

# THRUST LOADS

*THRUST AT FITTINGS IN POUNDS AT 200 POUNDS PER SQUARE INCH OF WATER PRESSURE*

<i>PIPE DIAMETER</i>	<i>90° BEND</i>	<i>45° BEND</i>	<i>22-1/2° BEND</i>	<i>11-1/4° BEND</i>	<i>DEAD END OR TEE</i>
4"	3,600	2,000	1,000	500	2,600
6"	8,000	4,400	2,300	1,200	5,700
8"	14,300	7,700	4,000	2,000	10,100
10"	22,300	12,100	6,200	3,100	15,800
12"	32,000	17,400	8,900	4,500	22,700
14"	43,600	23,600	12,100	6,100	30,800
16"	57,000	30,800	15,700	7,900	40,300

## NOTES:

- BLOCKING SHALL BE CEMENT CONCRETE CLASS "B" POURED IN PLACE AGAINST UNDISTURBED EARTH. FITTING SHALL BE ISOLATED FROM CONCRETE THRUST BLOCK WITH PLASTIC OR SIMILAR MATERIAL.
- TO DETERMINE THE BEARING AREA OF THE THRUST BLOCK IN SQUARE FEET (S.F.):  
EXAMPLE: 12" - 90 DEG. BEND IN SAND AND GRAVEL  
32,000 LBS : 3000 LB/S.F. = 10.7 S.F. OF AREA
- AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZE, PRESSURES AND SOIL CONDITIONS.
- BLOCKING SHALL BE ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATING PRESSURE UNDER ALL CONDITIONS OF SERVICE.
- BLOCKING FOR PIPES LESS THAN 4" DIA. WILL USE 4" PIPE VALUES.

## SAFE SOIL BEARING LOADS

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

<i>SOIL</i>	<i>POUNDS PER SQUARE FOOT</i>
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

<i>APPROVED BY</i>	<i>REVISED DATE</i>	<b>CITY OF CENTRALIA</b>	<i>STD. PLAN NO.</i>
<i>CITY ENGINEER</i>	<b>06/2017</b>	<b>THRUST LOADS</b>	<b>2-18</b>