DUCTILE IRON

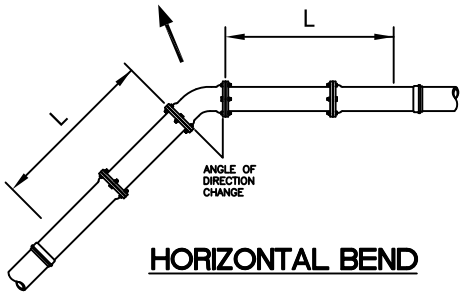
Pipe Size (in)	Minimum Pipe Length to be Restrained, L (ft)							
	Horizontal Fittings						45° Vertical Offset	
	90°	45°	22.5°	11.25°	Dead Ends/Valves	Equal Tees	L_{UPPER}	L_{LOWER}
3	22	10	5	3	46	1	19	10
4	27	11	6	3	56	1	23	11
6	38	16	8	4	79	1	33	16
8	48	20	10	5	101	11	42	20
10	58	24	12	6	123	32	51	24
12	67	28	14	7	143	51	59	28
14	76	32	15	8	164	70	68	32
16	84	35	17	9	182	88	76	35
18	92	38	19	10	202	106	84	38
20	100	42	20	10	219	123	91	42
24	114	48	23	12	255	156	106	48

PVC

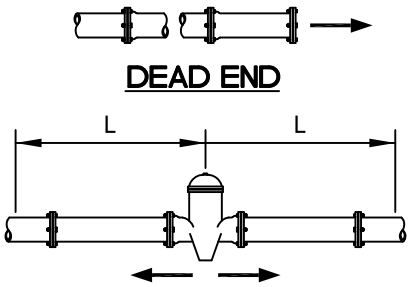
Pipe Size (in)	Minimum Pipe Length to be Restrained, L (ft)							
	Horizontal Fittings						45° Vertical Offset	
	90°	45°	22.5°	11.25°	Dead Ends/Valves	Equal Tees	L_{UPPER}	L_{LOWER}
3	25	11	5	3	61	1	26	11
4	30	13	6	3	73	1	31	13
6	43	18	9	5	105	1	44	18
8	54	23	11	6	133	14	55	23
10	65	27	13	7	162	42	67	27
12	75	31	15	8	189	67	78	31
14	85	36	17	9	216	93	90	36
16	94	39	19	10	241	116	100	39
18	104	43	21	11	267	140	111	43
20	112	47	23	11	290	162	120	47
24	128	53	26	13	337	206	140	53

NOTES:

1. CALCULATIONS ARE BASED ON THE FOLLOWING ASSUMPTIONS:
   TEST PRESSURE = 150 PSI, SOIL GROUP = SM, TRENCH TYPE = 3, DEPTH = 2.5', SAFETY FACTOR = 2
2. WITH EQUAL TEES, THE DISTANCE OF THE RUN LENGTH IS ASSUMED TO BE 40'. FOR OTHER RUN LENGTHS, INDIVIDUAL CALCULATIONS MUST BE MADE.
3. AS A MINIMUM, PIPE RESTRAINTS ARE TO BE PLACED ON THE FIRST JOINT FROM THE FITTING.
4. FOR ALL NEW CONSTRUCTION, WHEN A PIPE MUST BE INSTALLED IN A CASING THE REQUIRED JOINT RESTRAINTS MUST ALSO BE INSTALLED INSIDE THE CASING. THE CASING IS TO BE SIZED ACCORDINGLY.
5. FOR AN EXISTING MAIN LOCATED UNDER A PAVED SURFACE, THE CONTRACTOR WILL NOT BE REQUIRED TO PLACE RESTAINTS ON THE EXISTING PIPE.
6. FOR AN EXISTING MAIN NOT LOCATED UNDER A PAVED SURFACE, THE CONTRACTOR WILL BE REQUIRED TO PLACE RESTAINTS ON THE EXISTING PIPE.
7. L IS THE CALCULATED LENGTH OF PIPE TO BE RESTRAINED.

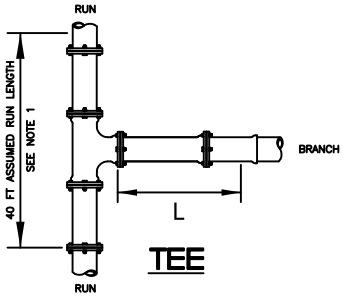


HORIZONTAL BEND



DEAD END

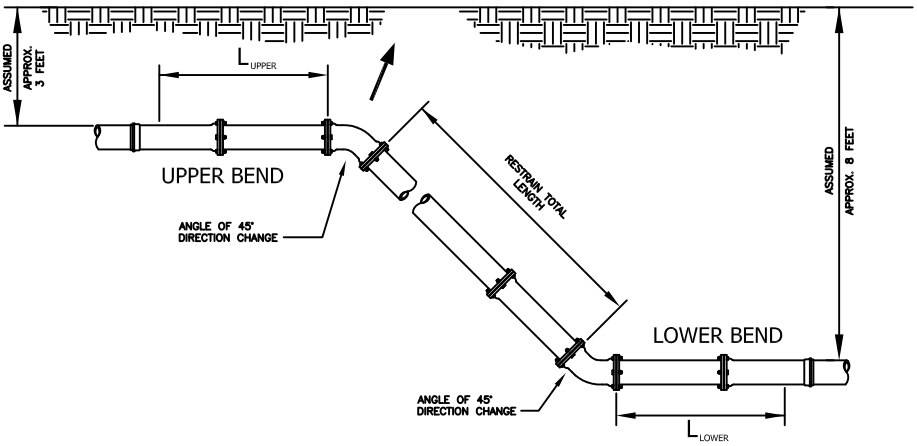
VALVE



TEE

NOTES:

1. AS A MINIMUM, RESTRAINTS SHALL BE INSTALLED ON THE FIRST JOINT ON ITHER SIDE OF THE TEE (RUN).



VERTICAL OFFSET PROFILE

EMERALD COAST UTILITIES AUTHORITY

SCALE: N.T.S.

DATE: 12/18/14

PIPE JOINT RESTRAINT TABULATION

DETAIL

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