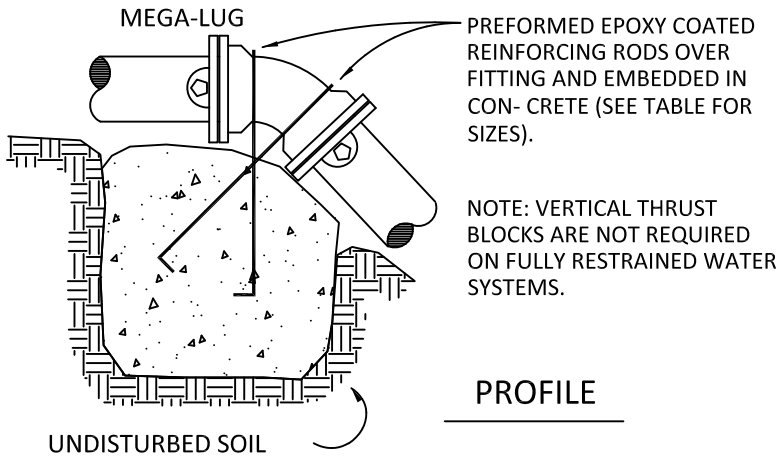
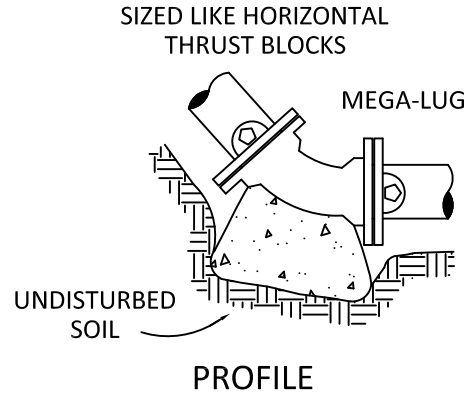


NOTES:

1. VERTICAL BENDS SHALL BE AVOIDED FOR 12" WATER LINES AND LARGER. WHERE VERTICAL BENDS ARE NECESSARY, VERTICAL THRUST BLOCKING IS SUBJECT TO THESE STANDARDS.
2. VERTICAL THRUST BLOCKS SHALL BE PROVIDED AT ALL UN-RESTRAINED WATER SYSTEM APPURTENANCES ONLY, UNLESS OTHERWISE DIRECTED BY THE CITY'S AUTHORIZED REPRESENTATIVE.
3. KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES. FITTINGS SHALL BE WRAPPED IN PLASTIC (8 MIL. MINIMUM) PRIOR TO PLACEMENT OF CONCRETE.
4. CONCRETE THRUST BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH.
5. CONCRETE SHALL BE COMMERCIAL MIX, MIN. COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
6. THRUST BLOCK VOLUMES FOR VERTICAL BENDS HAVING UPWARD RESULTANT THRUSTS ARE BASED ON TEST PRESSURE OF 150 PSIG. AND THE WEIGHT OF CONCRETE = 4050 LBS./CU.YD.
6. VERTICAL BENDS THAT REQUIRE A THRUST BLOCK VOLUME EXCEEDING 5 CUBIC YARDS REQUIRE SPECIAL BLOCKING DETAILS. SEE PLANS FOR VOLUMES SHOWN INSIDE HEAVY LINE IN TABLE.
7. ALL REBAR SHALL BE PREFORMED EPOXY COATED IN ACCORDANCE WITH AASHTO M-284. REBAR SHALL BE PREFORMED, AND LAST 4" OF BAR SHALL BE BENT 90° WITH A 1/2" RADIUS BEND. REBAR SHALL BE TIGHTLY FIT TO RESTRAINED FITTING.
8. FOR HORIZONTAL THRUST BLOCK DETAILS SEE DRAWING NO. WT-3000.



GRAVITY VERTICAL THRUST BLOCK



NORMAL VERTICAL THRUST BLOCK

VOLUME OF THRUST BLOCK IN CUBIC YARDS (VERTICAL BENDS)			
FITTING SIZE	BEND ANGLE		
	45°	22 1/2°	11 1/4°
4	1.1	0.4	0.2
6	2.7	1.0	0.4
8	4.0	1.5	0.6
10	6.0	2.3	0.9
12	8.5	3.2	1.3
14	11.5	4.3	1.8
16	14.8	5.6	2.3

FITTING SIZE	ROD SIZE	EMBED- MENT
12" AND LESS	#6	30"
18" OR LARGER	*	*

* THRUST BLOCKS FOR PIPES 18" OR LARGER WILL BE INDIVIDUALLY DESIGNED AND STAMPED BY THE ENGINEER.

Vertical Thrust Block

DRAWING NUMBER: WT-3005

DRAWN BY: SR

SCALE: N.T.S.

FILE NAME: WT-3005.DWG

APPROVED BY: NK

DATE: 6/4/14

**CITY OF
WILSONVILLE**



PUBLIC WORKS STANDARDS