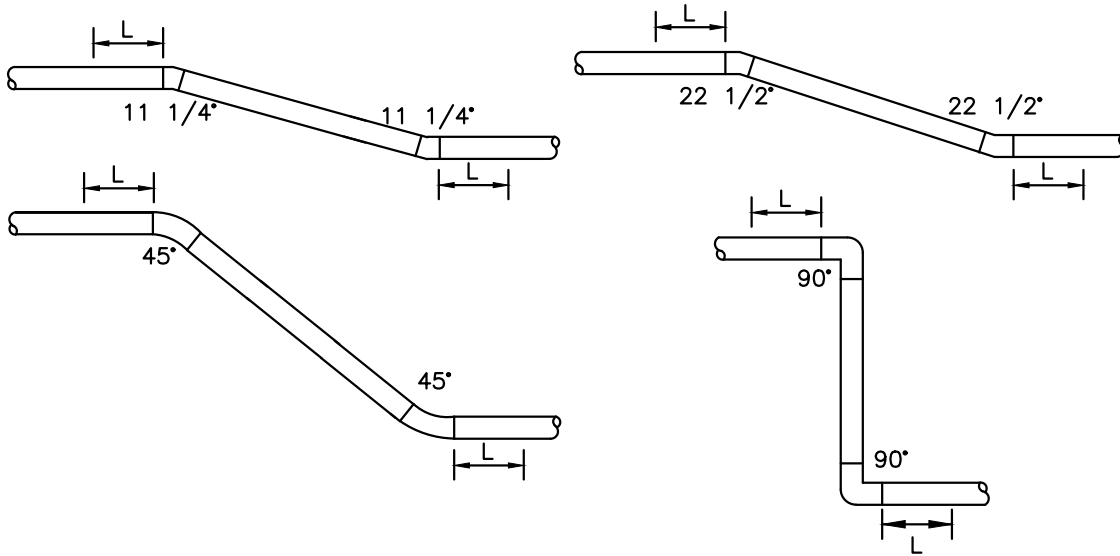


**VERTICAL BENDS**



VERTICAL OFFSET - L (FEET)								
DIAMETER	11-1/4°		22-1/2°		45°		90°	
	UPPER BEND	LOWER BEND	UPPER BEND	LOWER BEND	UPPER BEND	LOWER BEND	UPPER BEND	LOWER BEND
4"	4	2	8	3	17	5	39	11
6"	6	2	11	4	23	7	55	15
8"	8	2	15	4	30	9	72	20
10"	9	3	18	5	36	10	87	24
12"	11	3	21	6	43	12	102	28
14"	12	4	24	7	49	14	116	32
16"	13	4	27	8	55	16	131	36
18"	15	4	29	8	60	17	145	40
20"	16	5	32	9	66	19	158	44
24"	19	6	37	11	77	22	185	51
30"	22	7	45	13	92	26	222	62
36"	26	8	52	15	107	30	256	71
42"	29	8	58	16	120	34	289	80
48"	32	9	64	18	133	37	320	89

**NOTES:**

- THE REQUIREMENTS SET FORTH ABOVE WERE CALCULATED FOR PVC PIPE BASED UPON THE FOLLOWING ASSUMPTIONS:
  - SOIL CONDITIONS: SILTY SAND (SM)
  - TRENCH TYPE: 3 (PIPE BEDDED IN 4" MINIMUM OF LOOSE SOIL WITH BACKFILL LIGHTLY COMPACTED)
  - UPPER SIDE MINIMUM COVER: 3 FT
  - LOWER SIDE MINIMUM COVER: 5 FT
  - SAFETY FACTOR: 1.5
  - TEST PRESSURE: 150 PSI
- WHEN CONDITIONS DIFFER FROM THE ABOVE, THE ENGINEER-OF-RECORD (EOR) SHALL SUBMIT CALCULATIONS FOR REVIEW AND APPROVAL OF SLWSD.
- ALL JOINTS BETWEEN UPPER AND LOWER BENDS SHALL BE RESTRAINED.



**MINIMUM CONSTRUCTION STANDARDS FOR  
ST. LUCIE WEST SERVICES DISTRICT  
450 SW UTILITY DRIVE,  
PORT SAINT LUCIE, FL 34986  
PHONE: (772) 340-0220**

**PIPELINE RESTRAINT  
REQUIREMENTS (VERTICAL)**

**DETAIL: SLWG-06  
DATE: 03/2020  
SCALE: N.T.S.  
SHEET: 1 OF 1**