

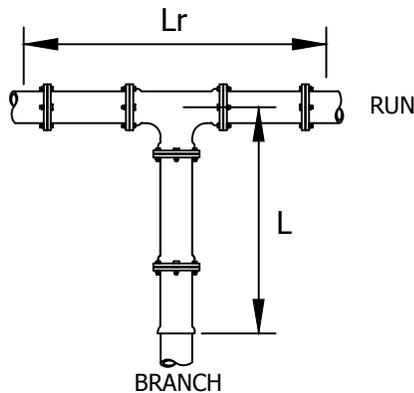
DUCTILE IRON											DUCTILE IRON										
STRAIGHT REDUCERS											REDUCING TEES										
Pipe Diameter (in)	Minimum Pipe Length to be Restrained, L (ft)										Pipe Diameter (in)	Minimum Pipe Length to be Restrained, Lb (ft)									
	4	6	8	10	12	14	16	18	20	24		4	6	8	10	12	14	16	18	20	24
3	18	54	81								3	1	1	1							
4		42	72	100	124						4		1	1	1	1	1				
6			41	75	103	130	153				6			1	1	1	1	1	1	1	1
8				43	77	108	133	159			8				1	1	1	1	1	1	1
10					41	77	107	136	161		10					12	1	1	1	1	1
12						43	78	110	137	188	12						32	14	1	1	1
14							41	78	108	165	14							55	38	21	1
16								42	77	139	16								73	59	27
18									40	109	18									94	66
20										77	20										98

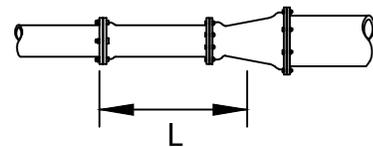
PVC											PVC										
STRAIGHT REDUCERS											REDUCING TEES										
Pipe Diameter (in)	Minimum Pipe Length to be Restrained, L (ft)										Pipe Diameter (in)	Minimum Pipe Length to be Restrained, Lb (ft)									
	4	6	8	10	12	14	16	18	20	24		4	6	8	10	12	14	16	18	20	24
3	24	71	107								3	1	1	1							
4		55	95	132	164						4		1	1	1	1	1				
6			54	99	136	172	203				6			1	1	1	1	1	1	1	1
8				57	101	142	177	210			8				1	1	1	1	1	1	1
10					54	102	142	180	213		10					16	1	1	1	1	1
12						57	103	146	182	249	12						43	19	1	1	1
14							54	103	144	217	14							73	50	28	1
16								56	102	184	16								97	78	36
18									53	143	18									124	87
20										101	20										130

**NOTES:**

1. CALCULATIONS ARE BASED ON THE FOLLOWING ASSUMPTIONS:  
TEST PRESSURE = 150 PSI, SORL GROUP = SM, TRENCH TYPE = 3, DEPTH = 2.5', SAFETY FACTOR = 2
2. WITH REDUCING TEES, THE DISTANCE OF THE RUN LENGTH IS ASSUMED TO BE 40'. FOR OTHER RUN LENGTHS (Lr), 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 RESTRAINTS ON THE EXISTING PIPE.
6. FOR AN EXISTING MAIN NOT LOCATED UNDER A PAVED SURFACE, THE CONTRACTOR WILL BE REQUIRED TO PLACE RESTRAINTS ON THE EXISTING PIPE.



**REDUCING TEE**



**STRAIGHT REDUCER**



SCALE: N.T.S.  
DATE: 9/01/2016

**PIPE JOINT RESTRAINT  
REDUCERS & REDUCING TEES**

DETAIL

**D-63**