Minimum Restrained Lenghts (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.

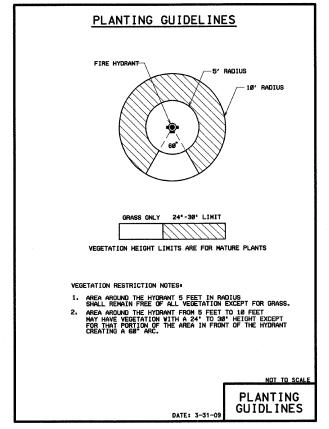
** Tee with MINIMUM 10' solid pipe on both sides of run.

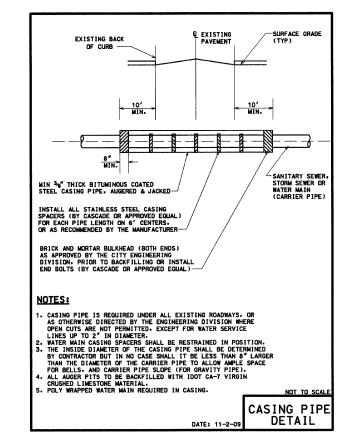
Number indicates length of branch to be restrained.

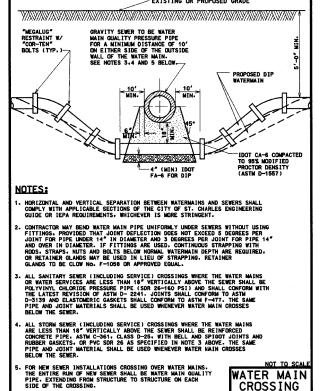
*** Length back from Large Eng of Reducer.

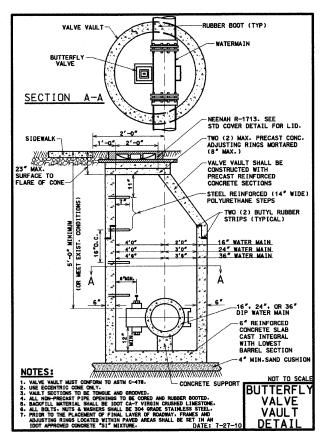
WATER MAIN RESTRAINT

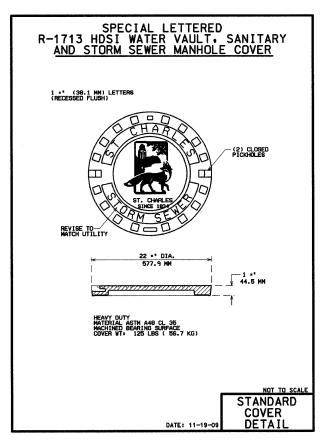
DATE: 3-31-0 EXISTING OR PROPOSED GRADE











FILE NAME =	USER NAME = \$USER\$	DESIGNED -	REVISED -		IL RTE 64 SANITARY AND WATER MAIN IMPROVEMENTS						SECTION	COUNTY	TOTAL	SHEET NO.
P:\2010\100186\cad\IDOT WM\dwg\100186-st	t-details.dgn	DRAWN -	REVISED -	STATE OF ILLINOIS						307	129 R-2	KANE	243	184
Ì	PLOT SCALE = \$SCALE\$	CHECKED -	REVISED -	DEPARTMENT OF TRANSPORTATION	DETAILS			CITY (CITY OF ST. CHARLES CON		CT NO.	52195		
	PLOT DATE = \$DATE\$	DATE -	REVISED -		SCALE:	SHEET NO. OF	SHEETS	STA.	TO STA.	ILLINOIS F		FED. AID PROJECT		

CROSSING

DETAIL

DATE: 3-31-09