



***PVC NON-ENCROACHING THRUST RESTRAINT CALCULATIONS**

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"

***NOTE:** If fittings are in close proximity to each other and the calculated restrained lengths overlap, the above table is not applicable. Refer to the DIPRA design Manual for restrained length calculations for encroachment applications.

Tee Branch Restraint
(Assumed Restraint of "Run" Pipe is 20 ft each side of Tee)
Tee Branch Diameter

Tee Run Dia.	4"	6"	8"	10"	12"	16"	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"

CITY OF FORT WAYNE

Assumptions

PVC Pipe

Design/Test Pressure=150 psi

Safety Factor = 1.5 (recommended by DIPRA)

Type 3 laying condition (rep. of actual field con.)

5' Cover

Soil/Backfill Conditions = CL (Design of Underground Thrust Restraint Systems for PVC)

= Saturated Soil

Calculated restraint lengths are for each side of the fitting. All fittings shall be restrained for the calculated length at a minimum.