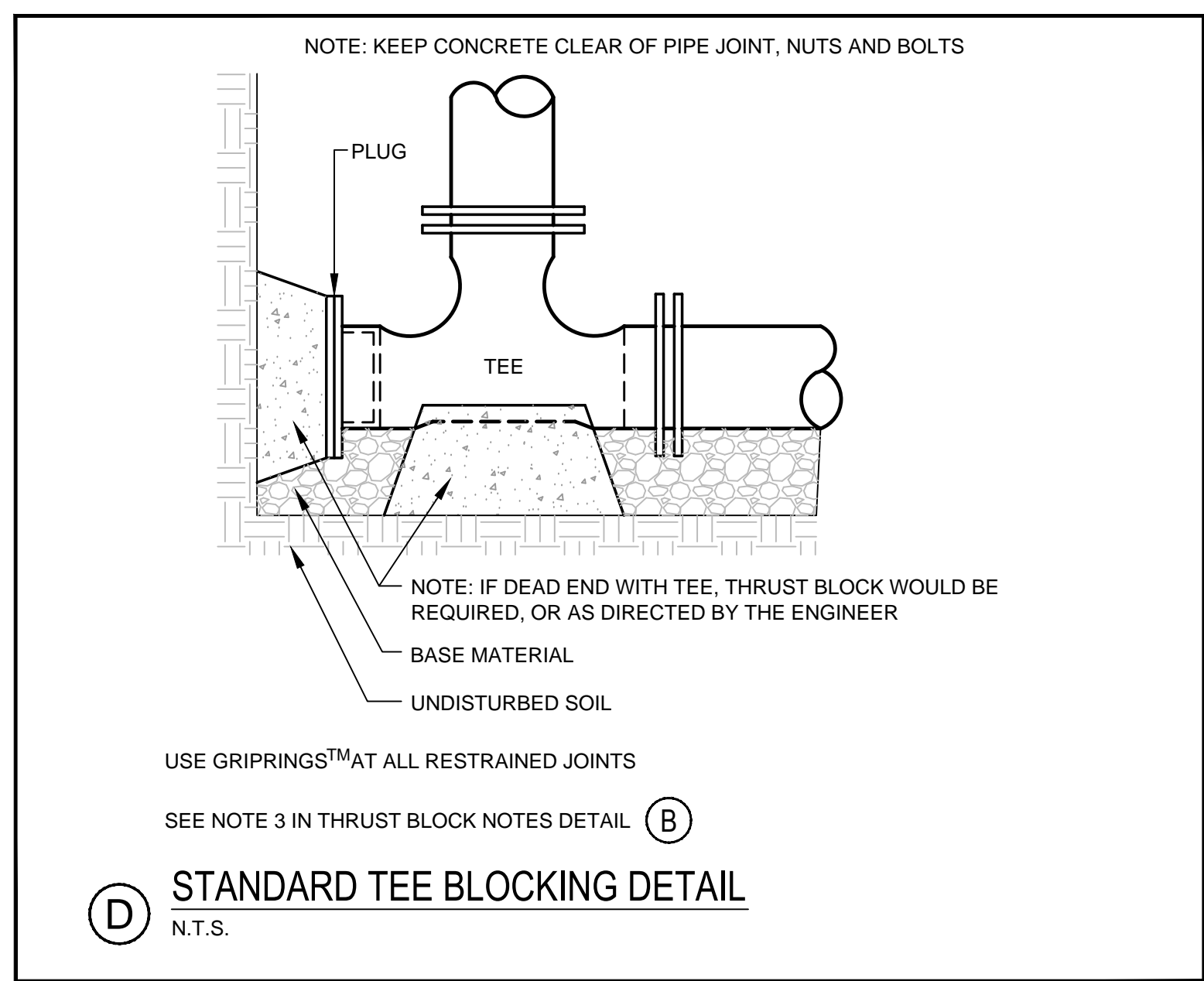
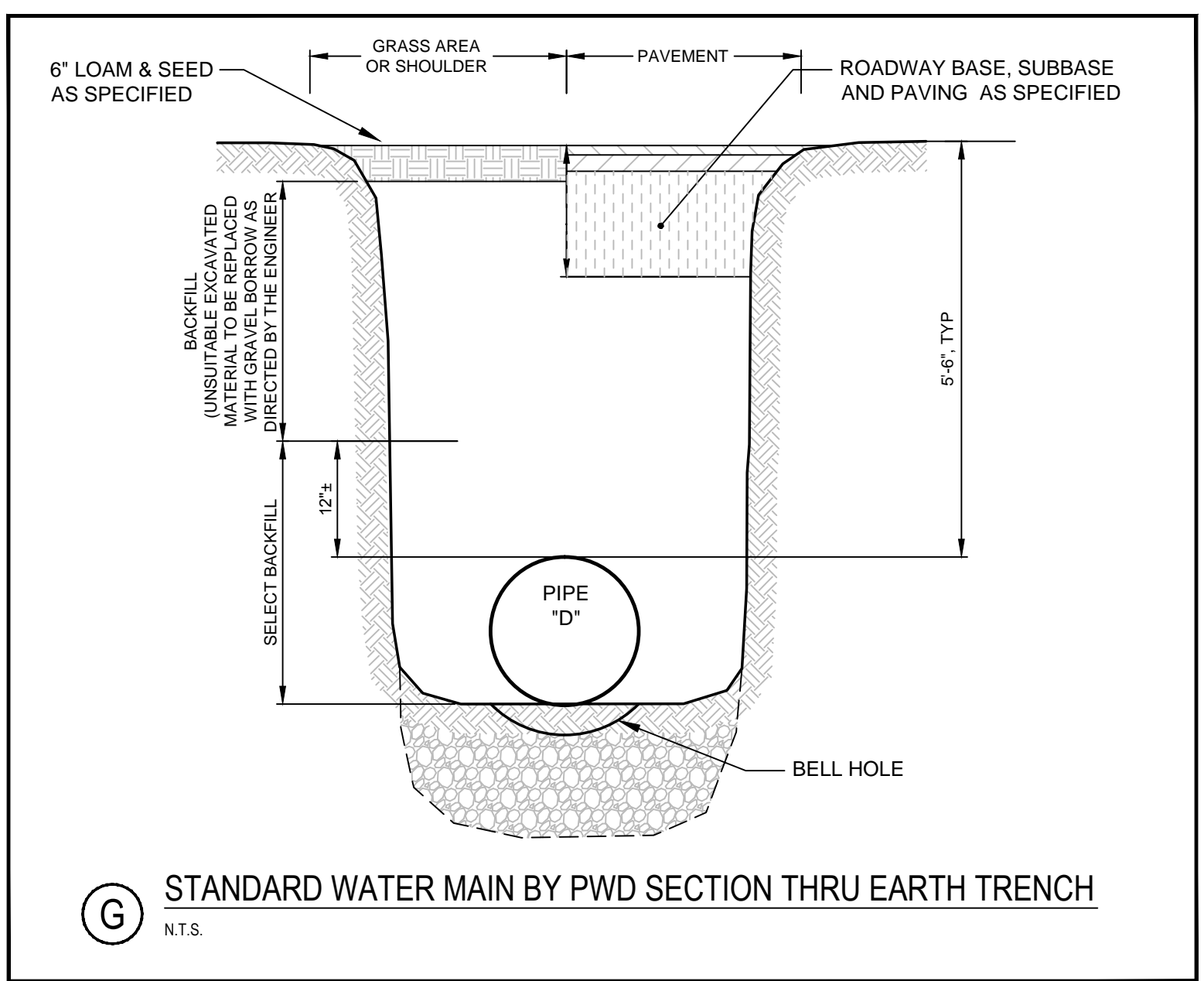


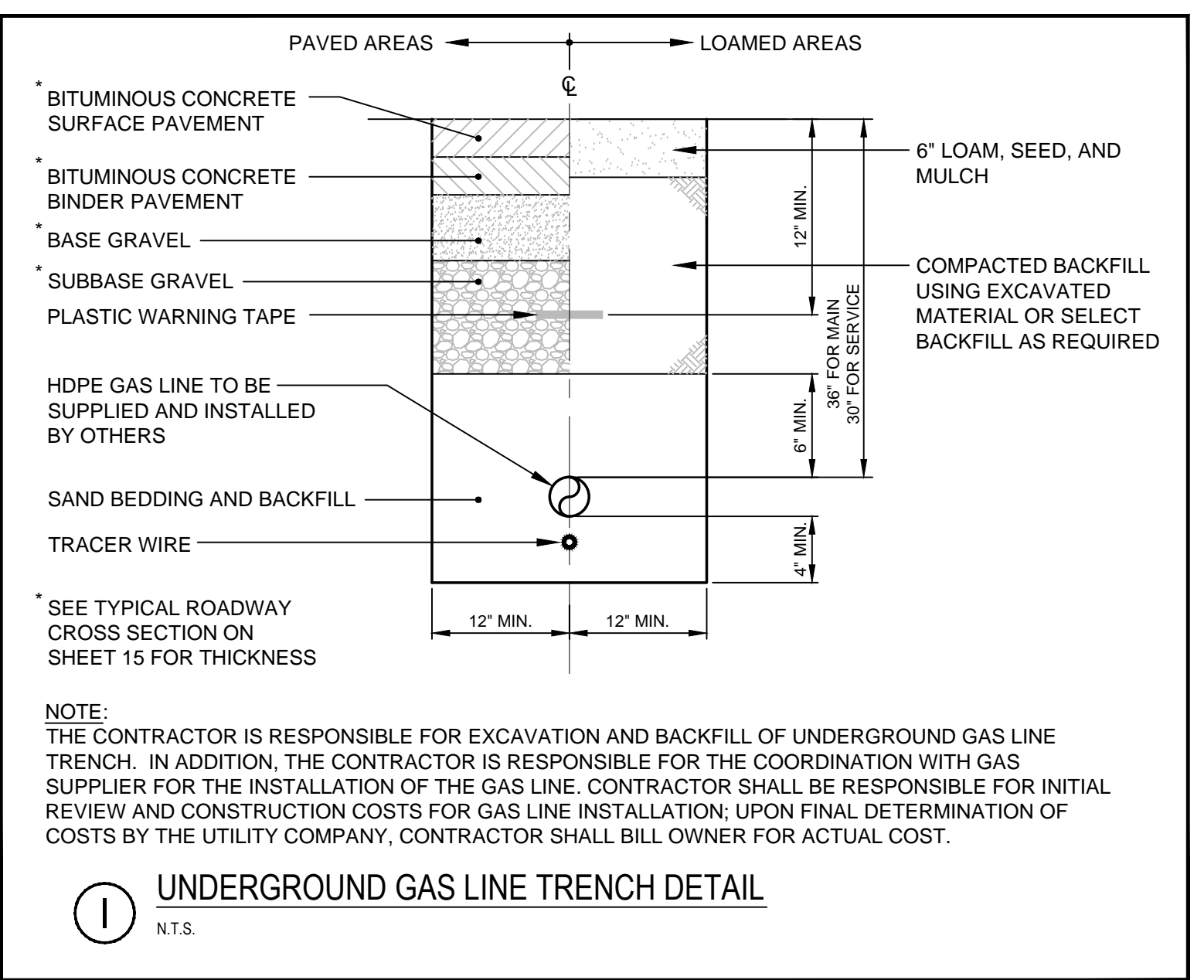
(A) FIRE HYDRANT INSTALLATION DETAIL
N.T.S. SEE NOTE 3 IN THRUST BLOCK NOTES DETAIL



(B) STANDARD TEE BLOCKING DETAIL
N.T.S. SEE NOTE 3 IN THRUST BLOCK NOTES DETAIL



(G) STANDARD WATER MAIN BY PWD SECTION THRU EARTH TRENCH
N.T.S.



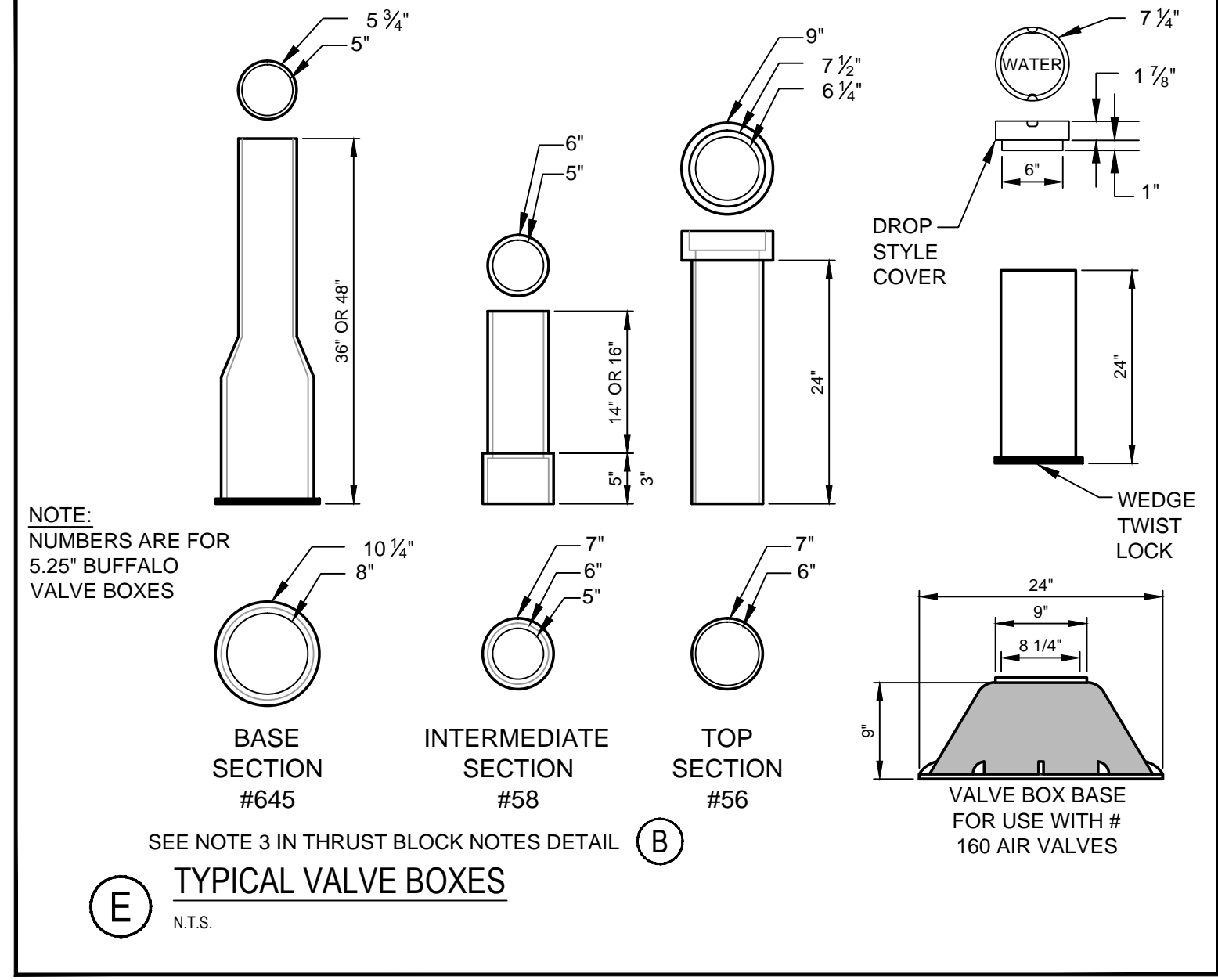
(I) UNDERGROUND GAS LINE TRENCH DETAIL
N.T.S.

1. INSTALL POLY BARRIER BETWEEN PIPE AND ALL THRUST BLOCKS.
2. ANY MODIFICATION TO THRUST BLOCK SIZING OR PIPE RESTRAINT REVISIONS SHALL BE APPROVED IN WRITING BY THE ENGINEER PRIOR TO IMPLEMENTATION IN THE FIELD.
3. ANY WORK RELATING TO WATER PIPING OR DETAILS SHALL BE IN ACCORDANCE WITH THE PORTLAND WATER DISTRICT SPECIFICATIONS.
4. ALL RESTRAINED JOINTS MUST HAVE GRIPRING™

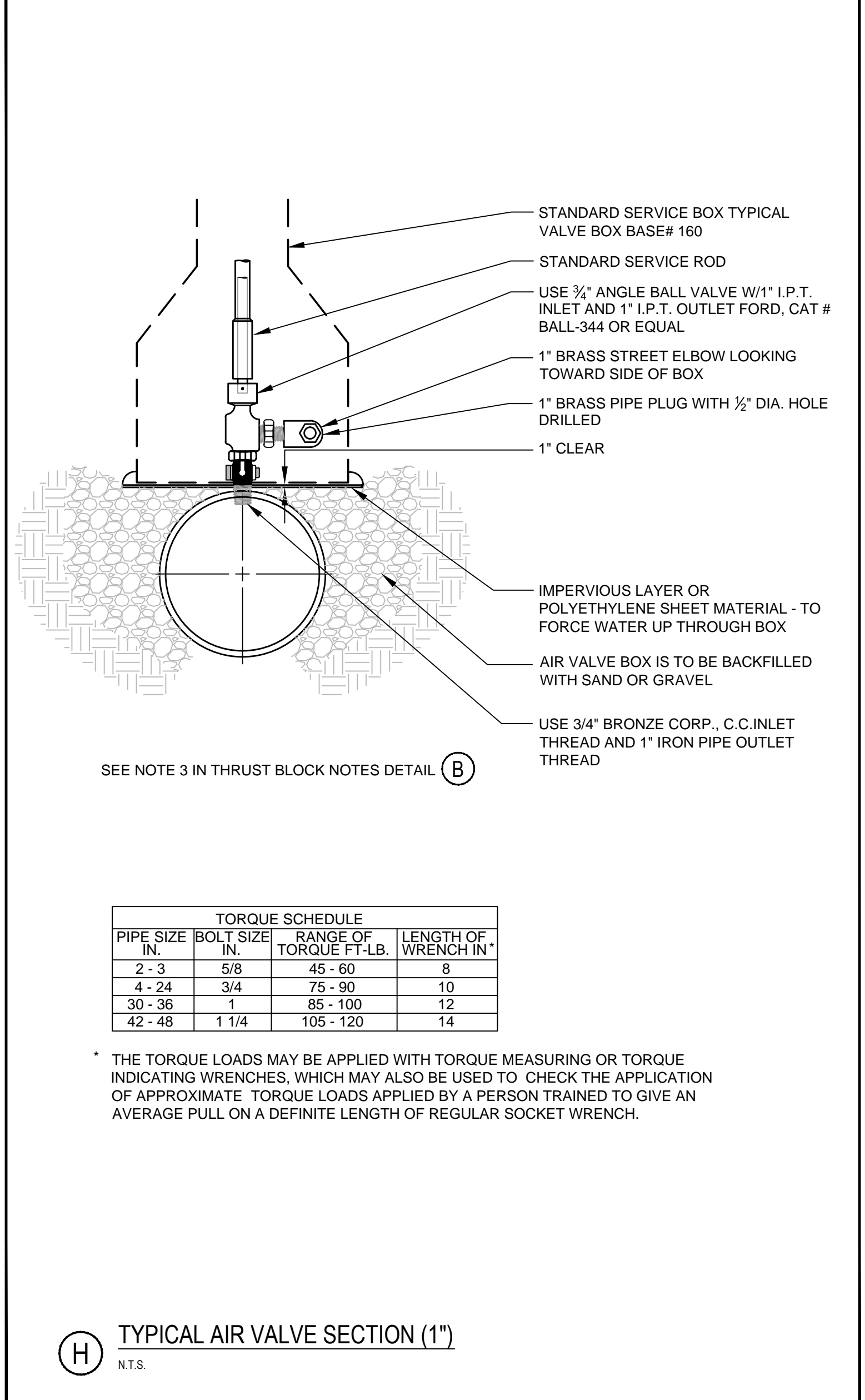
BEARING SURFACE REQUIRED IN SQUARE FEET

PIPE SIZE	1/32 BEND	1/16 BEND	1/8 BEND	1/4 BEND	TEES/CAPS
6" - 8"	5.0	5.0	5.0	6.5	5.0
12"	11.5	11.5	11.5	20.0	22.0

(B) THRUST BLOCK NOTES
N.T.S.



(E) TYPICAL VALVE BOXES
N.T.S. SEE NOTE 3 IN THRUST BLOCK NOTES DETAIL

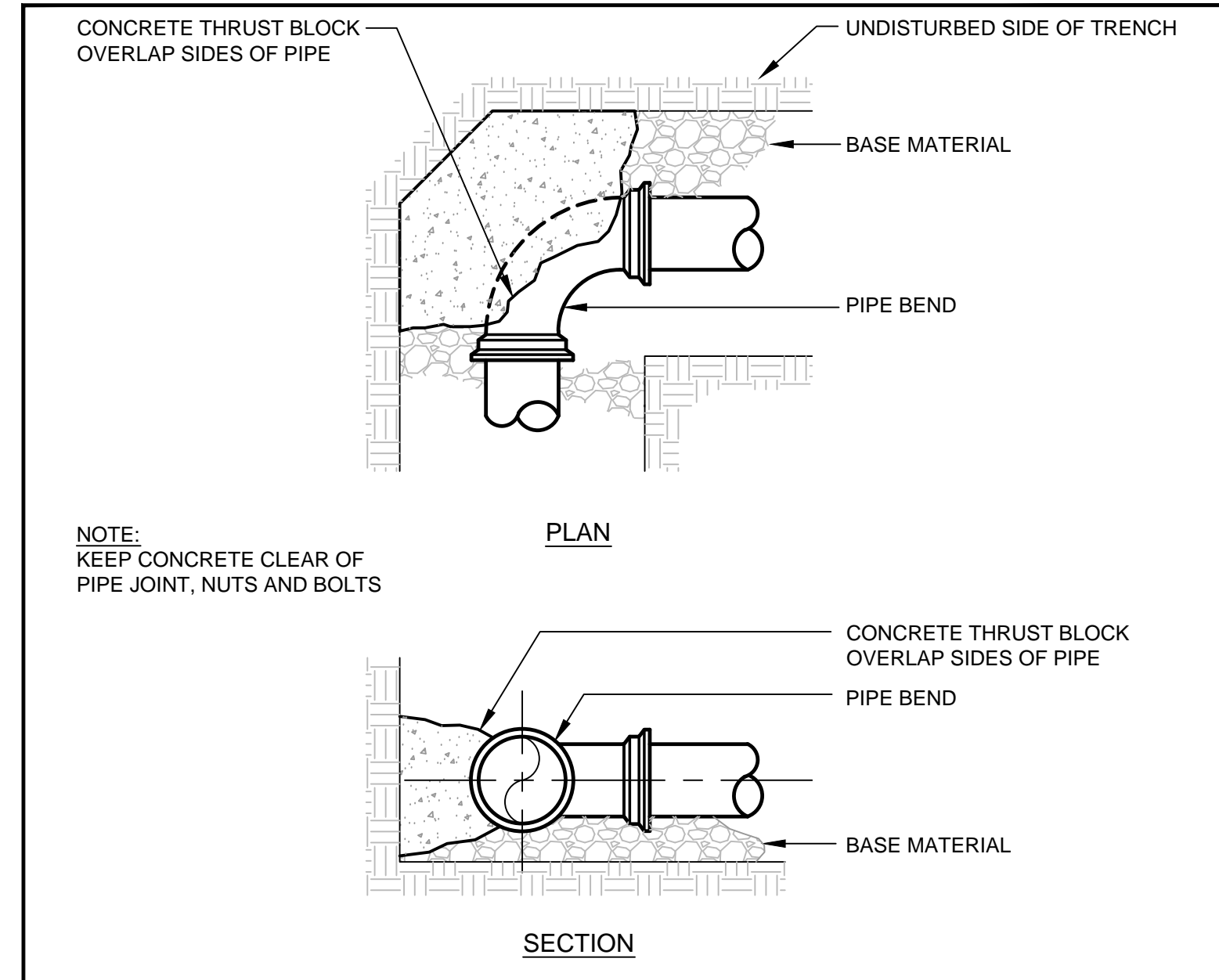


(H) TYPICAL AIR VALVE SECTION (1")
N.T.S.

TORQUE SCHEDULE

PIPE SIZE IN.	BOLT SIZE IN.	RANGE OF TORQUE FT.-LB.	LENGTH OF WRENCH IN"
2 - 3	5/8	45 - 60	8
4 - 24	3/4	75 - 90	10
30 - 36	1	80 - 100	12
42 - 48	1 1/4	105 - 120	14

* THE TORQUE LOADS MAY BE APPLIED WITH TORQUE MEASURING OR TORQUE INDICATING WRENCHES, WHICH MAY ALSO BE USED TO CHECK THE APPLICATION OF APPROXIMATE TORQUE LOADS APPLIED BY A PERSON TRAINED TO GIVE AN AVERAGE PULL ON A DEFINITE LENGTH OF REGULAR SOCKET WRENCH.



(C) TYPICAL THRUST BLOCK PLACEMENT BENDS
N.T.S.

THRUST/RETAINER GLAND SCHEDULE

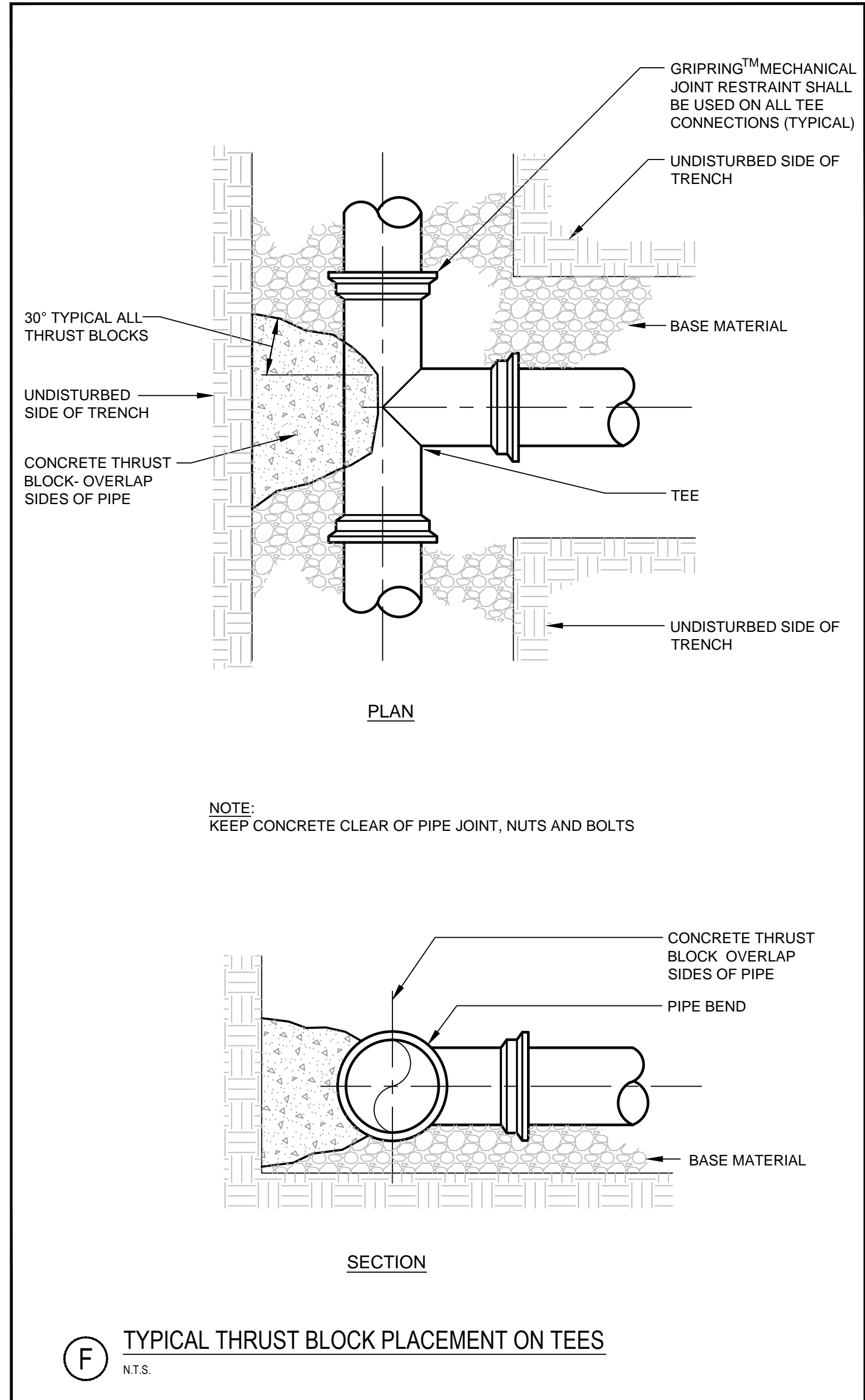
BEND	(DEGREE)	REQUIREMENTS
1/4 BEND	(90°)	USE POURED-IN-PLACE THRUST BLOCK WITH GRIPRING™ MECHANICAL JOINT RESTRAINT
1/8 BEND	(45°)	THRUST BLOCK w/ GRIPRING™
1/16 BEND	(22 1/2°)	THRUST BLOCK w/ GRIPRING™
1/32 BEND	(11 1/4°)	THRUST BLOCK w/ GRIPRING™

THE ABOVE SCHEDULE IS SUBJECT TO THE APPROVAL OF THE ON-SITE INSPECTOR DUE TO SOILS AND WORKING PRESSURES IN THE AREA.

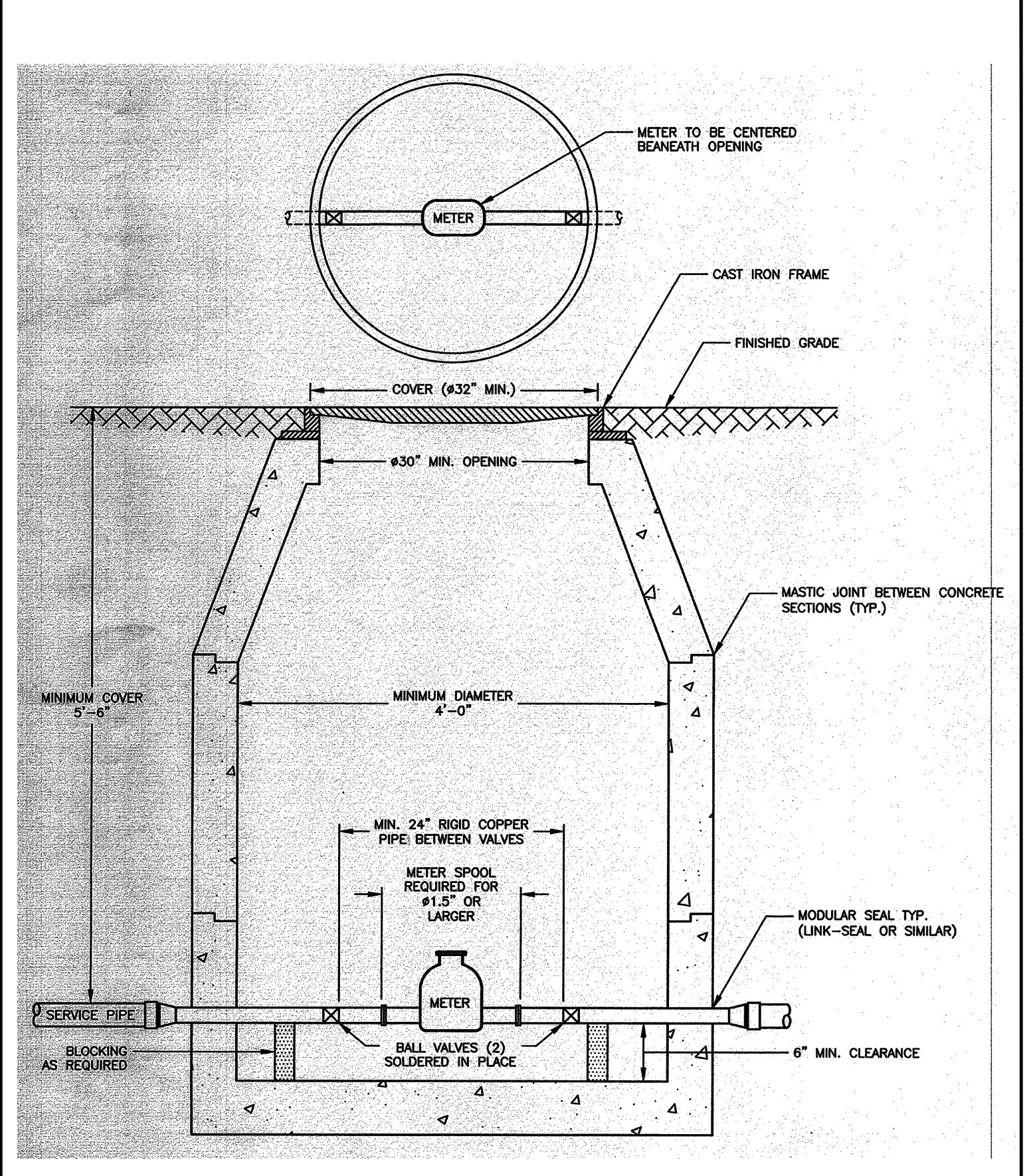
NOTES:

- THE PORTLAND WATER DISTRICT MAY HAVE INSPECTION FEES AND REQUIRE OBSERVATION OF ALL PIPING INSTALLATION BEFORE BURIAL. REFER TO SPECIFICATIONS.
- FOR WATER MAIN LAYOUT SEE DRAWINGS C-4.0
- FOR WATER MAIN PROFILE SEE CONSTRUCTION DRAWINGS C-11.0
- FOR WATER MAIN TRENCH SEE DETAILS ON THIS SHEET
- REFER TO PORTLAND WATER DISTRICT SPECIFICATIONS FOR TESTING AND CHLORINATION REQUIREMENTS.
- ALL HYDRANTS AND VALVES TO BE EPOXY COATED, NUTS AND BOLTS TO BE STAINLESS STEEL.
- SERVICE RODS FOR DOMESTIC SERVICE OR AIR VALVES TO BE STAINLESS STEEL.

(C) TYPICAL THRUST BLOCK PLACEMENT BENDS
N.T.S.



(F) TYPICAL THRUST BLOCK PLACEMENT ON TEES
N.T.S.



(J) WATER METER PIT DETAIL
N.T.S.

- METER PIT AND COVER NOTES**
- THE METER PIT SHALL BE SUPPLIED AND INSTALLED BY THE CUSTOMER AND SHALL BE LOCATED ON PRIVATE PROPERTY BETWEEN 10'-0" AND 20'-0" FROM THE PROPERTY LINE.
 - THE METER PIT SHALL BE MADE OF PRECAST CONCRETE OF SUFFICIENT SIZE TO PROVIDE 5'-6" MINIMUM GROUND COVER FROM FINISHED GRADE TO THE TOP OF THE SERVICE PIPE. ANY SEAMS BETWEEN CONCRETE SECTIONS SHALL BE SEALED WITH MASTIC JOINT. ALL OPENINGS IN THE CONCRETE FOR SERVICE PIPING SHALL BE SEALED WITH A MODULAR SEAL (LINK-SEAL OR SIMILAR).
 - THE INTERIOR OF THE METER PIT SHALL BE A MINIMUM OF 4'-0" IN DIAMETER, AND THE METER PIT OPENING SHALL BE A MINIMUM OF 30" IN DIAMETER WITH A CAST IRON FRAME. THE METER PIT COVER SHALL BE CAST IRON, 32" MINIMUM IN DIAMETER, AND BE EITHER PERMANENTLY LABELED "WATER" OR HAVE NO LABEL. ANY STEEL PLATE MATERIAL SHALL BE COATED WITH A RUST INHIBITOR PAINT.
 - WALL-MOUNTED LADDER RUNGS SHOULD NOT BE INSTALLED WITHIN METER PIT.
 - ALL PIPING INSIDE AND EXTENDING THROUGH THE METER PIT SHALL BE MADE OF COPPER, WITH A MINIMUM OF 6" CLEARANCE FROM THE METER PIT FLOOR. BLOCKING SHALL BE INSTALLED AS REQUIRED TO SUPPORT THE PIPE.
 - CUSTOMER SHALL ENSURE THE METER PIT AND COVER ARE PROPERLY RATED FOR TRAFFIC LOAD IF APPLICABLE.
- METER NOTES**
- ONLY PORTLAND WATER DISTRICT PERSONNEL ARE AUTHORIZED TO INSTALL WATER METERS. PORTLAND WATER DISTRICT PERSONNEL WILL BE ADDITIONALLY AUTHORIZED TO OPERATE METER VALVES AS NEEDED FOR INSTALLATION AND MAINTENANCE.
 - PORTLAND WATER DISTRICT WILL SUPPLY THE WATER METER AND NECESSARY FITTINGS FOR INSTALLATION. IF REQUIRED, A FLANGED METER SPOOL WILL BE AVAILABLE FOR CUSTOMER PICKUP AT DOUGLASS STREET CUSTOMER SERVICE AND MUST BE INSTALLED BY CUSTOMER PRIOR TO METER SET. ALL OTHER MATERIALS, INCLUDING VALVES, SHALL BE SUPPLIED AND INSTALLED BY THE CUSTOMER.
 - CUSTOMER WILL INSTALL TWO (2) BALL VALVES 24" APART FOR METER INSTALLATION, ALLOWING FOR THE WATER METER TO BE CENTERED UNDER THE METER PIT OPENING. BALL VALVES SHALL BE SOLDERED IN PLACE.
 - FOR A SERVICE PIPE WITH A DIAMETER OF 1" OR LESS, CUSTOMER WILL INSTALL RIGID COPPER PIPE (24" MINIMUM) BETWEEN THE BALL VALVES.
 - FOR PIPING WITH A DIAMETER OF 1-1/2" OR LARGER, THE CUSTOMER WILL OBTAIN A FLANGED METER SPOOL PIECE FROM THE PORTLAND WATER DISTRICT. THE CUSTOMER IS RESPONSIBLE FOR ENSURING THAT THE SPOOL PIECE IS INSTALLED PRIOR TO METER INSTALLATION.
 - THE METER PIT MAY HOUSE UP TO TWO 5/8", 3/4" OR 1" METERS. INSTALLATION OF MULTIPLE METERS IN A METER PIT MUST RECEIVE PRIOR APPROVAL FROM THE PORTLAND WATER DISTRICT.

PRELIMINARY - NOT FOR CONSTRUCTION

PROJECT: THE FOREFRONT AT THOMPSON'S POINT			FST FAY, SPOFFORD & THORNDIKE ENGINEERS - PLANNERS - SCIENTISTS 778 MAIN ST., SUITE 8, SOUTH PORTLAND, ME 04106
SHEET TITLE: WATER AND GAS SERVICE DETAILS			
CLIENT: FOREFRONT PARTNERS I, LP		DATE: SEPT 2014 SCALE: N.T.S. JOB NO: 2982.05	SHEET: C-7.7
1 12.12.14 FINAL SUBDIVISION APPLICATION SUBMISSION REV DATE DESCRIPTION		P.E. BOE KENNEDY LIC. #11994	