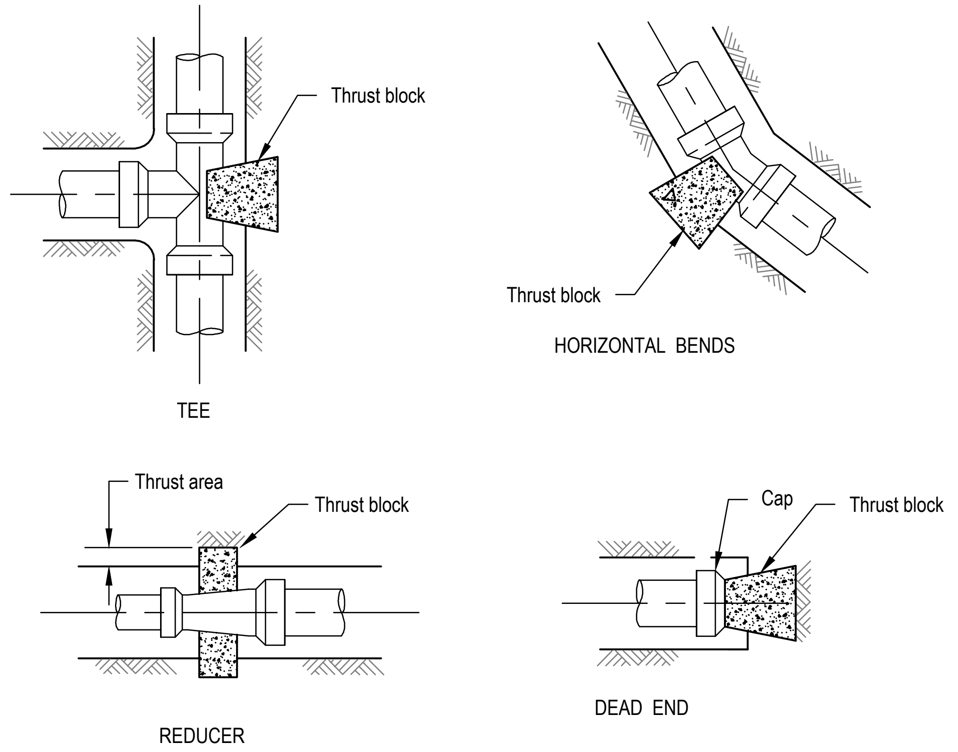


TEE

HORIZONTAL BENDS

REDUCER

DEAD END

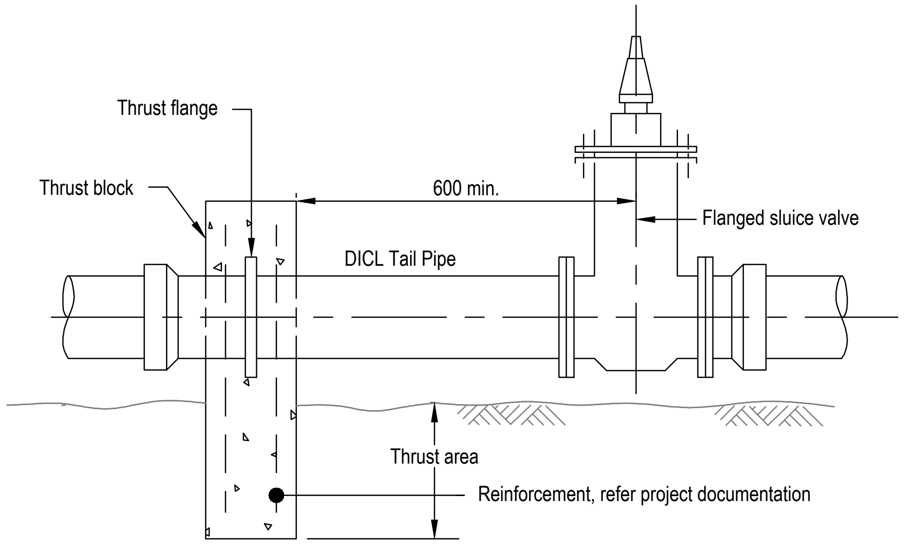
PLAN AT FITTINGS

Scale NTS

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

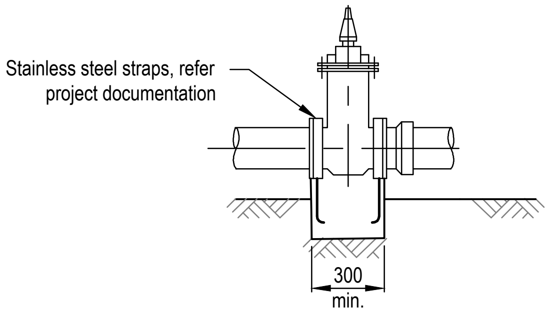
SAFE HORIZONTAL BEARING CAPACITY OF GROUND	90^0& 60 ^{0} HORIZ. BENDS				45^0& 30 ^{0} HORIZ. BENDS				22 1/2 ^{0} HORIZ. BENDS				11 1/4 ^{0} HORIZ. BENDS				TEES & DEAD ENDS			
For horizontal thrusts, the safe bearing load values for soils in trenches, where the cover over pipes is 450mm or greater.	SOFT CLAY	FIRM CLAY SANDY LOAM	SAND & GRAVEL HARD CLAY	SAND & GRAVEL CEMENTED WITH CLAY	SOFT CLAY	FIRM CLAY SANDY LOAM	SAND & GRAVEL HARD CLAY	SAND & GRAVEL CEMENTED WITH CLAY	SOFT CLAY	FIRM CLAY SANDY LOAM	SAND & GRAVEL HARD CLAY	SAND & GRAVEL CEMENTED WITH CLAY	SOFT CLAY	FIRM CLAY SANDY LOAM	SAND & GRAVEL HARD CLAY	SAND & GRAVEL CEMENTED WITH CLAY	SOFT CLAY	FIRM CLAY SANDY LOAM	SAND & GRAVEL HARD CLAY	SAND & GRAVEL CEMENTED WITH CLAY
DIAMETER OF FITTING	50 kPa	100 kPa	150 kPa	200 kPa	50 kPa	100 kPa	150 kPa	200 kPa	50 kPa	100 kPa	150 kPa	200 kPa	50 kPa	100 kPa	150 kPa	200 kPa	50 kPa	100 kPa	150 kPa	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	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	O.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)



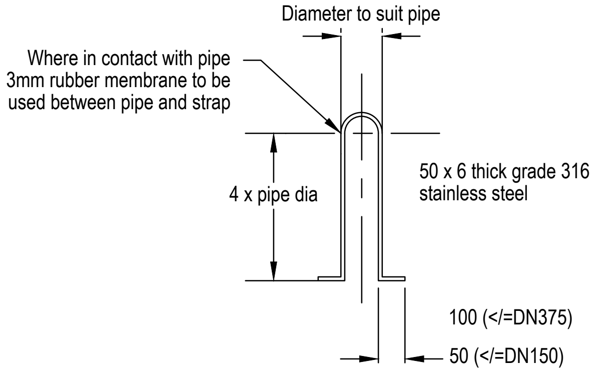
SLUICE VALVE (Ø300 OR LESS - SOFT CLAY)

(REFER NOTE 8)
Scale NTS



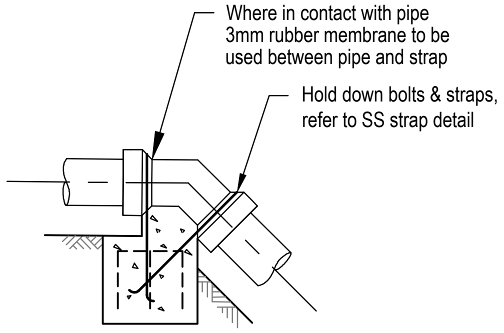
ELEVATION VALVES

Scale NTS



TYPICAL SS STRAP

Scale NTS



ELEVATION

Scale NTS

Concrete volume m^3

DIA.	90º	60º	45º	30º	22½º	11¼º
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

VERTICAL BENDS, CRESTS

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 PVC pipe, care shall be taken to avoid encasing the pipe completely. The maximum encasement shall be 180º.
10. Where PVC rubber ring jointed pipes are used, the normal practice of anchoring of bends tees, dead ends and reducers shall be followed.
11. When setting PVC 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.
16. All thrust blocks to be keyed in 50mm into natural or equivalent ground.
17. If solid natural ground does not exist then RPEQ Engineer is to design and identify options.

APPLICABILITY TABLE

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

REVISIONS		DATE
F	VERTICAL HOLD DOWN AMENDED	05/2022
E	IRC ADDED	11/2016
D	GRC AND LSC ADDED	09/2014
C	NOTE 2 AMMENDED	02/2013
B	RRC AMMENDMENTS	05/2011
A	ORIGINAL ISSUE	01/2010

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

WATER MAIN
THRUST BLOCK DETAILS

WATER
STANDARD DRAWING
A3
CMDG-W-041
REV. A B C D E F