

Minimum Restrained Lengths (in feet) back from both sides of fitting

Fitting type/nominal size	4"	6"	8"	10"	12"	16"
90 Degree Bend	17	25	32	38	45	59
45 Degree Bend	7	10	13	16	19	24
22.5 Degree Bend	3	5	6	8	9	12
11.25 Degree Bend	2	2	3	4	4	6
Dead End	39	55	73	87	103	134
Top Side Vertical Offset * (45 Degree)	16	23	30	36	43	55
Bottom Side Vertical Offset * (45 Degree)	4	6	8	10	11	15
Tee Run X Branch **	6" by		1	17		
Tee Run X Branch **	8" by		1	5	34	
Tee Run X Branch **	10" by		1	1	24	49
Tee Run X Branch **	12" by		1	1	15	41
Tee Run X Branch **	16" by		1	1	1	26
Reducer ***	6" by		28			
Reducer ***	8" by		52	30		
Reducer ***	10" by		71	54	29	
Reducer ***	12" by		90	75	55	51
Reducer ***	16" by		123	113	97	94

* Vertical offset with minimum 10' of solid pipe between upper and lower bend.
 ** Tee with MINIMUM 10' solid pipe on both sides of run. Number indicates length of branch to be restrained.
 *** Length back from Large End of Reducer.

WATER MAIN RESTRAINT
DATE: 3-31-09

