

NOTES:

- SA WATER DOCUMENTATION :**
AUTHORISED DOCUMENTATION COMPRISES:
 - WATER SERVICES ASSOCIATION OF AUSTRALIA (WSAA) CODES,
 - GRAVITY SEWERAGE CODE OF AUSTRALIA, WSA02-2014.
 - SEWAGE PUMPING STATION CODE OF AUSTRALIA, WSA04-2005.
 - VACUUM SEWERAGE CODE OF AUSTRALIA, WSA06-2008.
 - PRESSURE SEWERAGE CODE OF AUSTRALIA, WSA07-2007.
 - SA WATER SUPPLEMENTARY DOCUMENTATION TO EACH WSAA CODE.
 - SA WATER CONSTRUCTION MANUAL DRAWINGS.
 - SA WATER ENGINEERING STANDARDS & GUIDELINES.
 - SA WATER AUTHORISED ITEMS FOR USE WITH EACH CATEGORY.
- ORDER OF PRECEDENCE.**
WHERE SA WATER PROVIDES SPECIFIC DETAIL, IT'S DRAWINGS AND DOCUMENTS TAKE PRECEDENCE OVER THAT ASPECT OF THE RELEVANT WSAA CODE.
- AUTHORISED ITEMS:**
 - SA WATER HAS PRODUCT CATALOGUES IDENTIFYING SPECIFIC PRODUCTS APPROVED FOR USE.
 - ONLY ITEMS INCLUDED IN THESE CATALOGUES SHALL BE USED WITHIN THE RETICULATION SYSTEMS.
 - SHOULD A PROJECT REQUIRE AN ITEM NOT CONTAINED WITHIN THE CATALOGUES, APPROVAL SHALL BE SOUGHT FROM SA WATER FOR THE SPECIFIC ITEM.
- SA WATER REPRESENTATIVE:**
THE CONTRACTOR SHALL SEEK APPROVAL FOR:
 - NONCONFORMITY WITH THE SA WATER DRAWINGS.
 - DEVIATION FROM THE APPROVED DESIGN DRAWINGS.
 - UNFORESEEN SITE FACTORS IMPACTING THE PROPOSED LOCATION OF THE SA WATER INFRASTRUCTURE.
- EXCAVATION:**
 - ALL EXCAVATION WORK SHOULD BE UNDERTAKEN IN SUCH A MANNER AS TO MINIMISE RISK TO WORKERS AND OTHERS. AT ALL TIMES SAFE WORK PRACTICES SHALL BE IMPLEMENTED THAT AS A MINIMUM REQUIREMENT COMPLY WITH THE REQUIREMENTS OF RELEVANT LEGISLATION AND INDUSTRY GUIDELINES INCLUDING BUT NOT LIMITED TO:
 - THE WORK HEALTH AND SAFETY ACT 2012 (SA),
 - THE WORK HEALTH AND SAFETY REGULATIONS 2012 (SA),
(SPECIFICALLY CHAPTER 6, DIVISION 3 - EXCAVATION WORK.)
 - SAFE WORK AUSTRALIA'S EXCAVATION WORK CODE OF PRACTICE.
 - SA WATER RESERVES THE RIGHT TO REVIEW SAFE WORK PRACTICES UNDERTAKEN BY ALL CONTRACTORS IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.
- EMBEDMENT & BACKFILL:**
 - EXCAVATION OF TRENCH, EMBEDMENT AROUND PIPES & MAINTENANCE STRUCTURES & CONNECTIONS, AND TRENCH BACKFILL SHALL BE IN ACCORDANCE WITH 4005-20003-01.
 - ONLY MATERIALS APPROVED FOR PLACEMENT WITHIN TRENCHES & EXCAVATIONS SHALL BE USED.
 - FOR GEOTECHNICAL AND GROUNDWATER REQUIREMENTS REFER 4005-20003-02.
- CONCRETE**
 - ALL IN-SITU CONCRETE SHALL BE IN ACCORDANCE WITH TS68, CLAUSE 2.1.

- OBSTRUCTIONS & CLEARANCE REQUIREMENTS:**
 - FOR MINIMUM HORIZONTAL & VERTICAL CLEARANCE BETWEEN SA WATER INFRASTRUCTURE AND OTHER AUTHORITY PIPES/ CABLES REFER WSA02, TABLE 5.4.
 - CLEARANCE FROM PROPOSED STRUCTURES:
FOR THE MINIMUM HORIZONTAL CLEARANCE BETWEEN THE PROPOSED PIPE EDGE AND A PROPOSED WALL OR BUILDING. REFER TABLE 1.

TABLE 1

SEWER DIAMETER AND DEPTH	CLEARANCE TO WALL OR BUILDING (mm)
DN150 & DN225 (<3.3 m DEEP)	1500 *
DN150 & DN225 (>3.3 m DEEP)	2000 *
DN300 & DN375	2500 *

* BASED UPON EASEMENT WIDTH REQUIREMENT SHOWN IN TABLE 3, 4005-20002-02

- CLEARANCE FROM EXISTING STRUCTURES:
MINIMUM HORIZONTAL CLEARANCE BETWEEN THE PROPOSED PIPE EDGE AND AN EXISTING WALL OR BUILDING SHALL BE DISTANCE EQUIVALENT TO THE GREATER OF:
 - THE DEPTH OF THE SEWER TRENCH PLUS HALF THE TRENCH WIDTH, OR
 - A MINIMUM OF 1.5 m.
 - REDUCED CLEARANCES ARE POSSIBLE IF THE BUILDING FOOTINGS ARE FOUNDED ON PIERS EXTENDING TO AT LEAST THE INVERT LEVEL OF THE SEWER. PRIOR TO PROCEEDINGS WITH THE DESIGN THE CONSULTANT SHALL APPROACH SA WATER FOR APPROVAL OF ANY REDUCED CLARENCE.
- CLEARANCE FROM TREES:**
 - CLEARANCE BETWEEN PIPES AND TREES SHALL BE THE GREATER OF THE FOLLOWING TWO CONDITIONS:
 - MINIMUM 1.5 m LATERAL CLEARANCE BETWEEN THE PIPE EDGE AND THE TRUNK OF A MATURE SMALL TREE, OR
 - LARGE CLEARANCES (COVERING MANY TREE TYPES) AS DETERMINED BY THE SA WATER "TREE PLANTING GUIDE.

NOTE: WHERE IT IS NOT POSSIBLE TO ACHIEVE REQUIRED LATERAL CLEARANCE FROM TREES, BORING SHOULD BE CONSIDERED.
 - COLD BENDING OF PVC PIPE**
 - COLD BENDING OF PVC PIPE IS PERMITTED FOR HORIZONTAL AND VERTICAL CURVES.
 - COLD BENDING OF THE PIPE BARREL SHALL BE PERFORMED MANUALLY (NOT MECHANICALLY).
 - ALL BENDING SHALL BE IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
 - COLD BENDING SHALL NOT BE PERFORMED WHEN THE AMBIENT TEMPERATURE IS LESS THAN 5° C.
 - BRANCH SEWERS AND CONNECTIONS SHALL NOT BE LOCATED ON A CURVE.
 - PERMISSIBLE HORIZONTAL CURVE LENGTH AND VERTICAL CURVE LENGTH - REFER TABLE 2.

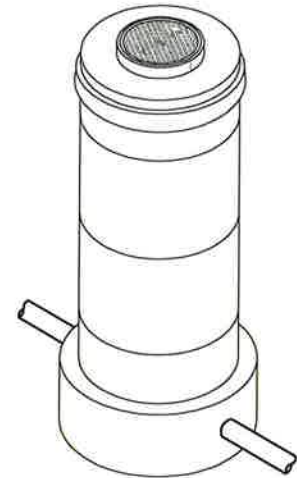
TABLE 2

DEFLECTION (ANGLE OR %)		MINIMUM CURVE LENGTH	
HORIZONTAL	VERTICAL	Ø150 mm	Ø225 mm
UP TO 10°	UP TO 18%	6 m	12 m
10° TO 22°	18% TO 40%	12 m	24 m

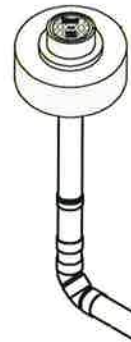
FOR ADDITIONAL NOTES REFER 4005-20002-02 & 4005-20002-03

REVISION PANEL					DESIGN PANEL		 This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.	SA WATER STANDARD DRAWINGS SEWER CONSTRUCTION MANUAL		A3 SHT SIZE TOTAL SHEETS: 3 SUPERSEDES: DRAWING NUMBER 4005-20002-01 PREFIX NUMBER SHEET		1 REVISION
REV	DATE	DRN	DETAILS	APR	CURRENT REV AUTHORISED:	SIGNATURE:						
1	31/03/16	MS	2016 STANDARDS REVIEW	TG	DESIGNED: 03/08/15 RJP DRAWN: 25/09/15 MS REVIEWED: 21/03/16 TG	AUTHORISED: 31/03/16 T.GALEK SIGNATURE: 	GENERAL NOTES SHEET 1 OF 3					

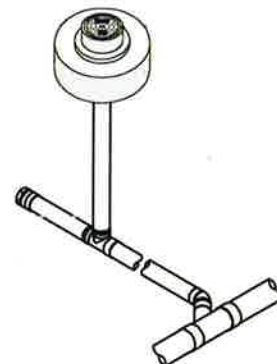
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MAINTENANCE HOLE
(TYPICAL)

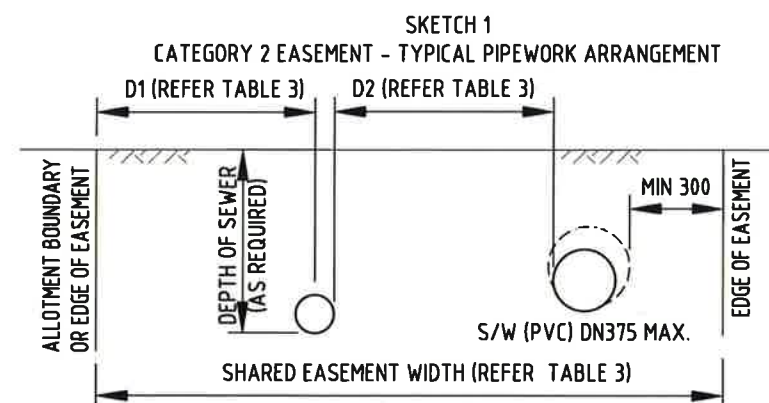


INSPECTION OPENING
(TYPICAL)



INSPECTION POINT
(TYPICAL)

10. MAINTENANCE HOLES:
- ALL COMPONENTS SHALL BE OBTAINED FROM THE SAME MANUFACTURER (PRECAST LID, RINGS, SLABS, SHAFTS & JOINT SEALANT).
 - PRECAST CONCRETE SHAFTS SHALL NOT BE SAWCUT.
 - PRECAST COMPONENTS ARE AVAILABLE IN VARIOUS HEIGHTS TO ASSIST IN ACHIEVING THE REQUIRED FINISHED SURFACE LEVEL.
 - THE FSL SHALL BE ACHIEVED BY A COMBINATION OF SHAFTS SECTIONS, CONVERSION SLABS & ADJUSTMENT RINGS.
 - THE CONSTRUCTOR SHALL DETERMINE THE COMBINATION OF ITEMS REQUIRED TO ACHIEVE THE REQUIRED FSL PRIOR TO PLACEMENT OF THE BUTT SHAFT INCREMENT.
 - FOR SLOPING & DIFFICULT LOCATIONS, THE PLACEMENT OF CONVERSION SLABS & ADJUSTMENT RINGS TO ACHIEVE THE FSL SHALL BE ACHIEVED USING APPROVED TECHNIQUES AS DEPICTED ON 4005-20005-04. WHERE THE CONTRACTOR IS UNCERTAIN CONCERNING THE PERMISSIBLE COMBINATION OF CONVERSION SLABS & ADJUSTMENT RINGS, DIRECTION SHALL BE SOUGHT FROM THE SA WATER REPRESENTATIVE.
 - SHAFT SECTION JOINTS, CONVERSION SLABS & ADJUSTMENT RINGS SHALL BE JOINED & SEALED BY AN APPROVED SEALANT. REFER 4005-20005-03.
11. MAINTENANCE SHAFTS:
- ALL MAINTENANCE SHAFTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH 4005-20005-10, 4005-20005-11 & 4005-20005-12.
 - REFER 4005-20005-12 FOR INFORMATION ON VARIO BENDS & ASSOCIATED FITTINGS.
12. INSPECTION OPENINGS:
- ALL INSPECTION OPENINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH 4005-20005-02.
13. PROPERTY CONNECTIONS:
- ALL CONNECTIONS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SCM SECTION 6 DRAWINGS.
14. EASEMENTS
- ALL SEWERS AND SEWER APPURTENANCES SHALL NORMALLY BE LOCATED IN ROADWAYS IN ACCORDANCE WITH THE REQUIREMENTS OF THE "SERVICES IN STREET CODE".
 - REFER 4005 - 20004 - 01 FOR ALLOCATION OF SPACE IN NEW DIVISIONS.
 - ONLY WHERE IT IS NEITHER PRACTICAL OR POSSIBLE TO LOCATE SEWERS IN ROADWAYS, DUE TO TOPOGRAPHICAL OR BACKFILL CONSTRAINTS, SEWERS MAY BE LOCATED IN EASEMENTS TAKEN SPECIFICALLY FOR THAT PURPOSE.
 - SA WATER EASEMENTS MAY ONLY BE SHARED WITH STORMWATER PIPES.



- OTHER AUTHORITIES AND UTILITIES, ARE NOT PERMITTED TO SHARE THE SA WATER SEWER EASEMENT TO ACCOMMODATE THEIR RESPECTIVE ASSETS.
- FOR MINIMUM HORIZONTAL CLEARANCE BETWEEN THE OUTSIDE FACE OF THE SEWER AND AN EXISTING OR PROPOSED BUILDING OR STRUCTURE REFER 4005-20002-01, TABLE 1.

UNDER NO CIRCUMSTANCES SHALL THE SEWER AND STORMWATER PIPELINE ARRANGEMENTS SHOWN IN SKETCH 1 BE ALTERED, RESULTING IN THE SEWER BEING CLOSER THAN THE PRESCRIBED DISTANCE FROM THE ALLOTMENT BOUNDARY / EDGE OF EASEMENT.

CATEGORIES OF EASEMENTS:

- EASEMENT REQUIREMENTS ARE DIVIDED INTO TWO CATEGORIES (REFER TABLE 3 & SKETCH 1):

TABLE 3

EASEMENT CATEGORIES

DEPTH TO INVERT (m)	PIPE SIZE	WIDTH (m)	LOCATION	CATEGORY 1 NOT SHARED	CATEGORY 2 SHARED EASEMENT	
					LOCATION	
					D1 (m) (REFER SKETCH 1)	D2 (m) (REFER SKETCH 1)
≤ 1	DN150 & DN225	2.5	CENTRAL (*)	-	-	MIN 1.2
	DN300	3.0	-	1.0	-	
1 TO 3.3	DN150 & DN225	5.0	CENTRAL (*)	1.5	-	
	DN150 & DN225	3.0	CENTRAL	-	-	MIN 1.5
	DN300	4.0	-	1.5	-	
> 3.3	DN150 & DN225	5.0	CENTRAL	1.5	-	
	DN150 & DN225	4.0	CENTRAL	-	-	MIN 1.5
	DN300	5.0	-	2.0	-	
	DN300	6.0	CENTRAL	-	-	
			-	2.0	-	

(* WHERE THERE ARE IMMOVABLE OBSTACLES ALONG THE CENTERLINE OF THE SEWER EASEMENT, OR ENCRANCHING UPON THE EASEMENT (EG. NEARBY TREES) AND THE SEWER DESIGN TO INVERT IS LESS THAN OR EQUIVALENT TO 1.0 m, OFF THE EASEMENT BOUNDARY THAT IS MOST DISTANT FROM ANY BUILDING OR PROPOSED BUILDING.

FOR THE FOLLOWING SPECIAL SITUATIONS, SA WATER SHALL DETERMINE EASEMENT WIDTHS (AND PIPELINE ALIGNMENTS WITHIN EASEMENTS), ON A CASE BY CASE BASIS:

- WHERE SITE SPECIFIC CONDITIONS WARRANT ADDITIONAL EVALUATION (EG. EXCESSIVE DEPTH OF SEWER, ANGLE OF REPOSE CONSIDERATIONS, DIFFICULT ACCESS REQUIREMENTS ETC.)
- FOR STORMWATER PIPELINES GREATER THAN DN375.
- WHERE BUTT JOINED CONCRETE STORMWATER PIPES ARE USED:
 - LEAKAGE FROM THE STORMWATER PIPES INTO SINGLE SIZE GRANULAR SEWER EMBEDMENT MEDIA IS VERY LIKELY, THEREBY UNNECESSARILY EXACERBATING THE EXISTING 'TRENCH' DRAIN EFFECT ASSOCIATED WITH SEWERS.
 - REPLACING A SECTION OF SEWER ADJACENT TO A DISCONTINUOUS STORMWATER PIPELINE (EG. BUTT JOINED CONCRETE PIPES) IS UNNECESSARILY DIFFICULT AND EXPENSIVE, REQUIRING SPECIAL SIDE SUPPORT FOR THE INDIVIDUAL CONCRETE PIPE LENGTHS.

REFER THE SA WATER SUPPLEMENT TO WSA 02-2014, CLAUSE 5.2.8 FOR PROVISION OF EASEMENTS REQUIREMENTS.

FOR ADDITIONAL NOTES REFER 4005-20002-03 & 4005-20002-01.

REVISION PANEL					DESIGN PANEL		SA Water		SA WATER STANDARD DRAWINGS		A3		1		
REV	DATE	DRN	DETAILS	APR	CURRENT REV	DESIGNED:	AUTHORISED:	This drawing is the property of the SOUTH AUSTRALIAN WATER CORPORATION and shall not be copied or modified in part or in whole without authorization.	SEWER CONSTRUCTION MANUAL		SHT SIZE	REVISION			
					AUTHORISED:	03/08/15	31/03/16								
					SIGNATURE:	RJP	T.GALEK								
						25/09/15									
1	31/03/16	MS	2016 STANDARDS REVIEW	TG		21/03/16									
										GENERAL NOTES		TOTAL SHEETS: 3			
										SHEET 2 OF 3		SUPERSEDES:			
												DRAWING NUMBER			
												4005-20002-02			
												PREFIX NUMBER SHEET			

CONTINUED FROM 4005-20002-02

15. PROTECTION OF EXISTING TREES/ VEGETATION:

- REFER WSA02, CLAUSE 14.3.
- THE DESIGN DRAWINGS SHALL BE EXAMINED FOR CONDITIONS ATTACHED TO THE RIGHT OF ENTRY.
- ALL EXISTING TREES AND SCRUBS ADJACENT TO THE SEWER LINE SHALL BE CAREFULLY SUPPORTED AND PROTECTED FROM DAMAGE. SPECIFIC CONSTRUCTION METHODS SUCH AS TUNNELLING OR BORING MAY BE IDENTIFIED TO PROTECT A DELICATE OR VALUABLE ENVIRONMENT.
- BEFORE CLEARING ANY TREES OR SCRUBS ALONG THE ROUTE, APPROVAL MUST BE OBTAINED FROM THE RELEVANT AUTHORITY AND IN THE CASE OF PRIVATE LAND, CONSENT MUST BE OBTAINED FROM THE OWNER.

16. BORING:

- REFER WSA02, CLAUSE 14.12.
- THE MINIMUM GRADE FOR ANY BORED SEWER PIPE SHALL BE 2.0%.
- PRIOR TO APPROVAL FOR THIS OPTION THE DESIGNER/ CONTRACTOR SHALL PROVIDE THE SA WATER REPRESENTATIVE WITH A METHODOLOGY FOR THE BORING TECHNIQUE & DETAILS OF THE CONTRACTOR WHO WILL UNDERTAKE THE BORE.
- THE DESIGNER/ CONTRACTOR SHALL SUBMIT DETAILS OF THE BORED PIPE MATERIAL (& SLEEVE PIPE IF REQUIRED) TO THE SA WATER REPRESENTATIVE FOR APPROVAL.
- THE BORE SHALL BE SHALL NOT AFFECT OR ENDANGER THE HEALTH OR STABILITY OF ANY TREE/ S.
- IF TREES WILL BE IMPACTED THE CONSULTANT SHALL PROVIDE SUPPORTING DOCUMENTATION FROM AN ARBORIST CONFIRMING SUCH WORK WILL NOT IMPACT THE TREE/ S.

17. CORROSION PROTECTION



ALL BURIED STEEL PIPE AND FITTINGS SHALL BE PROTECTED AS FOLLOWS:

- DICI COMPONENTS SHALL BE PROTECTED BY EITHER:
 - AN APPROVED (LLDPE) SLEEVING (REFER WSCM DRAWING 4005-30005-01).
 - OR
 - WRAPPING WITH PETROLATUM TAPE SYSTEM IN ACCORDANCE WITH TS 18.
- MSCL ITEMS SHALL BE PROTECTED AS FOLLOWS:
 - SINTAKOTED PIPES:
WHERE SINTAKOTE HAS BEEN DAMAGED OR REMOVED, THE PIPE SHALL BE WRAPPED WITH BITUMEN MASTIC TAPE SYSTEM, IN ACCORDANCE WITH TS 18.
 - NON-SINTAKOTED PIPES:
ALL PIPE SHALL BE WRAPPED WITH BITUMEN MASTIC TAPE SYSTEM, IN ACCORDANCE WITH TS 18.
- ALL BURIED METALLIC FLANGED FITTINGS SHALL BE COATED. PRIOR TO INSTALLATION, INSPECT ALL FITTINGS FOR DEFECTS. IF A FITTING IS FOUND TO HAVE A DEFECT IN THE COATING, THE ITEM SHALL BE WRAPPED WITH TS 18.
- ALL FLANGES SHALL BE WRAPPED IN ACCORDANCE WITH TS 18.

18. CATHODIC PROTECTION:

- CATHODIC PROTECTION IS GENERALLY ONLY REQUIRED FOR DOGLEGS LARGER THAN DN200.
FOR MORE SIGNIFICANT LOCATIONS, EG. MAJOR ROAD OR CREEK CROSSINGS, DN100 & DN150 STEEL PIPE MAY REQUIRE CATHODIC PROTECTION.
- WHERE A LENGTH OF MSCL MAIN OR MSCL/ DICI SPECIALS REQUIRE CATHODIC PROTECTION, THE DESIGNER SHALL CONSULT THE SA WATER CATHODIC PROTECTION SPECIALIST FOR CONFIRMATION OF REQUIREMENTS.
- CATHODIC PROTECTION SHALL BE UNDERTAKEN IN ACCORDANCE WITH WSCM DRAWING 4005-30010-07 & THE APPROVED CATHODIC PROTECTION DESIGN.
- REFER TO THE SA WATER CATHODIC PROTECTION SPECIALIST FOR COPIES OF STANDARD DRAWINGS FOR CATHODIC PROTECTION.
- BONDING OF STOP VALVES AND SCOUR VALVES SHALL BE IN ACCORDANCE WITH WSCM DRAWING 4005-30010-07.

FOR ADDITIONAL NOTES REFER 4005-20002-01 & 4005-20002-02

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