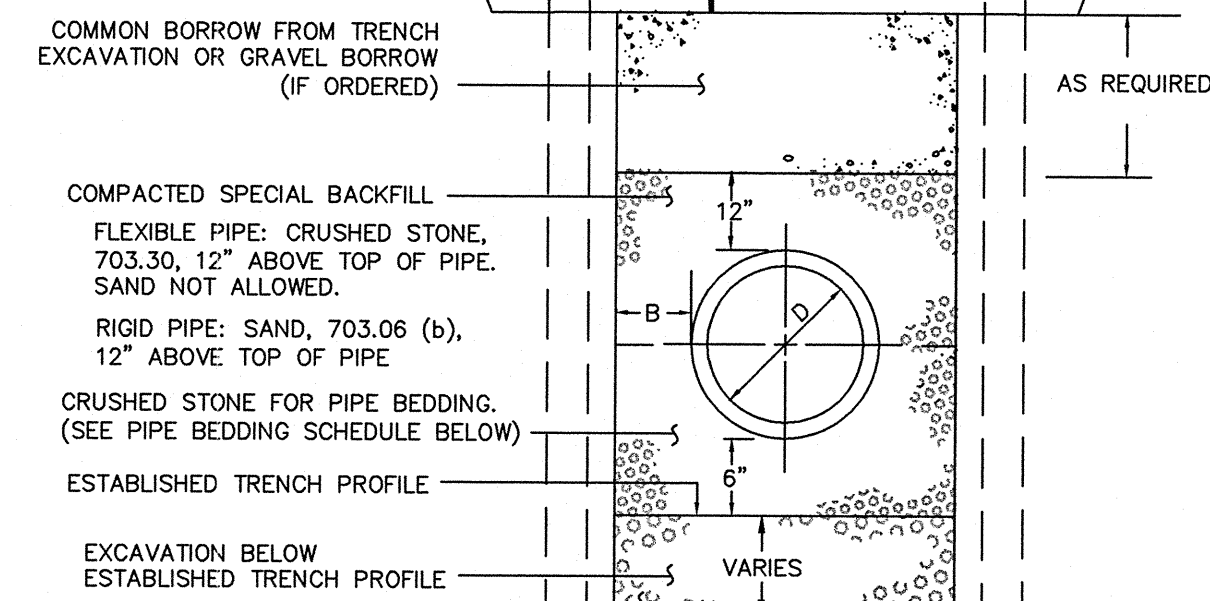


SEE NOTE 3 IN THRUST BLOCK NOTES DETAIL
WATER SERVICE TRENCH SECTION
 N.T.S.

NOTE: TRENCH PAVEMENT REPLACEMENT SHALL EXTEND 9' BEYOND EDGE OF TRENCH.



COMMON BORROW FROM TRENCH EXCAVATION OR GRAVEL BORROW (IF ORDERED)

COMPACTED SPECIAL BACKFILL
 FLEXIBLE PIPE: CRUSHED STONE, 703.30, 12" ABOVE TOP OF PIPE. SAND NOT ALLOWED.
 RIGID PIPE: SAND, 703.06 (b), 12" ABOVE TOP OF PIPE
 CRUSHED STONE FOR PIPE BEDDING. (SEE PIPE BEDDING SCHEDULE BELOW)
 ESTABLISHED TRENCH PROFILE
 EXCAVATION BELOW ESTABLISHED TRENCH PROFILE

PIPE DIAMETER	DIMENSION
D	B
12"	0'-10"
15"	0'-8 1/4"
18"	0'-6 1/2"

PIPE BEDDING SCHEDULE

TYPE OF PIPE	EMBEDMENT MATERIAL
CMP DUCTILE IRON CMP	MDOT 703.22 TYPE B LUD BACKFILL
PVC-SDR 35 HDPE	MDOT 703.22 TYPE C 3/4" CRUSHED STONE

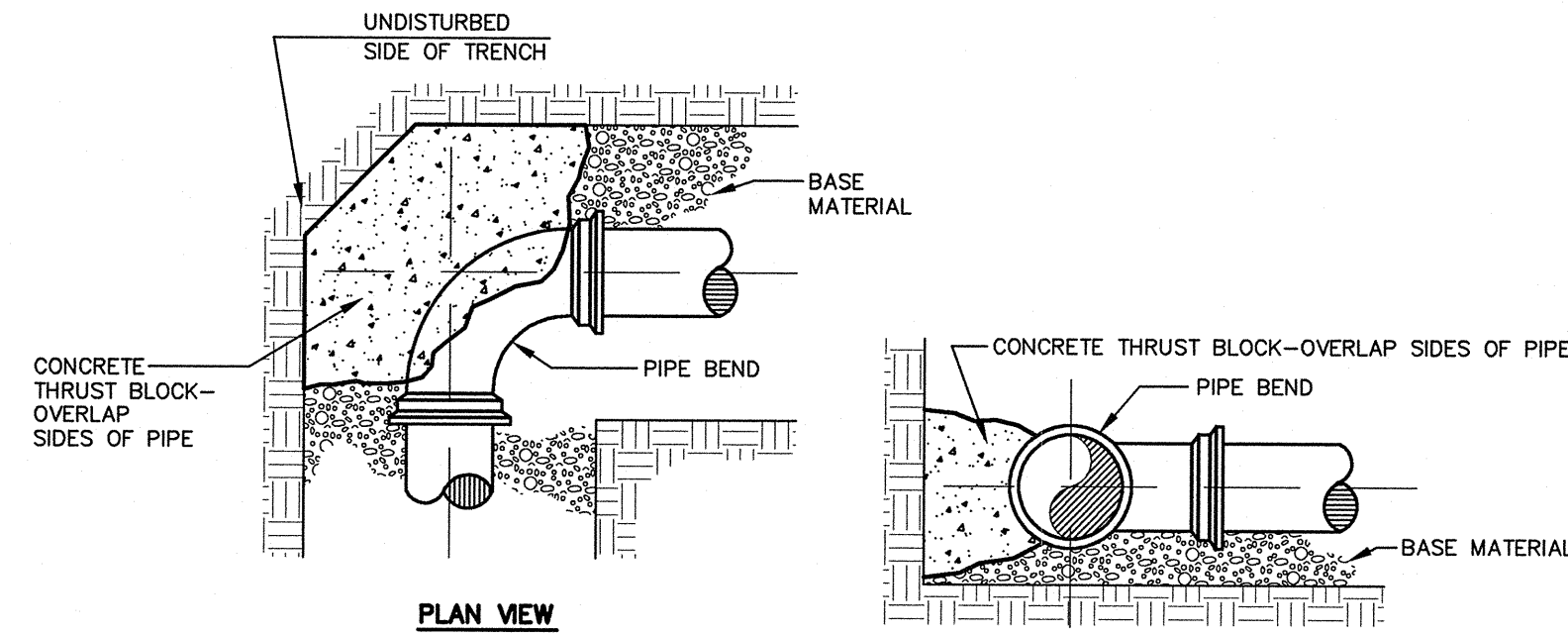
* PAVEMENT THICKNESSES NOTED ARE A MINIMUM. CONTRACTOR SHALL MATCH THICKNESS OF EXISTING PAVEMENT WITHIN CITY RIGHT-OF-WAYS.

TYPICAL PIPE INSTALLATION
 N.T.S.

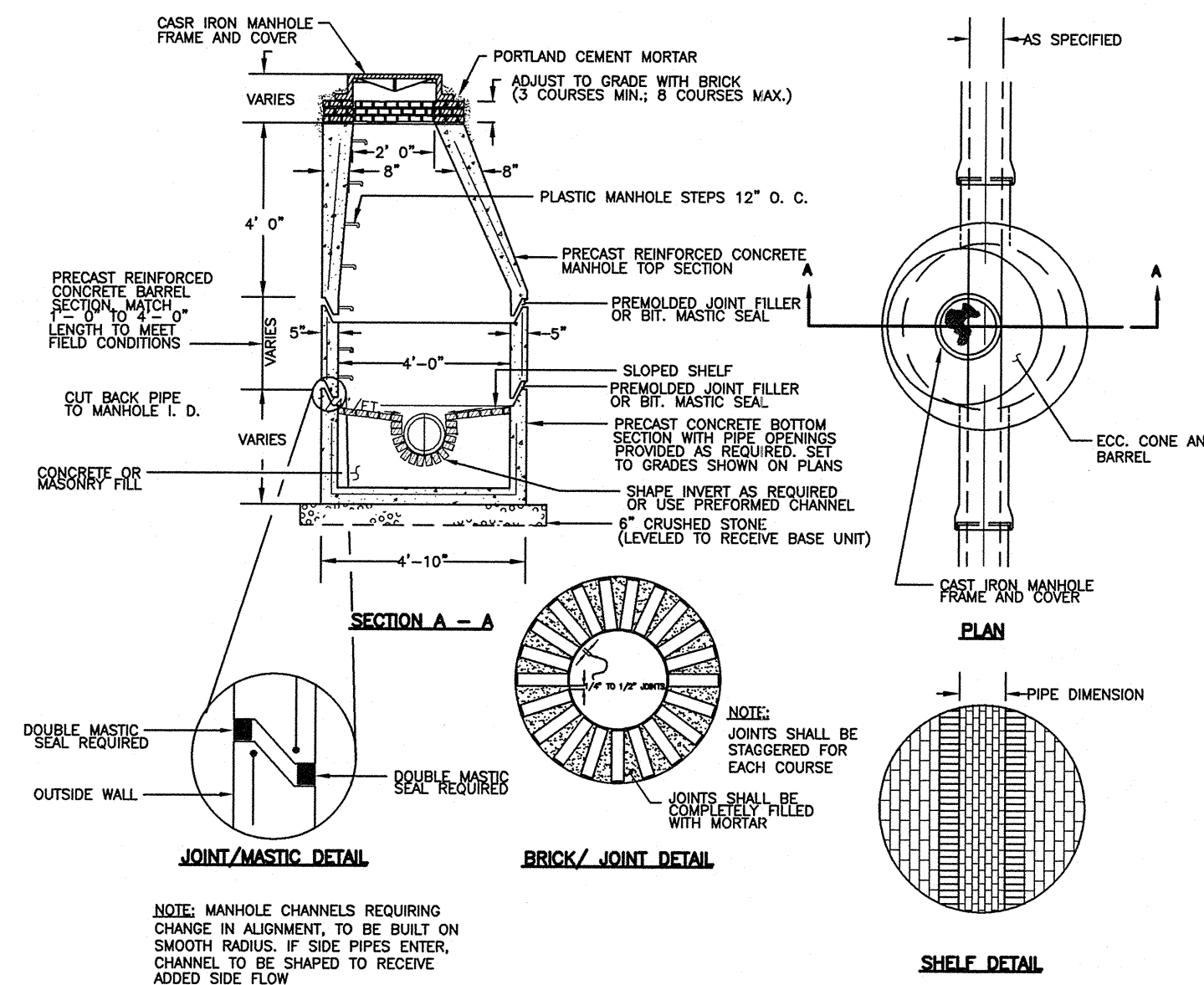
THRUST/RETAINER GLAND SCHEDULE

1/4 BEND (90°)	USE POURED-IN-PLACE THRUST BLOCK w/RETAINERS
1/8 BEND (45°)	THRUST BLOCK w/RETAINERS
1/16 BEND (22 1/2°)	THRUST BLOCK
1/32 BEND (11 1/4°)	THRUST BLOCK

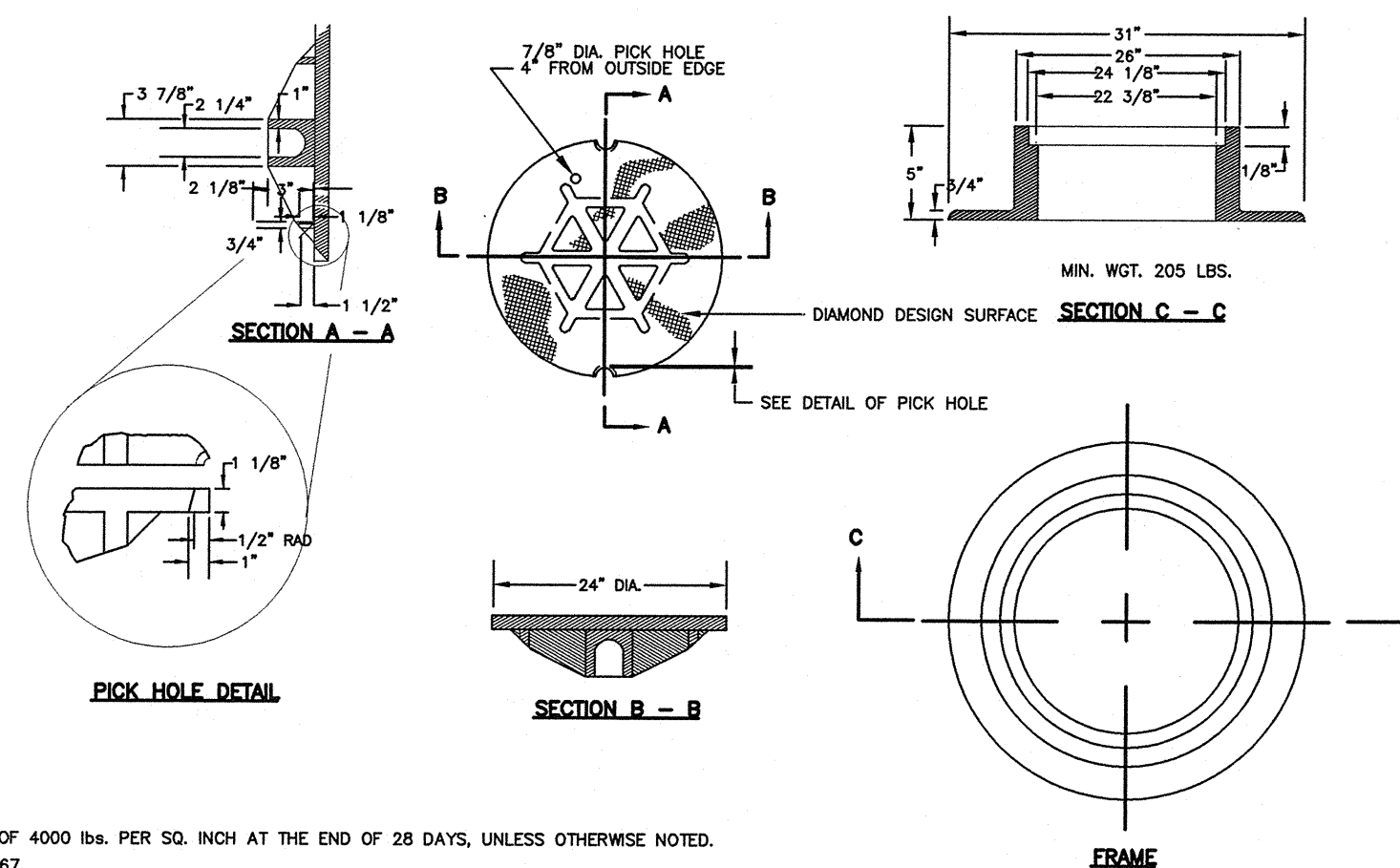
THE ABOVE SCHEDULE IS SUBJECT TO THE APPROVAL OF THE ON-SITE INSPECTOR DUE TO SOILS AND WORKING PRESSURES IN THE AREA.



SEE NOTE 3 IN THRUST BLOCK NOTES DETAIL
TYPICAL THRUST BLOCK PLACEMENT ON BENDS
 N.T.S.



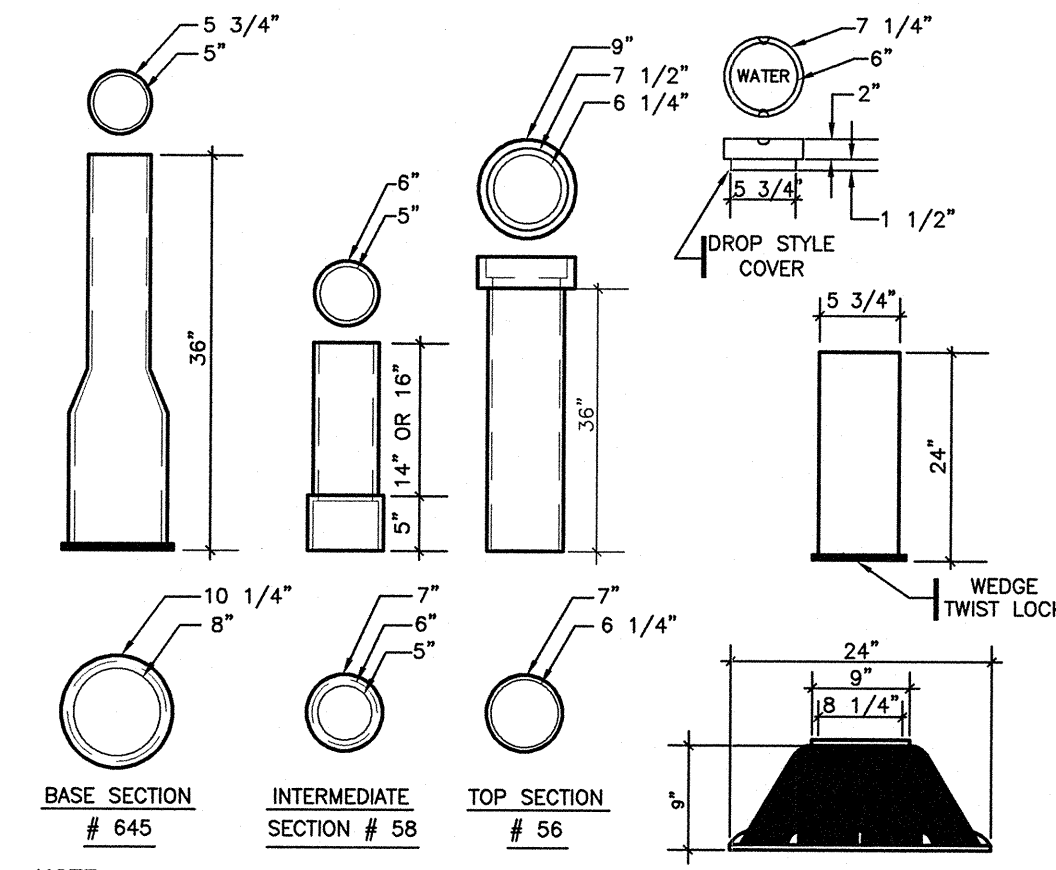
PRECAST CONCRETE MANHOLE TYPE "A"
 N.T.S.



GENERAL NOTES

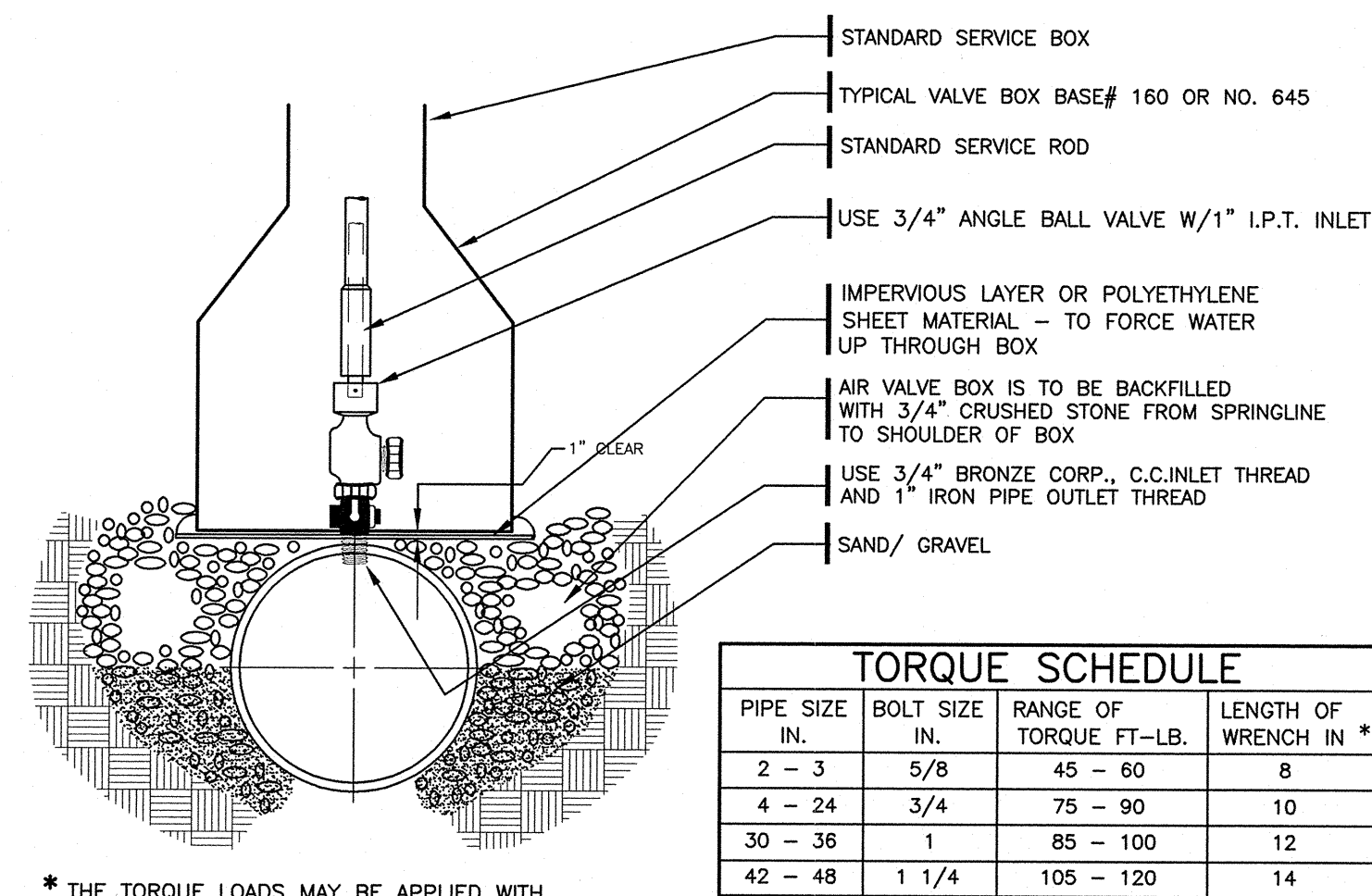
1. ULTIMATE STRENGTH OF 4000 LBS. PER SQ. INCH AT THE END OF 28 DAYS, UNLESS OTHERWISE NOTED.
2. ASTM SPEC. C-478-87
3. C-32-83, GRADE MA AND SA.
4. APPLIED TO THE EXTERIOR SURFACE IF CONSTRUCTION OF BRICK MASONRY, THE SMOOTH MORTAR SURFACE SHALL BE PLASTERED WITH A SMOOTH MORTAR FINISH 3/8" THICK. AFTER THE MORTAR HAS SET, THE SURFACE SHALL BE WATERPROOFED AS REQUIRED BY SUPPLEMENTAL SPECIFICATIONS SECTION 004.
5. CASTINGS SHALL CONFORM TO ASTM DESIGNATION A48-CLASS 30. ALL PARTS OF CASTINGS, EXCEPT FINISHED SURFACE, SHALL RECEIVE A COAT OF COAL TAR PITCH VARNISH OR ASPHALTUM PAINT WHICH SHALL BE SMOOTH AND TOUGH BUT NOT BRITTLE.
6. MANHOLES MAY BE CONSTRUCTED OF MASONRY, PRECAST REINFORCED CONCRETE, OR CAST IN PLACE.
7. ALL PRECAST MANHOLES AND CATCH BASINS SHALL BE IDENTIFIED BY STATION AND OFFSET, PAINTED ON THE SIDE OF THE STRUCTURE BY THE MANUFACTURER.
8. STORM AND SEWER MANHOLES SHALL HAVE SOLID COVERS WITH ONE DRILLED HOLE.
9. EXISTING MANHOLE AND CATCH BASIN FRAMES AND COVERS SHALL BE SALVAGED BY THE CONTRACTOR, AND REMAIN THE PROPERTY OF THE CITY OF PORTLAND.

TYPE "A" MANHOLE COVER AND FRAME
 N.T.S.



NOTE: NUMBERS ARE FOR 0.25" BUFFALO VALVE BOXES

SEE NOTE 3 IN THRUST BLOCK NOTES DETAIL
TYPICAL VALVE BOXES
 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	85 - 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.

SEE NOTE 3 IN THRUST BLOCK NOTES DETAIL
TYPICAL AIR VALVE SECTION (1")
 N.T.S.

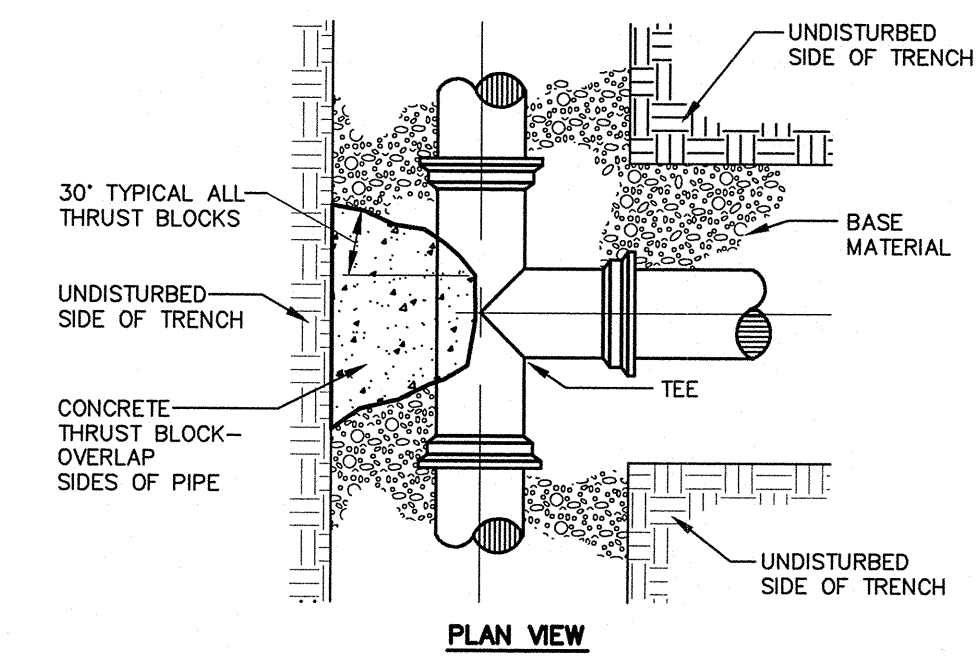
1. INSTALL POLY BARRIER BETWEEN PIPE AND ALL THRUST BLOCKS.
2. ANY MODIFICATION TO THRUST BLOCK SIZING OR PIPE RESTRAINT REVISIONS SHALL BE APPROVED IN WRITING BY THE ENGINEER PRIOR TO IMPLEMENTATION IN THE FIELD
3. ANY WORK RELATING TO WATER PIPING OR DETAILS SHALL BE IN ACCORDANCE WITH THE PORTLAND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

THRUST BLOCK NOTES

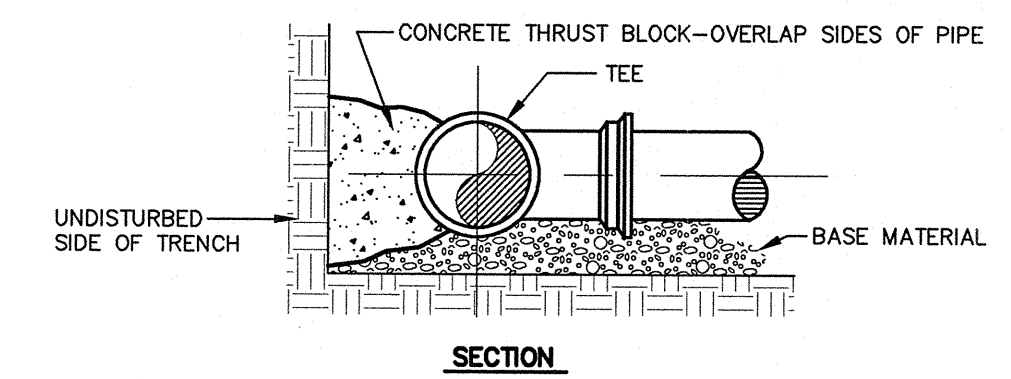
PIPE SIZE	1/32 BEND	1/16 BEND	1/8 BEND	1/4 BEND	TEES/CAPS
4"	1.0	1.9	3.7	6.8	4.8

BEARING SURFACE REQUIRED IN SQUARE FEET

NOTE: KEEP CONCRETE CLEAR OF PIPE JOINT, NUTS AND BOLTS

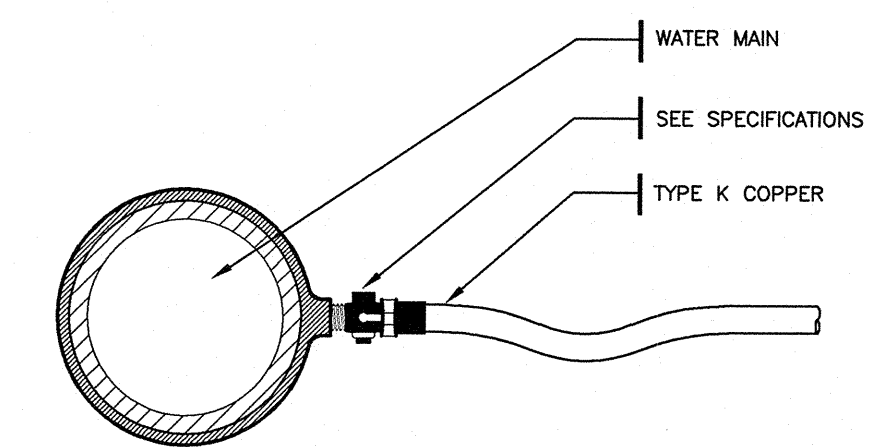


SEE NOTE 3 IN THRUST BLOCK NOTES DETAIL
TYPICAL THRUST BLOCK PLACEMENT ON TEES
 N.T.S.



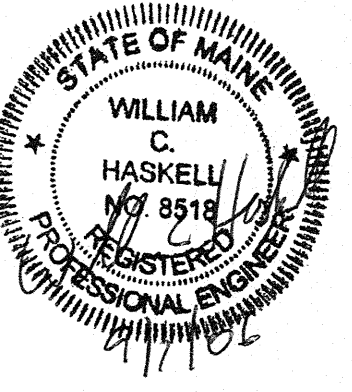
SEE NOTE 3 IN THRUST BLOCK NOTES DETAIL
STANDARD TEE BLOCKING
 N.T.S.

NOTE: SERVICE CONNECTIONS (DIRECT TAPS AND SERVICE CLAMPS) WILL BE INSTALLED SO THAT THE OUTLET IS AT AN ANGLE OF NOT MORE THAN 45° ABOVE THE HORIZONTAL. ALWAYS PUT A BEND OR "GOOSENECK" IN THE SERVICE LINE PRIOR TO CONNECTING TO PROVIDE FLEXIBILITY AND "GIVE" TO COUNTERACT THE EFFECTS OF A LOAD DUE TO SETTLEMENT OR EXPANSION AND/OR CONTRACTION.



SEE NOTE 3 IN THRUST BLOCK NOTES DETAIL
 (1 1/2" AND 2 1/2" C.C. OR IRON PIPE THREAD)

WATER SERVICE
 N.T.S.



**Pearl Place
 Building 1 & 2
 Portland, Maine**

Developer
 Avesta Pearl Street One, L.P.

Architect
 Winton Scott Architects

Landscape Architect
 Carroll Associates

Civil
 Gorrell Palmer Consulting Engineers

Structural
 Becker Structural

Mechanical / Plumbing
 Mechanical Systems Engineers

Electrical
 Bartlett Designs

**BUILDINGS 1 & 2
 UTILITY DETAILS**

C-5

Scale: NTS

September 1, 2006