- Water Standards -

Standard Number: W116

CHELAN COUNTY PUBLIC UTILITY DISTRICT
Owned By The People We Serve

HORIZONTAL THRUST BLOCKING

Originator: RCS

Standards Approval: Ron Slabaugh

Date: 3/12/2019

Rev #:	Revision Description:
1	2019 UPDATES

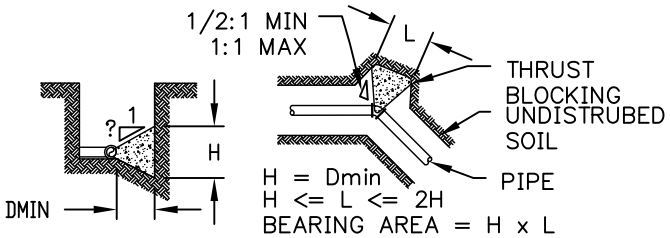


FIGURE 1

BEARING FACTOR

SIZE	TEST PRESSURE	TEES DEAD ENDS	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
3	200	2.25	2.25	2.25	2.25	2.25
4	200	2.25	2.25	2.25	2.25	2.25
6	200	2.83	4.00	2.25	2.25	2.25
8	200	5.00	7.11	3.85	2.25	2.25
10	200	7.86	11.11	6.00	3.06	2.25
12	200	11.31	16.00	8.66	4.41	2.25
14	225	12.83	18.14	9.82	5.00	2.51
16	225	15.08	21.33	11.54	5.88	2.96

* 2.25 BASED ON GEOMETRIC FACTORS
DISTRICT MAY ELECT TO TEST TO 1.5 TIMES THE OPERATING PRESSURE IN SOME HIGH PRESSURE AREAS.

TABLE 1

MULT. FACTOR

SOIL CONDITION	MULTIPLICATION FACTOR
*MUCK, PEAT, ETC.	–
SOFT CLAY	3.0
SAND	1.5
SAND & GRAVEL	1.0
SAND & GRAVEL CEMENTED W/CLAY	0.75
HARD SHALE	0.30

* THRUST BLOCKING SHALL BE DESIGNED BY ENGINEER

TABLE 2

BLOCK SHAPE

REQ'D BEARING AREA (SQ. FT.)	MIN. DEPTH DMIN
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'

TABLE 3

THRUST BLOCKING NOTES

CONSTRAINTS

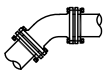
1. SOIL CONDITIONS AND BEARING CHARACTERISTICS ARE TO BE DETERMINED BY THE DISTRICT.
2. THIS STANDARD DETAIL IS FOR HORIZONTAL THRUST RESTRAINT ONLY.
3. CONCRETE BLOCKING SHALL BE PER DOT/APWA SPECIFICATION 7–11.3(13) 1998.
4. CONCRETE THRUST BLOCKING FOR FITTINGS LARGER THAN 16" SHALL BE AS SHOWN ON THE PROJECT PLANS.
5. MAINTAIN 24" MINIMUM GROUND COVER OVER THE TOP OF ALL CONCRETE CONCRETE BLOCKING.
6. ALL CONCRETE BLOCKING SHALL BE POURED AGAINST DRY, UNDISTURBED SUBGRADE.
7. WRAP PIPE CONTACT AREA WITH PLASTIC OR BUILDING PAPER.

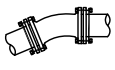
SIZING PROCEDURE

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 (Dmin) CORRESPONDING TO THE REQUIRED BEARING AREA.
4. USING Dmin, THE HEIGHT AND LENGTH OF THE THRUST BLOCKING CAN BE DETERMINED FROM THE DIMENSION RELATIONSHIPS ILLUSTRATED IN FIGURE 1 AND DESCRIBED BELOW:

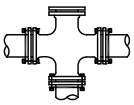
A. "H" EQUALS "D"
B. MAX. "L" EQUALS 2 X "H"
C. MIN. "L" EQUALS "H"

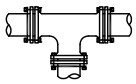

90° BEND

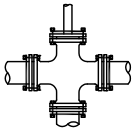

45° BEND

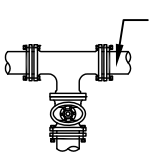

22 1/2° BEND


CAP


CROSS W/ BLIND FLANGE

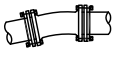

TEE


CROSS W/SMALLER SIZE OUTLET



TEE AND VALVE

IN–LINE VALVE


11 1/4° BEND