

MINIMUM PIPE WELDING LENGTHS FOR RESISTANCE

PIPE DIA.	INSTALLATIONS FOR CLASS 150 UP TO CLASS 200 (MAX.)			
	ANGLE OF BEND*			
	0-22.5°	22.5-45°	45-67.5°	67.5-90°
4"	5'	15'	35'	55'
6"	10'	25'	50'	80'
8"	10'	30'	65'	100'
10"	10'	40'	80'	125'
12"	10'	40'	80'	125'
14"	15'	40'	80'	130'
16"	15'	45'	95'	150'
18"	15'	50'	105'	165'
20"	15'	55'	115'	180'
24"	20'	65'	135'	215'
30"	20'	80'	160'	260'
36"	25'	90'	190'	305'

* AT THE BREAK POINT ANGLES (i.e: 22.5°, 45°, AND 67.5°) THE CONTRACTOR SHALL USE THE THRUST RESTRAINT COLUMN SHOWING THE LONGEST WELD LENGTH.

GENERAL NOTES

1. WELDED PIPE LENGTHS TO BE USED ONLY UPON APPROVAL BY J.C.S.D.
2. WELDED LENGTHS INDICATED ARE TO BE PROVIDED ON EACH SIDE OF BEND.
3. ALL JOINTS WITHIN THE LENGTHS INDICATED SHALL BE FULL WELD, DOUBLE PASS.
4. "DEAD END" THRUST IS EQUIVALENT TO A 90° BEND.
5. FOR SERVICE LATERALS, INCLUDING FIRE HYDRANTS, FIRE SERVICES, BLOW-OFFS ETC., FULLY WELD ALL MAINLINE JOINTS (DOUBLE PASS) 10' MINIMUM EACH SIDE OF TEE OUTLET.

THE FOLLOWING ASSUMPTIONS APPLY

1. LENGTH OF WELDED PIPE IS FOR EACH SIDE OF BEND USING THE FOLLOWING EQUATION:

$$L = 1.5PA (1 - \cos\Delta) / [U(2W_e + W_p)]$$

WHERE: P = MAXIMUM TEST PRESSURE (PSI)

A = CROSS-SECTION AREA OF THE PIPE (SQ. IN.)

Δ = ANGLE OF BEND (DEGREES)

U = COEFF. OF FRICTION BETWEEN PIPE AND SOIL (ASSUMED 0.3)

W_e = WEIGHT OF THE PRISM OR SOIL OVER THE PIPE (LB/FT.) OF PIPE LENGTH
(WT. OF SOIL ASSUMED TO BE 110 LB/CU. FT.)

W_p = WEIGHT OF THE PIPE (LB/FT)

W_w = WEIGHT OF THE CONTAINED WATER (LB/FT)

2. 3' MINIMUM PIPE COVER FOR PIPE DIAMETERS < 12", 4' MINIMUM PIPE COVER FOR PIPE DIAMETERS > 12".
3. FACTOR OF SAFETY = 1.5 TIMES MAXIMUM DESIGN PRESSURE. (200 PSI)
4. MAXIMUM ANGLE (?) USED FOR EACH RANGE SHOWN.

JURUPA COMMUNITY SERVICES DISTRICT

SCALE: NONE	MINIMUM PIPE WELDING LENGTH FOR THRUST RESTRAINT	DRAWING NO. C-2A
DATE: SEPTEMBER 2020	ALBERT A. WEBB ASSOCIATES CONSULTING ENGINEERS	
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