

CONSTRAINTS

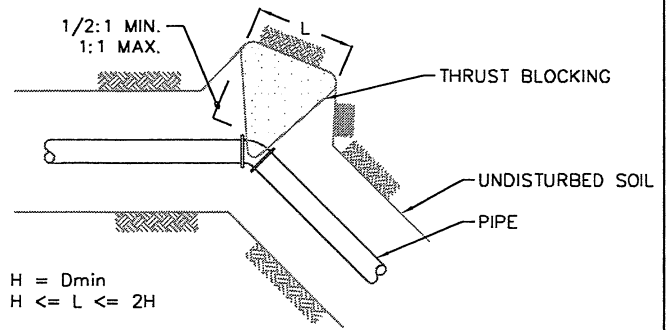
1. SOIL CONDITIONS AND BEARING CHARACTERISTICS ARE TO BE DETERMINED BY THE DISTRICT.
2. THIS STANDARD DETAIL IS FOR HORIZONTAL THRUST RESTRAINT ONLY.
3. CONCRETE BLOCKING SHALL BE PER APWA SPECIFICATION 7-11.3(13) 1984.
4. CONCRETE THRUST BLOCKING FOR FITTINGS LARGER THAN 16" SHALL BE AS SHOWN ON THE PROJECT PLANS.
5. MAINTAIN 18" MINIMUM GROUND COVER OVER THE TOP OF ALL CONCRETE BLOCKING.

PROCEDURE

1. DETERMINE BEARING FACTOR IN TABLE 1 CORRESPONDING TO APPROPRIATE PIPE SIZE AND TYPE OF FITTING.
2. MULTIPLY THE BEARING FACTOR DETERMINED IN TABLE 1 BY THE MULTIPLICATION FACTOR IN TABLE 2 FOR THE APPROPRIATE SOIL CLASSIFICATION.

THE RESULT IS THE REQUIRED AREA OF CONCRETE (IN SQ. FT.) WHICH MUST BEAR AGAINST UNDISTURBED SOIL.
3. USING TABLE 3 LOCATE THE MINIMUM DEPTH OF CONCRETE (D_{min}) CORRESPONDING TO THE REQUIRED BEARING AREA.
4. USING D_{min}, THE HEIGHT AND LENGTH OF THE THRUST BLOCKING CAN BE DETERMINED FROM THE DIMENSION RELATIONSHIPS ILLUSTRATED IN FIGURE 1 AND DESCRIBED BELOW:

- A. "H" EQUALS "D"
- B. MAX. "L" EQUALS 2 X "H"
- C. MIN. "L" EQUALS "H"



$$H = D_{min}$$

$$H \leq L \leq 2H$$

$$BEARING\ AREA = H \times L$$

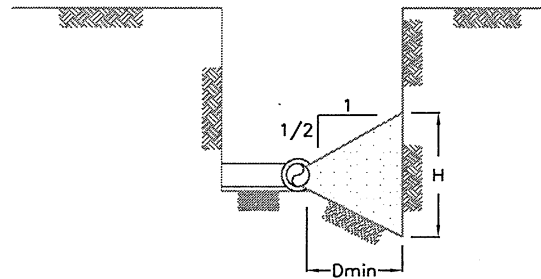
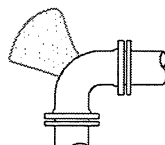


FIGURE 1

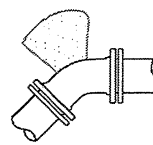
SIZE	TEST PRESSURE	TEES					
		DEAD ENDS	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	1 1/4° BEND
3	300	2.25	2.25	2.25	2.25	2.25	2.25
4	300	2.25	2.25	2.25	2.25	2.25	2.25
6	300	2.83	4.00	2.25	2.25	2.25	2.25
8	300	5.00	7.11	3.85	2.25	2.25	2.25
10	300	7.86	11.11	6.00	3.06	2.25	2.25
12	300	11.31	16.00	8.66	4.41	2.25	2.25
14	250	12.83	18.14	9.82	5.00	2.51	2.51
16	225	15.08	21.33	11.54	5.88	2.96	2.96

* 2.25 BASED ON GEOMETRIC FACTORS

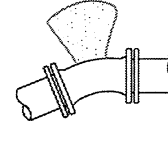
BEARING FACTOR
TABLE 1



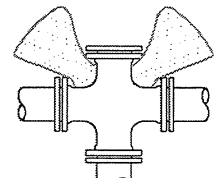
90° BEND



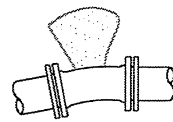
45° BEND



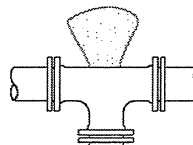
22 1/2° BEND



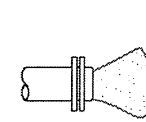
CROSS W/BLIND FLANGE



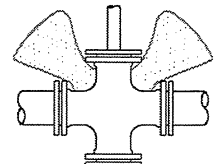
11 1/4° BEND



TEE



CAP



CROSS W/SMALLER SIZE OUTLET

SOIL CONDITION	MULTIPLICATION FACTOR
*MUCK, PEAT, etc.	-
SOFT CLAY	3.0
SAND	1.5
SAND AND GRAVEL	1.0
SAND AND GRAVEL CEMENTED W/ CLAY	0.75
HARD SHALE	0.30

* THRUST BLOCKING SHALL BE DESIGNED BY ENGINEER

MULTIPLICATION FACTOR
TABLE 2

REQ'D BEARING AREA (SQ. FT.)	MINIMUM DEPTH D _{min}
2.25 MIN. - 5.0	1.5'
5.01 - 10.0	2.25'
10.01 - 15.0	3.0'
15.01 - 30.0	4.0'
30.01 - 40.0	4.5'
40.01 - 50.0	5.0'
50.01 - 70.0	6.0'

BLOCK SHAPE
TABLE 3

HORIZONTAL THRUST BLOCKING

WATER STANDARD DETAIL

SNOQUALMIE PASS
UTILITY DISTRICT

FILE	SCALE	DATE
SPUDTW10	NTS	7/22/04