SA WATER STANDARD DRAWINGS
WATER SUPPLY CONSTRUCTION MANUAL
SLEEVING OF DICL PIPE FITTINGS

1. SLEEVING OF DICL PIPE

1.1 Pull the sleeving onto the pipe:
- Cut sleeving long enough to cover the pipe and overlap the socket end approx. 300 mm.
- Centralize the sleeve until the pipe is balanced.
- Pull the sleeving towards the sleeve.

1.2 Fit the sleeving onto the pipe:
- Fold the sleeving at top of the pipe, pulling tightly.
- Sleeving to be close to the witness marks but ensure marks are exposed.

1.3 Continue to secure the sleeving:
- Lower the pipe onto sandbags and remove sleeve.
- Pull the sleeve along the pipe.
- Tape the sleeve at regular 1 m intervals.
- Extra sleeve to be bunched at socket end.

2. SLEEVING OF DICL PIPE FITTINGS

2.1 Placement of pipe & completion of sleeving:
- Ensure a suitable depression has been made in the bedding where the joint will be located.
- Lift the pipe from the centre with a sling.
- Keep the fold of the sleeve at the top of the pipe.
- Overlap the sleeve over the joint and secure with the strap and buckle.

3. FLANGES

3.1 Flanges (Require sleeving plus polyethylene protection)
- Galvanized spacer plate required only with raised face Dicl flanges.
- Double thickness of sleeving secured with straps or tape to sleeve underneath on Dicl fitting pipe.
- Flange on PE fitting.
- Flanged joints, bolt heads, and nuts shall be protected with polyethylene primer, moulid plastic and tape as per TS 20.

4. TAPPING SADDLES

4.1 Remove a 150 mm section of sleeving at the tapping position.
4.2 Assemble the tapping saddle onto the pipe.
4.3 Using a separate piece of sleeving, wrap it circumferentially around the exposed pipe section and tapping saddle. Tape the ends of the sleeving.
4.4 Install the nipple to the tapping saddle as required.
4.5 Repair any damaged sleeving in the following manner:
- For holes smaller than tape width, use adhesive tape.
- For larger holes, either overlap with polyethylene sheet with strap and buckle or adhesive tape which shall be around full circumference of pipe.

NOTES:
1. Refer 4005-30002-01 & 4005-30002-02 for general notes.
2. For pipe mains:
- All fittings which are to be buried shall be protected by:
  - Polymer sleeving provided if fitting is associated with an anchor block.
  - Tape extra sleeving on fittings where anchor block will contact fitting.
- Polyethylene tape system in accordance with TS 18.
- PE fittings - only flanges need corrosion protection.
3. Where the restrained joint system is used the specially marked "restrained joint system" marking tape shall be used.

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TYPICAL DEFLECTION AT PIPE TO FITTING JOINTS

TYPICAL DEFLECTION AT PIPE TO PIPE JOINTS
NOTE: PIPE IS TO BE DEFLECTED ONLY AFTER JOINT HAS BEEN MADE.

NOTES:
1. REFER 4005-300002-01 & 4005-300002-02 FOR GENERAL NOTES.
2. PERMISSIBLE MAXIMUM ALLOWABLE DEFLECTIONS FOR BOTH THE PIPE SOCKET & THE FITTING SOCKET VARY DEPENDENT UPON PIPE MATERIAL, PIPE SIZE & PIPE MANUFACTURER.
3. WHERE A DESIGN IS BASED UPON A REQUIREMENT FOR DEFLECTED PIPES, THE DESIGNER SHALL SPECIFY THE REQUIRED DEFLECTION ON THE DESIGN DRAWINGS.
4. PIPES SHALL BE HANDLED AND INSTALLED IN ACCORDANCE WITH SA WATER'S CONSTRUCTION DOCUMENTATION & THE PIPE MANUFACTURER'S INSTRUCTIONS.
5. WHERE REQUIRED, PIPES CAN BE CUT TO LENGTH ON SITE USING EITHER A HAND SAWS OR POWERED CUTTING DISC.
6. REFER MANUFACTURERS INSTRUCTIONS FOR REQUIREMENTS FOR CHAMFERING THE CUT PIPE CHAMFER.
7. REFER MANUFACTURERS INSTRUCTIONS FOR DETAILS ON APPLICATION OF PIPE LUBRICANT, INSERTION OF CUT SLEEVE, THRUSTING OF PIPE TO WITNESS MARK.
9. WHERE INSERTING PIPE INTO DUCTILE IRON FITTINGS ENSURE THE APPROPRIATE WITNESS MARK IS USED TO SUIT THESE PARTICULAR SOCKETS.
10. PIPES SHALL NOT BE CUT WITHIN 1.0 m OF THE SOCKET END OF THE PIPE. THUS, THE MINIMUM PERMISSIBLE LENGTH OF PIPE SHALL BE 1.0 m.
NOTES:
1. REFER 4005-30002-01 TO 4005-30002-04 FOR GENERAL NOTES.
2. REFER 4005-30002-02, TABLE 1 FOR MINIMUM CUT PIPE LENGTH BETWEEN FITTINGS.
3. A VALVE OFFSET FROM A BRANCH IS ONLY AN OPTION FOR DN 100 AND DN 150 MAINS (DETAIL 3). FOR THIS CONFIGURATION A HYDRANT IS REQUIRED BOTH SIDES OF THE VALVE.
4. ALL OTHER DIAMETERS < DN 150 REQUIRE THE VALVE ADJACENT THE TEE.
5. WHERE MULTIPLE VALVES AND HYDRANTS ARE REQUIRED THE DESIGNER SHOULD CONSIDER CLEARANCE BETWEEN COVERS AS PART OF THE OVERALL DESIGN.
6. MAX. 3000 LIMITATION BETWEEN VALVE AND HYDRANT REQUIRED FOR DISINFECTION PURPOSES.
7. REFER SECTION 3 FOR THRUST AND HYDRANT BLOCKS SEE DETAIL.
8. FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH 4005-30005-10 & 4005-30005-11.
9. WHERE IN LINE THRUST RESTRANIST IS REQUIRED REFER 4005-30005-18 FOR OPTIONS.
10. REFER 4005-30000-01 FOR STREET BOX COVER INSTALLATION.
11. FLANGED FITTINGS MAY BE USED BETWEEN AN ISOLATION VALVE AND A FLANGED HYDRANT TEE IN LIEU OF THE ADDITIONAL THRUST BLOCK.
12. ALL DIMENSIONS IN MILLIMETRES.
**EXISTING PIPES PRIOR TO NEW BRANCH MAIN**

- Existing DCL Main
- Old Socket Location
- Existing Pipe Cut MIN 1500
- Refer Note 2
- New Pipe MIN 1500

**NEW BRANCH CUT INTO EXISTING MAIN AT SOCKET END OF PIPE**

- Branch Main
- Isolating Valve, FL – FL

**NEW BRANCH CUT INTO EXISTING MAIN AT SPIGOT END OF PIPE**

- Branch Main
- Refer Note 3

**NOTES:**

1. Refer 4005-30002-01 & 4005-30002-02 for general notes.
2. Prior to the cutting of new section of pipe, the new pipe OD shall be checked to confirm OD is within tolerance and the pipe is suitable for installation. Refer Table 1. Pipe with a larger OD may be chamfered to achieve required OD. Pipe with a smaller OD shall be rejected.
3. If new branch main is restrained joint DCL, refer 4005-30005-04.
4. If new branch main is PVC or non-restrained joint DCL, refer 4005-30005-03.
5. Where the existing main cannot be shut down to achieve the cut in, an under pressure tapping shall be performed. Refer 4005-30005-06.
6. Work shall only be undertaken under the direction of a person who has completed an approved ductile iron pipe installation training course.
7. Refer 4005-30003-09 for restrained joint requirements in lieu of thrust anchor blocks.
8. Where the restrained jointing system is used, marking tape showing ‘restrained joint system’ shall be used.
9. All dimensions in millimetres.

<table>
<thead>
<tr>
<th>PIPE DN</th>
<th>PIPE OD</th>
<th>TOLERANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>122</td>
<td>±1 mm TO - 2 mm</td>
</tr>
<tr>
<td>150</td>
<td>177</td>
<td>±1 mm TO - 2 mm</td>
</tr>
<tr>
<td>200</td>
<td>232</td>
<td>±1 mm TO - 2 mm</td>
</tr>
<tr>
<td>250</td>
<td>286</td>
<td>±1 mm TO - 2 mm</td>
</tr>
<tr>
<td>300</td>
<td>345</td>
<td>±1 mm TO - 2 mm</td>
</tr>
<tr>
<td>375</td>
<td>425</td>
<td>±/- 2 mm</td>
</tr>
</tbody>
</table>

**SA WATER STANDARD DRAWINGS**

**WATER SUPPLY CONSTRUCTION MANUAL**

**EXISTING RESTRANDED JOINT DCL MAIN**

**NEW BRANCH MAIN**

**RESTRAINED OR NON RESTRAINED**

**DRAWING NUMBER:** 4005-30005-05

**SUPERSEDES:** 91-0059-04 (C9)
**METHOD 1:** CUT OUT WITH FLANGED TEE AND CONNECTORS EACH SIDE

**METHOD 2:** UNDER PRESSURE TAPPING (USING STAINLESS STEEL FLANGED OFFTAKE)

**METHOD 3:** CUT OUT WITH MULTIFIT MECHANICAL COUPLINGS

**NOTE:**
- This method shall only be approved for AC pipe where the pipe end should not be chamfered.

**NOTE:**
- Max diameter of drilled hole to be 70% of host pipe OD.
- Refer 4005-30005-03 for options for location of hydrant after valve.

**TABLE 1**

<table>
<thead>
<tr>
<th>PIPE</th>
<th>DIMENSION 'A'</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC, AC OR CI CL</td>
<td>1000</td>
</tr>
<tr>
<td>DCL</td>
<td>Refer 4005-40, TABLE 1</td>
</tr>
</tbody>
</table>

**NOTES:**

1. Refer 4005-30002-01 to 4005-30002-02 for general notes.
2. If existing man is restrained joint DCL, the restrained system shall be continued for cut-in into restrained joint mains. Refer 4005-30005-05.
3. For Method 2 if the branch offtake is to be undertaken as a live connection (under pressure tapping), the work shall only be undertaken by an authorised contractor. Refer TS O5619, 9.3 for contractors approved to perform this work.
4. For Method 2, location of thrust block shall be either Option 1 or Option 2.
5. Prior to confirmation of the connecting method, the contractor shall confirm:
   - The existing main pipe material.
   - Proximity of existing pipe socket.
   - Availability of fittings and/or couplings.
6. If branch main is PVC or non-restrained joint DCL, an in-line thrust block is required.
7. Refer 4005-30005-08 for in-line thrust protection options and associated dimensions.
8. If branch main is restrained joint DCL, and the new main is restrained joint DCL, an anchor block may not be required, subject to confirmation of the proximity of the nearest socket.
9. If socket location cannot be confirmed, a thrust block shall be constructed. Refer 4005-30003-09 for restrained joint requirements in lieu of thrust/anchor blocks.
10. Refer Section 3 for thrust block designation.
11. All dimensions in millimetres.
1. All branch sizes except DN150

2. DN150 branch only

**MSCL Fabrication/Installation Requirements:**

1. All welding shall be in accordance with AS 4081. Class 2P.
2. Flanges shall be in accordance with AS 4081. Dimensions for Steel class 16, flat faced.
3. Clean existing pipe coating for full pipe circumference for 100 mm surrounding of take location.
4. Clean entire length of branch of take.
5. All welding slag shall be removed.
6. For buried applications:
   - Off take shall be protected with bitumen mastic tape system in accordance with TS 18.
   - Additional bitumen mastic tape system shall be extended around full pipe circumference, adjacent to off take, and onto the existing coating, in accordance with TS 18.

**Notes:**

1. Refer 4005-30002-01 & 4005-30002-02 for general notes.
2. A branch shall not be installed within min 100 mm of the socket end of a DN100 pipe.
3. MSCL flanged offtakes, DN150 & DN150, shall be an under pressure tapping and shall be undertaken by an authorised contractor. Refer authorised products for water systems for contractors approved to perform this work.
4. Thrust / anchor blocks are not required.
5. The consultant shall determine the reinforcing plate size. Confirmation of pipeline pressures shall be sought from the SA Water representative to assist with the calculation.
6. All below ground flanges, fire hydrants, isolating valves and tapers shall be protected with petroleum tape system or bitumen mastic tape system in accordance with TS 18.
7. Standard insulated flanged joint shall be installed where indicated. Refer 04-0408-01 for details.
8. Refer section 5 for details on pipe construction for the branch main.
9. Refer section 3 for thrust protection for the branch main.

SA WATER STANDARD DRAWINGS
WATER SUPPLY CONSTRUCTION MANUAL
LAYING DETAILS FOR BRANCHES OFF EXISTING MSCL MAIN
CONSIDERATIONS FOR DOGLEG DESIGN:

- LENGTH AND DEPTH: THE PRIMARY CONSIDERATION FOR ANY DOGLEG SHALL BE THE MINIMUMATION OF LENGTH & DEPTH.
- POSITIONING OF BRANCH MAINS & FITTINGS: THE LOWER SECTION OF THE DOGLEG SHALL BE A CONTINUOUS ITEM. THE POSITIONING OF BRANCHES, VALVES AND PROPERTY CONNECTIONS IS NOT PERMITTED. APPROVAL SHALL BE OBTAINED FROM THE SA WATER REPRESENTATIVE FOR DEVIATION FROM THIS REQUIREMENT.
- VERTICAL CLEARANCE TO OBSTRUCTION REFER WSA09 2011 TABLE 5.5 FOR MINIMUM CLEARANCE REQUIREMENTS.
- THE USE OF A SMALL DOGLEG RATHER THAN VERTICAL DEFLATION OF PIPES IS NOT A GIVEN. SA WATER HAS THE AUTHORITY TO NOT APPROVE THE USE OF A DOGLEG IN SUCH INSTANCES. FOR MINOR VERTICAL CHANGES CONFIRMATION OF REQUIREMENTS SHALL BE OBTAINED FROM THE SA WATER REPRESENTATIVE.

STANDARD / NON STANDARD DOGLEG:

- A DOGLEG IS CONSIDERED STANDARD IF IT IS IN ACCORDANCE WITH THIS DRAWING. REQUIREMENTS ARE:
  - THE LOWER LENGTH BEING A MAXIMUM 500.
  - THE VERTICAL CHANGE BEING EITHER 500 OR 1000. THE PREFERRED VERTICAL CHANGE (DIMENSION ‘A’) IS 500. THE 1000 OPTION MAY BE UTILISED WHERE THE OBSTRUCTION SIZE OR TYPE JUSTIFIES ITS USE, AND,
  - THERE IS ONLY ONE OBSTRUCTION.
- A DOGLEG IS CONSIDERED NON STANDARD IF IT:
  - INVOLVES MULTIPLE OBSTRUCTIONS,
  - IS UNSUALLY DEEP, OR IS EXCESSIVELY LONG.
- IS OVER THE TOP OF AN OBSTRUCTION. THIS REQUIRES APPROVAL BY THE SA WATER REPRESENTATIVE.
  FOR THIS OPTION, AN AUTHORISED AIR RELEASE MECHANISM SHALL BE INSTALLED. THE VALVE FLANGE & BOLTS SHALL BE WRAPPED IN ACCORDANCE WITH TS 18.

DESIGN DRAWINGS:

- ‘NON STANDARD’ DOGLEG SHALL BE DETAILED ON THE DESIGN DRAWINGS. SUFFICIENT DETAIL SHALL BE PROVIDED TO ALLOW PROPER ASSESSMENT. THIS REQUIRES THE INCLUSION OF A SECTION AND/OR ENLARGEMENT ON THE DESIGN DRAWING. ALL OBSTRUCTIONS SHALL BE LABELLED, EG 375 SWD, TOGETHER WITH THE WATER MAIN CHANGES, THE DESIGNED CLEARANCE BETWEEN THE WATER MAIN AND THE OBSTRUCTION. INDICATIVE DIMENSIONS ARE UNACCEPTABLE.
- WHERE A DOGLEG IS IN ACCORDANCE WITH THIS DRAWING (WITH STANDARD CLEARANCES), A NOTE PLACED ON THE DESIGN DRAWING IS SUITABLE. THE NOTE SHALL IDENTIFY THE CHANGING FOR THE DOGLEG TOGETHER WITH THE TYPE OF CONFLICTING SERVICE, AND THE DESIGNED CLEARANCE.

SA WATER STANDARD DRAWINGS
WATER SUPPLY CONSTRUCTION MANUAL
DOGLEG CONSIDERATIONS
& STANDARD PE DOGLEG

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PRE-TAPPED CONNECTOR

BEND REDUCER 90° WITH HEEL 100 S/D ≥ 80 FL

DN100 MAIN

CONCRETE THRUST BLOCK

PRE-TAPPED CONNECTOR

BEND REDUCER 90° WITH HEEL 150 S/D ≥ 150 FL

DN150 MAIN

REDUCER DN150 - DN90

PREF MADE 30005 - 11

DN200 TO DN375 MAINS USING CAP

PERMANENT END FIRE HYDRANTS
USED WHERE NO FUTURE EXTENSION IS REQUIRED
(DEAD END STREETS ETC.).

FLANGE EXTENSION PIECE (IF REQUIRED)

HYDRANT TEE DN90 FLANGE BRANCH

FIRE HYDRANT / FIREPLUG

INTERMEDIATE FIRE HYDRANT
DN100 TO DN375 MAINS

NOTES:
1. REFER 4005-30002-01 TO 4005-30002-04 FOR GENERAL NOTES.
3. BELOW GROUND FIRE HYDRANT SHALL BE PROTECTED WITH PETROLATUM TAPE SYSTEM OR BITUMEN HASTIC TAPE SYSTEM IN ACCORDANCE WITH TS 18.
4. REFER 4005-30003-01 FOR FOR THRUST BLOCK DETAILS.
5. REFER 4005-30007-01 FOR CAST IRON STREET BOX INSTALLATION & FINISHED HEIGHT OF HYDRANT.
6. REFER 4005-20002-02, TABLE 1 FOR MINIMUM PIPE LENGTH, MAX 1000.
7. REFER 4005-30007-03 FOR PLACEMENT OF BRM'S.
8. REFER 4005-30007-04 FOR MARKER POST DETAILS.
9. PERMANENT END FIRE HYDRANTS SHALL BE NO GREATER THAN 1000 FROM THE LAST WATER CONNECTION TO MINIMIZE DEAD END WATER.
ALL DIMENSIONS IN MILLIMETRES.
WATER CONNECTION
SELF TAPPING SADDLE OPTION

WATER CONNECTION
MECHANICAL COUPLING OPTION

NOTES:
1. REFER 4005-30005-01 AND 4005-30005-02 FOR GENERAL NOTES.
2. MAXIMUM DISTANCE BETWEEN ANY ALLOTMENT AND NEAREST FIRE HYDRANT SHALL BE 80 METRES.
3. MAXIMUM LENGTH OF OD25 TUBING IS 25 METRES.
4. MAXIMUM NUMBER OF WATER CONNECTIONS FROM A OD63 PE MAIN IS 10.
5. REFER SECTION 3 FOR COMPACTED PIPE BEDDING AND BACKFILL.
6. REFER 4005-30006-01 FOR WATER CONNECTIONS TYPICAL LAYOUT.
7. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.

SA WATER STANDARD DRAWINGS
WATER SUPPLY CONSTRUCTION MANUAL
OD63 POLYETHYLENE (PE) MAIN BRANCH CONNECTION DETAILS

REV. DATE ORN. DETAILS APP. CURRENT REV. AUTH. SIGNATURE
1 31/03/16 MS 2816 STANDARDS REVIEW TG

DESIGN PANEL
DESIGNED: RQ 28/04/15 AUTHOURSED: T. GADEK

DRAWN: MS 28/06/16 SIGNATURE: 28/06/16

REVIEWED: TG 28/06/16

TOTAL SHEETS: A3 1
SUPERSEDES: C16, C16
DRAWING NUMBER: 4005-30005-14

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GENERAL NOTES:

1. TWO METHODOLOGIES ARE APPROVED FOR DRILLING CONSTRUCTION OF PE PRESSURE PIPE BENEATH ROADS OR WATERCOURSES:
   a. HORIZONTAL DIRECTIONAL DRILLING (HDD)
   b. MICROTUNNELING/PIPE JACING.
   The use of an alternative method or where the standard methodology is proposed to be modified shall be confirmed in writing with the SA WATER REPRESENTATIVE.

2. THE REQUIREMENT FOR A DESIGN DRAWING IS DEFINED HEREIN. FOR SIMPLE PROJECTS THIS MAY BE PLAN VIEW ONLY WITH COORDINATES FOR START/ENDING/CHANGE OF ALIGNMENT LOCATIONS.
   THE REQUIREMENT FOR DETAILED DESIGN DRAWINGS SPECIFIC TO THE DRILL/BORE SHALL BE:
   a. LENGTH > 25 METRES - GENERALLY NOT REQUIRED. FOR CRITICAL LOCATIONS A DETAIL SHALL BE INCLUDED.
   b. LENGTH 25 TO 100 METRES - REQUIREMENTS TO BE CONFIRMED WITH THE SA WATER REPRESENTATIVE. A DESIGN SHALL BE REQUIRED WHERE MULTIPLE HORIZONTAL ALIGNMENT CHANGES ARE PROPOSED.
   c. LENGTH > 100 METRES - DETAILED DESIGN DRAWINGS REQUIRED.
   d. DETAILED DESIGN DRAWINGS SHALL BE IN ACCORDANCE WITH NOTE 6.

3. CONSTRUCTION MANAGEMENT SHALL BE:
   a. IN ACCORDANCE WITH PLANS AND RISK IDENTIFICATION PROVIDED TO SA WATER UNDER THE CMS.
   b. IN ACCORDANCE WITH ANY THIRD PARTY (E.G. AUTHORITY) REQUIREMENTS. REFER NOTE 9.
   c. INCLUSIVE OF ANY IDENTIFIED RISKS ASSOCIATED WITH THE PROJECT.

4. A GEOTECHNICAL REPORT SHALL BE PROVIDED FOR:
   a. CONSTRUCTION WITHIN GROUNDWATER.
   b. CROSSING OF SIGNIFICANT WATERWAYS/ RIVER CROSSINGS.
   c. DIFFICULT SOILS OR CRITICAL LOCATIONS WHERE REQUESTED BY THE SA WATER REPRESENTATIVE.
   d. WHERE COMPLEX SITE CONDITIONS ARE ASSESSED BY THE DESIGNER AS BEING A SIGNIFICANT RISK.

5. PE IS APPROVED UP TO EI290. SHOULD A PROJECT REQUIRE LARGER DIAMETER PE:
   a. SPECIFIC APPROVAL FROM THE SA WATER REPRESENTATIVE WILL BE REQUIRED TO PROCEED.
   b. THE DESIGNER SHALL BE RESPONSIBLE FOR THRUST BLOCK DESIGN, CONFIRMATION OF SOIL CLASSIFICATION AND GEOTECHNICAL INVESTIGATIONS, TOGETHER WITH ANY SITE SPECIFIC REQUIREMENTS.
   c. THE PIPE & Fittings SHALL BE OBTAINED FROM AN APPROVED PIPE MANUFACTURER (REFER TS 0593).

DESIGN:

6. THE CONSULTANT DETAILED DESIGN DRAWINGS SHALL INCLUDE:
   - THE PIPE HORIZONTAL AND VERTICAL ALIGNMENTS. REFER NOTES 2 & 8. THE VERTICAL ALIGNMENT SHALL BE DISPLAYED ON A LONGITUDINAL SECTION/ELEVATION.
   - THE POSITION OF ALL START AND FINISH LOCATIONS TOGETHER WITH ENTRY PITS.
   - THE PIPE CONNECTIONS AT EACH END OF THE DRILLED PIPE DETAILING.
     - THE FACTORY FABRICATED PE SPECIAL (WITH THRUST CONNECTOR AND HYDRANT BRANCH).
     - THE METHOD OF JOINING THE PE SPECIAL TO THE SEVERED DRILLED PIPE.
     - THE LOCATION OF VALVES, HYDRANTS AND ANCHOR BLOCKS. REFER NOTE 11.
   - ALL SERVICES. REFER NOTE 7.
   - THE REQUIREMENT FOR A CONCRETE PROTECTION SLAB FOR A CREEK OR CHANNEL CROSSING WHERE REQUIRED, THE SLAB DESIGN SHALL BE PROVIDED TO THE SA WATER REPRESENTATIVE.
   - DETAILS OF ANY THIRD PARTY APPROVALS OBTAINED. REFER NOTE 8, E.G. AUTHORITY REQUIREMENTS, ETC.
   - THE REQUIREMENT FOR A LOCATING WIRE SHALL BE CONFINED. REFER 4005-30005-17, NOTE 29.
   - OTHER RELEVANT DETAIL SPECIFIC TO THE SITE.

7. ALL SERVICES TOGETHER WITH PROPOSED CLEARANCES SHALL INCLUDE:
   - SHOWN ON THE DESIGN DRAWINGS. DRILLING CONTRACTORS TEND TO UTILISE LARGE CLEARANCE OFFSETS. THE DESIGNER SHALL SEEK ADVICE FROM A CONTRACTOR PRIOR TO FINALISING THE DRAWINGS.
   - SUBSEQUENTLY CONFIRMED BY THE DRILLING CONTRACTOR. REFER NOTE 15.

8. THE PIPE ALIGNMENT:
   - FOR A ROAD/RAIL/ CREEK CROSSING, THE VERTICAL ALIGNMENT FOR THE DRILLED SECTION SHALL NOT DEVIATE UNLESS APPROVED BY SA WATER OR THE RELEVANT AUTHORITY.
   - EL VALUES ALONG THE PIPELINE FOR THE NS AND ALL VERTICAL CHANGES SHALL BE CAPTURED.
   - THE DRILLED CROSSING SHALL EXTEND BEYOND THE FULL WIDTH OF THE ROAD OR CHANNEL. THAT IS, THERE SHALL BE NO PART DRILL OR CHANGE OF PIPE MATERIAL WITHIN THE ROAD LIMITS (ROAD MEDIAN INCLUDED).

9. AS PART OF THE DESIGN PROCESS THE DESIGNER SHALL CONFIRM WITH THE ROAD/RAIL/WATERCOURSE AUTHORITY:
   - APPROVAL FOR THE PROPOSED ALIGNMENT AND PIPE DEPTH.
   - ENDORSEMENT FOR THE PROPOSED CONSTRUCTION METHODOLOGY.
   - AGREEMENT FOR THE IMPACT THE PROJECT WILL IMPOSE FOR THE ANTICIPATED PROJECT DURATION.
   - THE REQUIREMENT FOR A SLEEVE PIPE.
   - WHERE THE PIPE CROSSES A CREEK OR CHANNEL, THE CONSULTANT SHALL CONTACT THE NATURAL RESOURCES MANAGEMENT BOARD FOR CONFIRMATION OF A PROTECTION SLAB AND ANY OTHER REQUIREMENTS.
   - IN ADDITION, DETAILS OF THE AUTHORITY APPROVALS SHALL BE PRESENTED TO SA WATER BY MEANS OF:
     - INCLUDED ON THE DRAWINGS SHALL BE THE AUTHORITY CONTACT AND PARTICULARS WHO PROVIDED THE APPROVAL.
     - A COPY OF THE THIRD PARTY AUTHORITY PERMIT/ APPROVAL (TOGETHER WITH ANY CONDITIONS).

10. ANCHOR BLOCKS SHALL BE INSTALLED ON EACH SIDE OF THE BORE AND SHALL BE LOCATED IN UNDISTURBED SOIL. IT IS MANDATORY THAT THEY SHALL BE POSITIONED SUFICIENTLY CLEAR OF ANY EXCAVATED AREA FOR AN ENTRY PIT OR THE DRILL HOLE. REFER 4005-30005-15 FOR REQUIRED SEPARATION.

11. A VALVE AND HYDRANT AND ANCHOR BLOCK SHALL BE POSITIONED EACH SIDE OF THE BORE.

   - WHERE A HIGHER SDR VALUE (I.THAN SDR 10 IS REQUIRED, THE PIPE SDR RATING SHALL BE SHOWN ON THE DRAWINGS AND INCLUDED IN THE SPECIFICATION.
   - THE LOCATION OF INTERMEDIATE HYDRANTS SHALL ALSO BE CONSIDERED AND SHOWN ON THE DRAWINGS. THIS SHALL INCLUDE THE FITTING AND METHOD TO BE USED TO INSERT THE TEE FOR THE HYDRANT. REFER 4005-30005-17, NOTE 29 FOR THE REQUIREMENT FOR A LOCATING CABLE.

CONSTRUCTION:

13. ONLY A SA WATER APPROVED CONTRACTOR CAN UNDERTAKE THE DRILL BORE. THE NAME OF THE CONTRACTOR SHALL BE SUBMITTED TO THE SA WATER REPRESENTATIVE FOR APPROVAL PRIOR TO COMMENCEMENT.
   - SA WATER RESERVES THE RIGHT TO REJECT THE NOMINATED CONTRACTOR.

14. PRIOR TO COMMENCEMENT OF WORK:
   - INTERFACE RESPONSIBILITIES BETWEEN THE CIVIL CONTRACTOR AND THE DRILLING CONTRACTOR SHALL BE CONFIRMED IN WRITING TO THE SA WATER REPRESENTATIVE.
   - THE DRILLING CONTRACTOR SHALL UNDERTAKE SITE INVESTIGATIONS/ TESTING TO CONFIRM THE APPROVED DESIGN.
   - ANY CONDITIONS ASSOCIATED WITH AUTHORITY APPROVALS SHALL BE COMPLIED WITH. REFER NOTE 9.

15. THE DRILLING CONTRACTOR’S INVESTIGATIONS/ TESTING SHALL CONFIRM:
   - ALL ENTRY/EXIT LOCATIONS TOGETHER WITH SIZE AND DEPTH, I.E. THE REQUIRED WORK AREA,
   - THE PIPE HORIZONTAL AND VERTICAL ALIGNMENTS.
   - DEPTH AND CHANCE OF SERVICES TO BE NEGOTIATED ALONG THE PIPE ALIGNMENT,
   - THE EXPECTED CLEARANCES FROM THESE SERVICES,
   - A RISK ASSESSMENT WITH CONSIDERATION OF OVERALL SITE SAFETY.
   - ANY DEVIATION FROM THE APPROVED DESIGN.

16. COLD BENDING OF THE PIPE SHALL NOT EXCEED THE MANUFACTURER’S SPECIFICATIONS.
NOTES:

CONSTRUCTION (CONT'D)

17. SHOULD IT BE DECIDED TO VARY THE APPROVED DESIGN THE DRILLING CONTRACTOR SHALL PROVIDE DETAILS TO THE DESIGNER. THE DESIGNER SHALL PREPARE AMENDED DESIGN DRAWINGS TO BE SUBMITTED TO THE SA WATER REPRESENTATIVE FOR APPROVAL PRIOR TO CONSTRUCTION PROCEEDING.

18. THE JONTING SYSTEM FOR THE DRILLED OR BORED PE PIPE SHALL BE BUTT WELD. FIELD BUTT WELDING SHALL ONLY BE PERFORMED BY A SA WATER AUTHORIZED CONTRACTOR. REFER TS 0503, 9.1.2.

19. PE SPECIALS (FOR END CONNECTIONS) SHALL ONLY BE OBTAINED FROM A SA WATER AUTHORIZED CONTRACTOR. REFER TS 0503, 9.1.1.

20. ENTRY/EXIT PITS SHALL BE DECOMMISSIONED BY REMOVING ALL CONSTRUCTION EQUIPMENT AND FILLING THE PITS TO THE FSL WITH:
   * SA-C SAND COMPACTED TO 95% MMDB

21. THE HDD BORE PATH SHALL FOLLOW THE APPROVED DESIGNED AUGMENT AND CONFORM TO THE PERMISSIBLE TOLERANCES UNLESS OTHERWISE AGREED BY THE SA WATER REPRESENTATIVE. THE PERMISSIBLE TOLERANCES SHALL BE:
   * HORIZONTAL +/- 500 mm
   * VERTICAL +/- 500 mm


23. SHOULD A SLEEVE PIPE BE REQUIRED:
   * DETAILS SHALL BE SHOWN ON THE DESIGN DRAWINGS TOGETHER WITH THE SLEEVE ON AND MATERIAL.
   * THE SLEEVE PIPE SHALL BE GRP, BUTT WELDED PE OR STEEL OF A PIK RATING APPROPRIATE TO THE GROUND CONDITIONS.
   * PIPE SPACERS SHALL BE UTILIZED WITHIN THE SLEEVE PIPE.
   * WHERE THE HOLE DIAMETER > 50, THE SLEEVE VOD SHALL BE GRouted WITH A FLOWABLE GROUT (F.E. LIQUAFULL OR BENTONITE).
   * THE CONTRACTOR SHALL ENSURE GROUTING PRESSURES DOES NOT EXCEED THE BUCKLING CAPACITY OF THE PIPE WHEN EMPTY.

24. A STEEL SLEEVE OR FABRICATED STEEL PIPEWORK SHALL BE PROTECTED IN ACCORDANCE WITH SA WATER REQUIREMENTS. REFER DETAIL 1.

25. FOR MICROTUNNELING OR PIPE JACING FULLY WELDED MSCL PIPE MAY BE PERMITTED PROVIDED THERE IS A MAXIMUM OF ONE PIPE JOINT BELOW THE STRUCTURE BEING CROSSED.

26. THE INSTALLED PIPE SHALL BE SUBJECT TO NORMAL ACCEPTANCE TESTING. E.G. PRESSURE TESTING, REFER DEVELOPER AGREEMENT OR THE SPECIFICATION FOR REQUIREMENTS.

27. THE AS CONSTRUCTED DRAWINGS SHALL CLEARLY INDICATE AND LABEL THE DRILLED/BORED SECTION OF THE MAIN, THE PIPE MATERIAL AND RATING SHALL BE MARKED.

28. A BORE LOG FOR EACH BORE SHALL BE INCLUDED WITH THE AS CONSTRUCTED DRAWINGS. THE LOG SHALL BE NEAT AND LEGIBLE, PRESENTED IN TABULAR FORM. INFORMATION PROVIDED SHALL INCLUDE, AS A MINIMUM:
   * PROJECT NAME AND LOCATION
   * DRILLING COMPANY NAME TOGETHER WITH THE NAME OF THE COMPANY REPRESENTATIVE
   * DATE
   * BORE NO.
   * SIZE AND NO OF CONDUITS INSTALLED
   * DEPTH BELOW FINISHED SURFACE LEVEL AT THE TOP OF THE BORE AT APPROPRIATELY METRE INTERVALS AND WHERE THERE IS A CHANGE OF HORIZONTAL ALIGNMENT OR VERTICAL GRADE.
   * ALIGNMENT DETAILS PROVIDED WITH CORRELATES.

29. LOCATING CABLE:
   * THE REQUIREMENT FOR A LOCATING CABLE SHALL BE CONFIRMED BY THE DESIGNER DURING THE DETAILED DESIGN. GUIDING PARAMETERS ARE:
     * SHORT LENGTH WITH STRAIGHT OR MINOR CHANGE OF HORIZONTAL ALIGNMENT - GENERALLY NOT REQUIRED PROVIDING SUFFICIENT VALVES/ HYDRANTS IN STREET BOXES ARE INCLUDED IN THE DESIGN (FOR ESTABLISHMENT OF THE ALIGNMENT).
     * SIGNIFICANT OR MULTIPLE CHANGES OF HORIZONTAL ALIGNMENT OR CURVED ALIGNMENT - REQUIRED.
     * LENGTH > 150 METRES - REQUIRED.

CABLE INSTALLATION SHALL BE:
   * AS PART OF THE HDD INSTALLATION ADJACENT THE PIPE
   * A SINGLE CONTINUOUS CABLE WHERE THERE MAY BE A PIPELINE INTERSECTION OR JUNCTION. ONLY APPROVED CONNECTORS SHALL BE UTILISED. LOOMPING OR CRIMPING OF CABLE SHALL NOT BE PERMITTED.
   * ANY DAMAGE TO OR BREAK OF THE TRACER CABLE DURING INSTALLATION SHALL BE IMMEDIATELY REPAIRED BY:
     * REPLACING THE DAMAGED CABLE
     * INSTALLING A NEW SECTION OF CABLE WITH APPROVED CONNECTORS.
   * NO BARE TRACER CABLE SHALL BE EXPOSED EITHER ABOVE GROUND EXCEPT ENDS SUCH AS AT VALVES OR HYDRANTS ARE NOT PERMITTED AND SHALL BE PROTECTED BY AN APPROVED CONNECTOR.
   * WHERE THE PE PIPE MAY BE CUT TO ENABLE THE FITTING OF TESTS FOR VALVES OR HYDRANTS IF THIS WORK IMPACTS THE TRACER CABLE THE INTEGRITY OF THE LINE SHALL BE MAINTAINED. APPROVED JOINERS TOGETHER WITH A SHORT LENGTH OF CABLE SHALL BE USED.
   * TRACER CABLE SHALL NOT BE TAPE OR WRAPPED AROUND PIPE.
   * TRACER CABLE MUST BE PROPERLY ARTED AS PER THE MANUFACTURER'S RECOMMENDATION.

MINIMUM CABLE SPECIFICATION SHALL BE:
   * ALL TRACER CABLE SHALL BE COPPER CLAD STEEL (CCS), COLOURED HOPE INSULATION INTENDED FOR DIRECT BURY.
   * ALL TRACER CABLE SHALL BE A COPPERHEAD PRODUCT OR AN APPROVED EQUIVALENT.
   * CABLE STRENGTH SHALL BE 13 AWG CCS, EXTRA HIGH STRENGTH WITH MINIMUM 521 KG, BREAK LOAD. MINIMUM HOPE INSULATION THICKNESS SHALL BE 30 ML.

MINIMUM CONNECTOR SPECIFICATION SHALL BE:
   * CONNECTORS SHALL BE GEL FILLED AND RATED FOR DIRECT BURY. THEY SHALL BE EITHER:
     * COPPERHEAD-3-WAY SNAP-ENGAGE CONNECTOR OR,
     * DRYDORN 3-WAY DIRECT BURY LUG OR AN APPROVED EQUIVALENT.
   * CABLE TERMINATIONS SHALL BE PROTECTED BY MEANS OF A DRYDON SINGLE LUG GEL FILLED CONNECTOR OR AN APPROPRIATE EQUIVALENT.

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**REVISION PANEL**

**DATE** | **DRAW** | **DRAWN BY** | **APPROVED BY** | **SUPERVISED BY** | **REVIEWED BY** | **AUTHORISED**
--- | --- | --- | --- | --- | --- | ---
09/10/11 | RP | new drawing | TG | --- | --- | ---

**DESIGN PANEL**

**DATE** | **DRAW** | **DRAWN BY** | **APPROVED BY** | **SUPERVISED BY** | **REVIEWED BY** | **AUTHORISED**
--- | --- | --- | --- | --- | --- | ---
09/10/11 | RP | new drawing | TG | --- | --- | ---

**SA WATER STANDARD DRAWINGS**

**WATER SUPPLY CONSTRUCTION MANUAL**

**ROAD OR CHANNEL CROSSING**

**HORIZONTAL DIRECTIONAL DRILLING METHOD**

**NOTES AND TYPICAL SLEEVE DETAIL**

**A3 SHEET**

**SUPERSEDES:**

**DRAWING NUMBER:** 4005-30005-17

**PREP:** TG

**PREP:** TG

**SUPERSEDES:**

**SA WATER STANDARD DRAWINGS**

**WATER SUPPLY CONSTRUCTION MANUAL**

**ROAD OR CHANNEL CROSSING**

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**NOTES AND TYPICAL SLEEVE DETAIL**

**A3 SHEET**

**SUPERSEDES:**

**DRAWING NUMBER:** 4005-30005-17

**PREP:** TG

**PREP:** TG

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**TABLE 11.1**

<table>
<thead>
<tr>
<th>WATER PIPE (DN)</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLEEVE PIPE MIN (DN)</td>
<td>300</td>
<td>375</td>
<td>425</td>
<td>500</td>
</tr>
</tbody>
</table>

**TYPICAL CROSS SECTION**

**DETAIL 1 - PIPE PLACEMENT WITHIN SLEEVE**

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**GROUT REFER CLAUSE 23**

**SPACERS TO KEEP PIPE IN POSITION**

**SLEEVE PIPE REFER TABLE 17.1**

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1. For each stage of a development, the designer shall consider disinfection requirements, including injection and discharge locations, for the positioning of hydrants and valves. This is particularly relevant adjacent the stage boundary.

2. A hydrant is required at the end of each section of main to be disinfected for discharging the solution.

3. Refer 4005-30005-10 for temporary end options showing the required fittings.

4. Preference is to usually undertake disinfection from a low point within the development and to discharge at a high point. (This may not always be possible)

5. Refer 4005-30002-01 to 4005-30002-04 for general notes.

6. For mains lengths > 5.5 metres, disinfection shall be undertaken by either SA Water or its representative.

7. The contractor shall provide SA Water or its representative with the required notifications and comply with the stated notification period.

8. Disinfection shall occur following the mains link ups and pressure testing at a time agreed following processing of the notifications.

9. Prior to the link ups and disinfection, the contractor shall internally clean all new pipes and fittings. All construction debris, sand and sediment, together with other contaminants shall be removed.

10. Disinfection of water mains is usually achieved by injecting a solution containing free chlorine into the water mains while charging the main with potable water from an existing connecting main.

11. The injection point is located upstream of a valve used to control the flow of water.

12. When the injection point is adjacent the new main it is to be within 3 metres of the valve.

13. Where there are multiple link ins to the existing reticulation system a hydrant shall be positioned adjacent each link in location.

14. For individual fittings or a length > 5.5 metres, topical (spray) disinfection shall be applied. All items shall be cleaned prior to the spray being applied. All spray disinfection shall be witnessed by the SA Water representative.

15. For a link in to an existing water main involving a cut out of the main, any pipe, valve or fittings required for the new branch and reinstatement of the existing main shall be disinfected using the topical spray method.