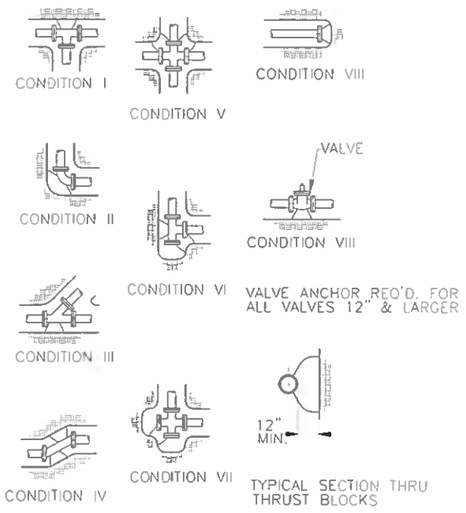
CONCRETE THRUST BLOCK RESTRAINING SYSTEM DETAILS



THRUST BLOCK BEARING AREA IN SQ. FT.								
PIPE SIZE	CONDITION I	II	III	IV	V	VI	VII	VIII
4	2.6	3.3	2.6	1.3	1.3	2.0	3.3	2.6
6	4.6	6.5	3.6	2.0	2.6	3.3	3.3	4.6
8	7.8	11.0	5.9	3.3	3.9	5.9	11.0	7.8
10	12.4	17.5	9.8	5.2	6.5	9.1	17.5	12.4
12	17.5	24.5	13.6	7.8	9.1	12.3	24.8	17.5
14	24.0	33.8	18.2	9.7	12.3	16.9	33.8	24.0
16	31.1	44.0	23.8	12.7	15.5	23.2	44.0	31.1

NOTES:
1. ALL THRUST BLOCK BEARING FACES SHALL BE PLACED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL
2. CONCRETE SHALL BE CLASS 3500.
3. CALCULATED ON 225 LB. TEST PRESSURE & ALLOWABLE BEARING PRESSURE OF 2000 LBS. PER SQ. FT.
4. IN POORER SOILS SPECIAL DESIGN REQ'D.
5. ALL THRUST BLOCK SIDES SHALL BE FORMED.
6. ALL PIPE FITTINGS TO BE WRAPPED WITH VISQUINE PRIOR TO THRUST BLOCK INSTALLATION.
7. CONTRACTOR SHALL USE EITHER MEGALUG OR CONCRETE THRUST RESTRAINING SYSTEM FOR THE ENTIRE PROJECT UNLESS SPECIFIED OTHERWISE.

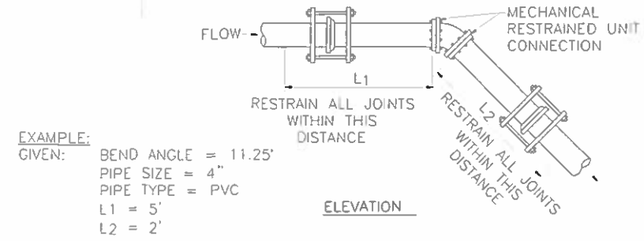
PVC VERTICAL BEND RESTRAINED LENGTHS IN FT. (L_1,–BEFORE CONNECTION/L_2, AFTER CONNECTION)										
BEND ANGLE	PIPE SIZE 4	6	8	10	12	14	16	18	20	24
11.25	5/2	7/2	9/3	11/4	13/4	15/5	17/5	19/6	21/6	24/7
22.5	10/3	15/5	19/6	23/7	27/9	31/10	35/11	38/12	42/13	49/15
45	22/7	30/10	40/13	48/15	56/18	64/20	72/23	80/25	87/27	102/31

CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND.

NOTE
FOR TWO WAY FLOW, SUCH AS FOUND IN DISTRIBUTION SYSTEMS, USE L_1ON BOTH SIDES OF FITTING.

DIP VERTICAL BEND RESTRAINED LENGTHS IN FT. (L_1,BEFORE CONNECTION/L_2,–AFTER CONNECTION)										
BEND ANGLE	PIPE SIZE 4	6	8	10	12	14	16	18	20	24
11.25	3/1	5/2	6/3	7/3	8/4	10/4	11/5	12/5	13/5	15/6
22.5	7/3	9/4	12/5	15/6	17/7	20/8	22/9	24/10	27/11	31/13
45	14/6	19/8	25/11	30/13	36/15	41/17	46/19	51/21	56/23	65/27

CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND.



EXAMPLE:
GIVEN: BEND ANGLE = 11.25°
PIPE SIZE = 4"
PIPE TYPE = PVC
L1 = 5'
L2 = 2'

ELEVATION

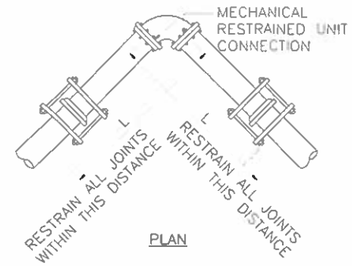
PVC HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.										
BEND ANGLE	PIPE SIZE 4	6	8	10	12	14	16	18	20	24
11.25	2	2	3	4	4	5	5	6	6	7
22.5	3	5	6	7	9	10	11	12	13	15
45	7	10	13	15	18	20	23	25	27	31
90	17	24	31	37	43	49	55	60	65	75

NOTES:
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DIP HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.										
BEND ANGLE	PIPE SIZE 4	6	8	10	12	14	16	18	20	24
11.25	1	2	3	3	4	4	5	5	5	6
22.5	3	4	5	6	7	8	9	10	11	13
45	6	8	11	13	15	17	19	21	23	27
90	14	20	26	31	37	41	46	51	56	64

NOTES:
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

EXAMPLE:
GIVEN: BEND ANGLE = 45°
PIPE SIZE = 6"
PIPE TYPE = PVC
L = 10'



PLAN

PVC TEE RESTRAINED LENGTHS L, IN FT.										
BRANCH SIZE DIA.	RUN SIZE DIAMETER 4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6	*	*	*	*	*	*	*	*	*	*
8	–	–	–	*	*	*	*	*	*	*
10	–	–	–	–	8	*	*	*	*	*
12	–	–	–	–	–	25	5	*	*	*
14	–	–	–	–	–	–	44	24	4	*
16	–	–	–	–	–	–	–	60	43	6
18	–	–	–	–	–	–	–	–	78	45
20	–	–	–	–	–	–	–	–	–	110
24	–	–	–	–	–	–	–	–	–	–

* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE

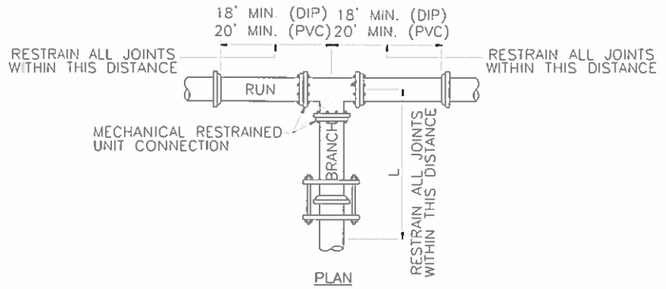
NOTES:
1. RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.
2. ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 20' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.

DIP TEE RESTRAINED LENGTH L, IN FT.										
BRANCH SIZE DIA.	RUN SIZE DIAMETER 4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6	*	*	*	*	*	*	*	*	*	*
8	–	–	–	*	*	*	*	*	*	*
10	–	–	–	1	*	*	*	*	*	*
12	–	–	–	–	13	*	*	*	*	*
14	–	–	–	–	–	24	13	*	*	*
16	–	–	–	–	–	–	36	25	14	*
18	–	–	–	–	–	–	–	47	37	16
20	–	–	–	–	–	–	–	–	58	39
24	–	–	–	–	–	–	–	–	–	78

* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE

NOTES:
1. RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.
2. ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 20' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.

EXAMPLE:
PIPE TYPE = DIP
PIPE SIZE = 16"
L = 36'



PLAN

PVC REDUCER RESTRAINED LENGTHS L, IN FT. (SMALL SIDE/LARGE SIDE)									
D2 \ D1	6	8	10	12	14	16	18	20	24
4	55/38	133/69	226/93	341/118	–	–	–	–	–
6	–	53/40	116/71	194/99	286/123	392/147	–	–	–
8	–	–	48/39	108/72	178/101	258/127	349/151	–	–
10	–	–	–	48/40	108/73	167/103	240/130	320/155	–
12	–	–	–	–	47/40	100/74	160/104	228/132	382/182
14	–	–	–	–	–	45/40	97/74	154/105	285/160
16	–	–	–	–	–	–	45/39	94/74	209/134
18	–	–	–	–	–	–	–	44/39	144/106
20	–	–	–	–	–	–	–	–	90/74

NOTES:
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DIP REDUCER RESTRAINED LENGTHS L, IN FT. (SMALL SIDE/LARGE SIDE)									
D2 \ D1	6	8	10	12	14	16	18	20	24
4	35/24	85/44	144/60	218/75	–	–	–	–	–
6	–	34/36	74/45	125/63	183/78	251/93	–	–	–
8	–	–	31/25	69/46	114/64	165/81	223/96	–	–
10	–	–	–	30/25	66/47	107/66	153/83	205/99	–
12	–	–	–	–	30/25	64/47	102/66	145/84	243/116
14	–	–	–	–	–	29/25	61/47	98/67	181/101
16	–	–	–	–	–	–	28/25	60/47	133/85
18	–	–	–	–	–	–	–	28/25	92/67
20	–	–	–	–	–	–	–	–	57/47

NOTES:
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

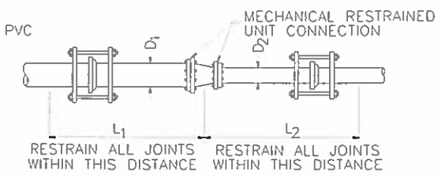
PVC DEAD END RESTRAINED LENGTHS L, IN FT.									
PIPE SIZE 4	6	8	10	12	14	16	18	20	24
52	73	96	115	136	155	174	192	211	246

NOTES:
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

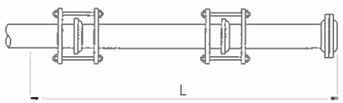
DIP DEAD END RESTRAINED LENGTHS L, IN FT.									
PIPE SIZE 4	6	8	10	12	14	16	18	20	24
33	47	61	73	86	98	111	122	134	156

NOTES:
1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

EXAMPLE:
PIPE TYPE = PVC
D1 = 8"
D2 = 6"
L1 = 40'
L2 = 53'



EXAMPLE:
PIPE TYPE = DIP
PIPE SIZE = 10"
L = 73'



TRENCH TYPE: 5 – PIPE BEDDED IN COMPACTED GRANULAR MATERIAL TO THE CENTER LINE OF PIPE, 4" MIN. UNDER PIPE. COMPACTED GRANULAR OR SELECT MATERIAL TO TOP OF PIPE. (APPROX. 90% STANDARD PROCTOR, AASHTO T-99)

SAFETY FACTOR: 1.5

• CALCULATIONS DERIVED FROM EBAA IRON SALES

NOTES:
1. CONTRACTOR SHALL USE EITHER MEGALUG OR CONCRETE THRUST RESTRAINING SYSTEM FOR THE ENTIRE PROJECT UNLESS SPECIFIED OTHERWISE.
2. CROSSES SHALL BE TREATED AS TEES FOR THE MEGALUG THRUST RESTRAINING SYSTEM.

BASED ON:

TEST PRESSURE: 200 PSI
SOIL TYPE: GM – SILTY GRAVEL, GRAVEL–SAND–SILT MIXTURE
BURIAL DEPTH: 4 FT.

HYDE PARK CITY
113 EAST CENTER
HYDE PARK, UTAH 84318
TEL: (435) 563-6507

HYDE PARK CITY
Established in 1860

SUNRISE ENGINEERING

THRUST BLOCK DETAILS

IR-10

DATE: 02-10-21