

REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS

BASED ON TEST PRESSURE OF 200 P.S.I.

ALL AREAS GIVEN IN SQUARE FEET.

| SIZE AND DEGREE OF BEND | STATIC THRUST IN POUNDS | MODERATELY DRY CLAY 4000 LBS/FT ² | SOFT CLAY 2000 LBS/FT ² | GRAVEL/COARSE SAND 1600LBS/FT ² | 8000 LBS/FT ² DRY CLAY - ALWAYS DRY | SAND, COMPACT FIRM 8000 LBS/FT ² | SAND - CLEAN DRY 4000 LBS/FT ² | SOIL 1000 LBS/FT ² QUICKSAND - VERY POOR | ROCK - POOR 10,000 LBS/FT ² |
|-------------------------|-------------------------|---|---------------------------------------|---|---|--|--|--|---|
| 24" | | | | | | | | | |
| 11 1/4° | 17,734 | 5 | 9 | 11 | 3 | 3 | 5 | 18 | 2 |
| 22 1/2° | 35,305 | 9 | 18 | 22 | 5 | 5 | 9 | 36 | 4 |
| 45° | 69,252 | 18 | 35 | 42 | 9 | 9 | 18 | 70 | 7 |
| 90° | 127,936 | 32 | 64 | 77 | 16 | 16 | 32 | 128 | 13 |
| PLUG | 90,478 | 23 | 46 | 55 | 12 | 12 | 23 | 91 | 10 |
| 30" | | | | | | | | | |
| 11 1/4° | 27,709 | 7 | 14 | 17 | 4 | 4 | 7 | 2 | 3 |
| 22 1/2° | 55,163 | 14 | 28 | 34 | 7 | 7 | 14 | 56 | 6 |
| 45° | 108,206 | 28 | 55 | 65 | 14 | 14 | 28 | 109 | 11 |
| 90° | 199,900 | 50 | 100 | 120 | 25 | 25 | 50 | 200 | 20 |
| PLUG | 141,372 | 36 | 71 | 85 | 18 | 18 | 36 | 142 | 15 |
| 36" | | | | | | | | | |
| 11 1/4° | 39,901 | 10 | 20 | 24 | 5 | 5 | 10 | 40 | 4 |
| 22 1/2° | 79,439 | 20 | 40 | 48 | 10 | 10 | 20 | 30 | 8 |
| 45° | 155,816 | 39 | 78 | 94 | 20 | 20 | 39 | 156 | 16 |
| 90° | 287,855 | 72 | 144 | 172 | 36 | 36 | 72 | 288 | 29 |
| PLUG | 203,575 | 51 | 102 | 122 | 26 | 26 | 51 | 204 | 21 |
| 48" | | | | | | | | | |
| 11 1/4° | 70,935 | 18 | 36 | 43 | 9 | 9 | 18 | 71 | 8 |
| 22 1/2° | 141,218 | 36 | 71 | 85 | 18 | 18 | 36 | 142 | 15 |
| 45° | 277,007 | 70 | 139 | 166 | 35 | 35 | 70 | 277 | 28 |
| 90° | 511,742 | 128 | 256 | 320 | 64 | 64 | 128 | 512 | 52 |
| PLUG | 361,911 | 91 | 181 | 217 | 46 | 46 | 91 | 362 | 37 |

REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.

USE 6° - 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

CITY OF RALEIGH

DEPARTMENT OF PUBLIC UTILITIES

THRUST BLOCKING DESIGN QUANTITY TABLE

| | | | | |
|----------|-----------|---------|-----------|------|
| DWG. NO. | REVISIONS | DATE | REVISIONS | DATE |
| W-11 | D.W.C. | 6-23-99 | | |