

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	65		
Tee Run X Branch **							
16" by	1	1	1	26	52	95	
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	54		

* 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 Eng of Reducer.

**WATER MAIN
RESTRAINT**

DATE: 3-31-09