

TABLE 1 - BEARING AREA OF THRUST BLOCKS IN SQUARE FEET
(HORIZONTAL BENDS & VERTICAL UPWARD BENDS)

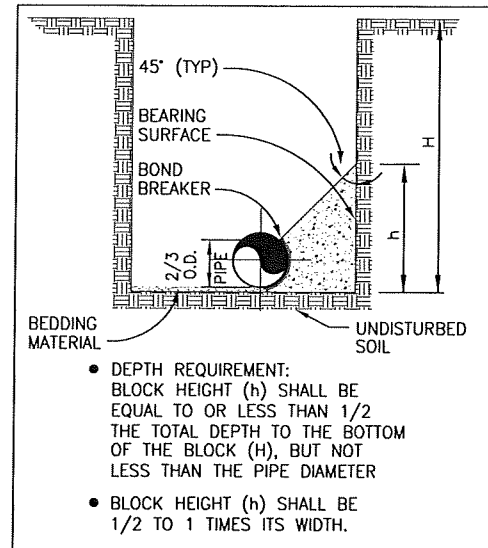
FITTING SIZE (IN)	A ₁	A ₂			
	TEE, WYE PLUG OR CAP (SF)	90° BEND (SF)	45° BEND (SF)	22 1/2° BEND (SF)	11 1/4° BEND (SF)
4	1.4	2.0	1.1	1.0	1.0
6	3.2	4.5	2.4	1.2	1.0
8	5.7	8.0	4.3	2.2	1.1
10	8.8	12.5	6.8	3.4	1.7
12	12.7	18.0	9.7	5.0	2.5
14	17.3	24.5	13.3	6.8	3.4
16	22.6	32.0	17.3	8.8	4.4
18	28.6	40.5	21.9	11.2	5.6
20	35.3	50.0	27.1	13.8	6.9
24	50.9	72.0	39.0	19.9	10.0

TABLE 2 - VOLUME OF THRUST BLOCK IN CUBIC YARDS
(VERTICAL DOWNWARD BENDS)

FITTING SIZE (IN)	V ₁			ROD SIZE	EMBEDMENT (FT)
	45° BEND (CY)	22 1/2° BEND (CY)	11 1/4° BEND (CY)		
4	0.5	0.3	0.1	#6	2.5
6	1.1	0.6	0.3	#6	2.5
8	2.0	1.1	0.5	#6	2.5
10	3.1	1.7	0.9	#6	2.5
12	4.4	2.4	1.2	#6	2.5
14	6.1	3.3	1.7	#8	3.0
16	7.9	4.3	2.2	#8	3.0
18	10.0	5.4	2.8	#8	3.0
20	12.3	6.7	3.4	#8	3.0
24	17.8	9.6	4.9	#8	3.0

GENERAL:

- FOR ALL BURIED PIPING EXCEPT FLANGED, SCREWED, SOCKET WELD PVC, OR WELDED STEEL PIPE SPECIFIED TO BE PRESSURE TESTED, ALL FITTINGS SHALL BE PROVIDED WITH CONCRETE THRUST BLOCKS AT ALL DIRECTION CHANGES UNLESS OTHERWISE NOTED.
- IN ADDITION TO THRUST BLOCKS, ALL FITTINGS AND VALVES SHALL BE RESTRAINED FOR AT LEAST 40 FEET IN ALL DIRECTIONS. MEGALUGS MAY BE USED ON DIP AND PVC PIPE FOR RESTRAINT EXCEPT IN LOCATIONS WHERE FLEXIBLE JOINTS ARE REQUIRED.
- CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH OR STRUCTURAL BACKFILL.
- KEEP CONCRETE CLEAR OF JOINT, BOLTS, NUTS, CLAMPS, AND OTHER ACCESSORIES.
- THRUST BLOCKS SHALL NOT BE LOCATED OR SIZED TO ENCASE ADJACENT PIPES OR FITTINGS.
- A BOND BREAKER SHALL BE PLACED BETWEEN THE PIPE AND THRUST BLOCK.



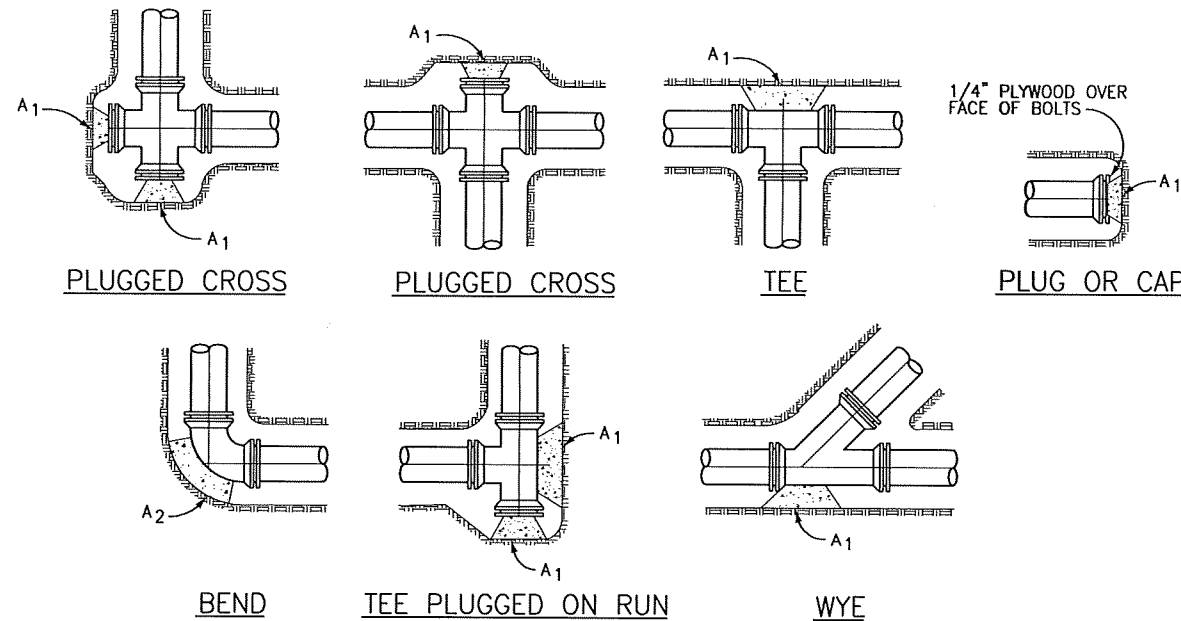
TYPICAL CROSS SECTION

HORIZONTAL BENDS AND VERTICAL UPWARD BENDS:

- BEARING AREAS (TABLE 1) BASED ON TEST PRESSURE OF 150 PSI, AN ALLOWABLE SOIL BEARING PRESSURE OF 2,000 PSF AND A SAFETY FACTOR OF 1.5, TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING PRESSURES, USE THE FOLLOWING EQUATION:

$$\text{BEARING AREA} = (\text{TEST PRESSURE} / 150 \text{ psi}) \times (2,000 / \text{SOIL BEARING PRESSURE psf}) \times (\text{TABLE 1 VALUE})$$

- UNLESS OTHERWISE NOTED ON THE GENERAL DRAWINGS IN THE GENERAL NOTES OR SPECIFICATIONS, USE SOIL BEARING PRESSURE = 2000 PSF FOR THIS PROJECT.
- BEARING AREA OF THRUST BLOCK SHALL NOT BE LESS THAN 1.0 SQUARE FOOT.
- IF THE DEPTH REQUIREMENT (SEE TYPICAL CROSS SECTION) CAN NOT BE ACHIEVED, THE DISTRICT SHALL BE NOTIFIED.



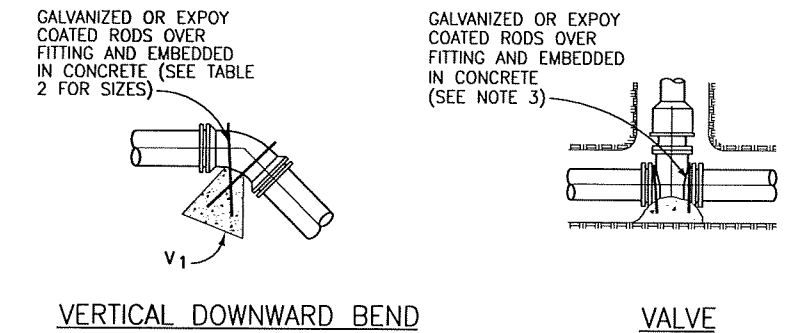
THRUST RESTRAINTS—TYPE A
NOT TO SCALE

VERTICAL DOWNWARD BENDS:

- VERTICAL BENDS THAT REQUIRE A THRUST BLOCK VOLUME EXCEEDING 5 CUBIC YARDS REQUIRE SPECIAL BLOCKING DETAILS. SEE DRAWINGS FOR VOLUMES SHOWN TO LEFT OF HEAVY, BOLD LINE IN TABLE 2.
- THRUST BLOCK VOLUMES (TABLE 2) FOR VERTICAL DOWNWARD BENDS HAVING UPWARD RESULTANT THRUSTS ARE BASED ON TEST PRESSURE OF 150 PSI, THE WEIGHT OF CONCRETE = 4050 LBS/CUBIC YARD, AND A SAFETY FACTOR OF 1.5. TO COMPUTE VOLUMES FOR DIFFERENT TEST PRESSURES AND CONCRETE WEIGHTS, USE THE FOLLOWING EQUATION:

$$\text{VOLUME} = (\text{TEST PRESSURE} / 150) \times (4,050 / \text{CONCRETE WEIGHT}) \times (\text{TABLE 2 VALUE})$$

- VOLUME OF THRUST BLOCK IN CUBIC YARDS FOR VALVES SHALL BE THE SAME VOLUME USED FOR 11 1/4° BENDS.



2600A

UPPER THOMPSON SANITATION DISTRICT
THRUST RESTRAINTS—TYPE A
STANDARD DETAIL NO. 2600A



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