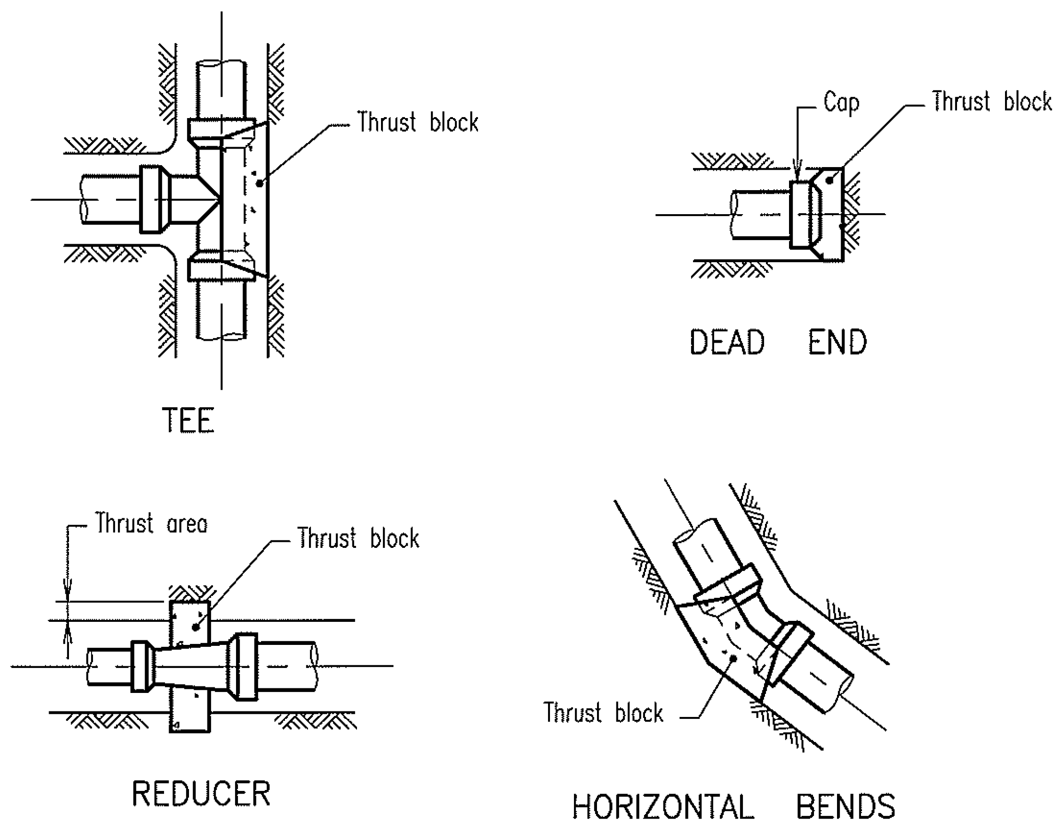
MINIMUM THRUST AREA FOR ANCHORAGE IN SQUARE METRES WITH TEST PRESSURE 1300 kPa (NOM. 130m – HEAD)

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	100 kPa FIRM CLAY SANDY LOAM	150 kPa SAND & GRAVEL HARD CLAY	200 kPa SAND & GRAVEL CEMENTED WITH CLAY	50 kPa SOFT CLAY	100 kPa FIRM CLAY SANDY LOAM	150 kPa SAND & GRAVEL HARD CLAY	200 kPa SAND & GRAVEL CEMENTED WITH CLAY	50 kPa SOFT CLAY	100 kPa FIRM CLAY SANDY LOAM	150 kPa SAND & GRAVEL HARD CLAY	200 kPa SAND & GRAVEL CEMENTED WITH CLAY	50 kPa SOFT CLAY	100 kPa FIRM CLAY SANDY LOAM	150 kPa SAND & GRAVEL HARD CLAY	200 kPa SAND & GRAVEL CEMENTED WITH CLAY	50 kPa SOFT CLAY	100 kPa FIRM CLAY SANDY LOAM	150 kPa SAND & GRAVEL HARD CLAY	200 kPa SAND & GRAVEL CEMENTED WITH CLAY
100	0.44	0.22	0.15	0.11	0.23	0.12	N	N	0.13	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

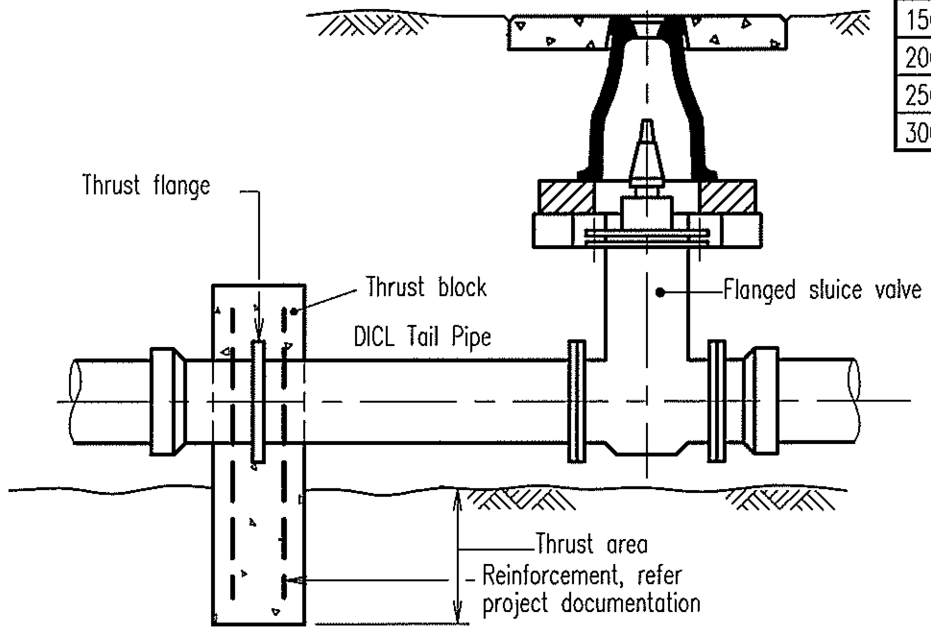
'N' Denotes nominal thrust area (Refer Note 5)



PLAN AT FITTINGS

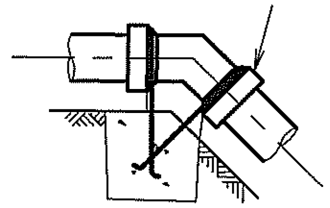
Concrete volume (m³)

DIA.	90°	60°	45°	30°	22½°	11¼°
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

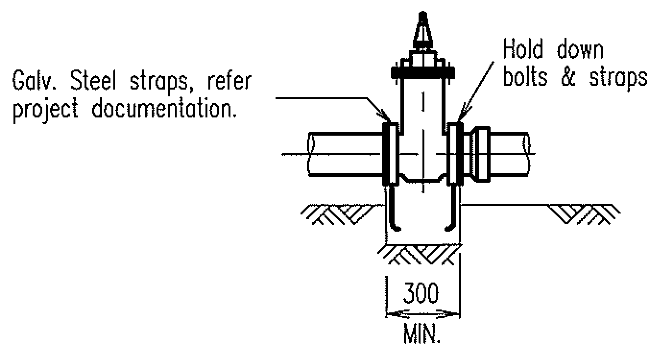


SLUICE VALVE (Ø300 OR LESS – SOFT CLAY)

(REFER NOTE 8)



VERTICAL BENDS, CRESTS



VALVES

NOTES

1. All fittings shall be provided with thrust blocks formed against solid ground to transfer unbalanced forces from fitting to solid ground.
2. Concrete N25 in accordance with AS 1379 and AS 3600.
3. 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.
4. Minimum area of blocks for reducers shall be equal to the difference in corresponding area for dead ends of each end diameter of reducer.
5. 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.
6. Shape and dimensions of concrete blocks shown are diagrammatic only.
7. For vertical thrust acting downwards, the safe bearing loads of the various soils may be taken as twice those for horizontal thrusts.
8. Sluice valves Ø375 or larger shall be installed in valve pits.
9. When placing the concrete on a uPVC pipe, care shall be taken to avoid encasing the pipe completely. The maximum encasement shall be 180°.
10. Where uPVC rubber ring jointed pipes are used, the normal practice of anchoring of bends, tees, dead ends and reducers shall be followed.
11. 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.
12. Unless otherwise specified, concrete anchorages are required for all valves Ø200 and above. Thrust area shall be as for dead ends.
13. Reducers to have a minimum area for anchors equal to difference in corresponding area for dead ends of each diameter of reducer.
14. Minimum cover to pipe shall be 600mm
15. All dimensions in millimetres.

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INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.

WATER MAIN THRUST BLOCK DETAILS

WATER
Standard Drawing
W-0041
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JWP – CADENZA 113327-W-0041