

THRUST LOADS

THRUST AT FITTINGS IN POUNDS AT 225 POUNDS PER SQUARE INCH OF WATER PRESSURE

PIPE DIAMETER	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND	DEAD END OR TEE
4"	4,100	2,300	1,200	600	3,000
6"	9,000	5,000	2,600	1,400	6,500
8"	16,500	9,000	4,700	2,500	11,500
10"	25,500	14,000	7,000	3,500	18,000
12"	36,000	20,000	10,500	5,500	26,000
14"	50,000	27,000	14,000	7,000	35,000
16"	65,000	35,000	18,000	9,000	46,000

NOTES:

1. BLOCKING SHALL BE COMMERCIAL CONCRETE POURED IN PLACE THRUST BLOCK WITH PLASTIC SHEETING OR SIMILAR MATERIAL TO ISOLATE THE FITTING.
2. TO DETERMINE THE BEARING AREA OF THE THRUST BLOCK IN SQUARE FEET(S.F.)
 EXAMPLE : 12" - 90° BEND IN SAND AND GRAVEL 36,000 LBS
 $3000 \text{ LB/S.F.} = 12 \text{ S.F. OF AREA}$
3. AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZE, PRESSURES AND SOIL CONDITIONS.
4. BLOCKING SHALL BE ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATING PRESSURE UNDER ALL CONDITIONS OF SERVICE.

SAFE SOIL BEARING LOADS

FOR HORIZONTAL THRUSTS WHEN THE DEPTH OF COVER OVER THE PIPE EXCEEDS 2 FEET

SOIL	POUNDS PER SQUARE FOOT
MUCK, PEAT	0
SOFT CLAY	1,000
SAND	2,000
SAND & GRAVEL	3,000
SAND & GRAVEL CEMENTED WITH CLAY	4,000
HARD SHALE	10,000

CITY OF TUMWATER, WASHINGTON DEPT. OF PUBLIC WORKS				
<h2 style="margin: 0;">THRUST LOADS</h2>				
APPROVED BY:				DWG. NO.
CITY ENGINEER				WA-2
DES. PW	DWG. BY PW	CK'D BY KMC	DATE JUNE 2014	NOT TO SCALE