKHEADS INTO SIDES AND BOTTOM OF TRENCH AGAINST A BEARING SURFACE OF UNDISTURBED SOIL.
5. CONCRETE TO BE CLASS N20.
6. DO NOT DEFORM PIPES DURING PLACEMENT OF CONCRETE.
7. SEAL BAGS TO PREVENT LEAKAGE OF CONTAINED MATERIAL.
8. PROVIDE CONTINUOUS DRAINAGE PATH - THROUGH BULKHEADS AND TRENCH STOPS - AROUND VALVE CHAMBERS - IN TRENCH EXCAVATIONS ACROSS ROADS.
9. COMRESSIBLE MEMBRANE AROUND PIPE TO BE 10 THICK POLYSTYRENE FOR BULKHEADS ADJACENT TO KERBS AND 3 THICK RUBBER FOR BULKHEADS AND TRENCH STOPS ON SLOPES.
10. FOR SLOPES >30% CONTINUOUSLY ENCAGE THE PIPE TO PREVENT MOVEMENT AND TRANSFERS OF GROUND WATER. WRAP JOINTS TO PREVENT DAMAGE RO RRJ.

PROJECT PLANNING AND DESIGN

COFFS HARBOUR CITY COUNCIL
CONSTRUCTION - SEWER WORKS

SOIL CLASSIFICATION GUIDELINES
AND ALLOWABLE BEARING PRESSURES
FOR BULKHEADS SEW-1200

(ADAPTED FROM C.H.C.C., P.W.D. & W.S.A. DRAWINGS)

NOT TO SCALE| PLAN DATE: AUG. 2015 | SHEET 1

TRENCH STOP DETAIL

EXCAVATE RECESS 100mm DEEP TO SUIT WIDTH OF BAGS ACROSS FULL TRENCH WIDTH & BOTH SIDE WALLS & Fill THE SPACE BETWEEN EXCAVATED RECESS & PIPE ENTIRELY.

100Ø PVC PIPE DRAIN WITH FILTER MEMBRANE COVERING UPSTREAM OPENING & DIRECT TO EXISTING DRAINAGE SYSTEM AT LOW POINTS.

NOTE: FOR TRENCHES 450 TO 600 WIDE, USE SINGLE PIPE. FOR TRENCHES > 600, USE 100Ø PIPES BOTH SIDES.

300 Nom.

TRENCH FILL IN ORGANIC MATERIAL WITH 75 MAXIMUM STONE SIZE

TRENCH STOP AND CONCRETE BULKHEAD NOTES:

1. TRENCH STOPS ARE TO BE PLACED ON GRADES 5% TO 14% AND TO BE INCORPORATED WITH CONCRETE BULKHEADS ON GRADES 15% TO 29%.
2. THE DISTANCE BETWEEN TRENCH STOPS SHOWN ON THE DESIGNS ARE MINIMUM DISTANCES. WHERE THE DISTANCE STATED IS GREATER THAN THE DISTANCE BETWEEN PITS/BENDS/VALVES, A TRENCH STOP IS STILL TO BE PLACED ON THAT LINE.

NOTE:

1. TRENCH STOPS ARE TO BE PLACED ON GRADES 5% TO 14% AND TO BE INCORPORATED WITH CONCRETE BULKHEADS ON GRADES 15% TO 29%.
2. THE DISTANCE BETWEEN TRENCH STOPS SHOWN ON THE DESIGNS ARE MINIMUM DISTANCES. WHERE THE DISTANCE STATED IS GREATER THAN THE DISTANCE BETWEEN PITS/BENDS/VALVES, A TRENCH STOP IS STILL TO BE PLACED ON THAT LINE.
**VEHICULAR LOADING**

**LEGEND**

# SPECIFIED BY DESIGNER IN DESIGN DRAWINGS

**NOTES:**

1. ALL DIMENSIONS IN MILIMETRES.
2. SPECIFY SPECIAL BEDDING TO SUIT THE CONDITIONS IF THE TRENCH FLOOR HAS:
   - IRREGULAR OUTCROSOPS OF ROCK.
   - AHBP OF <50 kPa (SEE SEW-1200), OR
   - BEEN DISTURBED BY UNCONTROLLED GROUND WATER.
3. COMPACT AND EVENLY GRADED FINISHED TRENCH FLOOR.
4. EMBEDMENT, TRENCH FILL AND COMPAC10N TO MEET THE REQUIREMENT OF DESIGN DRAWINGS AND WSA 02 PART 3.
5. USE GEOTEXTILE FILTER FABRIC WHERE SPECIFIED.
6. SIDES OF EXCAVATION TO BE KEPT VERTICAL TO AT LEAST 150 ABOVE THE PIPE.

---

### MATERIAL

<table>
<thead>
<tr>
<th>ZONE</th>
<th>ROAD SURFACE</th>
<th>VERGE &amp; TRACK</th>
</tr>
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<tbody>
<tr>
<td>ROAD SURFACE LAYER</td>
<td>TO MATCH EXISTING ROAD BASE OR TO ROAD OWNER'S REQUIREMENTS</td>
<td></td>
</tr>
<tr>
<td>MATCH EXISTING COURSE TO MATCH EXISTING ROAD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROAD BASE</td>
<td>TRENCH FILL TO ROAD OWNER'S REQUIREMENTS</td>
<td></td>
</tr>
<tr>
<td>INORGANIC FILL MATERIAL WITH 75 MAXIMUM STONE SIZE</td>
<td></td>
<td></td>
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<tr>
<td>EMBEDMENT MATERIAL IN ACCORDANCE WITH DESIGN DRAWINGS (SEE NOTE 4)</td>
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</table>

**SIDE SUPPORT**

**OVERLAY (300mm in Rock)**

**EMBEDMENT**

**OVER-EXCAVATION**

**TOPSOIL OR PAVEMENT**

**ORIGINAL OR IMPORTED MATERIAL**

**TO MATCH EXISTING ROAD**

---

### MINIMUM PIPE COVER

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>MINIMUM COVER #</th>
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<tbody>
<tr>
<td>PRIVATE PROPERTY NON VEHICULAR</td>
<td>600</td>
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<tr>
<td>NON VEHICULAR NEW DEVELOPMENTS</td>
<td>450</td>
</tr>
<tr>
<td>PRIVATE PROPERTY NON VEHICULAR</td>
<td>750</td>
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<tr>
<td>EXISTING DEVELOPMENTS</td>
<td>900</td>
</tr>
<tr>
<td>PRIVATE PROPERTY VEHICULAR</td>
<td>1200</td>
</tr>
<tr>
<td>FOOTPATHS, SEALED ROADS (NON ARTERIAL)</td>
<td>1200</td>
</tr>
<tr>
<td>UNSEALED ROADS</td>
<td>1200</td>
</tr>
<tr>
<td>ARTERIAL ROADS</td>
<td>1200</td>
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WHERE MINIMUM COVER CAN NOT BE ACHIEVED. PROVIDE ALTERNATIVE PROTECTION OF THE PIPELINE.

---

### SPRING LINE TRENCH CLEARANCE

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<thead>
<tr>
<th>NOMINAL DIAMETER DN</th>
<th>MINIMUM CLEARANCE &quot;LC&quot;</th>
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<tr>
<td>&lt;150</td>
<td>&lt;100</td>
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<tr>
<td>&gt;150-&lt;300</td>
<td>150</td>
</tr>
<tr>
<td>&gt;300-&lt;450</td>
<td>200</td>
</tr>
<tr>
<td>&gt;450-&lt;900</td>
<td>300</td>
</tr>
<tr>
<td>&gt;900-&lt;1500</td>
<td>350</td>
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</table>

TRENCH WIDTH TO BE SUFFICIENT TO SAFELY LAY PIPE AND COMPACT THE SIDE SUPPORT ZONE.

---

### GEOTEXTILE

(SEE NOTE 5)

---

### MARKING TAPE #

---

### NO VEHICULAR LOADING

INCLUDES LOCATIONS WHERE OCCASIONAL VEHICLE LOADING OCCURS E.G. RESERVES AND FOOTWAYS

---

### EMBEDMENT & TRENCHFILL

TYPICAL ARRANGEMENT

(ADAPTED FROM C.H.C.C., P.W.D. & W.S.A. DRAWINGS)

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**COFFS HARBOUR CITY COUNCIL**

**STANDARD DRAWING - SEWER WORKS**

**PROJECT PLANNING AND DESIGN**

**EMBEDMENT & TRENCHFILL**

**NOT TO SCALE**

**PLAN DATE: AUG. 2015**

**SHEET 2**
TRENCH DETAILS
CHCC STANDARD DRAWING OVERIDES - WSSA SEW-1202, SEW-1203, SEW-1204

TRENCH TYPE 1
RECOVERED TOPSOIL & SEED FOR GRASS
COMPACTED CLEAN INORGANIC BACKFILL
PRESTENCILLED & COLOUR CODED DETECTABLE TAPE
NON-COHESIVE GRADED GRANULAR MATERIAL **(MUST BE FOR FULL WIDTH AND FULL HEIGHT)

TRENCH TYPE 2
RECOVERED TOPSOIL & SEED FOR GRASS
COMPACTED CLEAN INORGANIC BACKFILL
PRESTENCILLED & COLOUR CODED DETECTABLE TAPE
NON-COHESIVE GRADED GRANULAR MATERIAL **(MUST BE FOR FULL WIDTH AND FULL HEIGHT)

TRENCH TYPE 2a
RECOVERED TOPSOIL & SEED FOR GRASS
COMPACTED CLEAN INORGANIC BACKFILL
PRESTENCILLED & COLOUR CODED DETECTABLE TAPE
NON-COHESIVE GRADED GRANULAR MATERIAL **(MUST BE FOR FULL WIDTH AND FULL HEIGHT)

TRENCH TYPE 3
RECOVERED TOPSOIL & SEED FOR GRASS
COMPACTED CLEAN INORGANIC BACKFILL
PRESTENCILLED & COLOUR CODED DETECTABLE TAPE
NON-COHESIVE GRADED GRANULAR MATERIAL **(MUST BE FOR FULL WIDTH AND FULL HEIGHT)

TRENCH TYPE 4
RECOVERED TOPSOIL & SEED FOR GRASS
COMPACTED CLEAN INORGANIC BACKFILL
PRESTENCILLED & COLOUR CODED DETECTABLE TAPE
NON-COHESIVE GRADED GRANULAR MATERIAL **(MUST BE FOR FULL WIDTH AND FULL HEIGHT)

NOTES
UNDERGROUND ELECTRIC CABLES SHOULD CROSS WATER MAINS AND SERVICES AT AN ANGLE OF NOT LESS THAN 45°, HAVE A VERTICAL SEPARATION OF MIN. 100mm AND BE SUITABLY MARKED WITH BRICKS OR WARNING TAPE WHICH ARE TO BE REPLACED IF DISTURBED. COUNTRY ENERGY REQUIRE A CERTIFIED OBSERVER ON SITE TO SUPERVISE ANY EXCAVATION NEAR EXISTING UNDERGROUND POWER. NOMINAL DEPTH OF COVER TO TOP OF CONDUIT OR CABLE FOR LOW VOLTAGE CABLES IS TO BE 600mm, FOR HIGH VOLTAGE CABLES TO 22kV IS TO BE 750mm AND FOR HIGH VOLTAGE CABLES TO 33kV AND ABOVE IS TO BE 900mm. UNDERGROUND ELECTRICITY CABLES IN ROAD RESERVES ARE TO BE SITUATED ON A FOOTPATH ALLOCATION OF BETWEEN 0.3m AND 0.9m FROM THE BOUNDARY.

CHCC STANDARD DRAWING OVERIDES - WSSA SEW-1202, SEW-1203, SEW-1204

NOT TO SCALE | PLAN DATE: AUG. 2015 | SHEET 3
CONCRETE BULKHEAD DETAIL

TRENCH STOP DETAIL

NOTES

1. TRENCH STOPS ARE TO BE PLACED ON GRADES 5% TO 14% AND TO BE INCORPORATED WITH CONCRETE BULKHEADS ON GRADES 15% TO 29%.
2. THE DISTANCE BETWEEN TRENCH STOPS SHOWN ON THE DESIGNS ARE MINIMUM DISTANCES. WHERE THE DISTANCE STATED IS GREATER THAN 1/2 THE DISTANCE BETWEEN FITTINGS/VALVES, A TRENCH STOP IS STILL TO BE PLACED ON THAT LINE.
COVER FRAME FIXED TO MH TOP FACE

FLOW

RISE RING

PROVIDE ROUNDED NOSING AT INLET AND OUTLET PIPE (SEE NOTE 6)

DN 1050 OR DN 1200 OR AS SPECIFIED

ø600 MIN.

MAINTENANCE HOLE TYPE C1

FOR MH =< 1200 DEEP

BOLTED RISER DETAIL

RECESS FILLED WITH MASTIC

4 x MASONRY ANCHOR OR ANGLE BRACKETS EQUALLY SPACED

PAIRS OF 4x12 BARS EQUALLY SPACED ON CENTRE LINE OF CONCRETE RING WITH 65 MIN COVER AND 500 MIN LAP

(SEE BOLTED RISER DETAILS SECTION A-A)

FLOW

PREFERRED LOCATION FOR LADDER OR STEP IRONS

FOR SEWERS =< DN 300

PREFERRED LADDER OR STEP IRON LOCATION

FLOW

FOR SEWERS > DN 300

MAINTENANCE HOLE TYPE C2

FOR MH > 1200 DEEP TO =< 6000 DEPTH

(SEE SEW - 1308)

PERMISSIBLE CONSTRUCTION JOINTS SCABBLE AND CLEAN THEN PRIME WITH CEMENT SLURRY BEFORE PLACING CONCRETE

CONCRETE MASTIC JOINTING

DOWEL PINS (WHERE SPECIFIED)

CONVERSION SLAB

FLOW

MAINTENANCE HOLE TYPE C1

FOR MH = 1200 DEEP

BOLTED RISER DETAIL

GATIC LID AND FRAME

GATIC LID AND SURROUND

THIS POSITION ALLOWS LADDER / STEP IRONS TO BE UTILISED MORE EASILY FOR MAINTENANCE PURPOSES (E.G TIE OFF & FLOW CONTROLS)

PREFERRED LOCATION FOR LADDER OR STEP IRONS

FLOW

FLOW

MAINTENANCE HOLE TYPE C2

FOR MH = 1200 DEEP TO 4900 DEPTH

(TOP SECTION MAY BE AS SHOWN OR STRAIGHT BACK TAPER)

GATIC LID AND SURROUND

CONCRETE MASTIC JOINTING

DOWEL PINS (WHERE SPECIFIED)

CONVERSION SLAB

FLOW

MAINTENANCE HOLES

SEWER =< DN300 CAST IN-SITU TYPES C1 & C2

(ADAPTED FROM C.H.C.C., P.W.D. & W.S.A. DRAWINGS)

NOT TO SCALE PLAN DATE: Aug. 2015 Sheet 6
PRE-CAST MAINTENANCE HOLES

CAST IN-SITU MAINTENANCE HOLES

SLOPING GROUND

NON TRAFFICABLE COVER

TRAFFICABLE COVER

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>FINISHED LEVELS OF MH COVERS</th>
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<tr>
<td>UNDEVELOPED AREAS</td>
<td>100</td>
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<tr>
<td>NEW SUBDIVISIONS</td>
<td>75</td>
</tr>
<tr>
<td>ROADS, LANE WAYS, FOOTWAYS &amp; DRIVEWAYS</td>
<td>FLUSH</td>
</tr>
<tr>
<td>EXISTING BUILT UP AREAS</td>
<td>25</td>
</tr>
<tr>
<td>OTHER AS SPECIFIED (EG ABOVE FLOOD LEVEL)</td>
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</table>

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>CLASS</th>
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<tbody>
<tr>
<td>RESERVES</td>
<td>B - NON-TRAFFICABLE</td>
</tr>
<tr>
<td>ROADWAYS</td>
<td>D - TRAFFICABLE</td>
</tr>
<tr>
<td>LOCATIONS SUBJECT TO FLOODING</td>
<td>D - TRAFFICABLE WITH BOLT-DOWN</td>
</tr>
<tr>
<td></td>
<td>(SEE NOTE 3)</td>
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NOTES:
1. ALL DIMENSIONS IN MILLIMETRES.
2. SEALING METHODS:
(a) MAKE JOINTS BETWEEN SHAFT TOP/MAKE-UP RING AND COVER SUPPORT RING USING
   BUTYL-MASTIC OR MORTAR MADE FROM 3 PARTS SAND TO 1 PART CEMENT.
(b) APPLY BUTYL-MASTIC IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION.
(c) THICKNESS OF CEMENT MORTAR AT ANY JOINT TO BE NO GREATER THAN 50.
(d) SCABBLE AND CLEAN JOINT SURFACES SO THAT ALL LOOSE OR SOFT MATERIAL IS REMOVED.
   (a) JOINT SURFACES TO BE BRUSHED CLEAN, SPONGED WET AND PRIMED WITH A CEMENT/WATER SLURRY PRIOR TO PLACING THE CEMENT MORTAR.
   (b) APPLY BUTYL-MASTIC IN ACCORDANCE WITH MANUFACTURERS SPECIFICATION.
   (c) THICKNESS OF CEMENT MORTAR AT ANY JOINT TO BE NO GREATER THAN 50.
3. IN AREAS SUBJECT TO SURCHARGE, USE CAST IN-SITU MH DOWEL OR BOLT COVER SLABS, D1 COVER AND FRAME TO THE SHAFT SECTION IN SUCH A MANNER THAT SEPARATION DURING SURCHARGE IS PREVENTED. SEE SEW-1301.
4. WHERE SPECIFIED JOIN METAL FRAME TO CAST IN-SITU MH RING AS FOLLOWS:
   (a) MAKE JOINTS BETWEEN SHAFT TOP AND METAL FRAME USING BUTYL-MASTIC AND LOCKING DOWN BOLTS, EQUALLY PLACED AROUND THE CIRCUMFERENCE.
   (b) USE 12 DIAMETER GALVANISED OR STAINLESS STEEL BOLTS EXTENDING 75 MM INTO CONCRETE.
   (c) FOR NON-TRAFFICABLE LOCATIONS USE A MINIMUM OF TWO BOLTS.  
   (d) FOR TRAFFICABLE LOCATIONS USE A MINIMUM OF FOUR BOLTS.
5. MAXIMUM PERMISSIBLE SLOPE OF COVERS:
   CLASS "B" 1 IN 4
   CLASS "C" 1 IN 10
6. COVERS AS AUTHORISED BY WATER AGENCY.
7. WHERE SPECIFIED USE GAS TIGHT COVERS.
TYPICAL MANHOLE CONNECTION - HDPE - HDPE

NOT TO SCALE

PLAN DATE: AUG. 2015
SHEET 8

CONCRETE ENCASEMENT
HDPE PIPE
ELECTROFUSION COUPLING
PUDDLE FLANGE CREATED BY HDPE STUB FLANGES BUTT WELDED BACK TO BACK

MANDOLY IN-SITU
PRECAST COMPONENT
MANHOLE
CONCRETE THRUST 650mm LONG KEYED IN 150mm MIN. ALL ROUND
MANHOLE BASE CAST IN-SITU
AQUATIC PUDDLE CLamped TEST STAINING FLANGE DN 190

TYPICAL LAYOUT OF CHANNELS

225mm
225mm
Fall
Fall
1in8
1in8
Fall 1 in 8
Fall 1 in 8

FALLS THROUGH MANHOLE FOR DEFLECTION ANGLES:
0° - 10° = 30mm FALL
10° - 60° = 50mm FALL
60° - 90° = 80mm FALL
NO DEFLECTION > 90°

NOTES:
1. CONSTRUCTION TO BE IN ACCORDANCE WITH AUSSPEC AND THE WSA 02 - 2002 SEWERAGE CODE OF AUSTRALIA.
2. APPLY AN EXTERNAL BITUMASTIC SEAL TAPE (BITUTHENE OR EQUIV.) 150mm WIDE OVER A COAT OF MANUFACTURERS RECOMMENDED PRIME SEAL TO ALL JOINTS.
3. FORM ROUNDED NOSSING ON INLET & OUTLET PIPES TO PREVENT DAMAGE TO JETTING EQUIPMENT, CCTV GUIDES & CABLES.
4. THE MAXIMUM SPACING BETWEEN MANHOLES IS 70m (AUSSPEC), UPSTREAM END OF MAINS TO TERMINATE IN A MAINTENANCE HOLE IF DISTANCE FROM DOWNSTREAM MANHOLE IS GREATER THAN 30m.
5. MAKE-UP RINGS - USE MIN. OF 1 MAKE-UP RING PREFERABLY 100mm TO 150mm (TO MAX. 350mm) PER SMH DURING CONSTRUCTION TO ALLOW FOR FUTURE SURFACE ADJUSTMENT WITHOUT AFFECTING THE SHAFT SECTIONS. FOR TAPERED MAKE-UP RING ON SLOPING GROUND SEE WSA DWG SEW-1308

CHANNEL SECTION

CROSS SECTION

MANHOLES CANNOT BE CONSTRUCTED IN THESE DROP RANGES
150Ø 150ø - 300ø
225Ø 300ø - 460ø
300Ø 300ø - 620ø
375Ø 400ø - 760ø
450Ø 450ø - 810ø
525Ø 400ø - 920ø
600Ø 400ø - 1000ø

POND FLANGE CREATED BY HDPE STUB FLANGES BUTT WELDED BACK TO BACK

NOTE: CONSTRUCTION TO BE IN ACCORDANCE WITH AUSSPEC AND THE WSA 02 - 2002 SEWERAGE CODE OF AUSTRALIA.

CONCRETE ENCASEMENT
MANHOLE BASE
CAST IN SITU
PRECAST COMPONENT
HDPE PIPE
ELECTROFUSION COUPLING
THRU CONNECTOR

HDPE PIPE
PRECAST COMPONENT
CONCRETE BULKHEAD

PIEPE

SIKAFLEX ADHESIVE

SIKAFLEX PROFILE

TO BE USED INSIDE FORMWORK WHERE SETUP TIME IS GREATER THAN 2 HOURS

SIKASWELL S-2

ONLY USE INSIDE FORMWORK WHERE SETUP TIME IS LESS THAN 2 HOURS

CONCRETE BULKHEAD DETAILS

THRU CONNECTOR

DI / MPVC

CORE WITH BULKHEAD

TYPICAL MANHOLE CONNECTION - DI / MPVC

SIKASWELL PROFILE AFFIXED WITH SIKA-FLEX ADHESIVE OR SIKASWELL S-2
(SIKASWELL S-2 APPLICATION CAN ONLY BE USED WHEN APPLIED WITHIN 2 HOURS OF CONCRETE POUR.)

SIKAFLEX PROFILE

TO BE USED INSIDE FORMWORK WHERE SETUP TIME IS GREATER THAN 2 HOURS

SIKASWELL S-2

CONCRETE ENCASEMENT
MANHOLE BASE
2 x RUBBER RING SPACER
CORE WITH BULKHEAD DETAILS

PRECAST COMPONENT
CONCRETE BULKHEAD

SIKAFLEX ADHESIVE

SIKASWELL S-2

SIKAFLEX ADHESIVE

SIKASWELL S-2

TO BE USED INSIDE FORMWORK WHERE SETUP TIME IS GREATER THAN 2 HOURS

NOT TO SCALE
PLAN DATE: AUG. 2015 SHEET 8

COFFS HARBOUR CITY COUNCIL
STANDARD DRAWING - SEWER WORKS

MAINTENANCE HOLES
CONNECTION DETAIL NON STANDARD
CHANNEL / BENCH DETAIL
(ADAPTED FROM C.H.C.C., P.W.D. & W.S.A. DRAWINGS)

NOT TO SCALE
PLAN DATE: AUG. 2015 SHEET 8

COFFS HARBOUR CITY COUNCIL
STANDARD DRAWING - SEWER WORKS

MAINTENANCE HOLES
CONNECTION DETAIL NON STANDARD
CHANNEL / BENCH DETAIL
(ADAPTED FROM C.H.C.C., P.W.D. & W.S.A. DRAWINGS)
SEWER CONNECTION DETAILS FOR PIPES
UNDER STRUCTURES & DEADEND LINES
180Ø PN16 HDPE TO 150Ø SN8 PVC ADAPTOR
NON STANDARD
COUNCIL APPROVED REQUIRED

PLAN DATE: AugL. 2015
SHEET 9

COFFS HARBOUR CITY COUNCIL
STANDARD DRAWING - SEWER WORKS
VENTILATION SYSTEMS
INDUCT VENT
180 HDPE TO 150 SN8 PVC ADAPTOR
(ADAPTED FROM C.H.C.C., P.W.D. & W.S.A. DRAWINGS)
NOT TO SCALE | PLAN DATE: AugL. 2015 | SHEET 9
**PRIVATE PUMP STATION CONNECTION TO SMH WITHIN PRIVATE PROPERTY**

- **Note:** Internal wall of sewer pipe to be lined with approved epoxy coating.

**PRIVATE PUMP STATION CONNECTION TO SMH IN PUBLIC RESERVE**

- **Note:** Internal wall of sewer pipe to be lined with approved epoxy coating.

**Private Pump Station SRM**

- Sized to manufacturers specifications.

**Humes Seal or Equivalent**

- 100ø x 50ø Pressure Pipe

**Private Pump Station SRM (Pressure Pipe)**

- Sized to manufacturers specifications.

**MIN 600 COVER**

- Humes Seal or Equivalent

**Property Boundary Riser**

- Core hole

**SRM Inlet 180° to Outlet**

- Typical pressure main discharge to manhole

(Not required when incoming sewer rising mains on falling grade)

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**PROJECT PLANNING AND DESIGN**

**MAINTENANCE HOLES**

**PRIVATE PUMP STATION DETAIL TO SMH & BOUNDARY SHAFT**

(Adapted from C.H.C.C., P.W.D. & W.S.A. Drawings)

**NOT TO SCALE**

**PLAN DATE: AUG. 2015**

**SHEET 10**

**COFFS HARBOUR CITY COUNCIL**

**STANDARD DRAWING - SEWER WORKS**
**Typical Scour Valve & Pumpout Pit Details**

**For Mains > 100 Dia.**

- **Concrete Manhole Base**
- **Concrete Level to be laid lower than external finish chamber or provide shear key, apply scabbled internal surface of manhole with internal floor min. 130mm thick bonding agent & pour concrete base if required.**

**Fl-Sp Pipe**

- **Gibault Scour Tee**
- **Cut to suit**

**FL-SP Pipe**

- **90mm x 90mm Tee**
- **Electrofusion bonded**

**Core Drill Manhole Chamber Section**

- **Suit Scour Pipe, install concrete bulkhead (see detail).**

**MPVC Spigot with RRJ Socket Facing Out**

- **MPVC Pipe**

**Sikaflex Adhesive**

- **Pipe**

**Sikaflex Profile**

- **To be used inside formwork where setup time is greater than 2 hours.**

**Sikaflex Profile**

- **To be used inside formwork where setup time is less than 2 hours.**

**Sikaflex S-2**

- **Only use inside formwork where setup time is less than 2 hours.**

**Sikaflex S-2 Application can only be used when applied within 2 hours of concrete pour.**

**Ext. Spindle, Marker Post**

- **Marking Post & Plate details**
- **Allow all pipe and fittings including FCP stop valves to be completely wrapped with Lilac or cream LPS (loose polyethylene sleeving).**

**NOTE:**

- All pipe and fittings including FCP stop valves to be completely wrapped with Lilac or cream LPS (loose polyethylene sleeving).

**MPVC Pipe**

- **Concrete bulkhead details**
- **Precast component**

- **4 x N12 Starter Bars Chemhet into concrete**

- **Concrete bulkhead to be used where depth from surface level to top of valve exceeds 380mm.**

- **20mmØ Solid MS Spindle shaft with C.I. Key**

- **Cap & std. C.I. Key max. 10mm below cover.**

- **24mmØ Slotted MS Spindle shaft with std. C.I. Key.**

- **Grub Screw or Bayonet Joint**

- **Flanged Stop Valve to be anchored as shown in detail.**

**NOTE:**

- Alternative to P45mm high patch with Min. 24mm letters can be attached to face of marker post instead of vinyl letters. All colours used to conform to AS 1345 for reclaimed water mains use Lilac powdercoated Dura-Post with white vinyl letters Min. 24mm high.

**Dura-Post**

- **Engraved Aluminium plate showing main size, depth and required information to front or rear of Dura-Post.**

- **Powdercoated Dura-Post driven into firm ground.**

- **Use mass concrete base if required for sewer rising mains.**

- **Use green powdercoated Dura-Post with white vinyl letters Min. 24mm high.**

- **Use Lilac powdercoated Dura-Post with white vinyl letters Min. 24mm high.**

**Rest of Document**

- **Project Planning and Design**

- **Coffs Harbour City Council**

- **Standard Drawing - Sewer Works**

- **Adapted from C.H.C.C., P.W.D. & W.S.A. Drawings.**

- **Plan Date: Aug. 2013**

- **Sheet 11**

- **Not to Scale**
SEWER GRAVITY MAIN DROP MANHOLE FOR 150Ø PVC - Min. REQUIREMENTS

Core drill manhole base and install HumeSeal or equiv. mechanical coupling

Guidelines for base cores (Humes Recommendations)
- HumeSeal core size DN 150 ~ 229mm
- HumeSeal core size DN 225 ~ 328mm
- HumeSeal core size DN 300 ~ 398mm

Min. distance between core holes ~ 75mm for DN150
Min. distance between core holes ~ 50mm for DN225
Min. distance between core holes ~ 50mm for DN300

NOTES:
1. No cores to be through joints or within 50mm of joints. Use extended manhole base heights as required.
2. If min. core separation distances used, extreme care needs to be taken not to overtighten HumeSeals as this could result in cracking of the base between cores.

1100 HDPE SP-SP (for butt or fusion weld)
1250 HDPE SPIGOT REDUCER (for butt or fusion weld)
375Ø DICL TO 500 OD HDPE CONNECTION DETAIL
375Ø DICL TO 450 OD HDPE CONNECTION DETAIL

375Ø DICL TO 125 OD HDPE CONNECTION DETAIL

TYPICAL 100Ø DICL TO 125 OD HDPE CONNECTION DETAIL
TYPICAL CONNECTION OF DICL PIPE TO MPVC DETAIL
**PROPERTY CONNECTION DETAIL**

**SHALLOW SEWER JUNCTION (< 1.2m)**

- Mark as "H" on W.A.E

**DEEP SEWER JUNCTION (> 1.2m)**

- Mark as "V" on W.A.E

**CIVIL CONTRACTOR - Aus-Spec**

- 1 x 150mm x 150mm PVC 45° Junction
- 1 x 150mm PVC 45° Bend
- 1 x 150mm x 150mm PVC 90° Junction
- 2 x 150mm PVC Threaded Couplings
- 2 x 150mm PVC Screw Caps

**PLUMBER - AS 3500**

- Shallow Sewer Junction (<1.2m)
  - 1 x 150mm Concrete Bolted Trap Screw

**Note:**

- No branch drain or future discharge pipe shall be connected to an inspection shaft where a junction is installed in a graded drain.

**Council’s Responsibility:**

- Council is responsible for all maintenance and repairs to the inspection shaft.

**For properties where there is only a 150mm screw cap connection point, the Plumber is to construct the inspection shaft in 150mm PVC as per Civil Contractor (Aus-Spec).**
5.6.5.2 Soffit requirement

The soffit requirement applies to all sewered lots and shall be 1.2 m.
With the approval of the Water Agency, the soffit requirements may be reduced to 0.9 m where:
(a) the number of lots connected upstream of the subject lot does not exceed 10 or the equivalent loading; or
(b) the grade of the sewer downstream of the property connection is steeper than 3%.

Where the minimum soffit requirement cannot be met for an existing lot, alternative means of safeguarding against overflow shall be determined, e.g. lifting system, installation of reflux valve. Such measures shall comply with AS/NZS 3500.2.

SOFFIT REQUIREMENT

The soffit requirement is the depth from the controlling surface level on the property (usually the overflow relief gully) to the soffit of the sewer connection point. The soffit requirement is based on providing assurance that a reticulation sewer, flowing at full capacity, will not surcharge via the customer sanitary drain.

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7.6.5.2 Permanent ends of pipe (CHCC)

Reticulation sewers that are not to be extended do not need to be terminated at a SMH if all the following requirements are met:

(a) If the length of sewer from the downstream maintenance structure is less than 30 m. then only a maximum of 2 lots can be connected to the sewer.

(b) If the length of sewer from the downstream maintenance structure is less than 20 m. then only a maximum of 4 lots can be connected to the sewer.

(c) The grade is 1 in 60 or steeper. (1.67%) (SMH required for grades below 1.67%)

(d) Minimum Soffit height is achieved (1.2m)

(e) 100% of the Lot is serviceable into the vertical riser

Reticulation sewers that comply with the above requirements may be terminated with a vertical boundary riser to FGL. (See Standard Drawing)

Note: Maintenance Chambers, Maintenance Shafts, Terminating Maintenance Shafts not approved for use by CHCC.
ANCHOR LEGS BOLTED TO LUGS THEN SET IN MIN. 300 TK CONCRETE KEYED INTO UNDISTURBED GROUND

CLOCKWISE CLOSING SO-SO STOP VALVE WITH ANCHOR LUGS SEWER
COUNTER CLOCKWISE CLOSING SO-SO STOP VALVE WITH ANCHOR LUGS WATER

**NOTE:** ALL PIPE AND FITTINGS PRECIOUS FOR STOP VALVES TO BE COMPLETELY WRAPPED WITH ULAC OR CREAM LPS (LOOSE POLYETHYLENE SLEEVING)

VALVE ANCHORAGE FOR ALL OTHER VALVES > 100mm MAINS
(VALVES > 375Ø ONLY AVAILABLE FLANGED)

DIMENSIONS FOR G, H, T & W DEPEND ON REQUIRED BEARING AREA. REFER TO SCHEDULE ON SHEET 8

VALVE ANCHORAGE FOR 100Ø AND 150Ø PIPES
SO - SO ANCHORED STOP VALVE
(TYCO CODE: VZ10ANCHORKIT OR APPROVED EQUIVALENT)

**NOTE:** STRIPED STOP VALVES NOT TO BE USED - ONLY EXCEPTION IS FOR TEMPORARY VALVE

VALVE ANCHORAGE FOR 100Ø AND 150Ø PIPES
NOT TO SCALE PLAN DATE: AUG. 2015 SHEET 17

COFFS HARBOUR CITY COUNCIL
STANDARD DRAWING - SEWER WORKS
**N16 STEEL DETAIL**

HORIZONTAL & VERTICAL N16 BARS @ 200 CENTRES
PUDDLE FLANGE CENTERED BETWEEN N16 FABRICATED SHEETS
THRUSt SIZE TO BE DETERMINED BY TEST PRESSURE & SOIL TYPE

**F82 STEEL DETAIL**

PUDDLE FLANGE CENTERED BETWEEN F82 MESH SHEETS
THRUSt SIZE TO BE DETERMINED BY TEST PRESSURE & SOIL TYPE

---

**THRUST CONNECTION STEEL REQUIREMENT**

**PIPEDØ > 300**

N16 @ 200 CTS EA. WAY BOTH
FACES 8 x N16 BARS @ Min. LENGTH = 2 x PIPE Ø TIED TO N16 BARS EA. FACE. (16 BARS TOTAL)

**PIPEDØ < 300**

F82 MESH BOTH FACES
8 x N12 BARS @ Min. LENGTH = 2 x PIPE Ø TIED TO F82 MESH EA. FACE. (16 BARS TOTAL)

---

**FRONT AND BACK FACE**

8 TRIMMER BARS EA. FACE (16 TOTAL)
F82 MESH OR N16 BARS (SEE NOTES 1 & 2)

---

**NOTE:** ALL PIPE AND FITTINGS INCLUDING FCP STOP VALVES TO BE COMPLETELY WRAPPED WITH (COLOUR SPECIFIED) LPS (LOOSE POLYETHYLENE SLEEVING)

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COFFS HARBOUR CITY COUNCIL
STANDARD DRAWING - WATER & SEWER WORKS

THRUSt CONNECTOR REO DETAIL

(ADAPTED FROM C.H.C.C., P.W.D. & W.S.A. DRAWINGS)

PLAN DATE: AUG. 2015
SHEET 18

NOT TO SCALE
TYPICAL CONCRETE THRUST BLOCKS FOR ADJACENT DUAL WATER MAINS

FIRST THRUST BLOCK

SECOND THRUST BLOCK

STARTER BARS

COMPRESSIBLE MEMBRANE BETWEEN TOP OF FIRST THRUST BLOCK AND BARREL OF PIPE.

CLEARANCE REFER DESIGN

250 Min

50 Min

FIRST THRUST BLOCK

SECOND THRUST BLOCK

STARTER BARS

COMPRESSIBLE MEMBRANE BETWEEN TOP OF FIRST THRUST BLOCK AND BARREL OF PIPE.

PLAN DATE: AUG. 2015

SHEET 19

NOT TO SCALE

COFFS HARBOUR CITY COUNCIL
STANDARD DRAWING - SEWER WORKS

MULTIPLE BEND
THRUST DETAIL

(ADAPTED FROM C.H.C.C., P.W.D. & W.S.A. DRAWINGS)
ANCHOR BLOCK CONSTRUCTION NOTES:
- Locate anchor block centrally around bend.
- Key anchor block into base of trench a min. depth of 250mm.
- Pour concrete against a solid excavated face.
- Use grade N20 concrete.
- Keep concrete clear of all bolts, nuts and pipe joints.

Dimensions for G & W depend on required bearing area. Refer to schedule on sheet 6.
### Table: Longsection Setout as per WSA 02 - 2002 AusSpec 2008 CHCC

<table>
<thead>
<tr>
<th>CH. FROM D/S MH</th>
<th>MANHOLE/END NAME</th>
<th>MANHOLE/END NAME</th>
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<tr>
<th>SURFACE TYPE</th>
<th>DIAMETER</th>
<th>GRADE</th>
<th>CLASS</th>
<th>MATERIAL</th>
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<tr>
<th>JUNCTION INVERT LEVEL</th>
<th>MIN/DESIGN/MAX ET's</th>
<th>DESIGN SURFACE LEVEL</th>
<th>RUNNING CHAINAGE</th>
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<th>DEPTH TO INVERT</th>
<th>RUNN Höhe</th>
<th>DESIGN INVERT LEVEL</th>
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### Notes:
- Gravity sewers are to be designed within the property boundary with a 1.2m setback from boundary.
- Council approval is required for gravity sewer mains in road reserve.
- Exemptions: sewers crossing roads at RP.
- Extensions of existing sewers where no alternative route is available.
- Retaining walls: sewers are to be designed in front of retaining walls.

---

### Explanatory Notes

**5.6 VERTICAL ALIGNMENT OF SEWERS**

- Vertical alignment is primarily determined by the topography and minimum pipe size and grades required to transport the design flows. Other critical factors that influence the final sewer size, level and grade include:
  - Adequate depth to sewer, entire individual lot-soffit requirement;
  - Adequate depth to sewer all lots within the catchment by gravity;
  - Adequate grade for self-cleansing;
  - Adequate grade for slime stripping when required;
  - Minimum depth requirements to ensure mechanical protection of the sewer and to avoid interference from underground services and future excavation work;
  - Achieving clearances between the sewer, utility services and obstructions; and
  - Allowance for various drops and losses through maintenance structures.

**5.6.2 Long section design plan**

The vertical alignment of sewers shall be shown as longitudinal sections in the Design Drawings.

The longitudinal section (or level schedule) shall nominate all relevant levels along the length of the proposed sewer at prescribed intervals specified by the Water Agency.

In addition, different levels shall also be provided for the following locations:
- At each side of any road and waterway crossing.
- At crossings of existing and proposed drains, cables and other pipes and services.
- At changes in grade including at maintenance structures and vertical bends.
- At regular intervals on vertical curves so that the sewer depth is within minimum and maximum limits below FSL.
AIR VALVES ARE TO BE DESIGNED ABOVE THE 1 IN 100 YEAR FLOOD HEIGHT IN TRAFFICABLE AREAS.

SET CHAMBER TO BE 300mm ABOVE NATURAL SURFACE.

BITUMEN/CONCRETE IN ROADWAY AND FOOTPATHS.

SET CHAMBER TO BE 300mm ABOVE NATURAL SURFACE.

HEAVY DUTY ALL LD BOLTS LOCKED TO PIT USING CUP HEAD SCREWS (MIN. 12 HOLE)
150 AIR RELEASE HOLES DRILLED AT 150 C.C.
ALTERNATE - CONC. SURFACE INLET FIT LD WELDED TO CONCRETE GUIDED INSERT.

VENTOMAT RGX 50mm FLANGED AV 80Ø/100Ø/100Ø PN16 HYDRANT CONTROL VALVE/AIR VALVE ISOLATOR (TYCO RED TOP CWC FOR BOTH WATER AND SEWER)

NOTES:
· HOLE DRILLED CENTRALLY.
· BOLT HOLES TO BE 18mmØ FOR BASE/FLANGE AND TO CONFORM TO AS4087

CONCRETE FILLED BESSER BLOCKS

ALTERNATE:
· CPR TAPED/FLANGED OR EQUIVALENT (NOM. 50mm BSP BALL VALVE)

AIR VALVES ARE TO BE DESIGNED ABOVE THE 1 IN 100 YEAR FLOOD HEIGHT
SET CHAMBER TO BE 300mm ABOVE NATURAL SURFACE.
SET CHAMBER TO BE 300mm ABOVE FINISHED SURFACE IN TRAFFICABLE AREAS.
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SET CHAMBER TO BE FLUSH WITH EXISTING BITUMEN/CONCRETE IN ROADWAY AND FOOTPATHS.

NOTES:
· ALL PIPE AND FITTINGS INCLUDING FCP STOP VALVES TO BE COMPLETELY WRAPPED WITH BLUE LPS (LOOSE POLYETHYLENE SLEEVING)
· ALL PIPE AND FITTINGS INCLUDING FCP STOP VALVES TO BE COMPLETELY WRAPPED WITH BLUE LPS (LOOSE POLYETHYLENE SLEEVING)
· AIR VALVES ARE TO BE DESIGNED ABOVE THE 1 IN 100 YEAR FLOOD HEIGHT
SET CHAMBER TO BE 300mm ABOVE NATURAL SURFACE.
SET CHAMBER TO BE 300mm ABOVE FINISHED SURFACE IN TRAFFICABLE AREAS.
SET CHAMBER TO BE FLUSH WITH EXISTING BITUMEN/CONCRETE IN ROADWAY AND FOOTPATHS.

CONCRETE FILLED BESSER BLOCKS

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CONCRETE FILLED BESSER BLOCKS

ALTERNATE
· CPR TAPED/FLANGED OR EQUIVALENT (NOM. 50mm BSP BALL VALVE)
FLANGED AIR VALVE ADAPTOR FOR 225Ø to 100Ø
STANDARD 100Ø PIPE FLANGE
TO CONFORM TO AS4087, AS2129
STANDARD 225Ø PIPE FLANGE
TO CONFORM TO AS4087, AS2129

PLAN - TOP FLANGE
SECTION
PLAN - BOTTOM FLANGE

NOTES:
· BOTTOM 225Ø FLANGE TO BE BLANK FLANGE WITH 100Ø INLET HOLE DRILLED CENTRALLY.
· BOLT HOLES TO BE 18mmØ FOR M16 BOLTS AND TO CONFORM TO AS4087

FLANGED AIR VALVE ADAPTOR 150Ø to 100Ø
STANDARD 100Ø PIPE FLANGE
TO CONFORM TO AS4087, AS2129
STANDARD 150Ø PIPE FLANGE
TO CONFORM TO AS4087, AS2129

PLAN - TOP FLANGE
SECTION
PLAN - BOTTOM FLANGE

NOTES:
· BOTTOM 150Ø FLANGE TO BE BLANK FLANGE WITH 100Ø INLET HOLE DRILLED CENTRALLY.
· BOLT HOLES TO BE 18mmØ FOR M16 BOLTS AND TO CONFORM TO AS4087
SHALLOW SEWER JUNCTION (< 1.2m)

GRADE

150øx150ø SQUARE JUNCTION

Max. 6m

SEWER MAIN

CONC. BEDDING Min. 150mm THICK ON UNDISTURBED GROUND

/ / / / / / / /
PROPERTY

0.6m-1.0m

BOUNDARY

Swimming Pool Back Wash

150øx100ø Taper

Min. 300mm GRANULAR MATERIAL

FINAL GROUND LEVEL

ELEVATION

AS3500 HOLDPOINT

AS3500 SEC. 4.4.3.1 (a) - No branch drain or fixture discharge pipe shall be connected to an inspection shaft where the shaft is constructed from a square junction installed in a graded drain

Private Pump Station 5RM
Sized to Manufacturers Specifications

Min. 150mm GRANULAR MATERIAL

Offset 150mm

100øx100ø 90ø Bend

100øx100ø 90ø Junction

50ø 45ø Bends

Private Pump Station SRM

Sized to Manufacturers Specifications

Min. 150mm GRANULAR MATERIAL

Offset 150mm

150mm Air Gap

0.6m-1.0m

SM8 150Ø INSPECTION SHAFT

Min. 300mm GRANULAR MATERIAL

150øx150ø SQUARE JUNCTION

150øx150ø 90ø Bend

150mm Air Gap

PRIVATE PUMP STATION

OFFSET 150MM

Min. 150mm GRANULAR MATERIAL

SIZED TO MANUFACTURER'S SPECIFICATIONS

ELEVATION

PRIVATE PUMP STATION

SHALLOW SEWER JUNCTION (< 1.2m)

NOTES:
All work to comply with AS3500
Required Documentation
Department of Fair Trading
Notice of Works
Certificates of Compliance (3 Copies)
Drainage diagram
Pump Station
Specifications

CONC. BEDDING Min.
150mm THICK ON
UNDISTURBED GROUND

AS3500 HOLDPOINT

PROJECT PLANNING AND DESIGN

COFFS HARBOUR CITY COUNCIL
STANDARD DRAWING - SEWER WORKS

PRIVATE PUMP STATION
CONNECTION TO BOUNDARY RISER

(ADAPTED FROM C.H.C.C., P.W.D. & W.S.A. DRAWINGS)

NOT TO SCALE | PLAN DATE: AUG. 2015 | SHEET 25
MINIMUM NO. OF BOLTS / PAIR OF STRAPS = 4. SELECTED NO. & SIZE OF BOLTS MUST SUIT SHEAR CAPACITY. **REF. AUSTRALIAN INSTITUTE OF STEEL CONSTRUCTION (AISC) 1ST EDITION

BEARING CAPACITIES:

NOTE *: ROCK IS DEFINED AS MATERIAL THAT CANNOT BE EXCAVATED WITH A SHovel ETC.

<table>
<thead>
<tr>
<th>SHEAR CAPACITY (KN)</th>
<th>BOLT TYPE</th>
<th>NOM. PIPE SIZE (DN)</th>
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<td>500</td>
<td>M20</td>
<td>80</td>
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<td>375</td>
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<tr>
<td>100</td>
<td>M2</td>
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THRUST BLOCKS SCHEDULE FOR 80m. HEAD IN SAND & GRAVEL BONDED WITH CLAY

SAFE BENDING PRESSURE AT MIN & MAX DEEP FOR HORIZONTAL AND VERTICAL THRUST BLOCKS, IN UNDISTURBED GROUND FOR 3% HEAD TIMES BY FACTOR OF SAFETY OF 1.5.

BEARING CAPACITIES:

LEGEND: (A) = MIN. O.D. (B) = WIDTH (H) = AREA (G) = DEPTH BELOW PIPE

SAND AND GRAVEL BONDED WITH CLAY = 100000KN/m²

ROCK = 4000KN/m²

NOTE *: ROCK IS DEFINED AS MATERIAL THAT CANNOT BE EXCAVATED WITH A SHovel ETC.

SAFE BENDING TIMES BY FACTOR OF SAFETY OF 1.5.

MINIMUM TRENCH WIDTHS

<table>
<thead>
<tr>
<th>NOM. PIPE SIZE (DN)</th>
<th>MIN. CLEAR WIDTH OF TRENCH INSIDE TIMBERSCREEN PLUG (A/F)</th>
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<tr>
<td>80</td>
<td>305</td>
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<tr>
<td>75</td>
<td>290</td>
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<tr>
<td>63</td>
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<td>32</td>
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THRUST BLOCKS SCHEDULE FOR 80m. HEAD IN SAND & GRAVEL BONDED WITH CLAY

THRUST BLOCKS SCHEDULE FOR 80m. HEAD IN SAND & GRAVEL BONDED WITH CLAY

MINIMUM COVER - SEWER PIPELINES

LOCATION | MIN. COVER (mm) |
----------|-----------------|
PRIVATE PROPERTY - NON VEHICULAR - NEW DEVELOPMENT | 800 |
PRIVATE PROPERTY - NON VEHICULAR - EXISTING DEVELOPMENT | 450 |
PRIVATE PROPERTY VEHICULAR | 750 |
FOOTPATHS, SEALED ROAD (NON-ARTERIAL) | 300 |
UNSEENED ROADS | 1200 |
ARTERIAL ROADS | 1200 |
1. At each collar, strap down pipe firmly to base steel cage to prevent floating.
2. Where abrasiflex or equivel is required at collars for continuous pours, ensure it fits snug around spigot end of pipe barrel.

**Temporary Plastic Cap**

**Concrete Cover**
- Min. 200mm, Max. 300mm
- Min. 100mm concrete.
- Min. 150mm TK.

**Concrete Block Pipe Support**
- Straight Y16 bars @ 200 cs. Min. 65mm to 75mm cover all round.

**Compacted Bedding and Subgrade**

**Detectable Tape**

**Concrete Pipe Encaissement Under Load**

**Option 1 - Fibrecrete on Concrete Base**

**Option 2 - Reinforced Concrete Cage**

**Concrete Encased Pipe Notes**
2. Minimum steel reinforcement of 3.4% of concrete cross section placed centrally and with minimum cover of 65mm to external face. Specify reinforcement for the applicable loading in design drawings.
3. Pipe drain where trenches require continuous drainage (min. DN 100 both sides) through bulkheads and in trench excavations across roads. Where reinforcing is used locate drain inside the reinforcing. Depth may need to be increased to compensate.

**Conduit with Pull Rope**
- As supplied by VINIDEX P/L or similar and joined by mechanical or fusion welded joints for future communications cable. Install pits similar to Telstra type at max. 300m spacings at suitable locations approved by Superintendence.

**Communications Pits are to firmly bedded and backfilled.**

**Marking Tape**
- Y16' U Bar @ 600 mm (Refer Schedule)

**Concrete Cover**
- Min. 200mm, Max. 300mm

**Concrete Slab**
- Continuous N25 concrete slab Min. 150mm TK.

**Concrete Pipe Encaissement Under Load**

**Option 1 - Fibrecrete on Concrete Base**

**Option 2 - Reinforced Concrete Cage**

**Concrete Encased Pipe Notes**
1. Reinforced concrete N25. For aggressive conditions use special grades of concrete.
2. Minimum steel reinforcement of 3.4% of concrete cross section placed centrally and with minimum cover of 65mm to external face. Specify reinforcement for the applicable loading in design drawings.
3. Pipe drain where trenches require continuous drainage (min. DN 100 both sides) through bulkheads and in trench excavations across roads. Where reinforcing is used locate drain inside the reinforcing. Depth may need to be increased to compensate.
**Typical HDPE to DICL Connection Details**

- **HDPE Pipe**
- **SS Backing Flange**
- **Alternate Coupling Using Maxi Stub Flanges**
- **DICL Water Main**
- **55mm Cu Cable**
- **Continuous Loop**
- **Electro Fusion Coupling (HDPE 400Ø OD or Less)**
- **Fusion Butt Weld (HDPE > 400Ø OD)**
- **SS Long Bolts**

**Detail 1**

- **1 Off Earth Clamp**
- **DICL Connector**
- **SEE SHEET 1 - ALTERNATIVE VALVE RESTRAINT DETAIL**

**Detail 2**

- **Copper Crimp Lug**
- **70mm² Cable Lug**
- **M10 Bolt Assembly**
- **Tinned Copper Busbar**
- **40x6mm TO SUIT**
- **Note: Ensure Epoxy Coating is Removed From Flange Before Connection**
- **Use Electrical Jointing Paste on Both Surfaces Before Tightening**

**Electrical Jointing Paste is a Unique Electrical Joining Compound, Formulated to Prevent Galvanic Corrosion and Enhance Connections in Electrical Join**

**In-Ground Earthing Ring**

- **Electro-Fusion Coupling (HDPE 400Ø OD or Less)**
- **Fusion Butt Weld (HDPE > 400Ø OD)**
- **SS Long Bolts**
- **Pl-R. Reducer**
- **DICL Water Main**

**Plan View**

- **Underground Warning Tape**
- **Ground Level**
- **Shower Head**

**Elevation View**

- **Copper Crimp Lug**
- **70mm² Cable Lug**
- **CABAC CAL70-10 or EQUIV**
- **M10 Bolt Assembly**
- **Copper Crimp Lug**
- **70mm² Cable Lug**

**Project Planning and Design**

- **Coffs Harbour City Council**
- **Standard Drawing - Sewer Works**

**In-Ground Earthing Ring**

(Adapted From C.H.C.C., P.W.D. & W.S.A. Drawings)
PIPEWORK IN THIS ZONE ('X' + 1200mm) TO BE TYTON EXTREME (FOR SEWER) OR D.I.C.L. (FOR WATER). PIPE TO EXTEND 600mm BEHIND BACK OF KERB.

PIPEWORK IN THIS ZONE (DEEPER THAN 'X' + 1200mm), D.I.C.L. RECOMMENDED BUT PVC SN8 FOR GRAVITY SEwers AND OPVC PN16 OR MPVC PN16 FOR PRESSURE MAINS WOULD BE ACCEPTABLE SUBJECT TO C.H.C.C. APPROVAL.

PVC COLLARS NOT TO BE USED ON D.I.C.L PIPE SPIGOTS.
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<th>225</th>
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<td>%</td>
<td>Minimum (k:mm)</td>
<td>Maximum (k:mm)</td>
<td>Minimum (k:mm)</td>
<td>Maximum (k:mm)</td>
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CONCRETE MARKER POST
- Used for identification of valves and hydrants
- Heavy duty, solid concrete
- Size 100m square x 1600mm long
  4 x 12mm @ 800mm centres
- 40MPA concrete

CONCRETE MARKER POSTS
- Used for identification of valves and hydrants
- Heavy duty, solid concrete
- Size 100mm square x 1600mm long
  2 x 12mm @ 800mm centres
- 40MPA concrete

BASE SLAB FOOTING: FOR RETAINING WALL. ADD CONCRETE WITH F12 MESH T & B WITH MIN. 30mm COVER, Y2 BARS @ 200 c-c EW

PIECE MARKER POSTS & PLATES INDICATING SIZE, DEPTH & ALIGNMENT AT VALVES & CHANGES IN ALIGNMENT TO DESIGN & LOCATIONS OF NEW SERVICES

PIECE MARKER POSTS & PLATES INDICATING SIZE, DEPTH & ALIGNMENT AT VALVES & CHANGES IN ALIGNMENT TO DESIGN & LOCATIONS OF NEW SERVICES

GENERAL CONSTRUCTION NOTES
(TO BE READ IN CONJUNCTION WITH THE PART V ENVIRONMENTAL ASSESSMENT)

1. Construction to be in accordance with water services association (WSA 03-2002) water supply code of Australia.
2. Backfill trench to achieve min. 0.45m cover over pipe in path & 0.6m in road.
3. Trenches greater than 1.2m deep to be benched & use trench shield for road crossings >1.2m deep.
4. Sawed trenches at road crossings & backfill using 1:1 sand/soil mix as shown in trench details on details sheet.
5. Carry out sediment and erosion control measures in accordance with Landcom's 'Soil and Construction - Managing Urban Stormwater Guidelines (Blue Book)' in accordance with the conditions of the part V environmental assessment.
6. Exercise caution when excavating across telestra & electrical underground cables.
7. Locate sewer services & mains crossing new main prior to construction.
8. Locate & renew existing water services affected by new mains & replace gms pipes with copper.
9. Set valve cover boxes & surrounds to suit level of existing or proposed surface level & paint the appropriate colour on sewer pipeline.
10. Renew existing stormwater outlets affected by work.
11. All access points to be made as per A.S. 4087-1996 Class 16 (Fig. No. B5) for ductile iron pipes.
12. All bolts used underground on fitting to be protected with an anti-corrosive putty & tape (i.e. perno) unless 316ss is used & nuts & bolts to be coated with molybond.
13. All stop valves are to be strapped & anchored (see details sheet).
14. Evenly trim all footpaths affected by construction, then topsoil & lay turf to min. 1.2m wide.
15. Place marker posts & plates indicating size, depth & alignment of valves & changes in size & direction & 200m intervals on straight reaches & pipe ends on pipelines.
16. Place marker plates indicating depth & size on kerb face where mains cross road.
17. Water supply operator for the area to be contacted min. 7 days in advance to arrange watermain locations, any shutdowns or notifications.
18. Lay cream colour detectable tape over new sewer rising main min. 150mm above top of pipe.
19. D.I.C.L. pipelines to be wrapped in appropriately coloured polyethylene sleeving to protect against corrosion.
20. Lay all new pipeline above existing service pipes or main to a min. 150mm above top of pipe.
21. Renew existing stormwater outlets affected by work.
22. Place clear marker plates indicating depth & size of new service or mains across road.
23. Acid Sulphate Soils have been identified in this area & will require treatment to EPA conditions of the part V environmental assessment.
24. Exercise caution when excavating across electrical & underground cables.
25. Renew existing stormwater outlets affected by work.
26. Lay all new pipeline above existing service pipes or main to a min. 150mm above top of pipe.
27. Place clear marker plates indicating depth & size of new service or mains across road.
28. Acid Sulphate Soils have been identified in this area & will require treatment to EPA conditions of the part V environmental assessment.
29. Renew existing stormwater outlets affected by work.
30. Lay all new pipeline above existing service pipes or main to a min. 150mm above top of pipe.
31. Place clear marker plates indicating depth & size of new service or mains across road.
32. Acid Sulphate Soils have been identified in this area & will require treatment to EPA conditions of the part V environmental assessment.
33. Renew existing stormwater outlets affected by work.
34. Lay all new pipeline above existing service pipes or main to a min. 150mm above top of pipe.
35. Place clear marker plates indicating depth & size of new service or mains across road.
36. Acid Sulphate Soils have been identified in this area & will require treatment to EPA conditions of the part V environmental assessment.
37. Renew existing stormwater outlets affected by work.
38. Lay all new pipeline above existing service pipes or main to a min. 150mm above top of pipe.
39. Place clear marker plates indicating depth & size of new service or mains across road.
40. Acid Sulphate Soils have been identified in this area & will require treatment to EPA conditions of the part V environmental assessment.
41. Renew existing stormwater outlets affected by work.
42. Lay all new pipeline above existing service pipes or main to a min. 150mm above top of pipe.
43. Place clear marker plates indicating depth & size of new service or mains across road.
44. Acid Sulphate Soils have been identified in this area & will require treatment to EPA conditions of the part V environmental assessment.
45. Renew existing stormwater outlets affected by work.
46. Lay all new pipeline above existing service pipes or main to a min. 150mm above top of pipe.
47. Place clear marker plates indicating depth & size of new service or mains across road.
48. Acid Sulphate Soils have been identified in this area & will require treatment to EPA conditions of the part V environmental assessment.
49. Renew existing stormwater outlets affected by work.
50. Lay all new pipeline above existing service pipes or main to a min. 150mm above top of pipe.
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