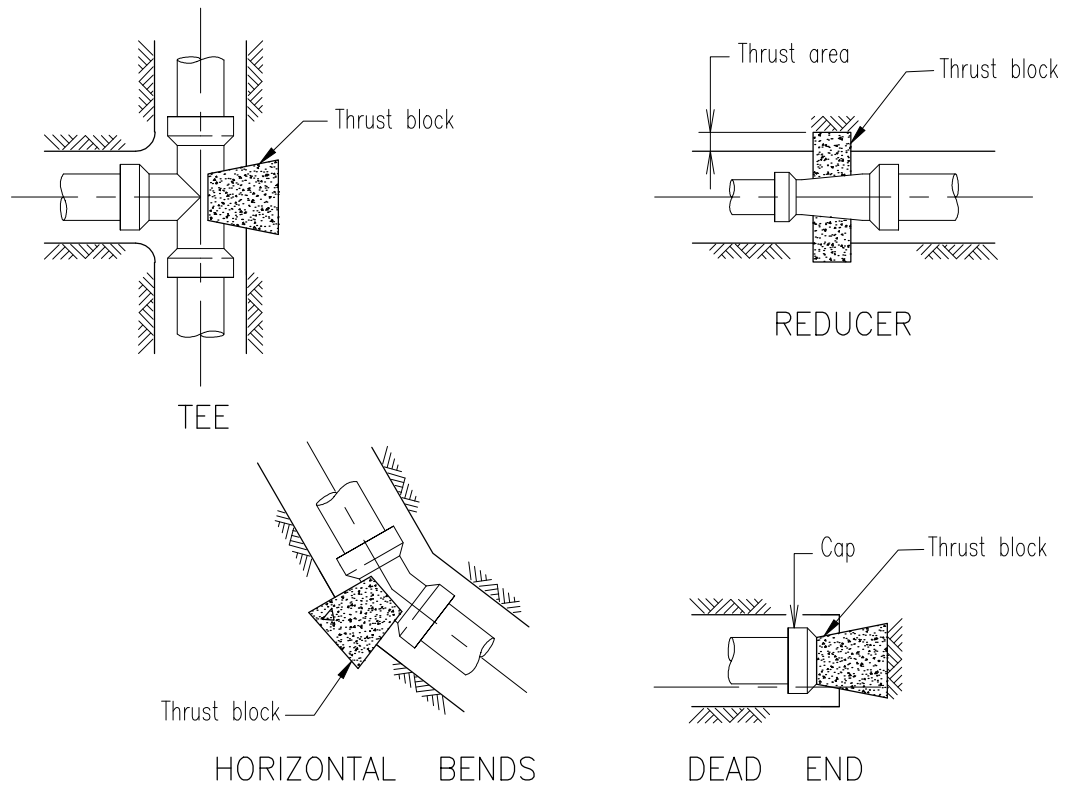


**MINIMUM THRUST AREA FOR ANCHORAGE IN SQUARE METRES
WITH TEST PRESSURE 1300 kPa (NOM. 130m - HEAD)**



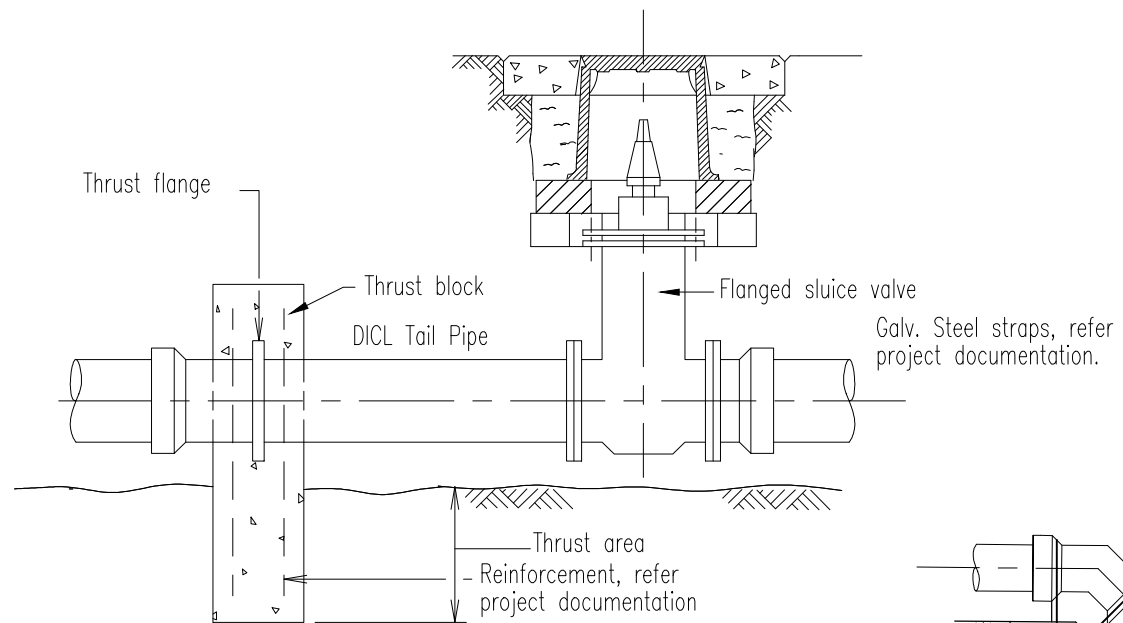
SAFE HORIZONTAL BEARING CAPACITY OF GROUND

For horizontal thrusts, the safe bearing load values for soils in trenches, where the cover over pipes is 450mm or greater.

DIAMETER OF FITTING	90° & 60° HORIZ. BENDS				45° & 30° HORIZ. BENDS				22 1/2° HORIZ. BENDS				11 1/4° HORIZ. BENDS				TEES & DEAD ENDS						
	50 kPa SOFT CLAY	FIRM CLAY SANDY LOAM 100 kPa	SAND & GRAVEL HARD CLAY 150 kPa	SAND & GRAVEL CEMENTED WITH CLAY 200 kPa	50 kPa SOFT CLAY	FIRM CLAY SANDY LOAM 100 kPa	SAND & GRAVEL HARD CLAY 150 kPa	SAND & GRAVEL CEMENTED WITH CLAY 200 kPa	50 kPa SOFT CLAY	FIRM CLAY SANDY LOAM 100 kPa	SAND & GRAVEL HARD CLAY 150 kPa	SAND & GRAVEL CEMENTED WITH CLAY 200 kPa	50 kPa SOFT CLAY	FIRM CLAY SANDY LOAM 100 kPa	SAND & GRAVEL HARD CLAY 150 kPa	SAND & GRAVEL CEMENTED WITH CLAY 200 kPa	50 kPa SOFT CLAY	FIRM CLAY SANDY LOAM 100 kPa	SAND & GRAVEL HARD CLAY 150 kPa	SAND & GRAVEL CEMENTED WITH CLAY 200 kPa			
100	0.44	0.22	0.15	0.11	0.23	0.12	N	N	0.13	N	N	N	N	N	N	N	N	N	N	0.31	0.16	0.11	N
150	0.91	0.46	0.30	0.23	0.49	0.25	0.16	0.12	0.26	0.13	0.09	N	0.13	N	N	N	0.65	0.33	0.22	0.16			
200	1.56	0.78	0.52	0.39	0.83	0.42	0.28	0.21	0.44	0.22	0.15	0.11	0.21	0.10	N	N	1.09	0.55	0.36	0.27			
250	2.37	1.18	0.79	0.59	1.27	0.64	0.42	0.32	0.65	0.33	0.22	0.16	0.34	0.17	0.11	N	1.66	0.83	0.55	0.42			
300	3.46	1.73	1.15	0.86	1.87	0.94	0.62	0.47	0.96	0.48	0.32	0.24	0.47	0.23	0.16	0.12	2.44	1.22	0.81	0.61			
375	5.25	2.63	1.75	1.31	2.83	1.42	0.94	0.71	1.46	0.73	0.49	0.36	0.73	0.36	0.24	0.18	3.72	1.86	1.24	0.93			
450	7.44	3.72	2.48	1.86	4.03	2.02	1.34	1.01	2.05	1.03	0.68	0.51	1.04	0.52	0.35	0.26	5.25	2.63	1.75	1.31			

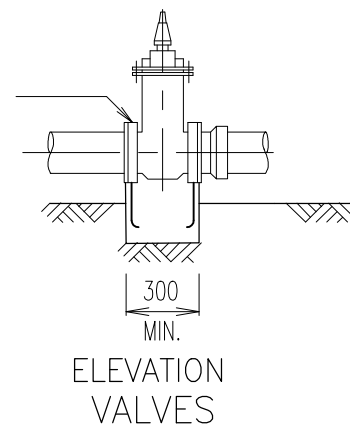
'N' Denotes nominal thrust area (Refer Note 5)

PLAN AT FITTINGS



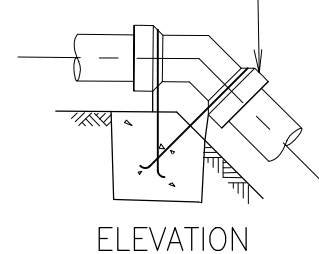
SLUCE VALVE (Ø300 OR LESS - SOFT CLAY)

(REFER NOTE 8)



ELEVATION VALVES

Hold down bolts & straps, refer valves elevation. (size of straps to have RPEQ certification)



VERTICAL BENDS, CRESTS

Concrete volume (m³)

DIA.	90°	60°	45°	30°	22 1/2°	11 1/4°
100	0.50	0.40	0.30	0.20	0.15	0.10
150	1.25	0.90	0.70	0.50	0.35	0.20
200	2.25	1.70	1.25	0.80	0.65	0.35
250	3.50	2.50	1.90	1.30	1.00	0.50
300	4.90	3.50	2.70	1.80	1.40	0.70

NOTES

- All fittings shall be provided with thrust blocks formed against solid ground to transfer unbalanced forces from fitting to solid ground.
- Concrete N25 in accordance with AS 1379 Supp 1-1997/Amdt 1-2000 and AS 3600-2001/Amdt 2-2004.
- Nominal thrust area 'N' shall be effected by Class N25 concrete over full length of fitting, and extending in depth from the bottom of the trench to 65mm above the top of the fitting.
- Minimum area of blocks for reducers shall be equal to the difference in corresponding area for dead ends of each end diameter of reducer.
- Tabulated "minimum thrust area for anchorage" apply for test pressure of 1300 kPa. Areas shall be adjusted pro rata for other specified test pressures except that nominal thrust areas 'N' shall have to be re-calculated for test pressures over 1300 kPa.
- Shape and dimensions of concrete blocks shown are diagrammatic only.
- For vertical thrust acting downwards, the safe bearing loads of the various soils may be taken as twice those for horizontal thrusts.
- Sluce valves Ø375 or larger shall be installed in valve pits.
- When placing the concrete on a uPVC pipe, care shall be taken to avoid encasing the pipe completely. The maximum encasement shall be 180°.
- Where uPVC rubber ring jointed pipes are used, the normal practice of anchoring of bends tees, dead ends and reducers shall be followed.
- When setting uPVC pipes in concrete a membrane of polythene, PVC or felt shall surround the pipe and fitting to permit pipe movement in the concrete.
- Unless otherwise specified, concrete anchorages are required for all valves Ø200 and above. Thrust area shall be as for dead ends.
- Reducers to have a minimum area for anchors equal to difference in corresponding area for dead ends of each diameter of reducer.
- Minimum cover to pipe shall be 600mm
- All dimensions in millimetres.
- All thrust blocks to be keyed in 50mm into natural or equivalent ground.

APPLICABILITY TABLE

Council	BSC	CHRC	GRC	IRC	LSC	MRC	RRC
Applicable	Yes	Yes	Yes	Yes	Yes	Yes	Yes

REVISIONS	DATE
E IRC ADDED	11/2016
D GRC AND LSC ADDED	09/2014
C NOTE 2 AMENDED	02/2013
B RRC AMENDMENTS	05/2011
A ORIGINAL ISSUE	01/2010

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Capricorn Municipal Development Guidelines

Incorporating:
Banana Shire Council (BSC) Livingstone Shire Council (LSC)
Central Highlands Regional Council (CHRC) Maranoa Regional Council (MRC)
Gladstone Regional Council (GRC) Rockhampton Regional Council (RRC)
Isaac Regional Council (IRC)

**WATER MAIN
THRUST BLOCK DETAILS**

ROADS				
STANDARD DRAWING				
CMDG-W-041				
REV.	A	B	C	D