



PVC NON-ENCROACHING THRUST RESTRAINT CALCULATIONS

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Scale: N.T.S.

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PIPE DIA.	HORIZONTAL BENDS AND VERTICAL UP BENDS				VERTICAL DOWN BENDS		DEAD ENDS	PIPE DIA.
	11.25°	22.5°	45°	90°	22.5°	45°		
4"	1	3	5	13	7	15	25	4"
6"	2	4	8	19	10	22	35	6"
8"	2	5	10	24	13	28	47	8"
10"	3	6	12	29	16	34	56	10"
12"	3	7	14	35	19	40	67	12"
16"	4	9	19	45	25	53	87	16"
20"	5	11	23	55	31	65	107	20"
24"	6	13	27	65	37	76	127	24"
30"	8	16	32	78	45	93	156	30"
36"	9	18	38	92	53	110	185	36"

TEE BRANCH RESTRAINT (ASSUMED RESTRAINT OF "RUN" PIPE IS 20' EACH SIDE OF TEE)

TEE BRANCH DIAMETER

TEE RUN DIA.	4"	6"	8"	10"	12"	16"	20"	24"	30"	36"	TEE RUN DIA.
4"	0										4"
6"	0	0									6"
8"	0	0	0								8"
10"	0	0	0	0							10"
12"	0	0	0	0	0						12"
16"	0	0	0	0	0	13					16"
20"	0	0	0	0	0	0	33				20"
24"	0	0	0	0	0	0	17	52			24"
30"	0	0	0	0	0	0	0	33	81		30"
36"	0	0	0	0	0	0	0	14	65	110	36"

NOTES:

1. ASSUMPTIONS

- 1.1. PVC
- 1.2. DESIGN/TEST PRESSURE= 150PSI
- 1.3. SAFETY FACTOR ± 1.5 (RECOMMENDED BY DIPRA)
- 1.4. TYPE 3 LAYING CONDITION (REP. OF ACTUAL FIELD CON.)
- 1.5. 5' COVER
- 1.6. SOIL/BACKFILL CONDITIONS = CLAY 2 (DIPRA CHART)

2. CALCULATED RESTRAINT LENGTHS ARE FOR EACH SIDE OF THE FITTING. ALL FITTINGS SHALL BE RESTRAINED THE CALCULATED LENGTH AT A MINIMUM.

3. IF FITTINGS ARE IN CLOSE PROXIMITY TO EACH OTHER AND THE CALCULATED RESTRAINED LENGTHS OVERLAP, TABLE 1 IS NOT APPLICABLE REFER TO THE DIPRA DESIGN MANUAL FOR RESTRAINED LENGTH CALCULATIONS FOR ENCROACHMENT APPLICATIONS.