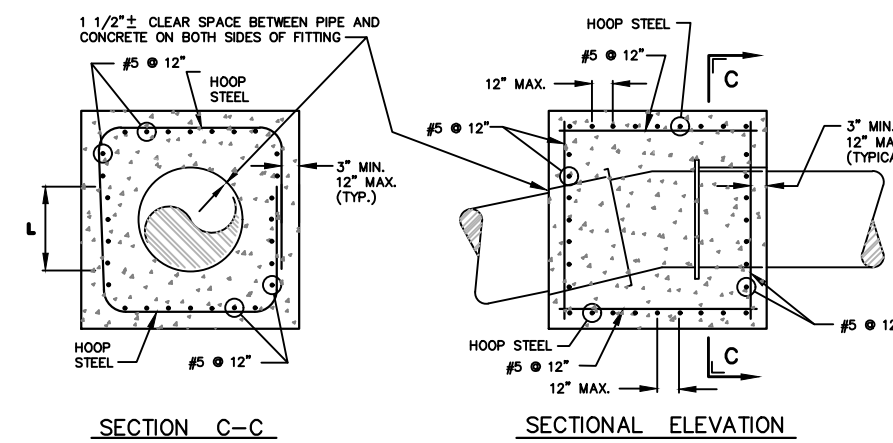


LEGEND OF PIPELINE MATERIALS

- (A) CORPORATION STOP (BRASS), BALLCORP STYLE
- (B) SWIVEL QUARTER BENDS AS PER FORD, 1" L0244S & FOR 2" L0277S
- (C) THREADED END ELBOW 304 STAINLESS STEEL
- (D) SOLDER END ELBOW
- (E) SOFT COPPER TUBING (TYPE K)
- (F) RIGID COPPER PIPE (TYPE K)
- (G) BALL VALVE CURB STOP W/ FLARED ENDS
- (H) FLARED SOLDER TRANSITION COUPLING (BRASS)
- (I) SOLDER END TEE
- (J) SOLDER END BALL VALVE WITH LEVER OPERATOR
- (K) FLARED/THREADED END BALL VALVE
- (L) COMBINATION AIR/VACUUM VALVE
- (M) SOLDER/THREADED UNION (BRASS)
- (N) THREADED NIPPLE 304 STAINLESS STEEL SCHD. 40
- (O) THREADED NIPPLE (PVC)
- (P) HOSE BIB
- (Q) 304 STAINLESS STEEL COUPLING
- (R) 304 STAINLESS STEEL PIPE, THREADED ENDS SCHD. 40
- (S) CURB BOX-BINGHAM & TAYLOR NO.93-E W/FIG. NO. 4901-A, OR TYLER PIPE 6500 SERIES, ITEM 93-E.
- (T) VALVE BOX-3 PIECE SCREW, 5 1/4" DIA., TYLER PIPE SERIES 6860 W/#6 BASE FOR 10" AND SMALLER, AND #160 BASE FOR 12" AND LARGER.
- (U) DUCTILE IRON PLUG OR CAP W/ 2" I.P. TAP
- (V) MANHOLE FRAME AND COVER: MINIMUM 22" CLEAR OPENING WITH INNER LID, FRAME AND COVER TO BE NEENAH 1758-E, EAST JORDAN IRON WORKS 1044, WOODWARD FOUNDRIES 3087-W169, OR ALLEGHENY FOUNDRY 109W-110-300 (WITH TWO HANDLES ON INNER LID ADDED TO STANDARD PATTERN). THE WORD "WATER" IS TO BE CAST IN LARGE LETTERS ON THE SURFACE OF THE COVER.
- (W) CAST ALUMINUM OR REINFORCED PLASTIC MANHOLE STEPS.
- (X) PRECAST MANHOLE WITH 4'-0" INSIDE DIAMETER.
- (Y) REDUCER (304 STAINLESS STEEL)
- (Z) TWO PIECE VALVE BOX, TYLER PIPE SERIES 6850



LARGE GRAVITY BLOCK (FOR UPWARD VERTICAL THRUST RESTRAINT) MINIMUM REINFORCING STEEL REQUIREMENTS

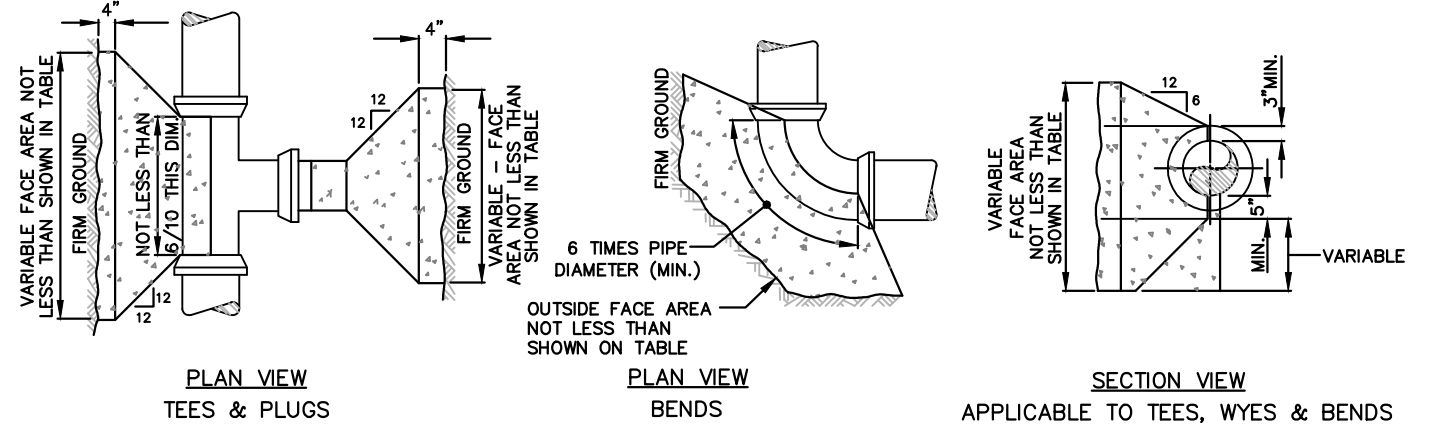
BAR SIZE	MINIMUM NUMBER OF TOTAL HOOPS PER C.Y. OF CONCRETE PROVIDED X	MINIMUM L
5	.037	30"
6	0.220	45"
7	0.192	58"

RESPONSIBILITY AND MINIMUM PROVISIONS
 IT IS THE CONTRACTOR'S BROAD OVERALL RESPONSIBILITY TO CONSTRUCT A WORKABLE WATERLINE WHICH WILL BE SERVICEABLE AND WHICH WILL SATISFACTORILY MEET THE REQUIRED HYDROSTATIC TEST UPON COMPLETION. IN ALL INSTANCES, EVEN IN AREAS WHERE RESTRAINED JOINTS ARE TO BE INSTALLED, THE CONTRACTOR SHALL INSTALL NO LESS THAN THE AMOUNTS OF CONCRETE REACTION BLOCKING INDICATED IN THE TABLE AS ADJUSTED TO REFLECT ACTUAL HYDROSTATIC TEST PRESSURE. FOR UPWARD THRUSTING VERTICAL BENDS, THE VOLUME OF GRAVITY BLOCKING SHALL CONFORM TO THE ABOVE TABLE AS ADJUSTED TO REFLECT ACTUAL HYDROSTATIC TEST PRESSURE EXCEPT THAT IN RESTRAINED JOINT AREAS, THE VOLUME OF CONCRETE REACTION BLOCKING MAY BE 67% OF THE VOLUME AS ADJUSTED TO REFLECT ACTUAL HYDROSTATIC TEST PRESSURE. TO ADJUST REACTION BLOCKING AND GRAVITY BLOCKING VALUES GIVEN IN THE TABLE TO REFLECT THE ACTUAL HYDROSTATIC TEST PRESSURE CONDITIONS, MULTIPLY THE VALUE GIVEN IN THE TABLE TIMES THE ACTUAL HYDROSTATIC TEST PRESSURE (IN POUNDS PER SQUARE INCH) TO BE APPLIED, AND DIVIDE THAT RESULTING NUMBER BY 300.

PIPE SIZE (in.)	AREA (sq.in.)	TOTAL FORCE (lbs.)	REACTION BLOCKING					GRAVITY BLOCKING # X				
			90° BENDS	45° BENDS	22 1/2° BENDS	11 1/4° BENDS	45° BENDS	22 1/2° BENDS	11 1/4° BENDS			
4	19.39	5,820	1.5	2.1	1.1	1.0	1.0	1.6	0.9	0.5		
6	39.24	11,770	2.9	4.2	2.3	1.1	1.0	3.3	1.8	0.9		
8	66.73	20,020	5.0	7.1	3.8	2.0	1.0	5.5	3.0	1.6		
10	99.71	29,910	7.5	10.6	5.7	2.9	1.5	8.2	4.5	2.3		
12	140.32	42,100	10.5	14.9	8.1	4.1	2.1	11.5	6.3	3.2		
16	242.38	72,720	18.2	25.8	14.0	7.1	3.6	19.9	10.8	5.5		
20	372.13	111,640	28.0	39.5	21.4	10.9	5.5	30.5	16.5	8.5		

* BEARING SURFACE AREA OF BLOCKING AGAINST UNDISTURBED EARTH.
 * GRAVITY BLOCKING TABLE APPLIES ONLY TO VERTICAL BENDS WHERE THE THRUST IS UPWARD. THE REACTION BLOCKING TABLE APPLIES TO ALL OTHER TYPES OF FITTINGS.

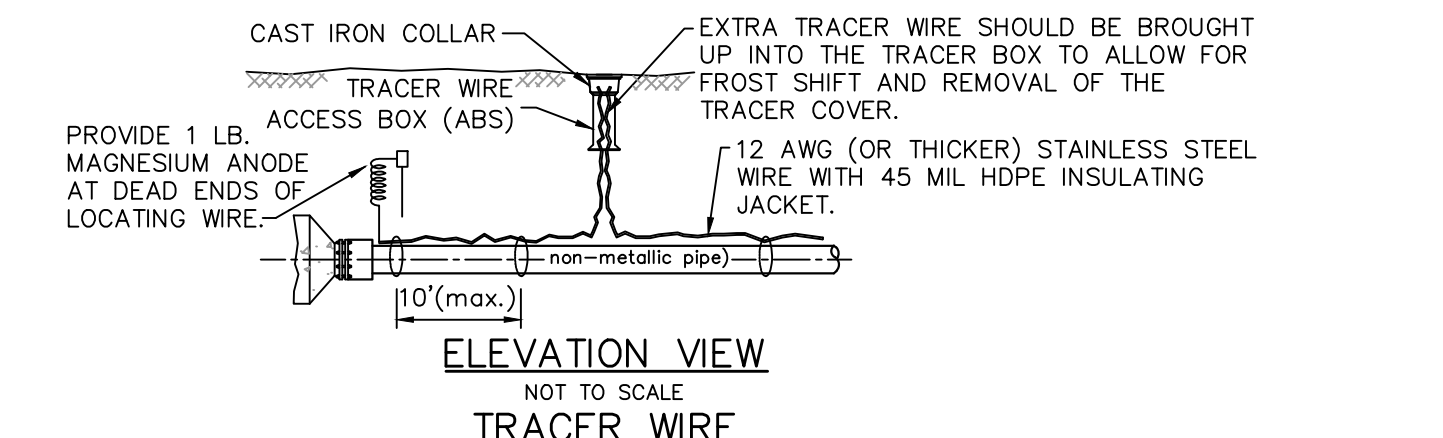
COMPUTATION NOTES:
 • CALCULATIONS BASED ON 300 P.S.I. PRESSURE IN PIPELINE.
 • CALCULATIONS FOR CONCRETE VOLUME REQUIREMENTS OF GRAVITY BLOCKING INCLUDE A FACTOR OF SAFETY OF 1.50.
 • CALCULATIONS FOR REACTION BLOCKING COMPUTED USING AN ASSUMED ALLOWABLE EARTH BEARING PRESSURE OF 4000 P.S.F. IF EARTH ENCOUNTERED WILL NOT WITHSTAND THIS PRESSURE, THE BEARING SURFACE AREA OF THE BLOCK MUST BE INCREASED IN PROPORTION TO THE ACTUAL SOIL BEARING CAPACITY.



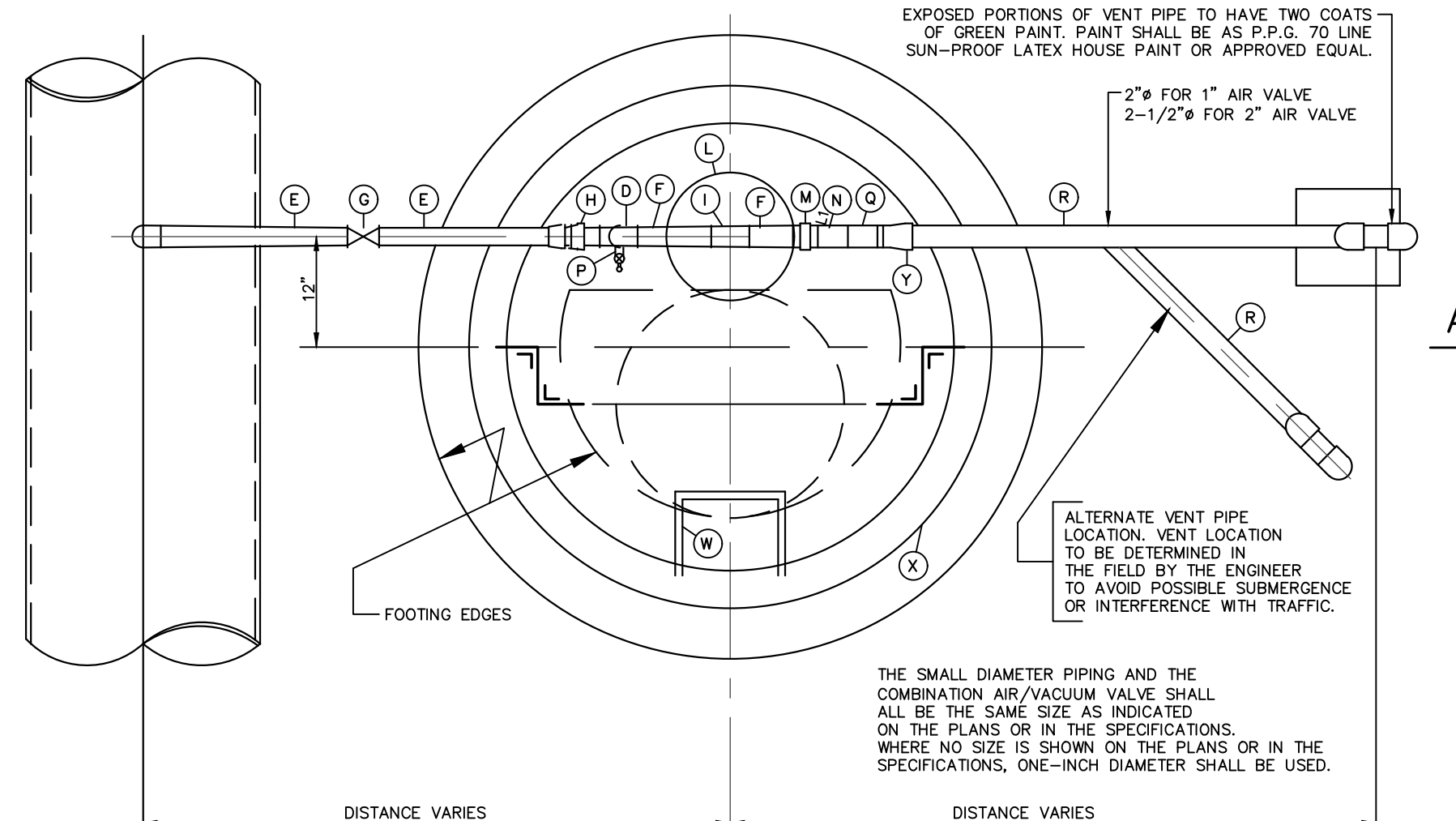
HORIZONTAL AND DOWNWARD VERTICAL THRUST REACTION BLOCKING DETAILS

GUIDE TO THRUST BLOCKING REQUIREMENTS

- NOTE:
1. TRACER WIRE IS REQUIRED FOR ALL NON-METALLIC PRESSURE PIPELINES INCLUDING FORCE MAINS, PRESSURE SEWERS, PRESSURE SEWER SERVICE LINES, WATER MAINS, WATER SERVICE LINES AND GAS LINES. TRACER WIRE IS NOT REQUIRED FOR GRAVITY SEWERS OR FOR METALLIC PRESSURE PIPELINES.
 2. WHERE THE PIPELINE IS INSTALLED BY OPEN CUT, THE WIRE SHALL BE SECURELY FASTENED TO THE TOP OF THE PIPE AT INTERVALS OF NO GREATER THAN 10 FEET. WHERE THE PIPELINE IS INSTALLED BY DIRECTIONAL BORING, THE TRACER WIRE SHALL BE PULLED ALONG WITH THE PIPE AND NOT FASTENED.
 3. NO TRACER WIRE SPLICES ARE TO BE MADE BELOW GROUND. ALL TRACER WIRE SPLICES SHALL BE ACCOMPLISHED USING A TRACER WIRE ACCESS BOX.
 4. TRACER WIRE ACCESS BOXES SHALL BE PROVIDED AT THE INTERSECTIONS (TEES) OF ALL NON-METALLIC LINES, EXCEPT NO TRACER WIRE IS REQUIRED ALONG THE PORTION OF LINE LOCATED BETWEEN THE CUSTOMERS CURB BOX AND THE TEE CONNECTION TO THE MAIN WHERE THE TEE IS SITUATED BELOW A TRAVELED LANE OF PUBLIC ROAD PAVEMENT OR WHERE THE HORIZONTAL DISTANCE BETWEEN THE CURB BOX AND THE TEE IS 10 FEET, OR LESS.

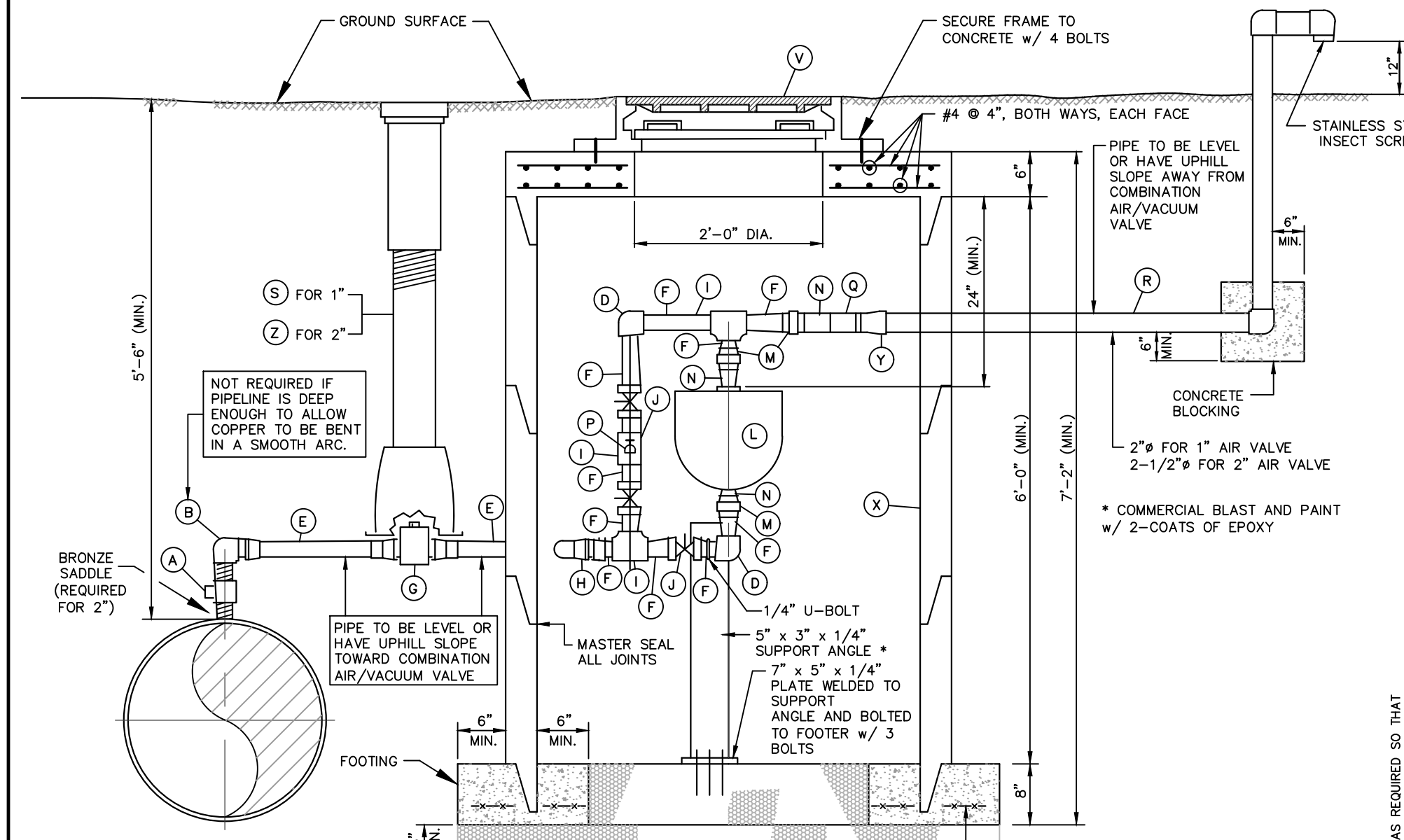


TRACER WIRE



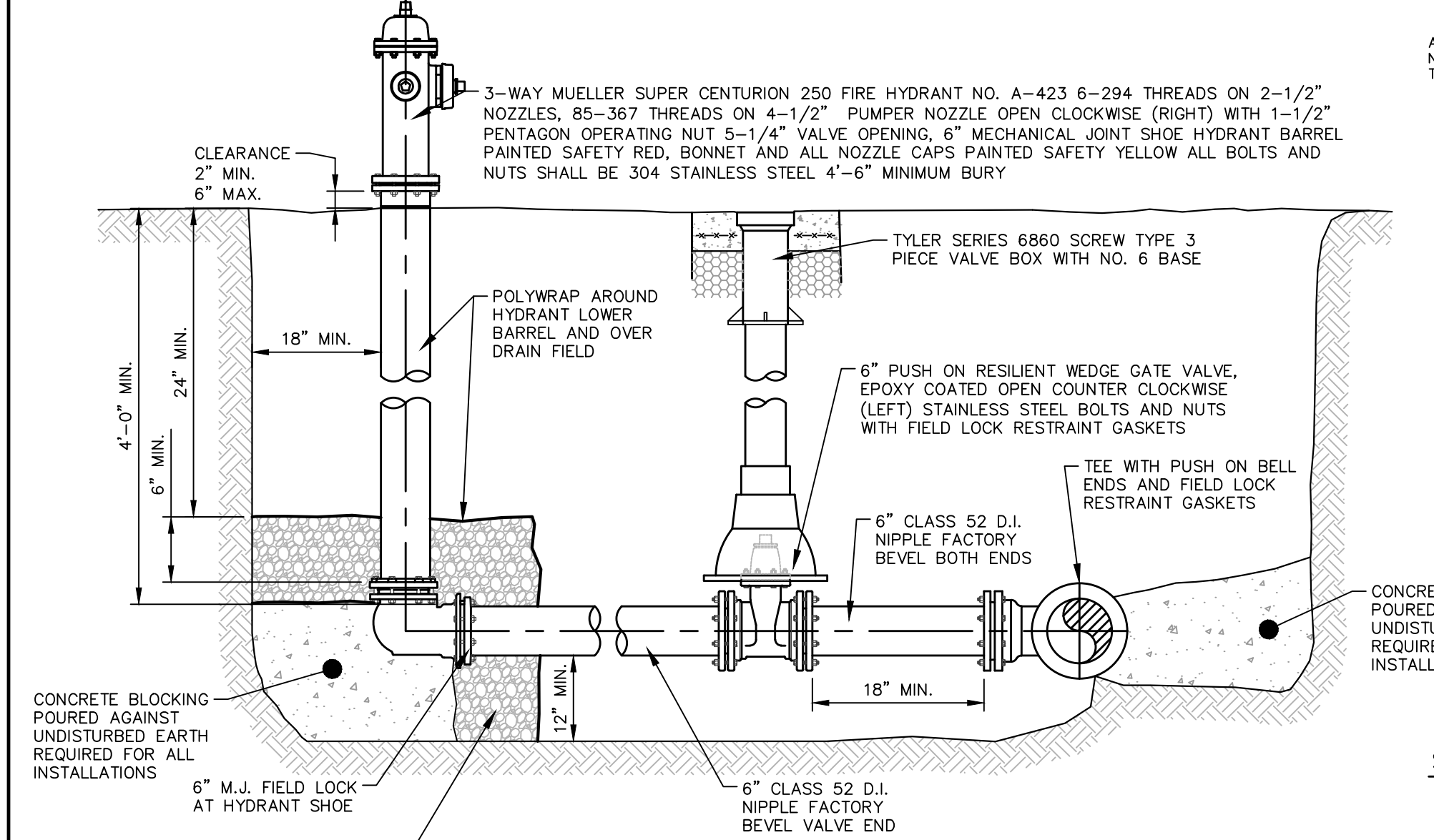
PLAN VIEW

1" AND 2" COMBINATION AIR/VACUUM RELIEF VALVE VAULT

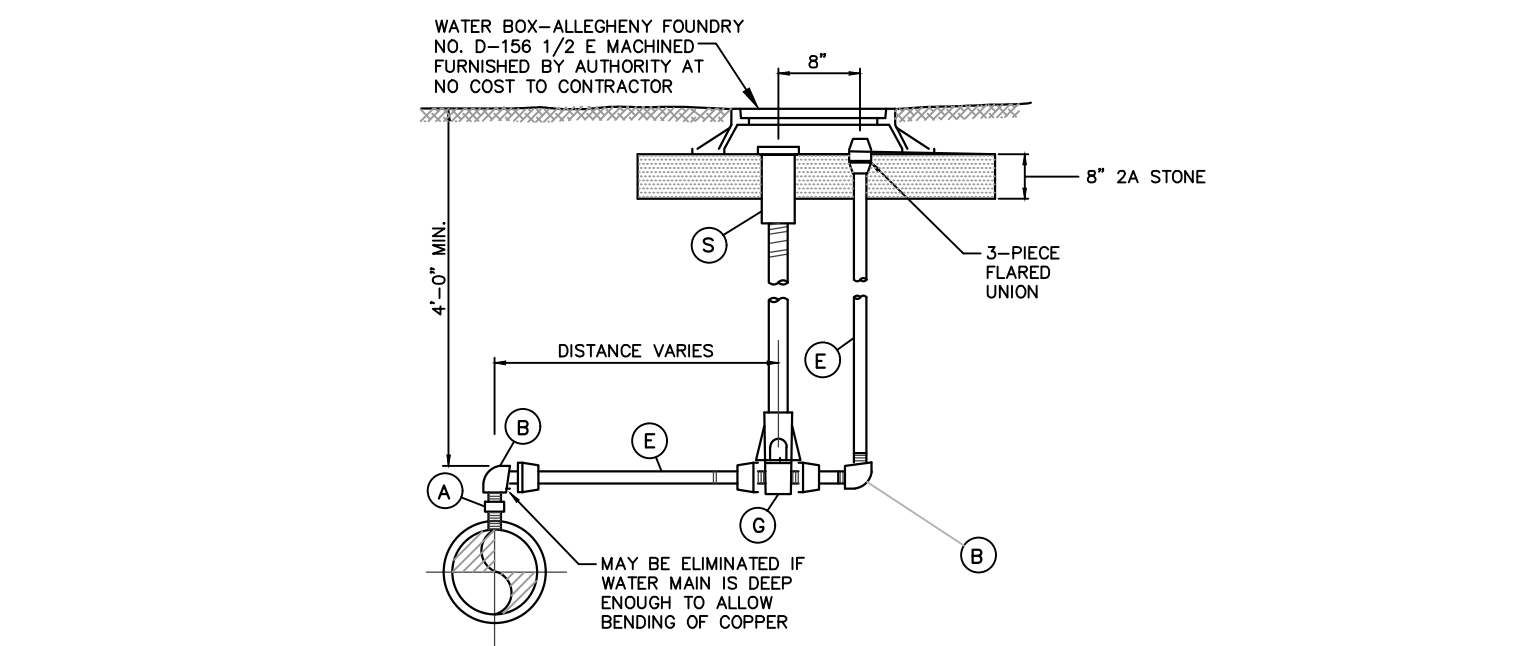


SECTION A-A

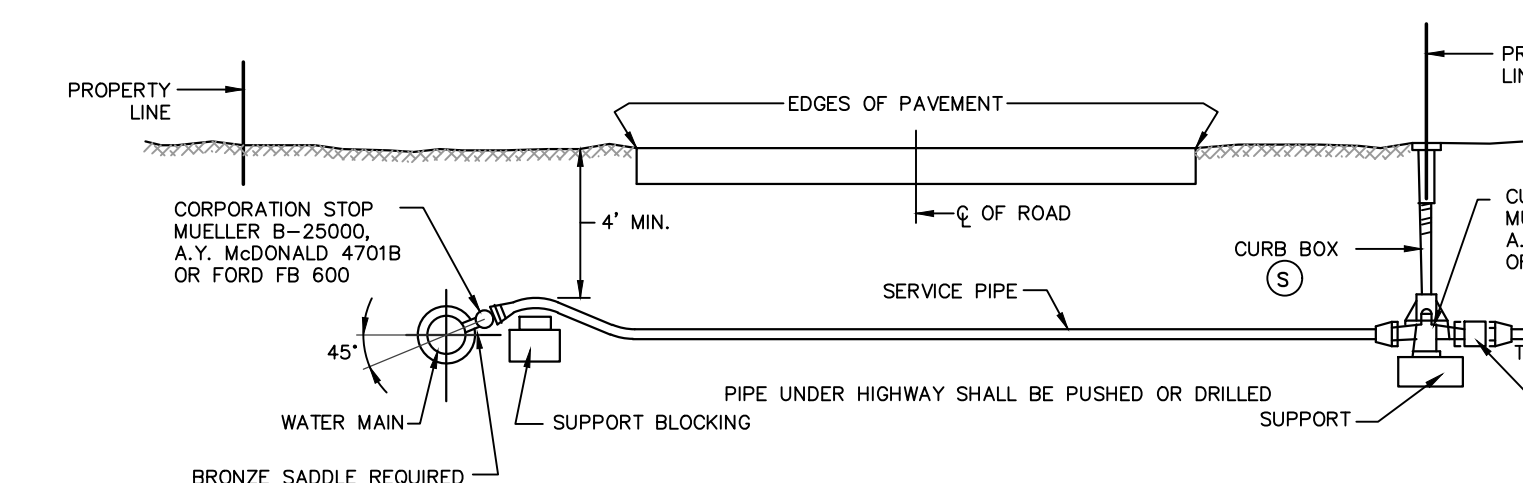
1" AND 2" COMBINATION AIR/VACUUM RELIEF VALVE VAULT



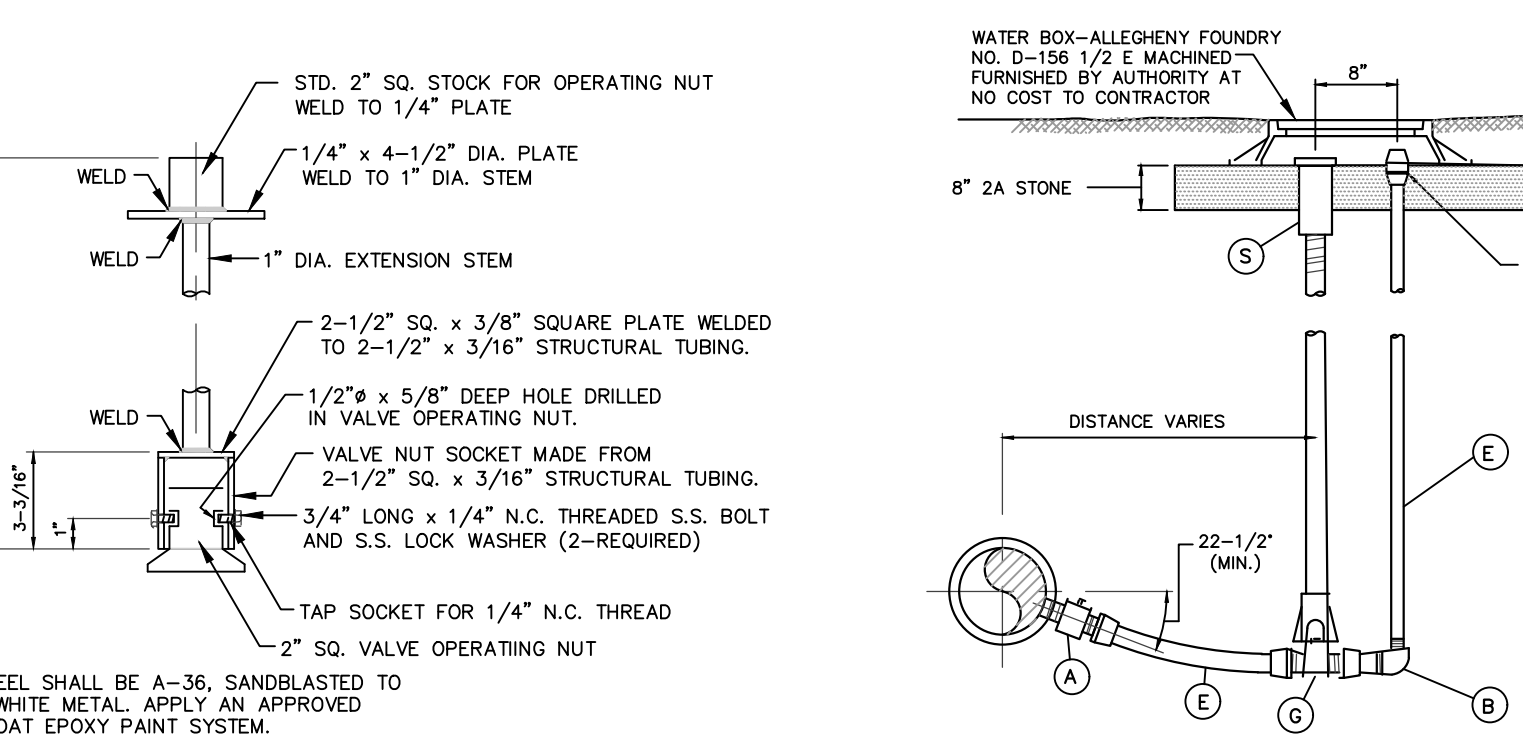
TYPICAL FIRE HYDRANT INSTALLATION



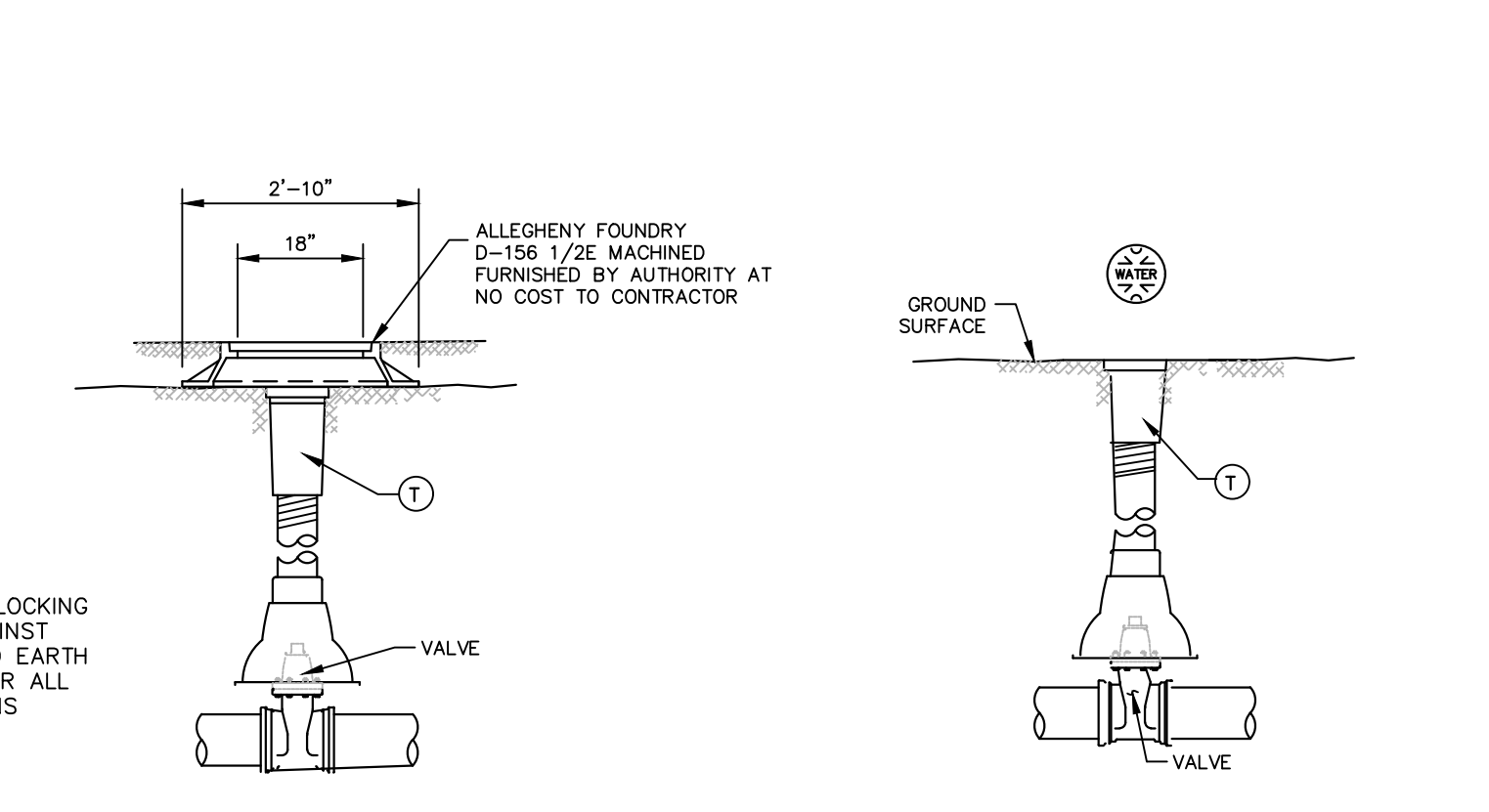
3/4" AND 1" MANUAL AIR RELEASE UNIT



TYPICAL SERVICE LINE CONNECTION

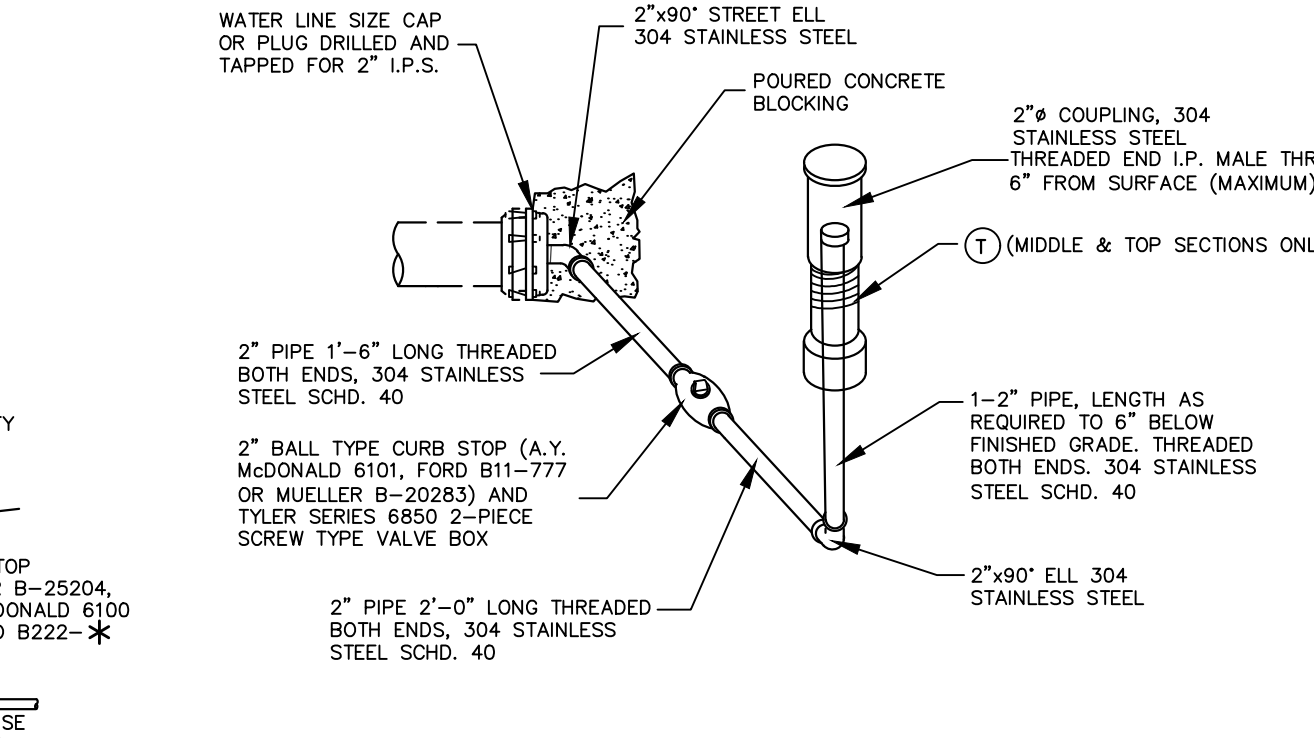


VALVE STEM EXTENSION DETAIL

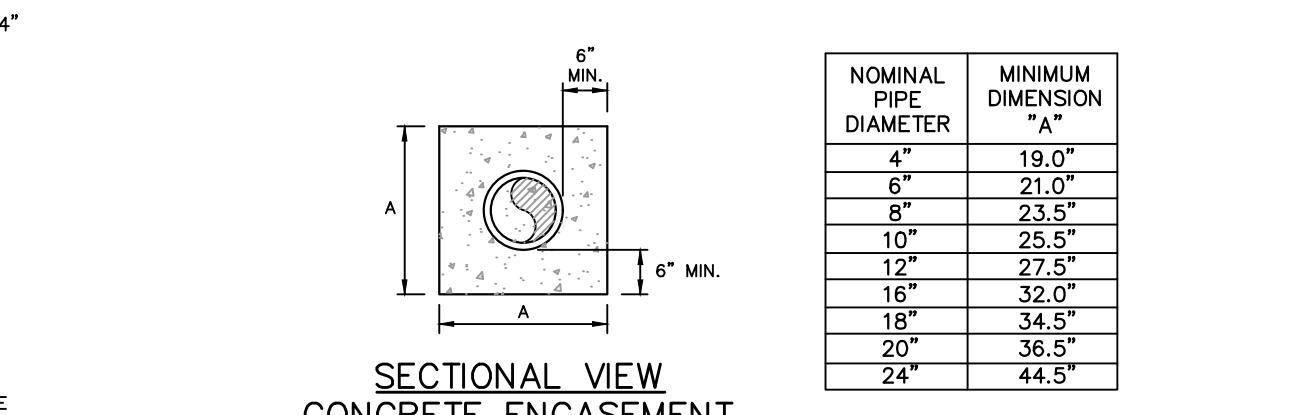


1" BLOW OFF UNIT

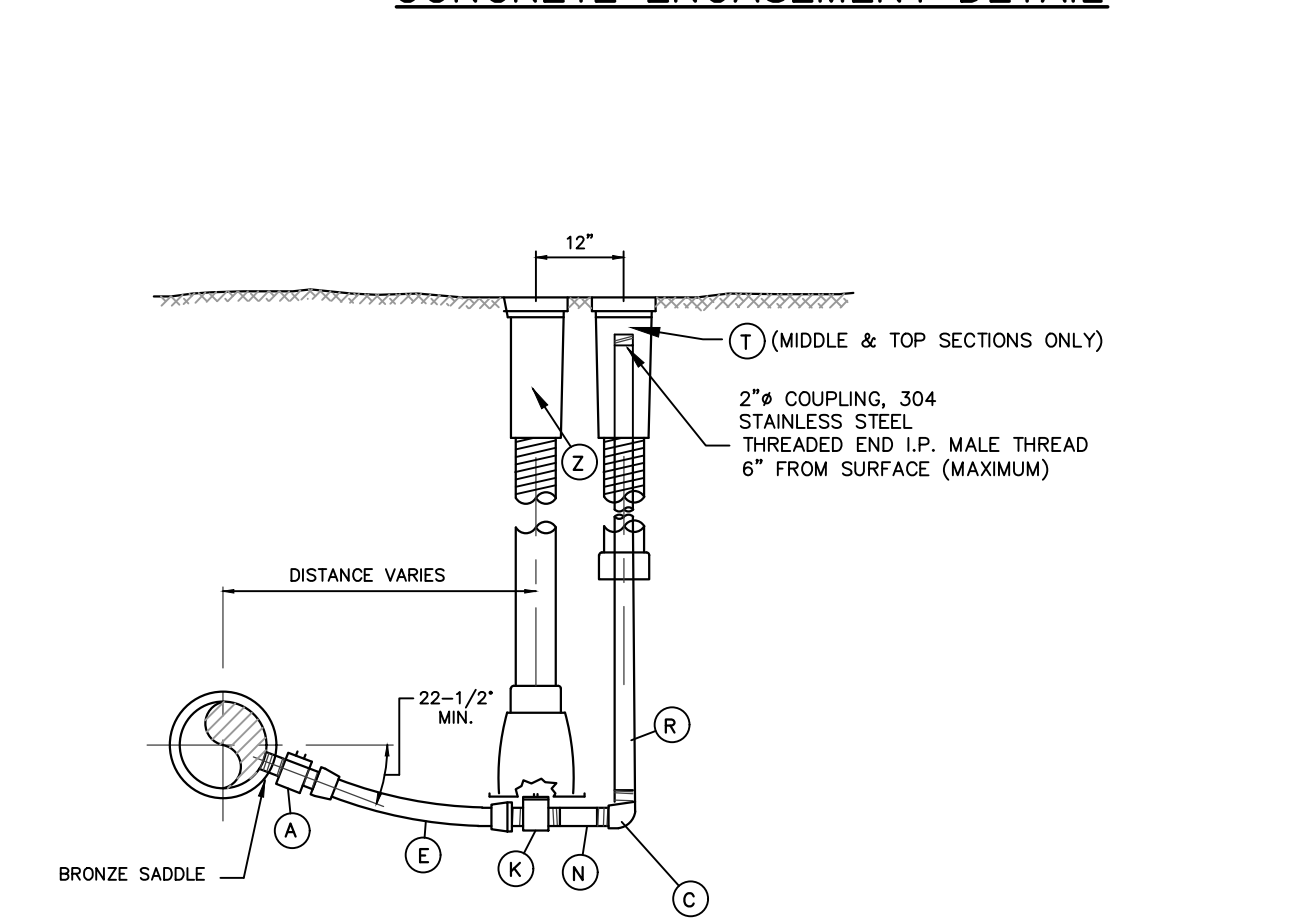
SPECIAL-ONLY WHERE DESIGNATED ON DRAWINGS



TYPE A - 2" BLOW OFF UNIT



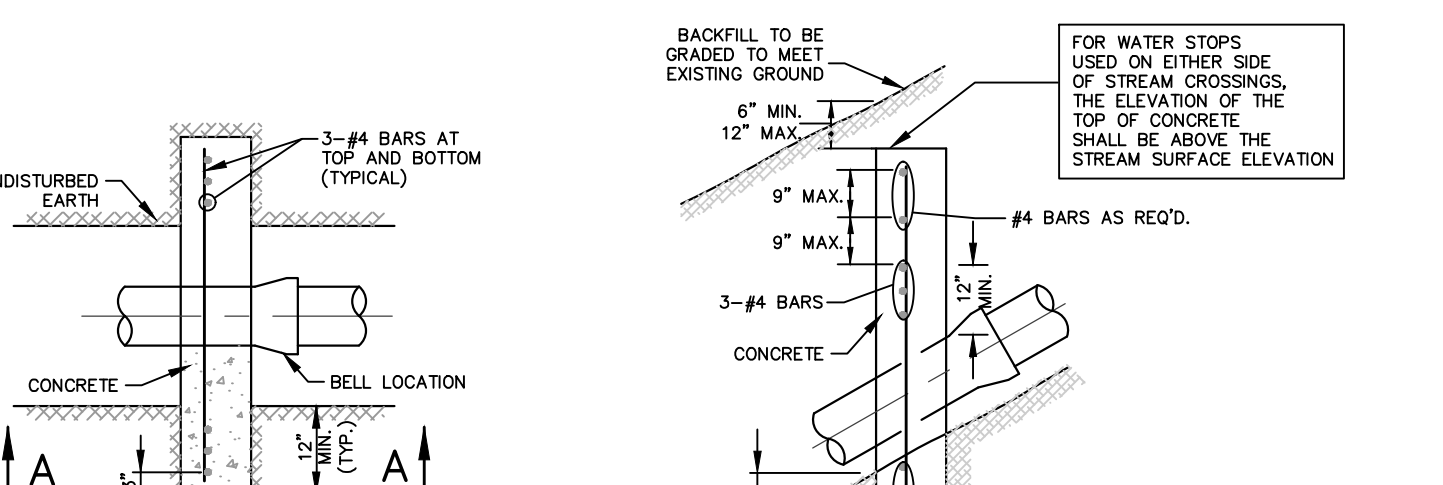
SECTIONAL VIEW CONCRETE ENCASEMENT



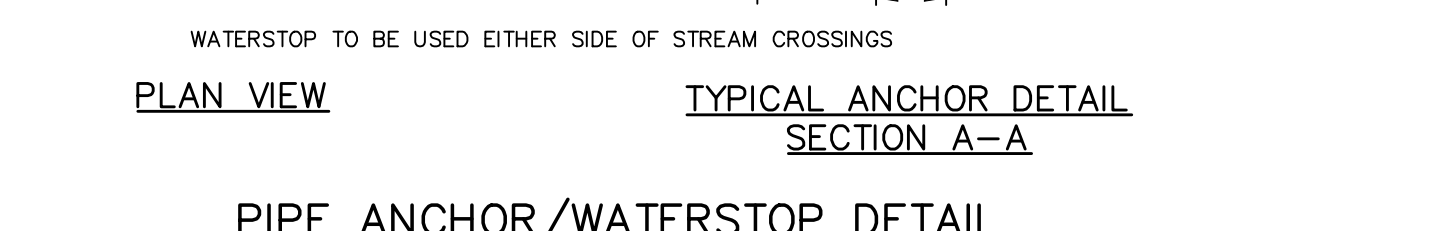
TYPE B - 2" BLOW OFF UNIT



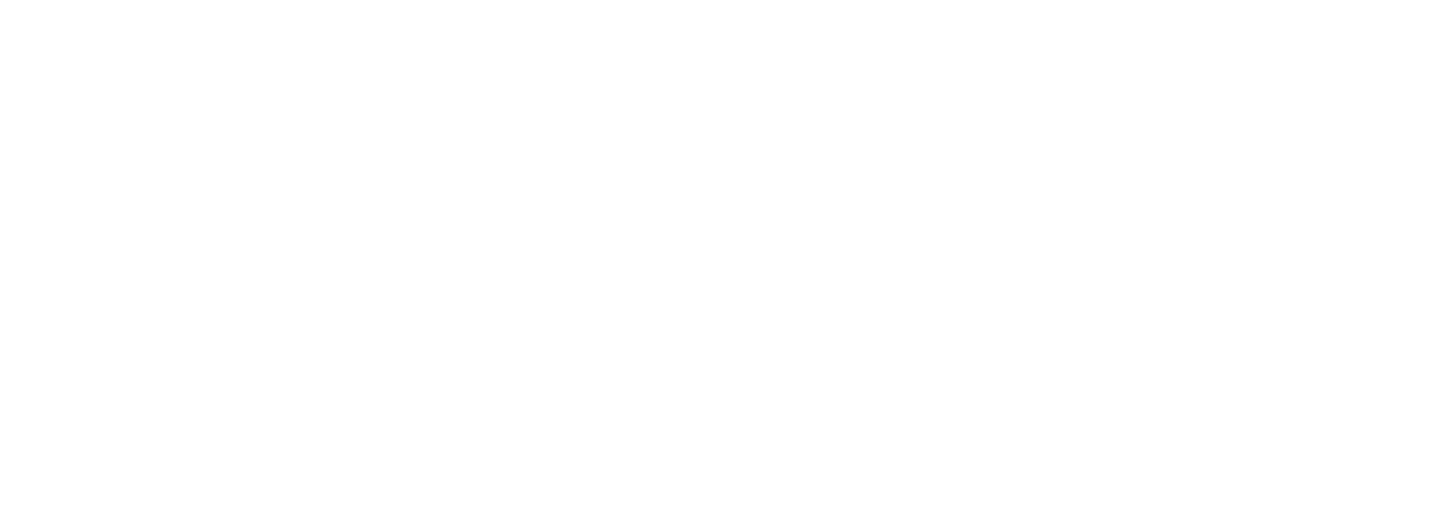
PIPE ANCHOR/WATERSTOP DETAIL



TYPICAL ANCHOR DETAIL SECTION A-A



PIPE ANCHOR/WATERSTOP DETAIL



VALVE BOX INSTALLATIONS



TYPICAL

REVISIONS

NO.	DATE	DESCRIPTION
1	06-30-2023	REVISED FIRE HYDRANT DETAIL

ORIGINAL DRAWING SCALE VERIFICATION 	PRELIMINARY	FOX CHAPEL AUTHORITY	
		ALLEGHENY COUNTY	PENNSYLVANIA
IF LINE IS NOT ONE INCH ON THIS DRAWING, ADJUST ALL SCALES AS REQUIRED		XXXXXXXXXXXXXXXXXXXX	
		XXXXXXXXXXXXXXXXXXXX	
		MISCELLANEOUS WATER LINE DETAILS	
		CONTRACT NUMBER X	
BANKSON ENGINEERS, INC. CONSULTING ENGINEERS CHESTNUT, PA. 15024		SCALE AS NOTED	DRAWN BY X.X.X.
		DATE XXX XXXX	APPROVED BY X.X.X.
		SHEETS IN SET XX	
		DRAWING NUMBER 1-XXX-XX-X	