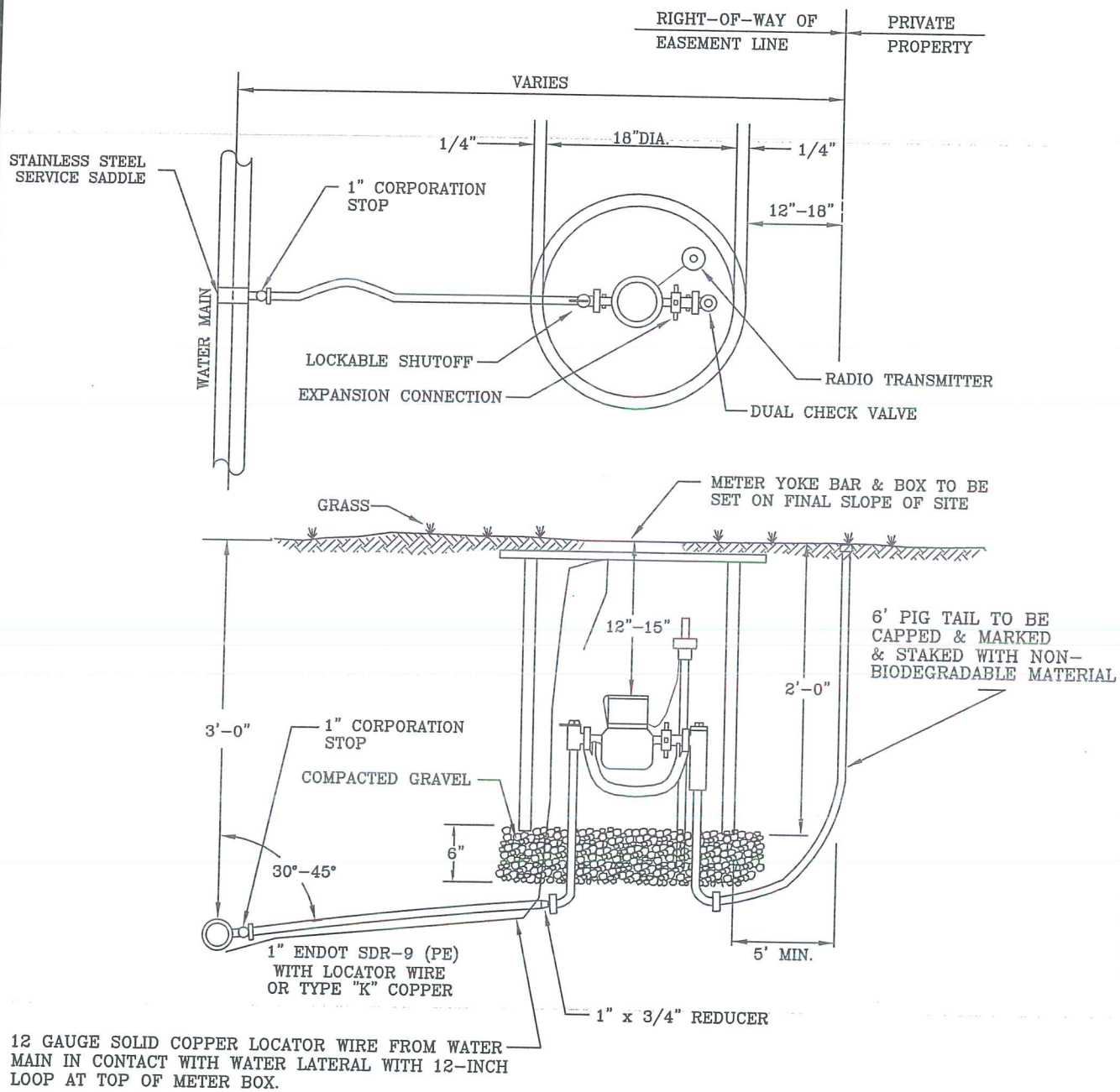
MONTGOMERY COUNTY PUBLIC SERVICE AUTHORITY
WATER AND SEWER DESIGN & CONSTRUCTION STANDARDS
THIRD EDITION
JULY 2012

SECTION FOUR - LIST OF WATER DETAIL DRAWINGS

W#	Title
01	Single Residential Water Service
02	Single Residential Service for High Pressure (Line Pressure over 120 psi)
03	Single Residential Service with PRV (Line Pressure of 80 to 120 psi)
04	Commercial Water Service
05	Double Residential Water Service
06	Typical Sewer Subtraction Meter Configuration
07	Sewer Subtraction Meter Installation
08	Water Line Valve Installation
09	Permanent End of Line
10	Blow-Off Assembly for Main Line Temporary Termination
11	In-Line Blow-Off Assembly
12	Automatic Air Release Assembly
13	Automatic Air Release Assembly for Deep Water Lines
14	Main Line Pressure-Reducing Valve Assembly
15	Alternate Valve Vault (Manhole)
16	Installation Detail for All Frames and Covers
17	Manhole Frame and Cover
18	Fire Hydrant Assembly
19	Thrust Block Construction
20	Thrust Restraint of Pipe Joints Design Lengths
21	Typical Water Pressure Test Rig
22	Pipe Support in Casing Pipe

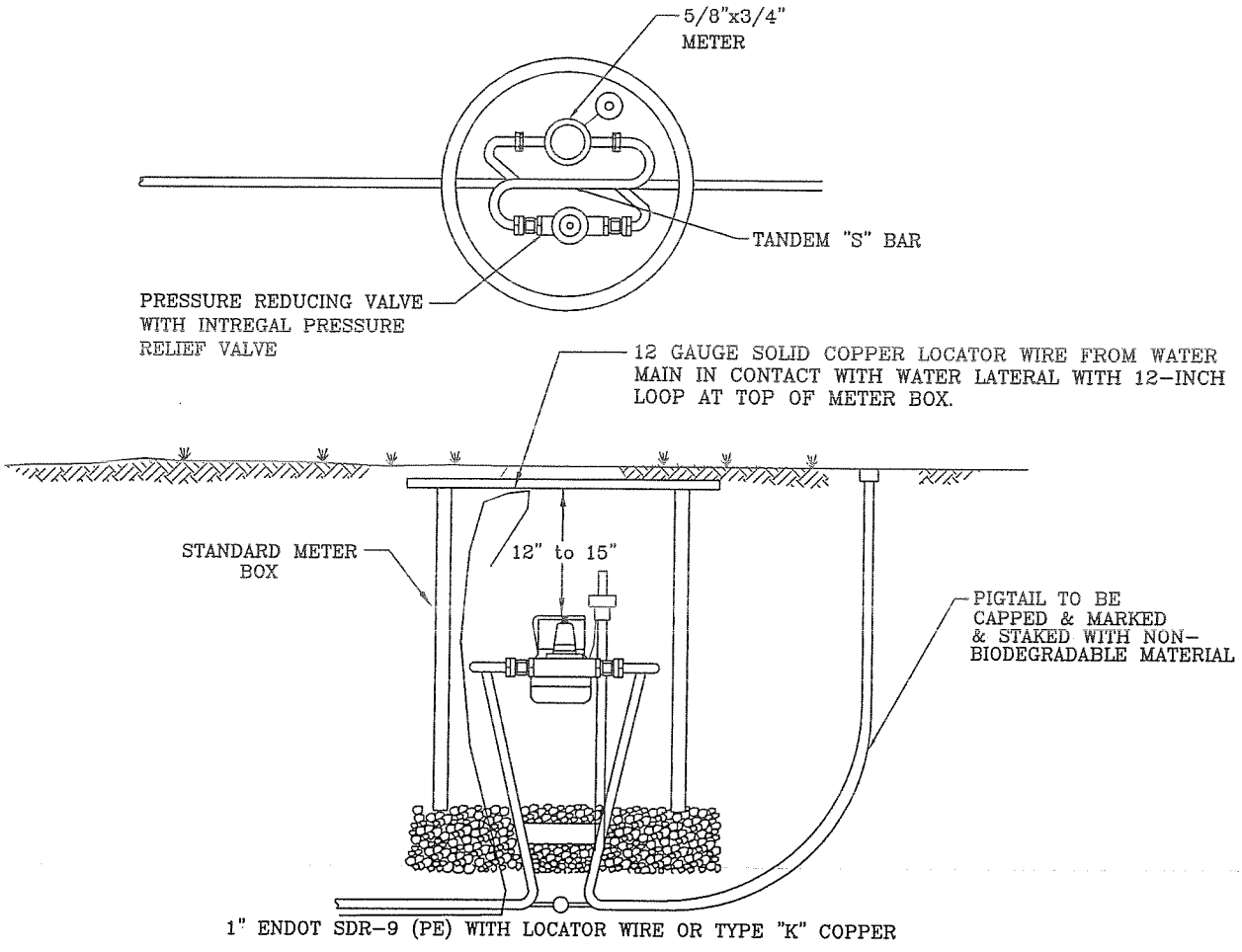
1. YOKE BAR TO BE Y-502 FORD OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PIPE.
3. METER BOX MUST BE CARSON 2200-18 WITH CAST IRON LID OR APPROVED EQUAL.



12 GAUGE SOLID COPPER LOCATOR WIRE FROM WATER MAIN IN CONTACT WITH WATER LATERAL WITH 12-INCH LOOP AT TOP OF METER BOX.

REVISIONS				SINGLE RESIDENTIAL WATER SERVICE	DRAWING W-01
NO.	DATE				
ORIGINAL	12/01/06				
1	07/25/12				

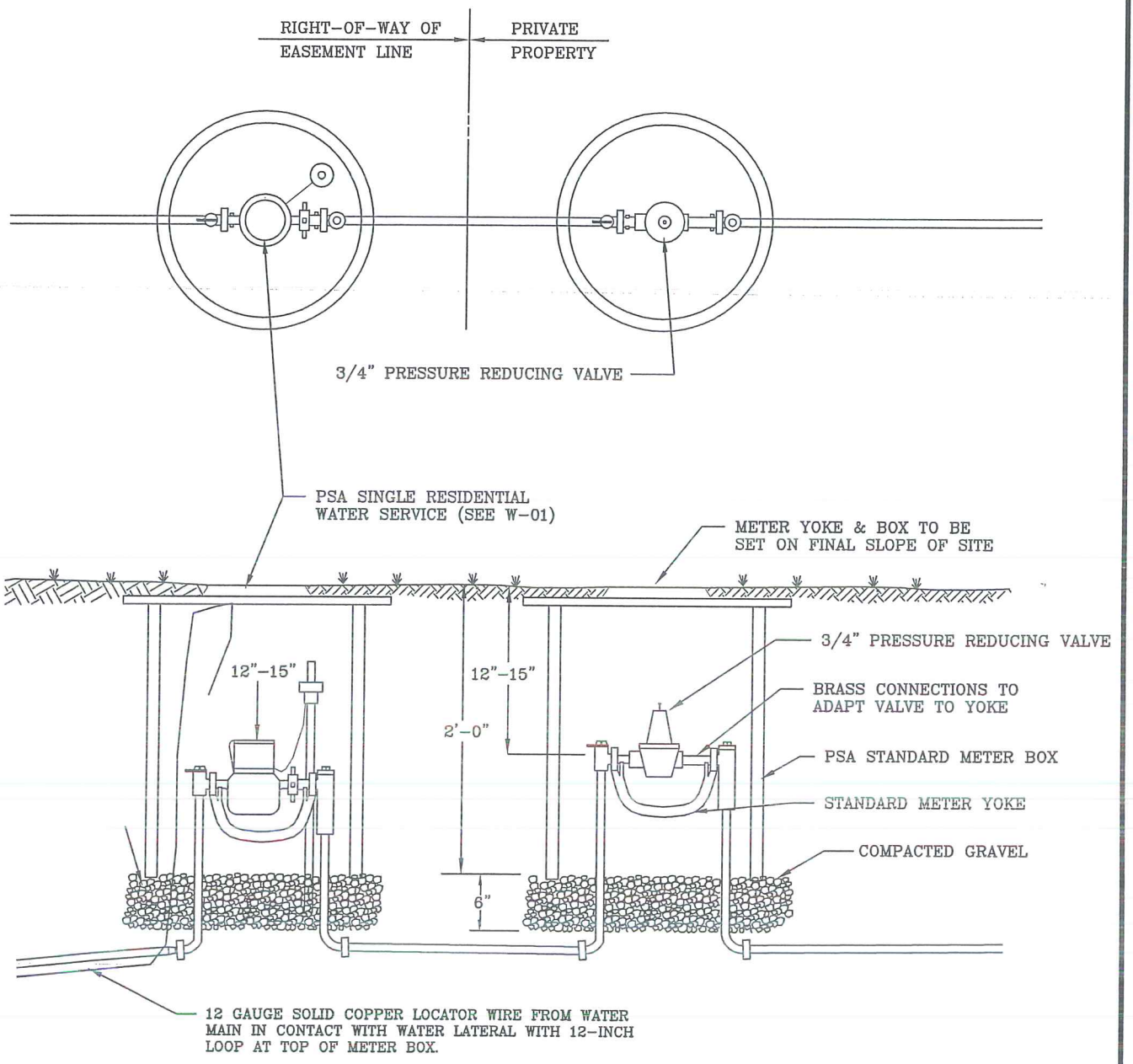
1) SETTER TO BE FORD TVBHH72-9W-1133 OR APPROVED EQUAL.
2) PRESSURE REDUCING VALVE TO BE WILKINS BR4EC OR APPROVED EQUAL.
3) S BAR TO BE ST-2-31084-01 WITH PRV OR APPROVED EQUAL.
4) METER BOX MUST BE CARSON 2200-18 WITH CAST IRON LID OR APPROVED EQUIVALENT.
5) THIS CONFIGURATION IS REQUIRED WHEN THE WATER PRESSURE AT THE WATER MAIN EXCEEDS 120 PSI.
6) PRESSURE REDUCING VALVE SHALL BE INSTALLED ON PUBLIC WATER SYSTEM SIDE OF SETTER BEFORE WATER METER.



REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	07/25/12		

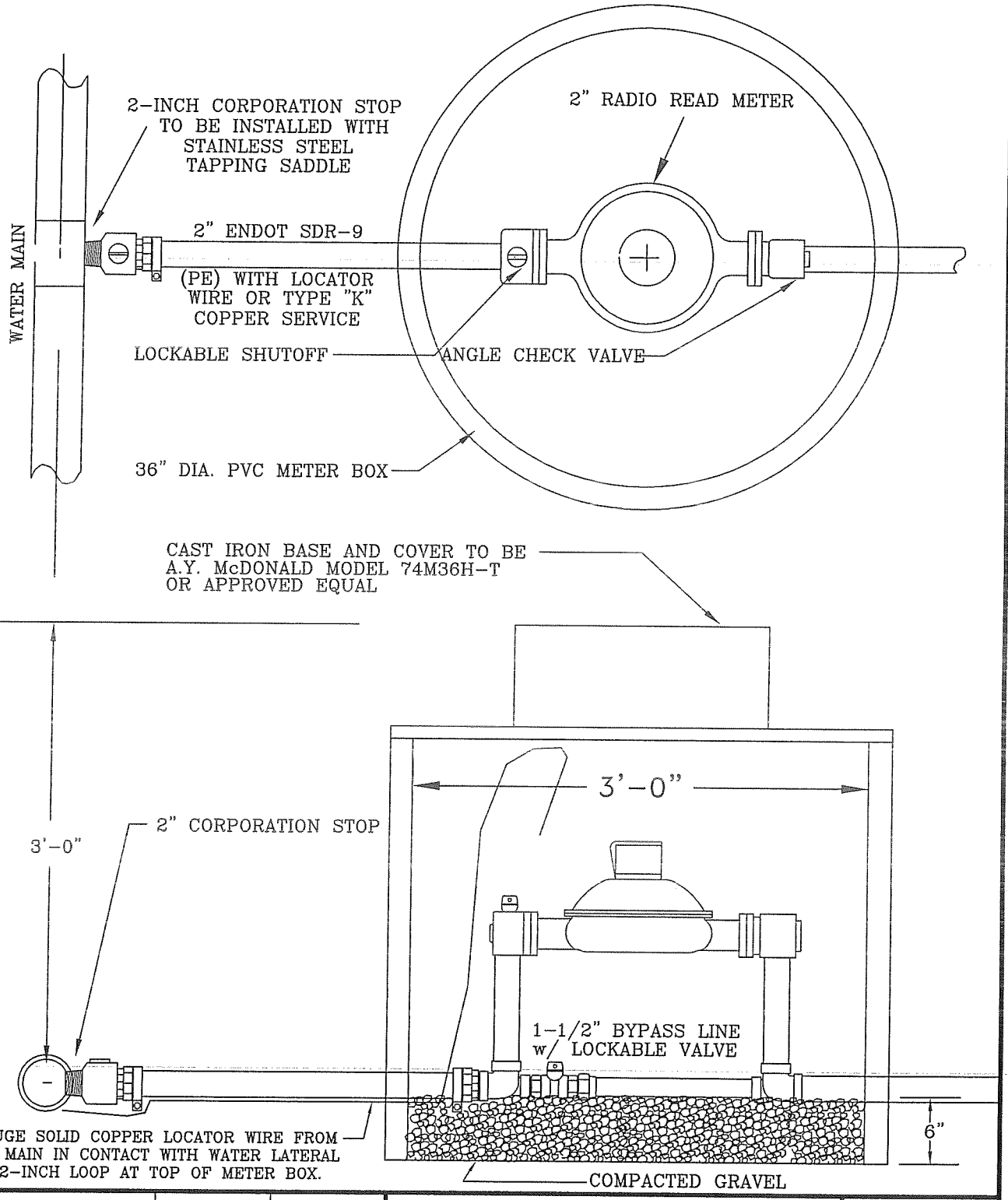
SINGLE RESIDENTIAL SERVICE FOR HIGH PRESSURE (LINE PRESSURE OVER 120 PSI)

DRAWING W-02



1) THIS CONFIGURATION REQUIRED WHEN WATER PRESSURE AT THE WATER MAIN IS BETWEEN 80 AND 120 PSI.

REVISIONS				SINGLE RESIDENTIAL WATER SERVICE WITH PRV (LINE PRESSURE OF 80 TO 120 PSI)	DRAWING W-03
NO.	DATE				
ORIGINAL	12/01/06				
1	09/01/07				
2	07/25/12				

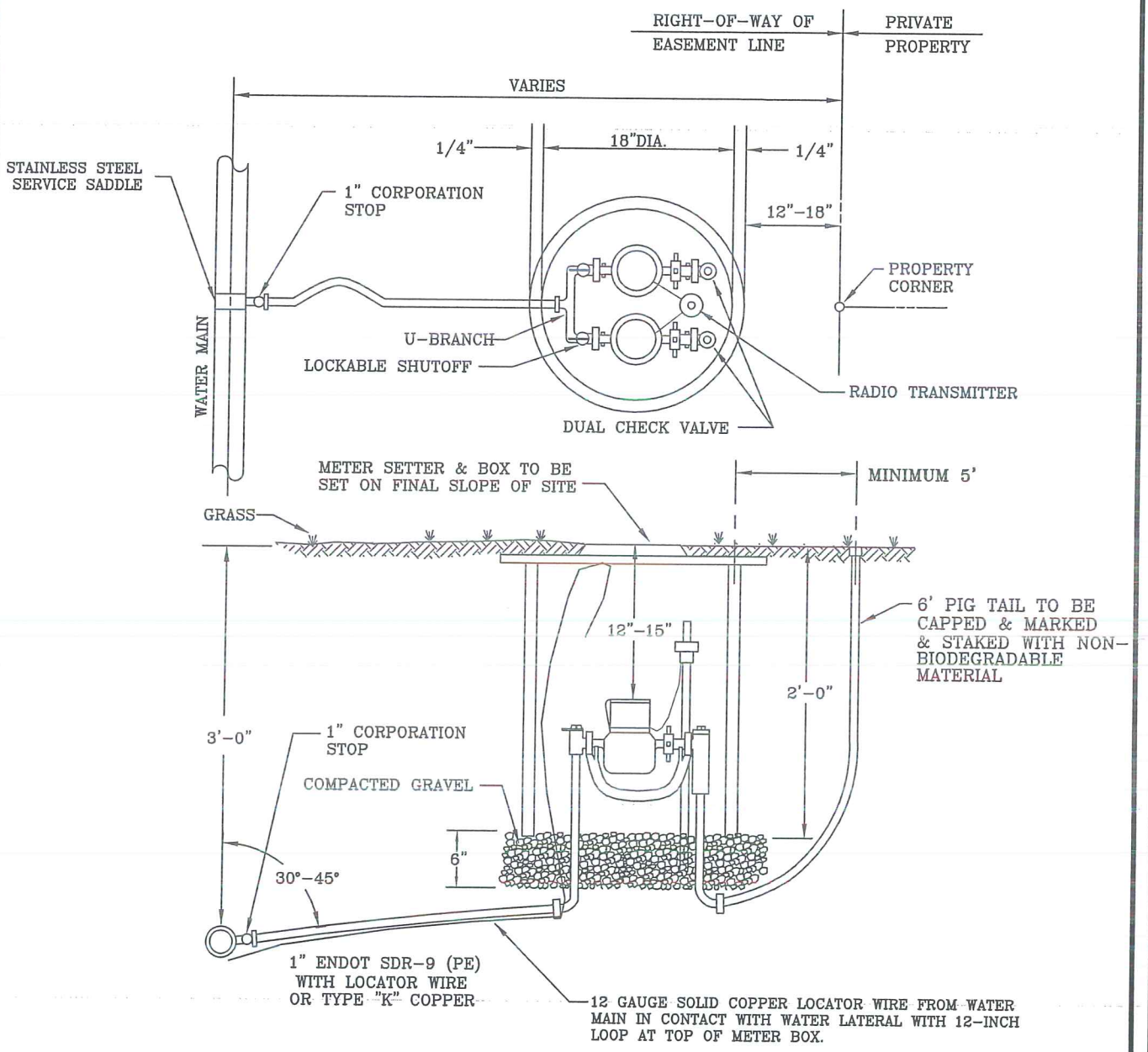


REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	5/01/12		

COMMERCIAL
WATER SERVICE

DRAWING
W-04

1. SETTER TO BE A.Y. McDONALD #20-215 WDLL33 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PIPE.
3. METER BOX MUST BE CARSON 2200-18 WITH CAST IRON LID OR APPROVED EQUAL.

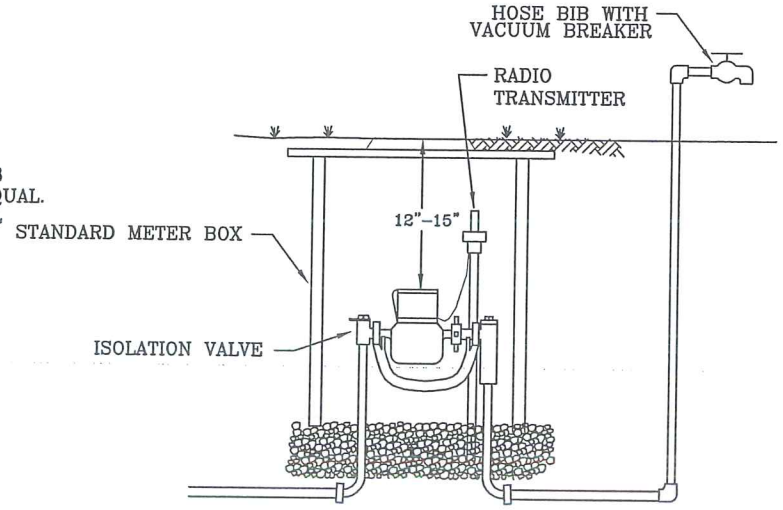


REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	07/25/12		

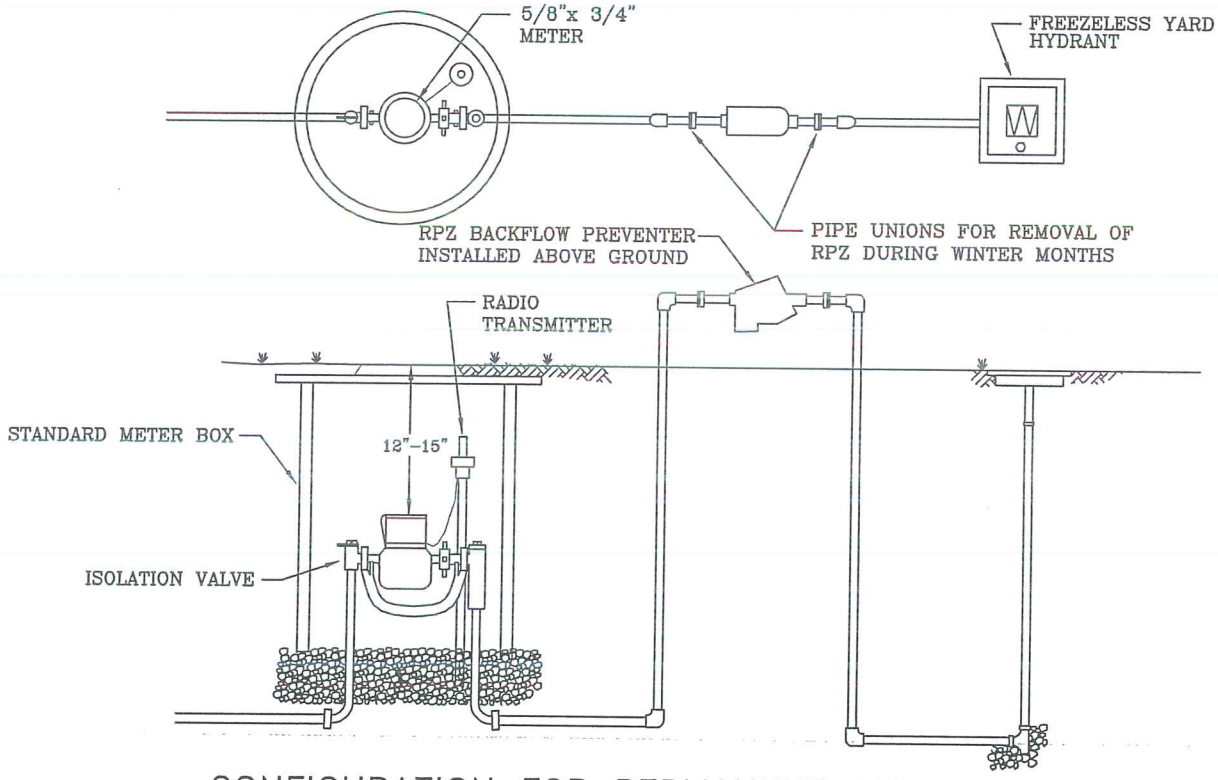
DOUBLE RESIDENTIAL WATER SERVICE

DRAWING W-05

1) YOKE TO BE Y-502 FORD OR APPROVED EQUAL.
2) BACKFLOW PREVENTER TO BE RPZ MEETING ASSE STANDARD 1013.
3) CUSTOMER IS RESPONSIBLE FOR OPERATION AND MAINTENANCE OF BACKFLOW PREVENTER.
4) METER BOX MUST BE CARSON 2200-18 WITH CAST IRON LID OR APPROVED EQUAL.
5) METER SHALL BE CURRENT PSA MODEL WITH RADIO-READ UNIT



ALTERNATE CONFIGURATION FOR LIMITED USE

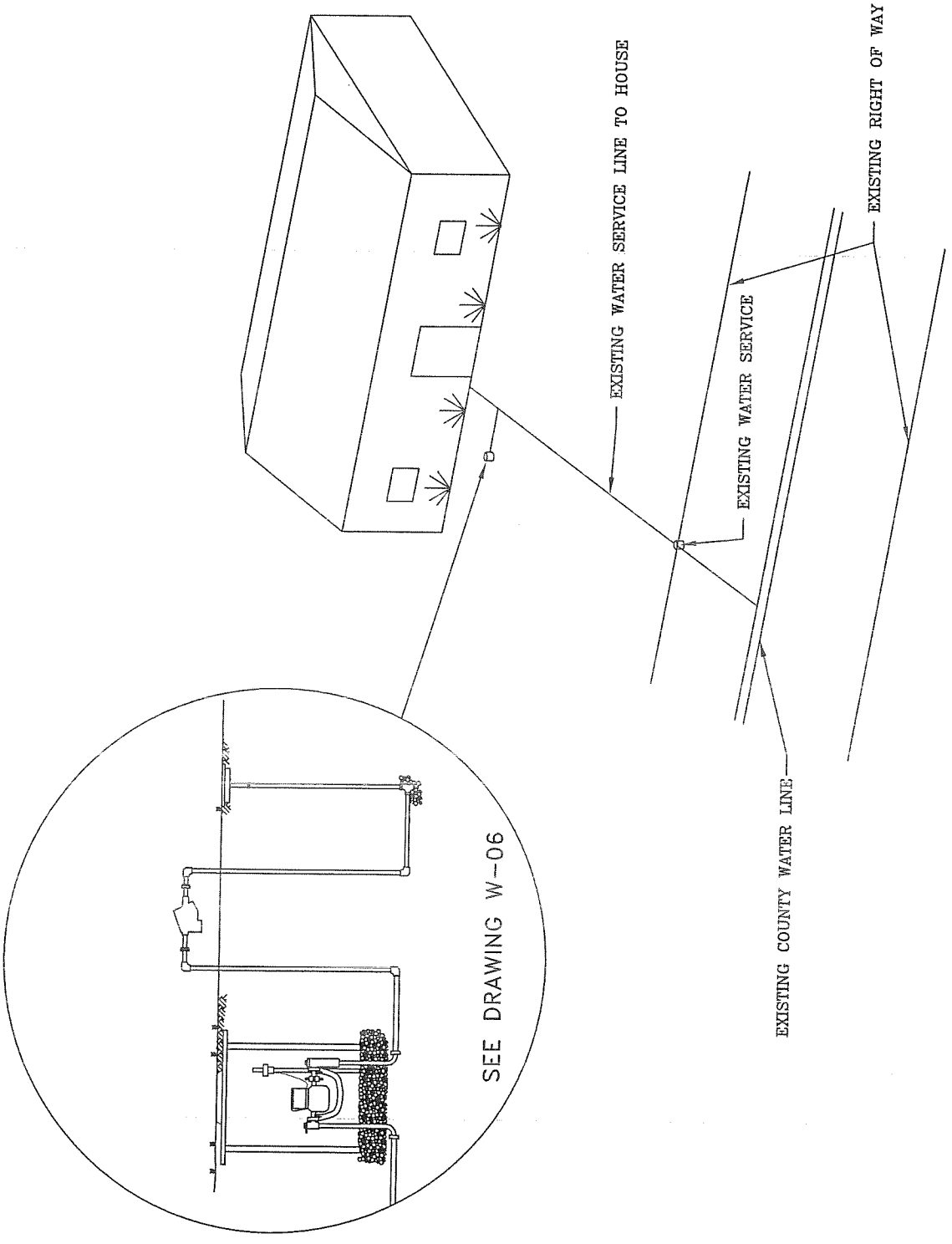


CONFIGURATION FOR PERMANENT SYSTEMS

REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	07/25/12		

TYPICAL SEWER SUBTRACTION METER CONFIGURATION

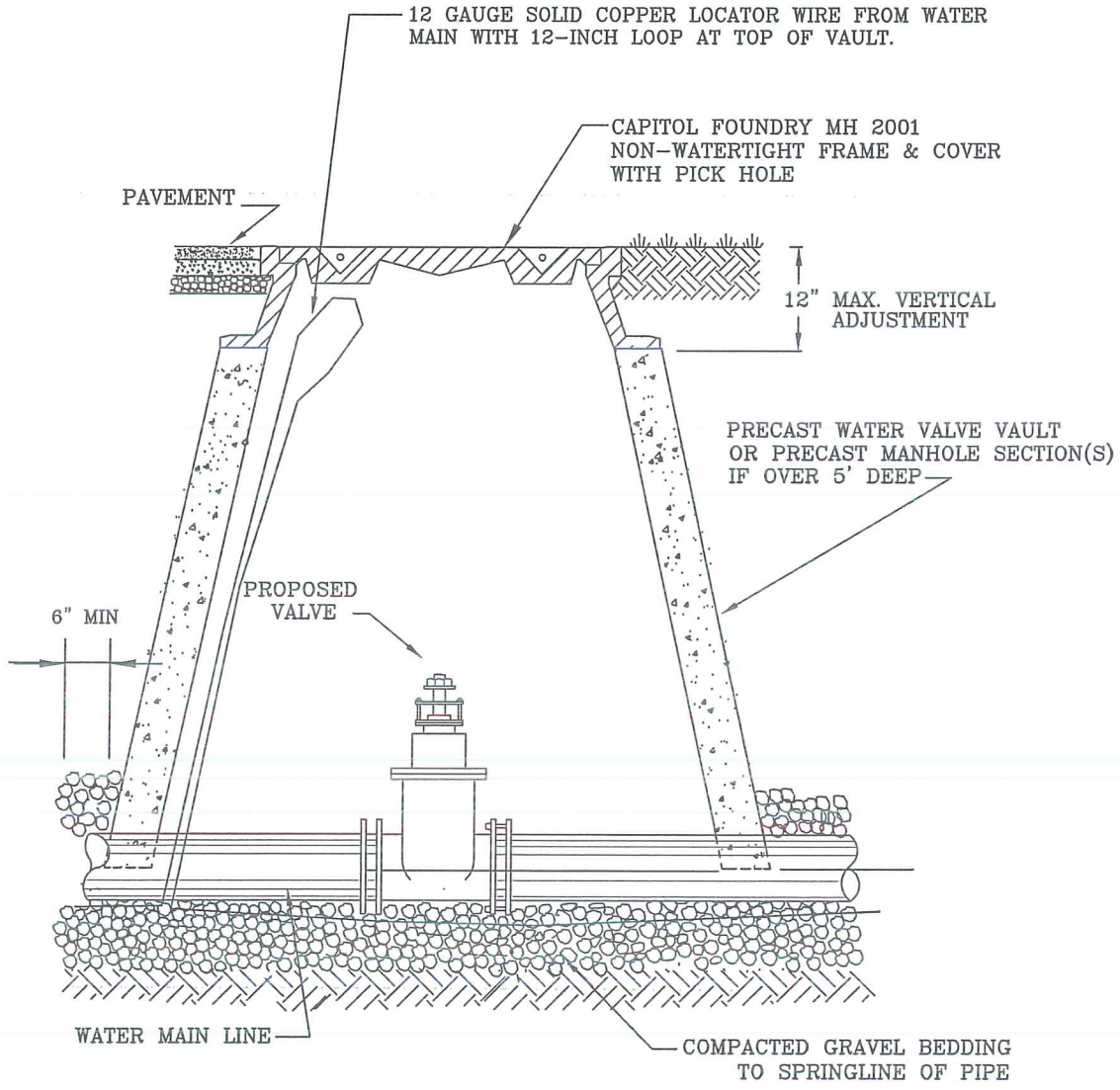
DRAWING W-06



REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	07/25/12		

SEWER SUBTRACTION METER INSTALLATION

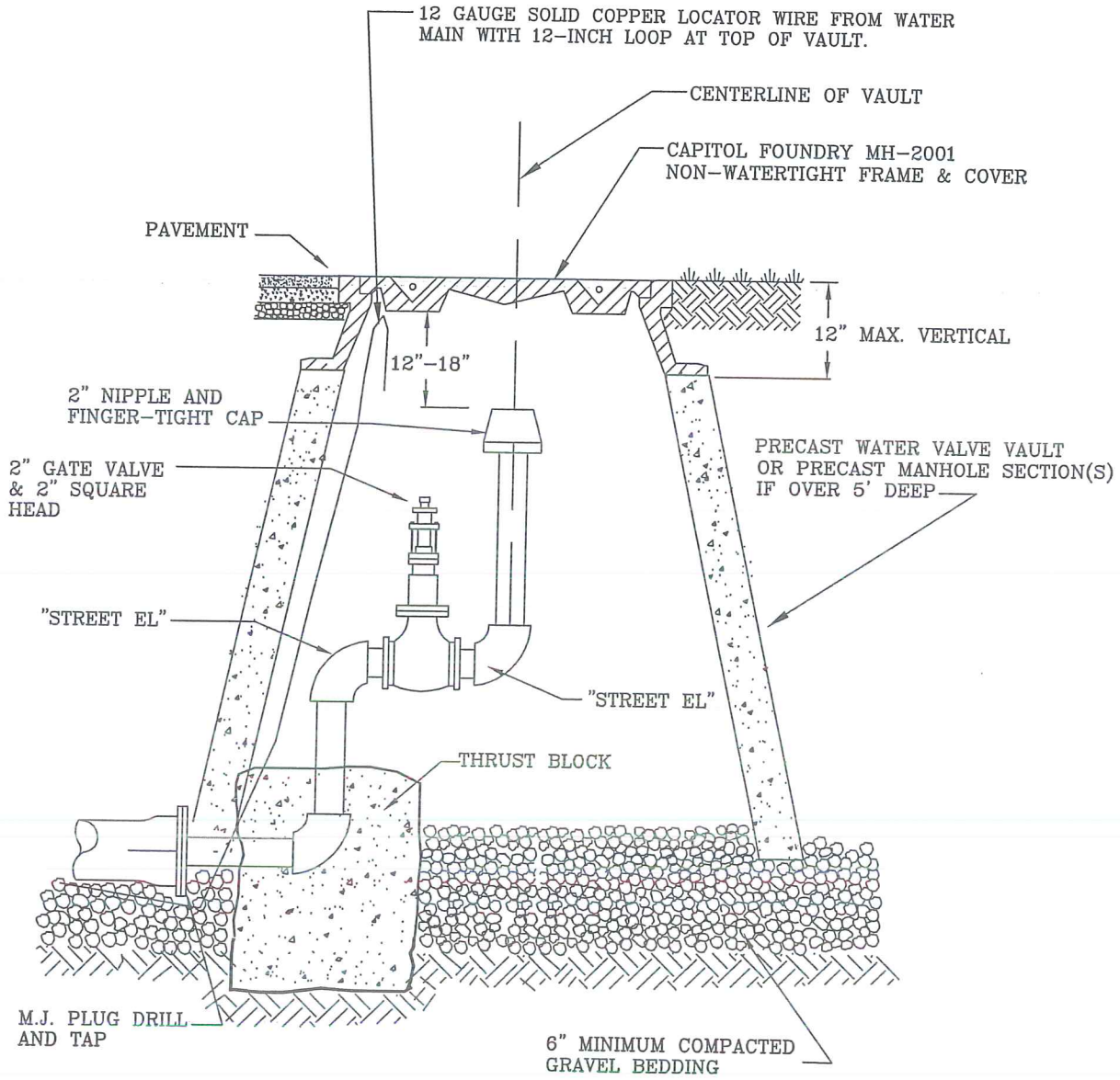
DRAWING
W-07



REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	5/01/12		

WATER LINE VALVE INSTALLATION

DRAWING
W-08

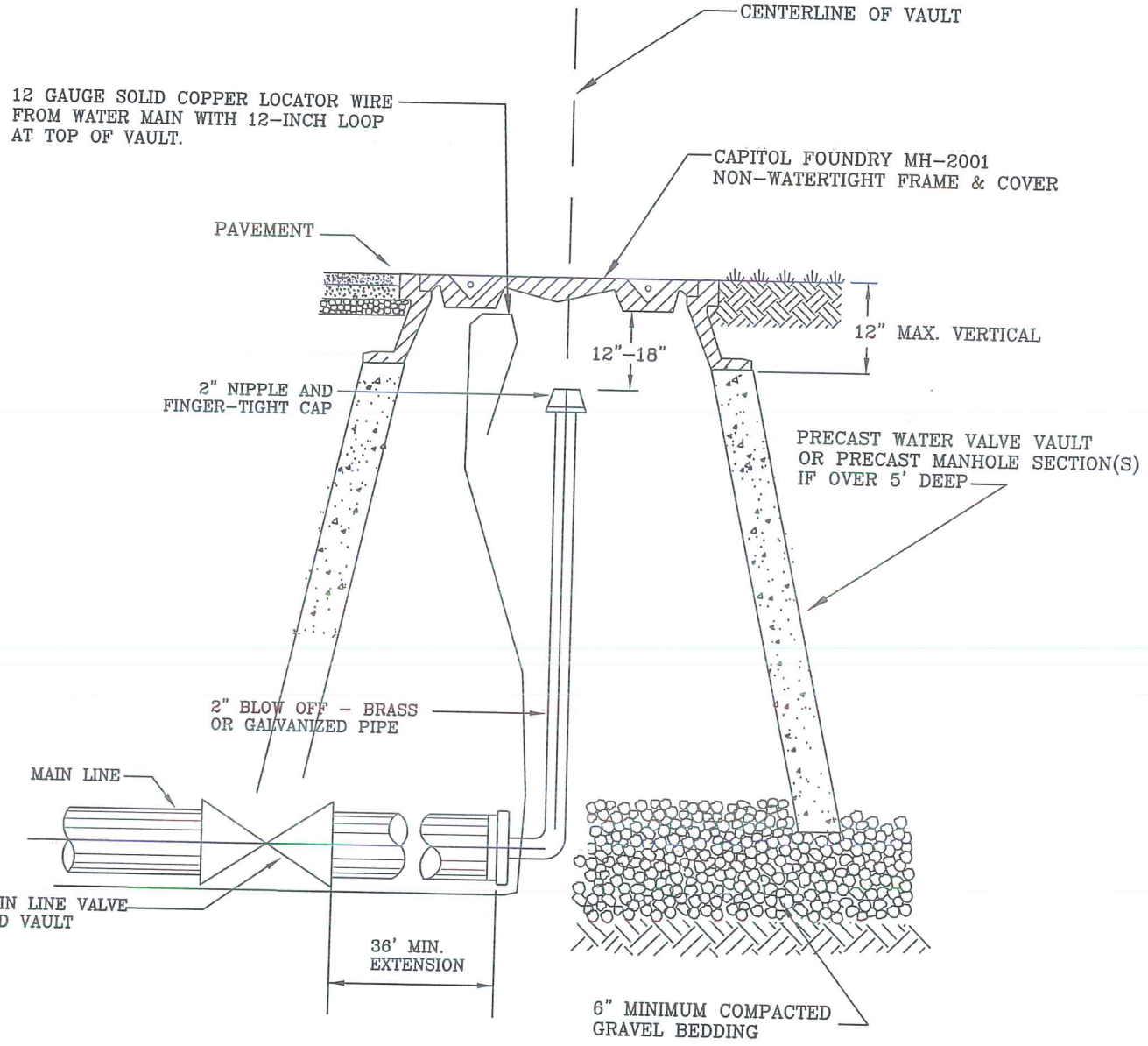


NOTE: FIRE HYDRANT ASSEMBLIES MAY BE USED AS PERMANENT END OF LINES.

REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	9/01/07		
2	5/01/12		

PERMANENT END OF LINE

DRAWING W-09

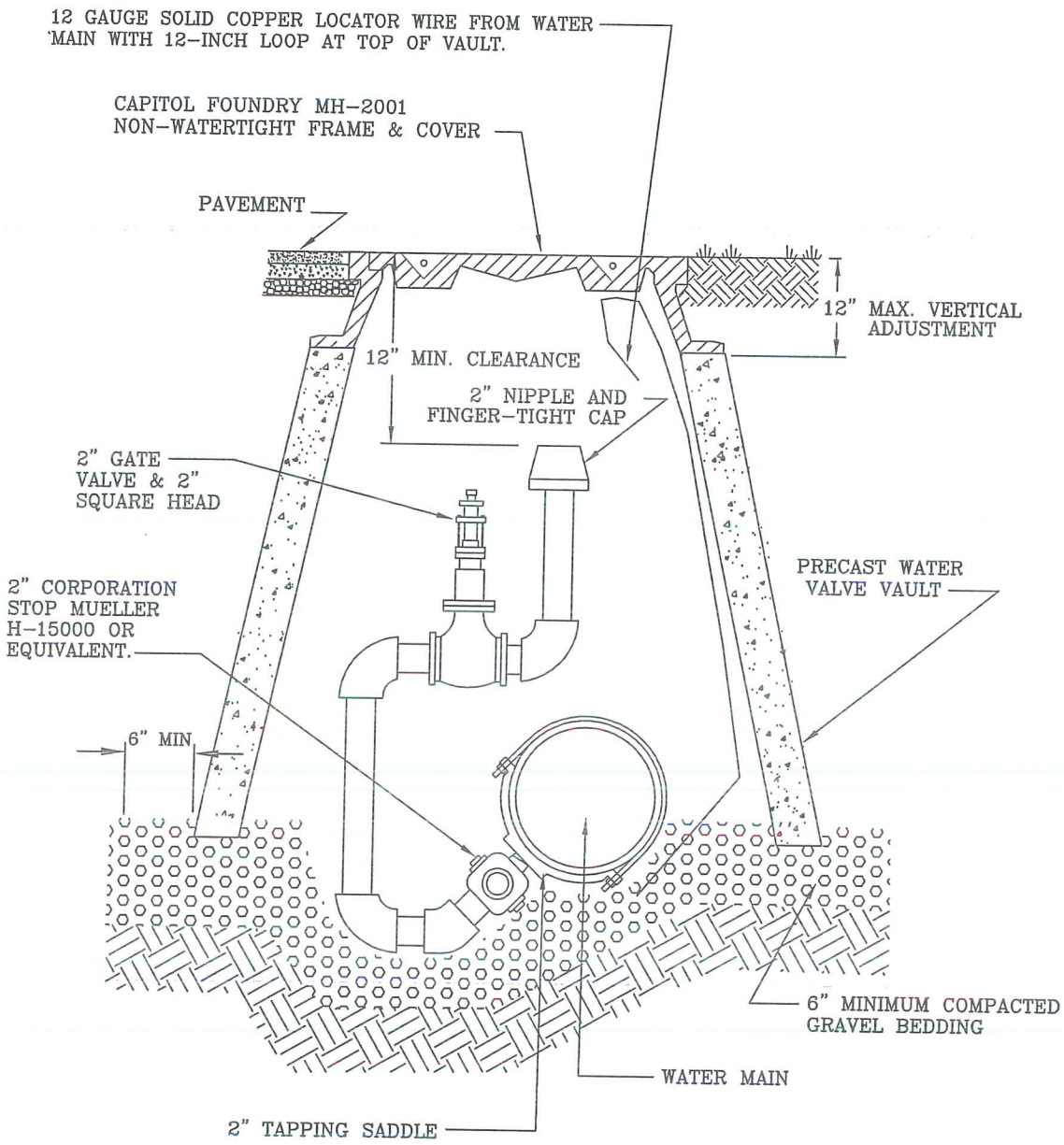


NOTE: PRESSURE TEST SHALL BE TO END OF BLOW-OFF ASSEMBLY

REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	9/01/07		
2	5/01/12		

BLOW-OFF ASSEMBLY FOR MAIN LINE TEMPORARY TERMINATION

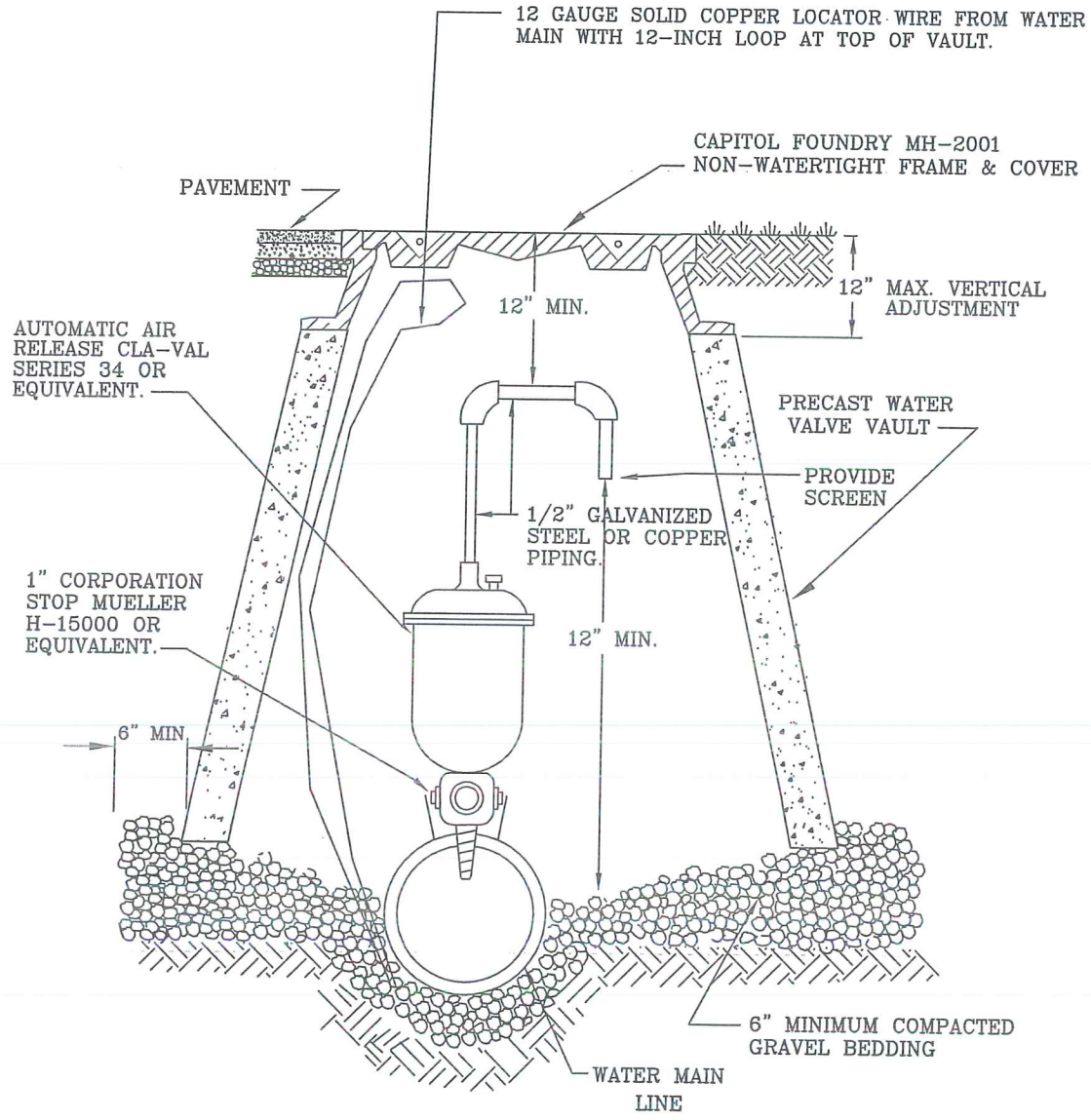
DRAWING W-10



REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	9/01/07		
2	5/01/12		

IN-LINE BLOW-OFF ASSEMBLY

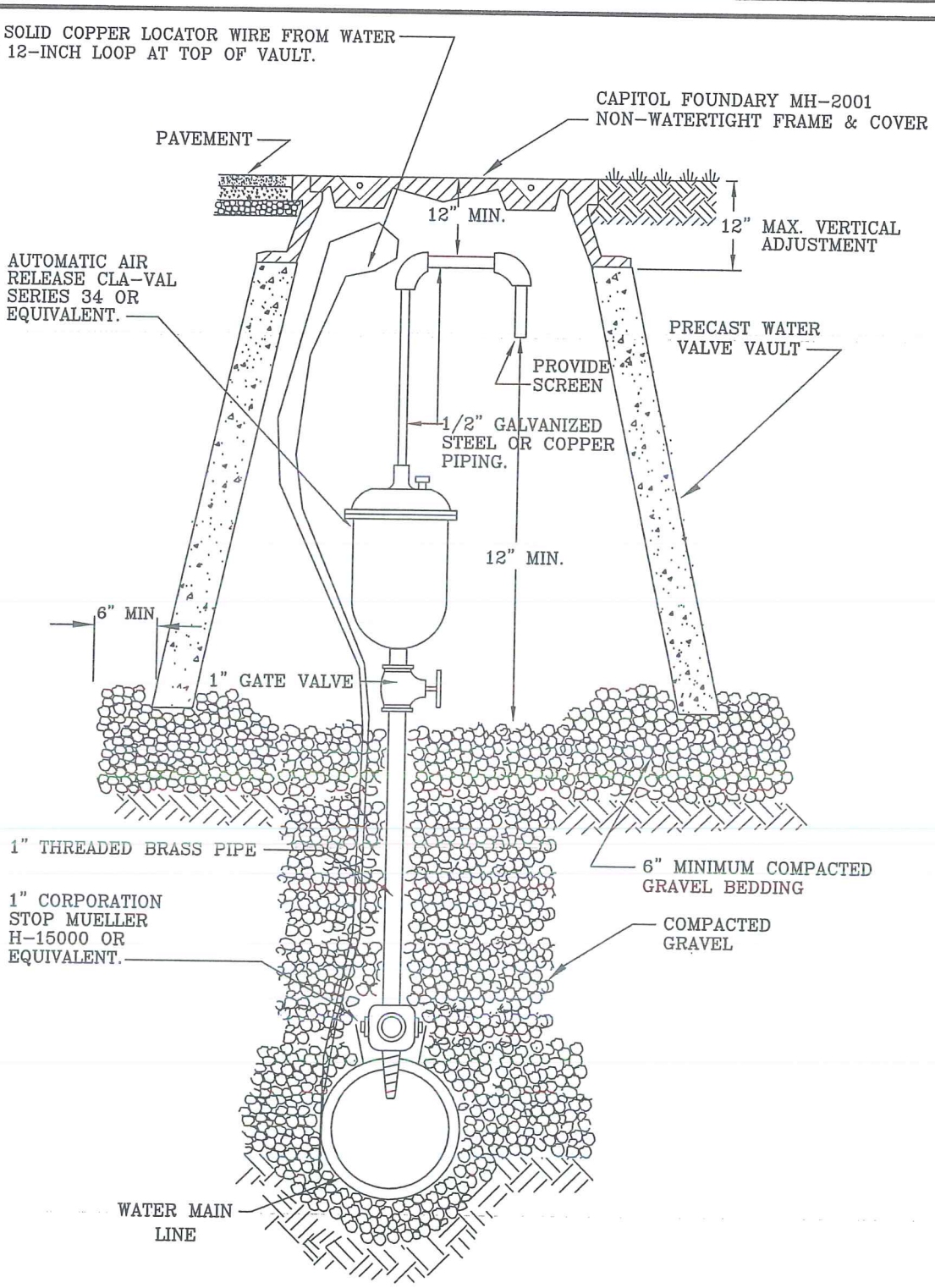
DRAWING W-11



REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	9/01/07		
2	5/01/12		

AUTOMATIC AIR RELEASE ASSEMBLY

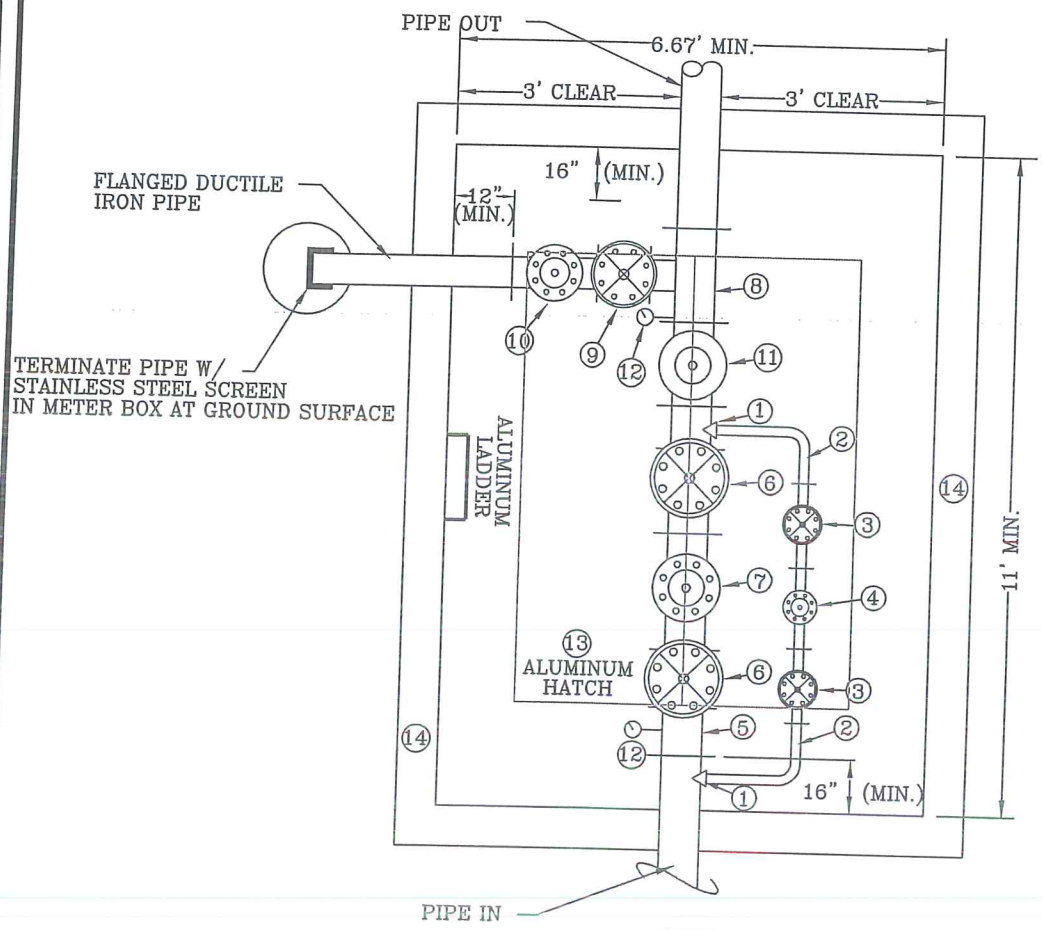
DRAWING
W-12



REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	9/01/07		
2	5/01/12		

AUTOMATIC AIR RELEASE ASSEMBLY FOR DEEP WATER LINES

DRAWING W-13

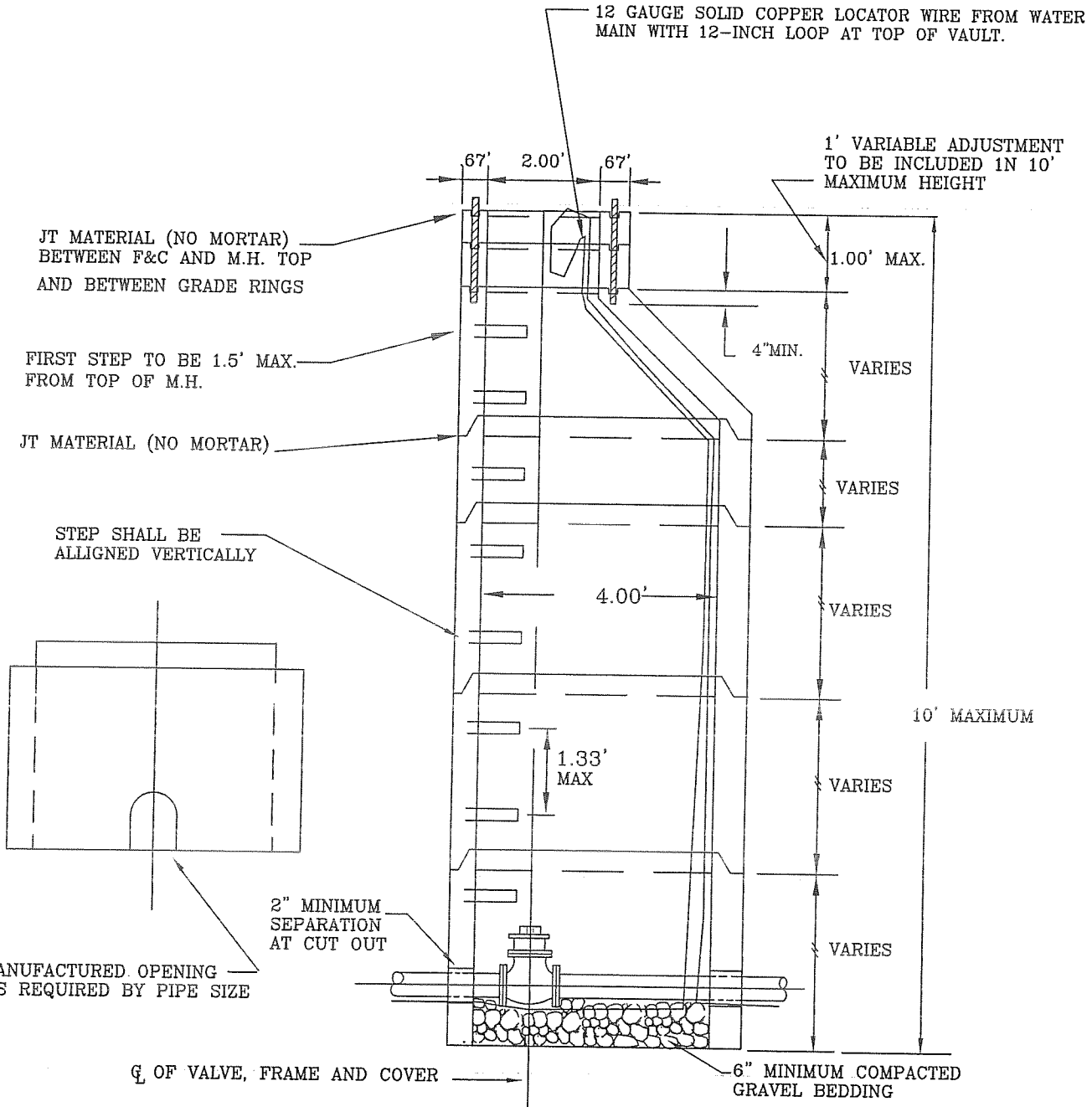


NOTES:
ALL FITTINGS SHALL BE FLANGED OR COMPRESSION TYPE

① CORPORATION STOP
② 2" LOW-FLOW BYPASS LINE TYPE "K" COPPER
③ 2" NPT GATE VALVE
④ 2" FLANGED RATE OF FLOW/PRESSURE REGULATING VALVE (CLA-VAL MODEL 49-01) SET AT WORKING PRESSURE & 100 GPM
⑤ FLANGE x MECH. JOINT ADAPTOR (SEE NOTE BELOW)
⑥ FLANGE x FLANGE MAIN LINE GATE VALVE
⑦ FLANGE x FLANGE MAIN LINE PRESSURE REGULATING VALVE (CLA-VAL MODEL 690-01) SET AT 3 psi LESS THAN #4
⑧ FLANGE x FLANGE MAIN LINE REDUCING TEE
⑨ FLANGE x FLANGE GATE VALVE, ONE SIZE LESS THAN MAIN LINE
⑩ FLANGE x FLANGE PRESSURE RELIEF VALVE, ONE SIZE LESS THAN MAIN LINE (CLA-VAL MODEL 650-01) SET AT 5 psi GREATER THAN #4
⑪ MAIN LINE "TURBO" TYPE WATER METER
⑫ LIQUID FILLED PRESSURE GAUGE
⑬ 48"x 72" H20 TRAFFIC RATED ALUMINUM ACCESS HATCH (BILCO JD-3 H20) OR EQUAL
⑭ PRE-CAST REINFORCED CONCRETE VAULT W/ 6" MIN. WALLS, TOP, AND BOTTOM

REVISIONS				MAIN LINE PRESSURE-REDUCING VALVE ASSEMBLY	DRAWING W-14
NO.	DATE				
ORIGINAL	12/01/06				
1	07/25/12				

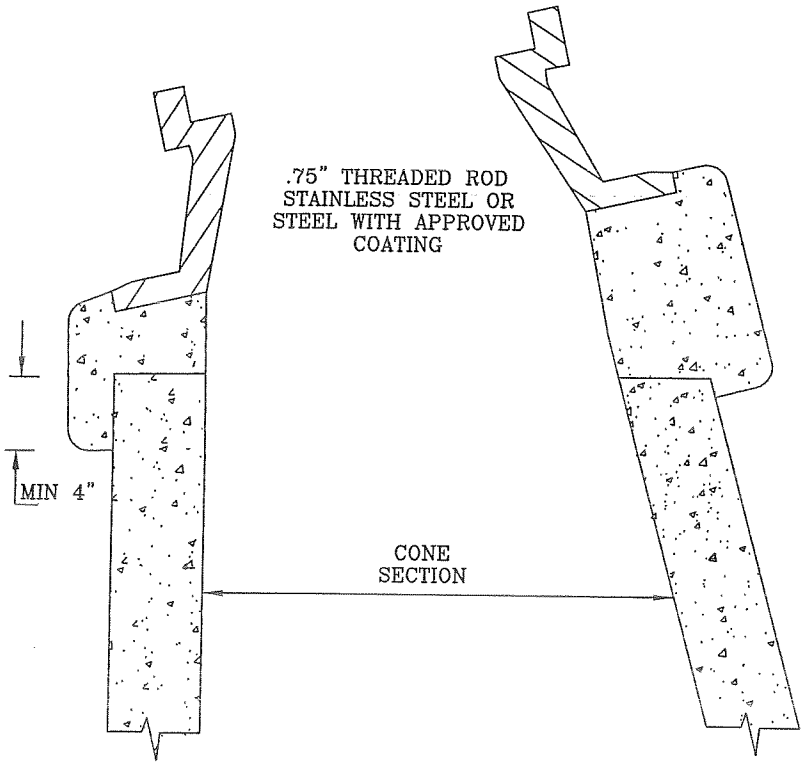
NOTE:
TO BE USED WHEN STANDARD VAULT CONSTRUCTION EXCEEDS MAXIMUM VERTICAL HEIGHT OF 5'.



REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	5/01/12		

ALTERNATE VALVE VAULT (MANHOLE)

DRAWING
W-15



SECTION

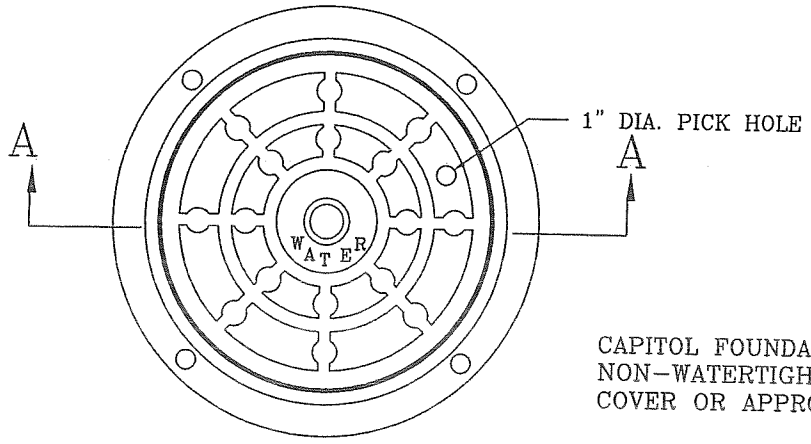
NOTE:

1. USE MODERATELY STIFF MIX OF NON SHRINK CEMENT, SAND AND 1/2" AND LESS DIAMETER GRAVEL WITH 28 DAYS, STRENGTH AT 3,000 P.S.I.
2. MIX IS TO BE FORCED INTO ALL GROOVES AND UNDER FLANGE OF FRAME AND LEFT AT OR ABOVE TOP OF FLANGE.
3. MAX. OF 4 BRICK OR CONCRETE BLOCKS TO BE USED FOR GRADE CONTROL.
4. DO NOT BACKFILL AROUND FRAME AND COVER, FOR 48 HOURS AFTER CON. IS PLACED. THE USE OF HIGHEARLY STRENGTH CONCRETE WOULD REDUCE TIME TO (24HRS).
5. RESTRICT TRAFFIC LOAD FOR MIN. 24 HOURS.

REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		

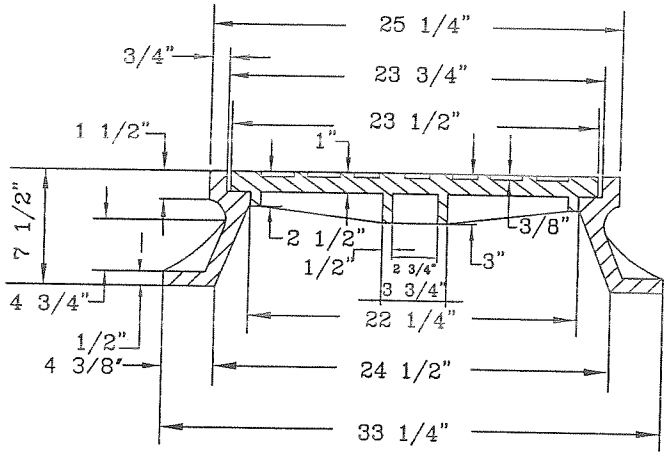
INSTALLATION DETAIL FOR ALL FRAMES AND COVERS

DRAWING W-16



CAPITOL FOUNDARY MH-2001
NON-WATERTIGHT FRAME &
COVER OR APPROVED EQUAL

PLAN



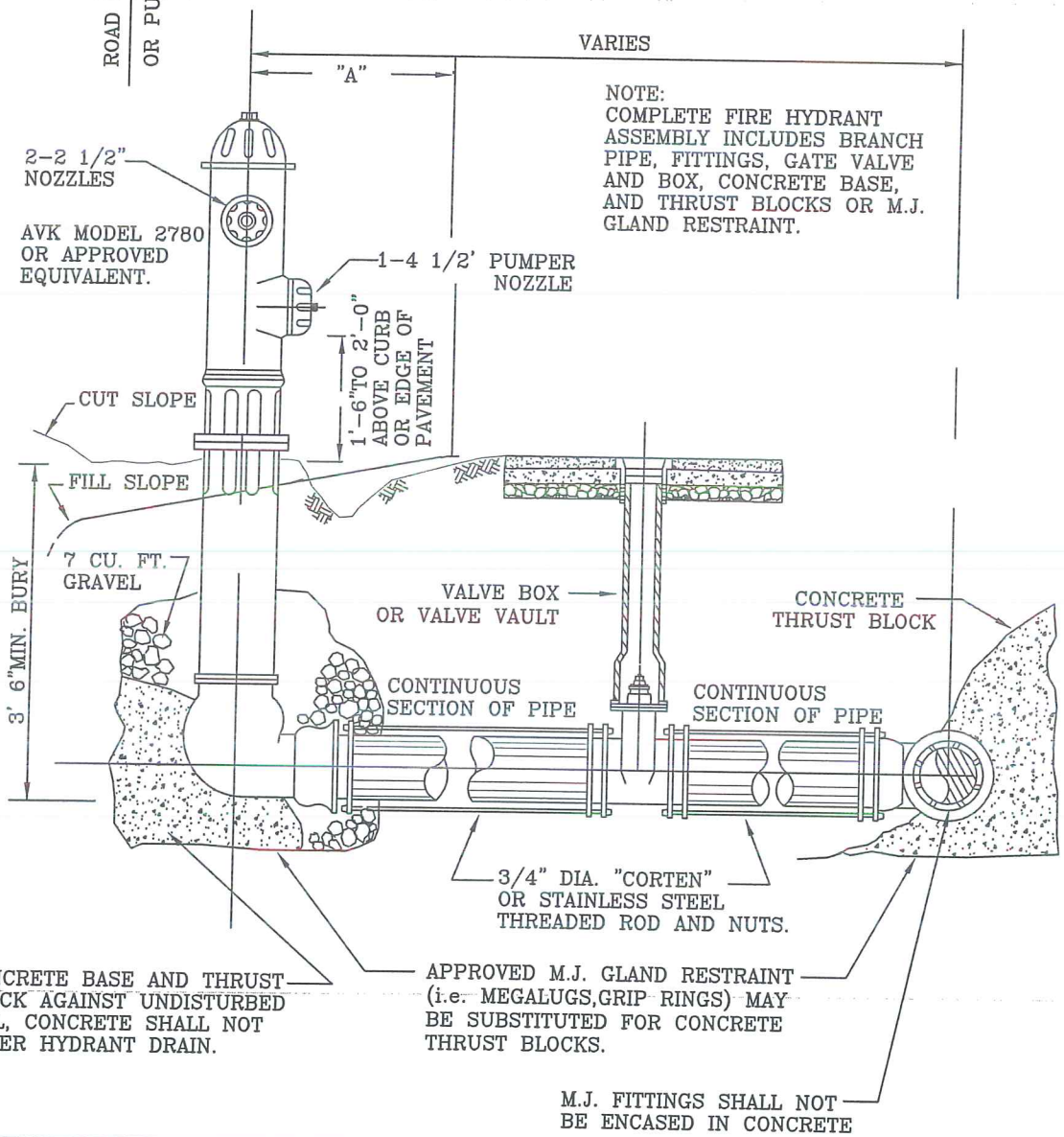
REVISIONS				MANHOLE FRAME AND COVER	DRAWING W-17
NO.	DATE				
ORIGINAL	12/01/06				

NOTES:
(1) MAIN BODY OF HYDRANT MUST BE PAINTED ENTIRELY RED.

(2) FIRE HYDRANT TO BE INSTALLED AT ROAD RIGHT-OF-WAY LINE OR EASEMENT LINE.

(3) AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE APPROXIMATELY LEVEL AND UNOBSTRUCTED.

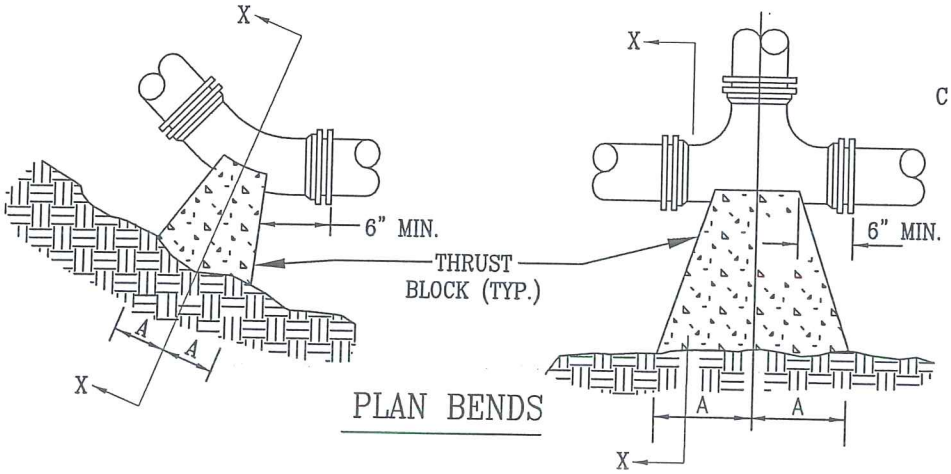
(4) "OUT OF SERVICE" RING SHALL BE PLACED UNDER 4 1/2" NOZZLE OF NEWLY INSTALLED FIRE HYDRANTS. PLASTIC BAGS SHALL NOT BE PLACED OVER HYDRANTS.



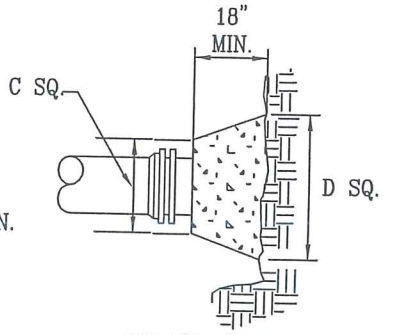
REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		
1	10/25/07		
2	07/25/12		

FIRE HYDRANT ASSEMBLY

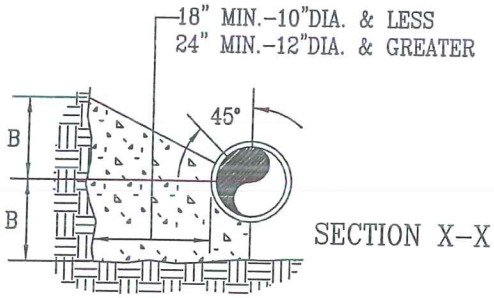
DRAWING W-18



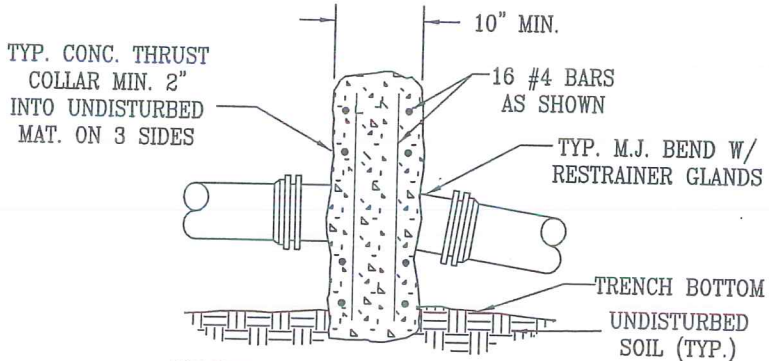
PLAN BENDS



PLAN AND ELEVATION PLUGS



BENDS AND TEES



SECTION OF VERTICAL BEND

NOTES:

1. FOR VERT. BEND DOWN IN EXCESS OF 11 1/4" BEND, ANCHORAGE SHALL BE DESIGNED BY ENGINEER.
2. FOR VERT. BEND UPWARD, BLOCKING TO BE SIMILAR TO THAT FOR HORIZ. BEND.
3. GLANDS & BOLTS SHALL BE PROTECTED FROM CONC. BY PLASTIC SHEETING WHEN POURING THRUST BLOCKS.
4. ALL THRUST BLOCK & SUPPORT CONC. SHALL BE 3000 PSI READY MIX CONC.
5. THRUST BLOCKS WITH "B" DIMENSION GREATER THAN 30" SHALL HAVE THE RESTRAINED PIPE INSTALLED WITH A MINIMUM OF 4' OF COVER.

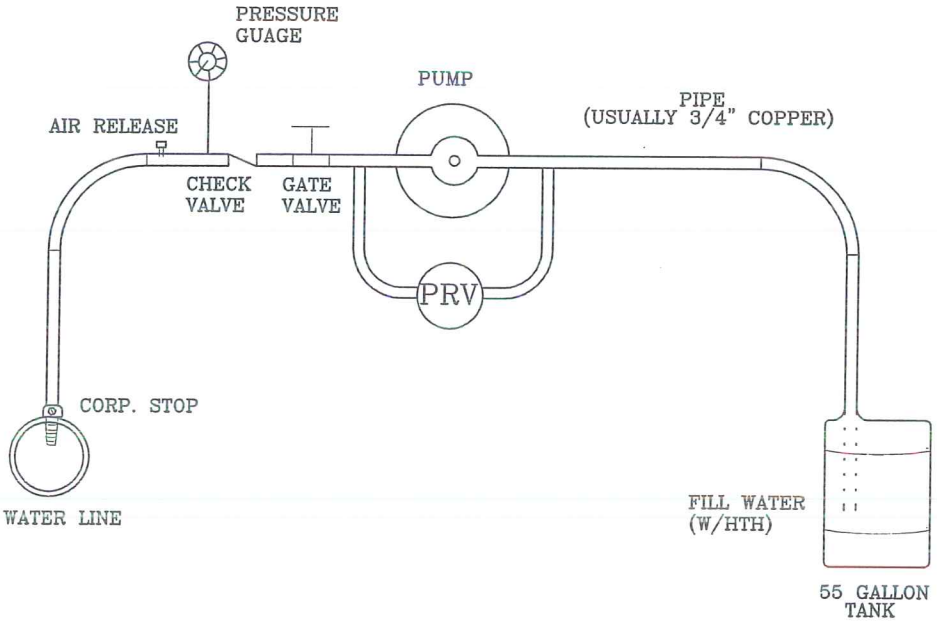
PRESSURE = 200 psi
BEARING = 2000 psf
FACTOR OF SAFETY = 1.5

PIPE SIZE	90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND		TEE		PLUG	
	A	B	A	B	A	B	A	B	A	B	C	D
4"	8"	12"	8"	8"	6"	6"	6"	6"	11"	9"	10"	6"
6"	18"	12"	8"	10"	8"	8"	8"	8"	11"	10"	12"	18"
8"	18"	13"	10"	10"	8"	8"	8"	8"	11"	12"	12"	24"
10"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
12"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
16"	26"	20"	16"	18"	11"	13"	11"	13"	18"	20"	20"	36"
24"	82"	42"	62"	30"	44"	22"	22"	16"	82"	42"	82"	42"
30"	185"	42"	100"	42"	52"	42"	40"	30"	185"	42"	185"	42"

REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		

THRUST BLOCK CONSTRUCTION

DRAWING W-19



TYPICAL WATER PRESSURE TEST RIG

REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		

TYPICAL WATER
PRESSURE TEST RIG

DRAWING
W-21

FACTOR OF SAFETY = 1.5

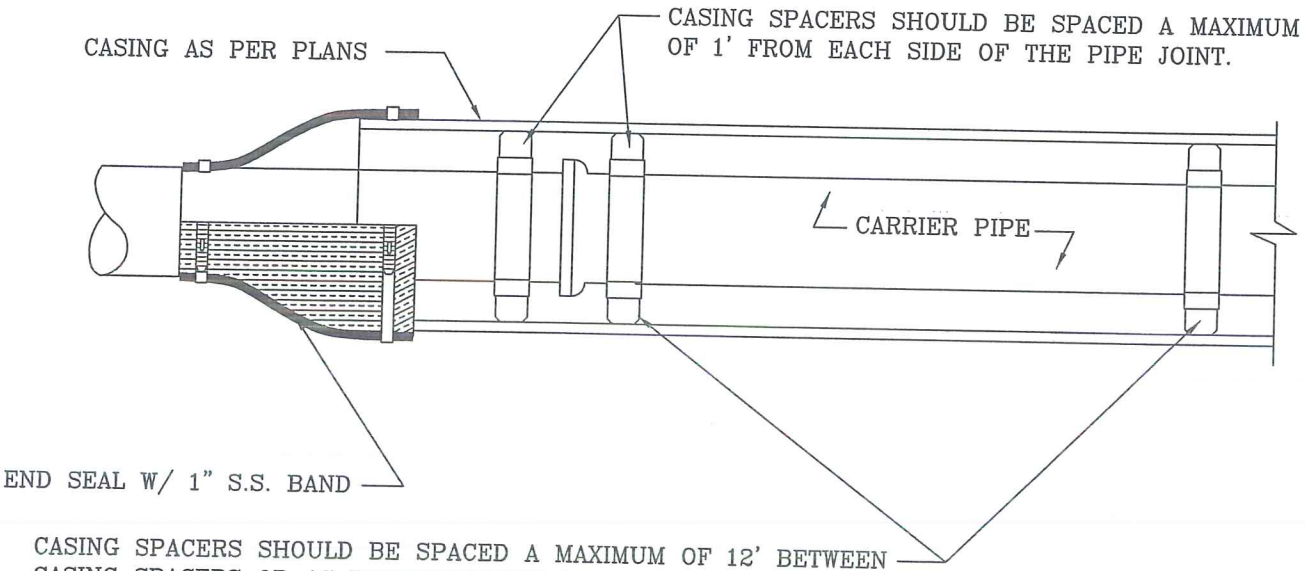
PIPE SIZE	PIPE MAT'L	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	VALVE /PLUG	TEE BRANCH	REDUCER (NOTE 2)	VERT. 45°	VERT. 22 1/2°	VERT. 11 1/4°
6"	D.I.	28'	12'	6'	3'	38'	34'	20'	23'	11'	5'
8"	D.I.	37'	15'	7'	4'	51'	47'	21'	30'	15'	7'
10"	D.I.	45'	19'	9'	4'	61'	57'	20'	37'	18'	9'
12"	D.I.	53'	22'	11'	5'	73'	69'	38'	43'	21'	10'
6"	PVC	30'	12'	6'	3'	56'	38'	29'	35'	17'	8'
8"	PVC	40'	16'	8'	4'	74'	56'	31'	46'	22'	11'
10"	PVC	47'	20'	9'	5'	89'	82'	30'	56'	27'	13'
12"	PVC	56'	23'	11'	6'	106'	88'	56'	66'	32'	16'

1. ALL JOINTS SHALL BE RESTRAINED ON BOTH SIDES OF THE FITTING FOR THE LENGTH SHOWN UNLESS OTHERWISE INDICATED.
2. REDUCER IS ONE SIZE SMALLER THAN PIPE LISTED. RESTRAINED LENGTH IS UPSTREAM ON THE LARGE SIDE OF THE REDUCER.

REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		

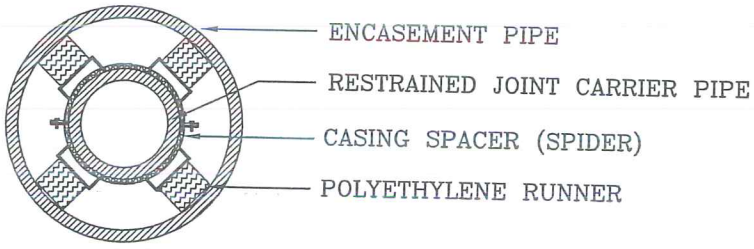
THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS

DRAWING W-20



CASING SPACERS SHOULD BE SPACED A MAXIMUM OF 12' BETWEEN CASING SPACERS OR AS RECOMMMENDED BY MANUFACTURER.

MAXIMUM TOTAL FREE PLAY BETWEEN OUTSIDE OF SPACERS AND INSIDE OF CASING PIPE SHALL BE 1 INCH.



NOTE: A 1" DRAIN WILL BE REQUIRED ON THE LOWER END OF THE CASING IF THE CASING ENDS ARE SEALED WITH MORTER AND BRICK.

REVISIONS			
NO.	DATE		
ORIGINAL	12/01/06		

PIPE SUPPORT
IN CASING PIPE

DRAWING
W-22