



THRUST RESTRAINT CALCULATIONS (NON-POLYWRAPPED DIP)

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Scale: N.T.S.

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NON-POLYWRAPPED DIP 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	6	15	5	11	27	4"
6"	2	4	9	21	8	16	39	6"
8"	3	5	11	27	10	21	51	8"
10"	3	7	14	33	12	26	62	10"
12"	4	8	16	40	15	31	74	12"
16"	5	10	21	52	19	41	98	16"
20"	6	13	26	64	24	50	122	20"
24"	7	15	31	76	29	60	145	24"
30"	9	19	39	93	36	75	180	30"
36"	11	22	46	110	43	89	215	36"

TEE BRANCH RESTRAINT (ASSUMED RESTRAINT OF "RUN" PIPE IS 20FT 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	5							10"
12"	0	0	0	0	11						12"
16"	0	0	0	0	3	22					16"
20"	0	0	0	0	0	16	34				20"
24"	0	0	0	0	0	9	28	45			24"
30"	0	0	0	0	0	0	21	39	62		30"
36"	0	0	0	0	0	0	13	32	57	79	36"

NOTES:

1. ASSUMPTIONS

- 1.1. NON POLYWRAPPED DUCTILE IRON PIPE
- 1.2. DESIGN/TEST PRESSURE= 150PSI
- 1.3. SAFETY FACTOR - + 1.5 (RECOMMENDED BY DIPRA)
- 1.4. TYPE 3 LAYING CONDITION (REP. RECOMMENDED BY DIPRA)
- 1.5. TYPE 3 LAYING CONDITION (REP. OF ACTUAL FIELD CON.)
- 1.6. 5' COVER
- 1.7. 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.