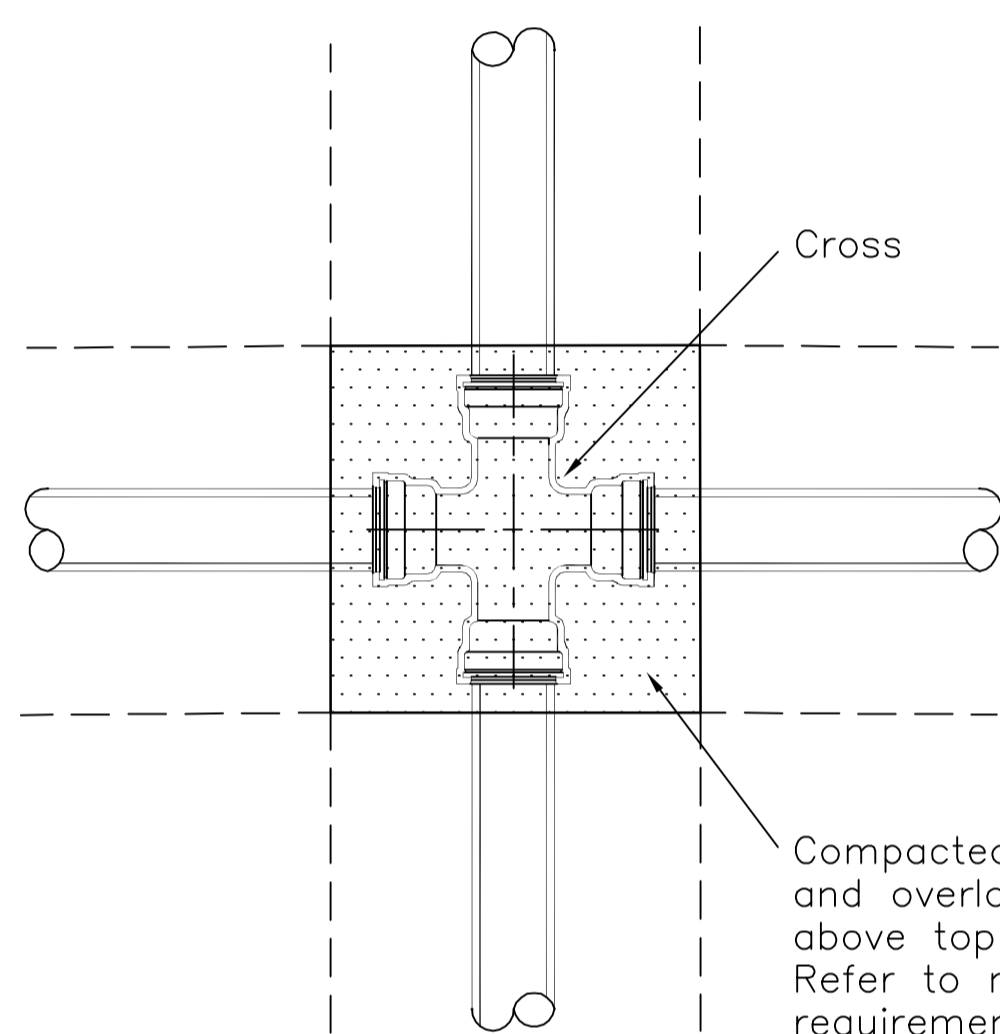
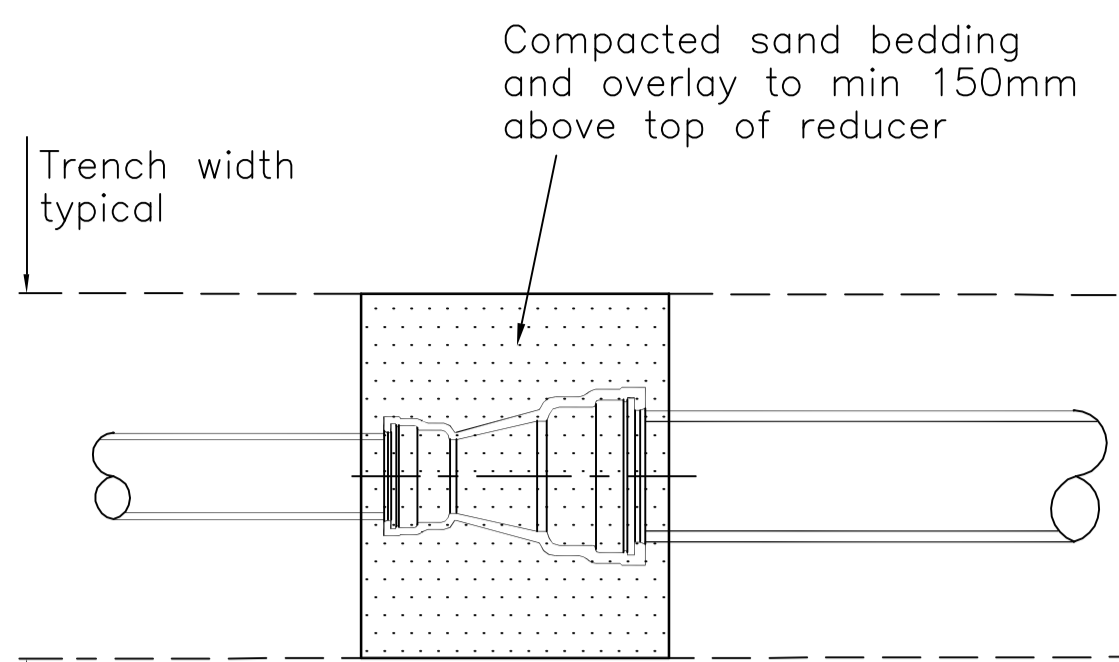


TEE

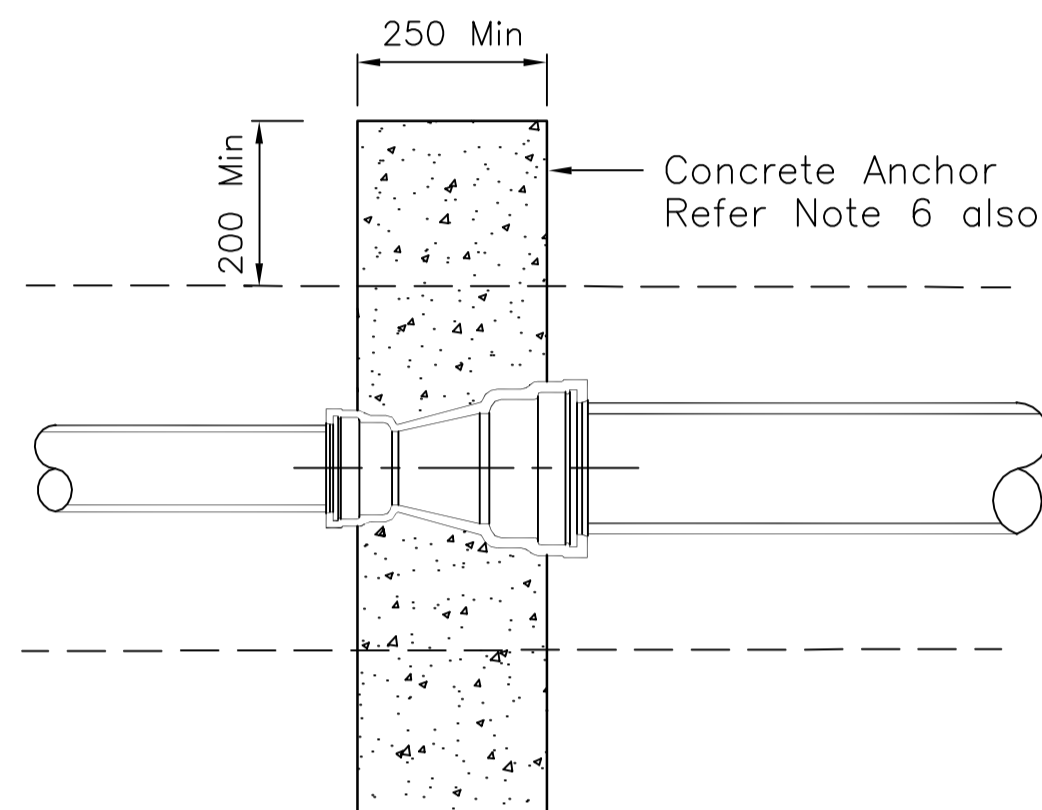


CROSS

Compacted sand bedding and overlay to min 150mm above top of cross Refer to note 5 for requirements where valve or dead end located on any branch

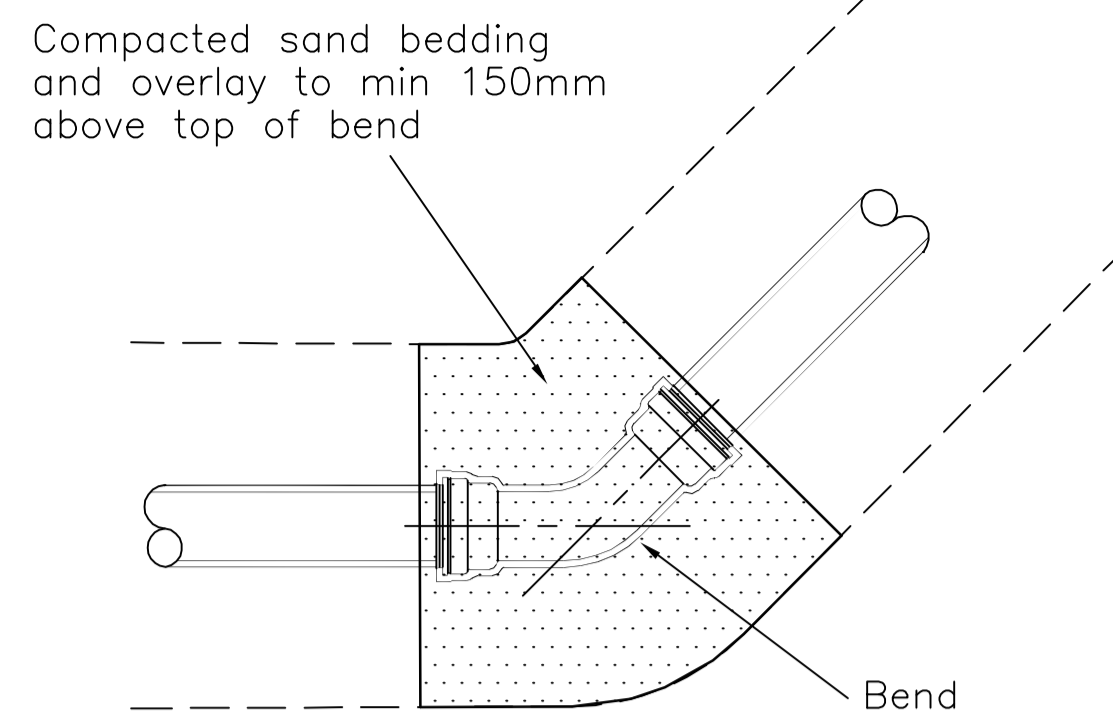


150mm DIA TO 100mm DIA

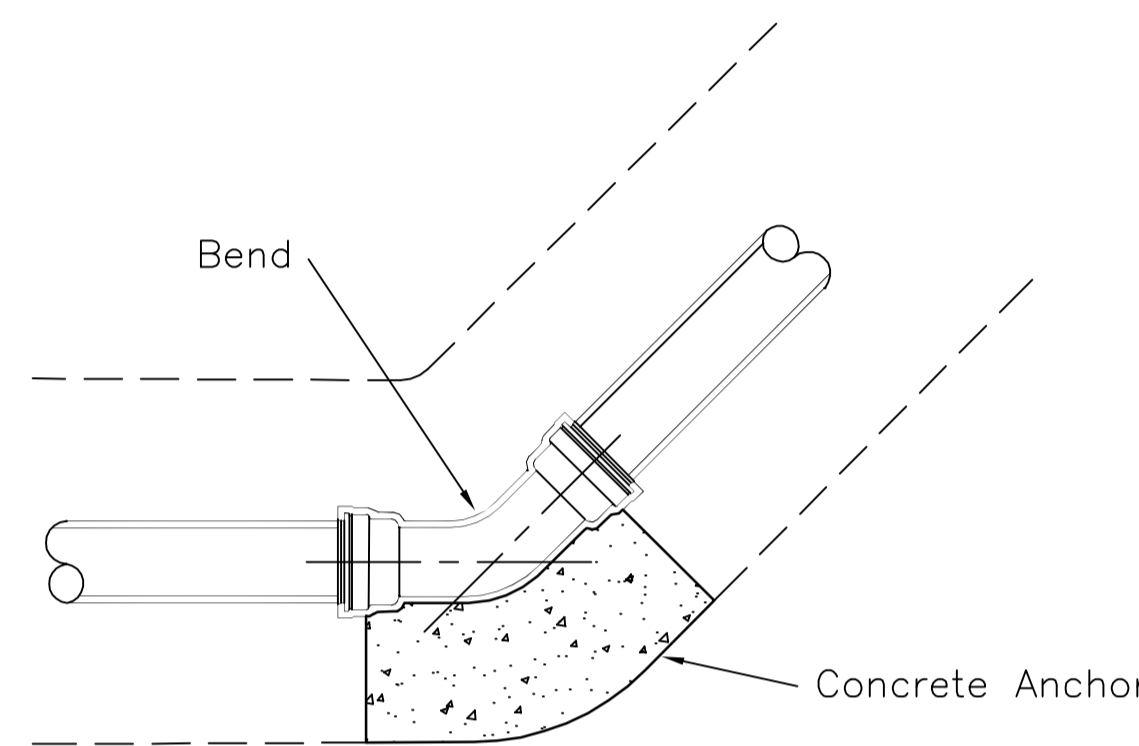


OTHER THAN 150mm DIA TO 100mm DIA

REDUCER

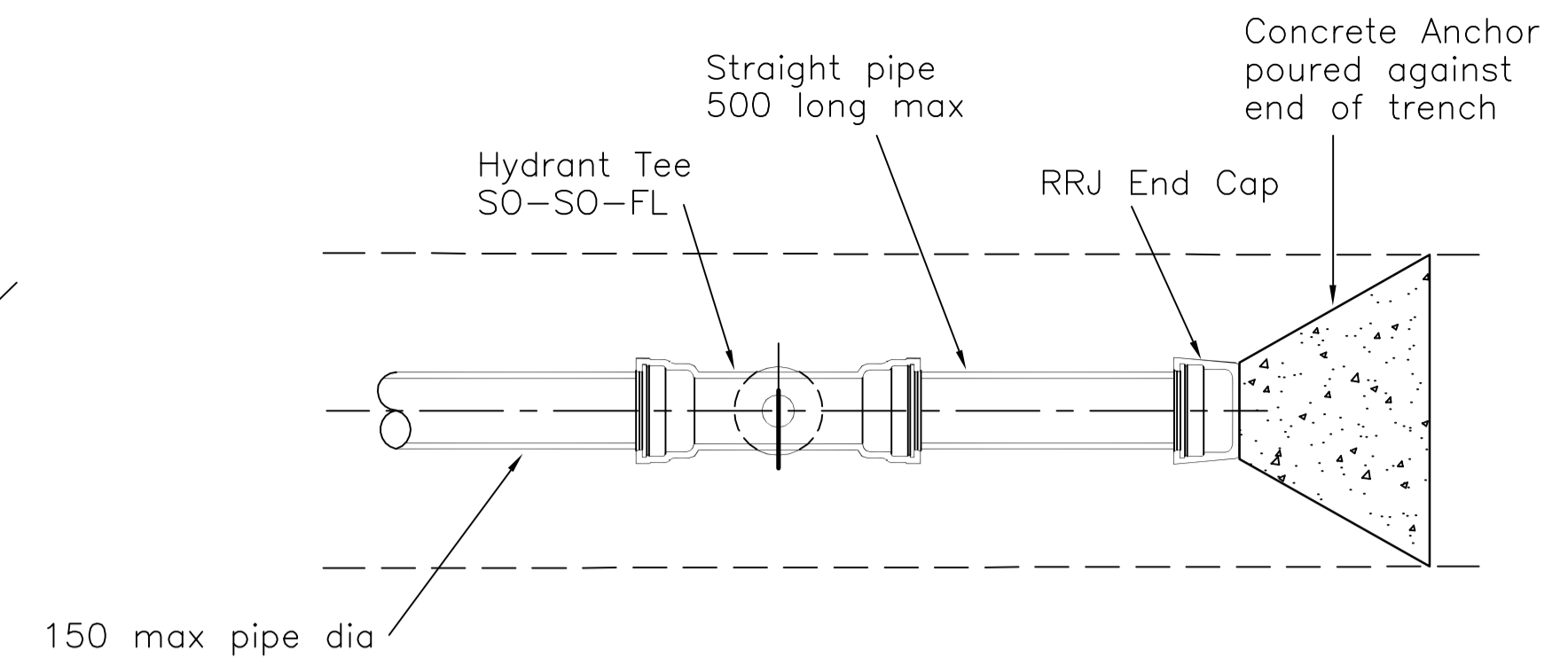


NOMINAL THRUST LOADS (Denoted N in table below)

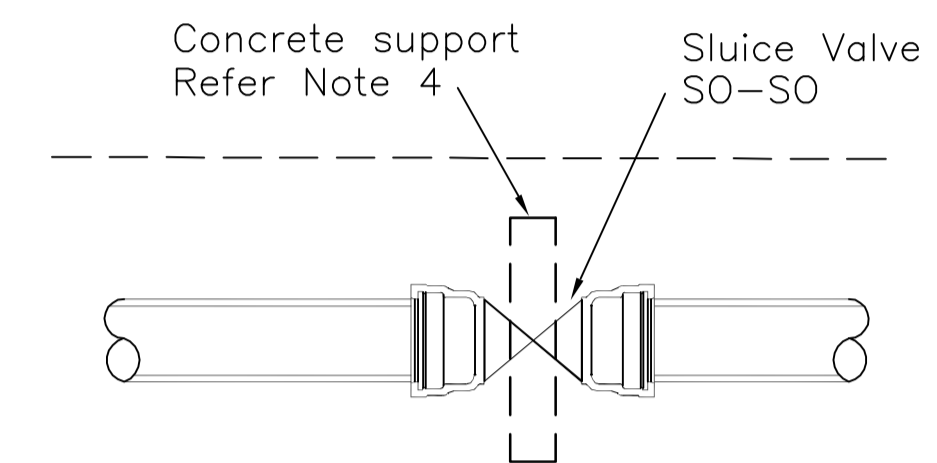


DESIGN THRUST LOADS (Refer Note 10)

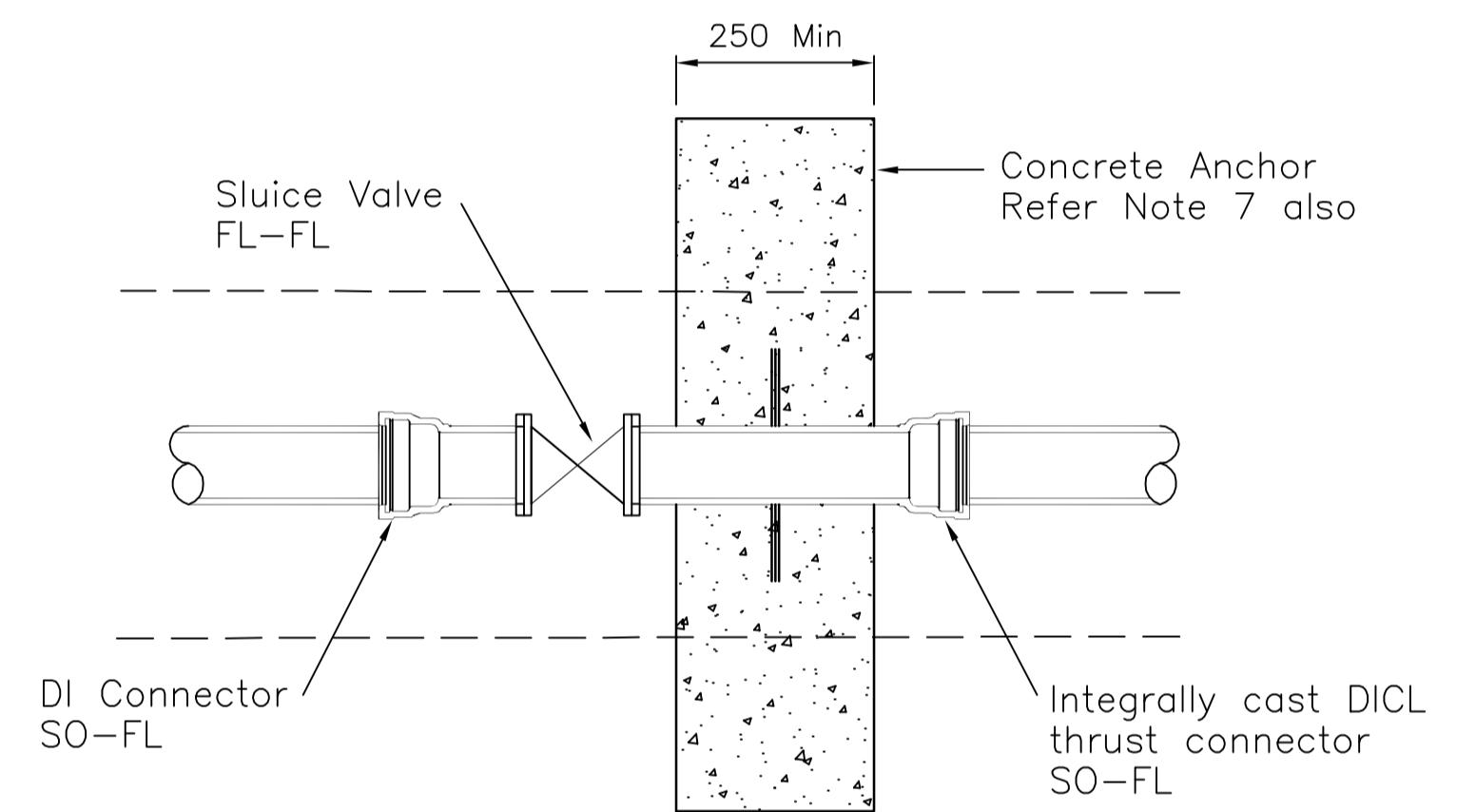
TYPICAL BENDS



TEMPORARY DEAD END



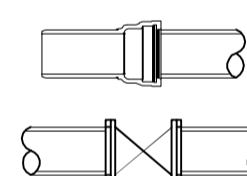
100mm and 150mm DIA



200mm DIA OR LARGER

VALVES

LEGEND



Denotes rubber ring jointed spigot and socket joint, gibault joint or other flexible joint
Denotes flanged fittings

NOTES

- All dimensions are in millimetres unless noted otherwise.
- All fittings to be provided with thrust anchor of minimum bearing area against solid ground to transfer unbalanced forces from fittings to solid ground.
- Permanent anchors to be grade N20 concrete. Temporary anchors may be approved timber toms.
- Valves to be supported on concrete pads to carry weight only.
- Crosses to be anchored as for tees if one or more branches blanked off.
- Minimum area of anchors for reducers to be equal to difference in area for valve anchors of diameters of each end of reducer. The minimum area so derived is the area of anchorage required to be placed against undisturbed ground.
- The thrust area shown in the table for valves is the area of anchorage required to be placed against undisturbed ground.
- For water mains greater than 375mm diameter thrust areas and anchorage details to be determined separately for each project.
- Tabulated minimum anchorage areas apply for test pressures of 1000 kPa. Areas may be adjusted pro-rata for other specified test pressures except that nominal N anchorage shall not be used over 1000 kPa without the approval of the Director of Engineering Services.
- Bend anchorage details are for horizontal bends and vertical bends with downward thrust. Anchorage for vertical bends with upward thrust to be to details approved by the Director of Engineering Services.
- Concrete anchors shown on drawing are diagrammatic only. Anchors are not to extend over flexible joints.
- When setting pipes in concrete a membrane of polyethylene, or similar shall surround the pipe and fittings to permit movement.
- Joint rings with stainless steel locking segments may be used to replace anchor blocks subject to approval of individual designs by the Director of Engineering Services.

ANCHORAGE THRUST AREA (m²) FOR 1000kPa TEST PRESSURE

		SAFE BEARING CAPACITY OF GROUND (kPa)														
		90° Bends			45° Bends			22 1/2° Bends			11 1/4° Bends			Valves, Tees & Dead Ends		
		50	100	200	50	100	200	50	100	200	50	100	200	50	100	200
DIAMETER Valve, Bend or Branch of Tee	100	0.24	0.12	0.07	0.12	0.07	0.07	0.07	0.07	0.07	N	N	N	0.17	0.10	0.07
	150	0.51	0.26	0.14	0.28	0.14	0.07	0.14	0.07	0.07	N	N	N	0.38	0.19	0.10
	200	0.93	0.47	0.24	0.49	0.28	0.14	0.26	0.14	0.07	0.14	0.07	0.07	0.63	0.33	0.17
	250	1.40	0.70	0.35	0.77	0.40	0.21	0.40	0.21	0.12	0.21	0.12	0.07	0.98	0.49	0.26
	300	2.00	1.00	0.54	1.10	0.56	0.28	0.56	0.28	0.14	0.31	0.17	0.12	1.42	0.72	0.38
375	3.12	1.56	0.82	1.70	0.86	0.45	0.86	0.45	0.24	0.45	0.24	0.12	2.21	1.12	0.56	

NOTE: In solid rock minimum areas as approved by Engineer

BEARING CAPACITIES	
GROUND DESCRIPTION	SAFE BEARING CAPACITY (kPa)
Solid Rock	> 200
Hard Clays Cohesive Gravels Shales	200
Sandy Clays (Non cohesive) Well graded Sands Well graded Gravels	100
Soft Clays Blacksoils Loose Sands	50

NOTE: Maximum safe bearing capacities to be approved by Engineer

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NOTES : Not to Scale
Supersedes TW2B

DISCLAIMER. The City of the Council of Thuringowa shall have no liability or responsibility to the user or any other person or entity with respect to any liability, loss or damage caused or alleged to be caused, directly or indirectly, by the adoption and use of these Standard Drawings. Persons must not rely on these Standard Drawings as the equivalent of, or a substitute for, project-specific design and assessment by an appropriately qualified professional.



CITY OF THURINGOWA

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DRAWN: NRN

Engineer Approved: Original Signed by C.Phillips Date: 13/12/1999

CHECKED: WJP

D.E.S. Approved: Original Signed by K.Shephard Date: 13/12/1999

**PRESSURE MAIN FITTINGS
ANCHORAGE DETAILS - PLAN VIEWS**

**STANDARD
DRAWING
WATER**

10310

No.	DATE	DESCRIPTION	AP'D
A	1/7/99	ORIGINAL ISSUE	
REVISIONS			

A