

NOTES:

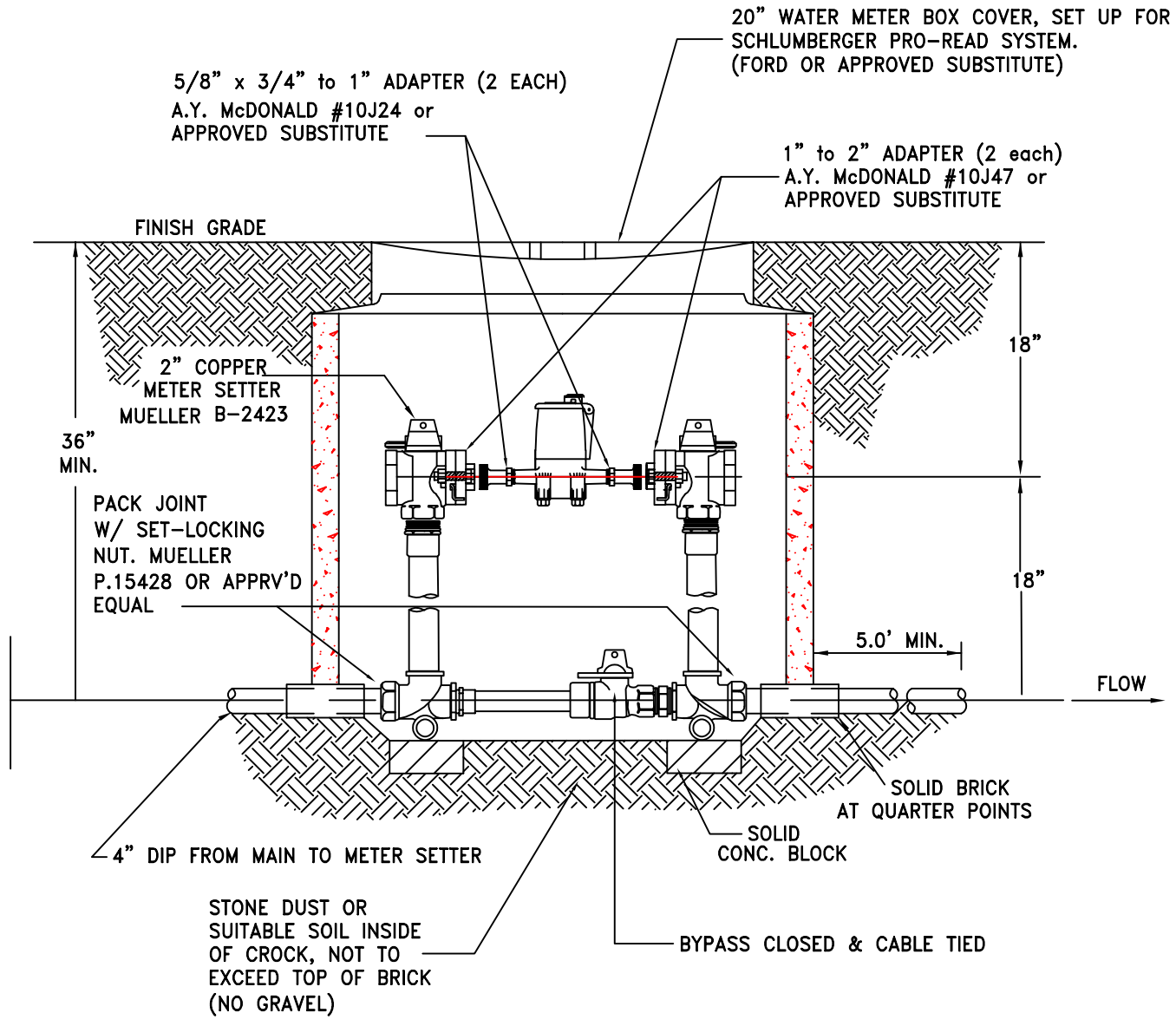
1. ALL WATER METERS SHALL REGISTER IN GALLONS AND BE SET LEVEL - METERS PROVIDED BY PWCSA.
2. 36" OF COVER SHALL BE REQUIRED OVER SERVICES FROM DISTRIBUTION MAIN TO METER BOX.
3. METER BOX SHALL BE ONE PIECE CONSTRUCTION OF CONCRETE, PVC, OR RIGID FIBERGLASS. (NOT ORANBURG)
4. METER YOKE SHALL INCLUDE ONE 3/4" ANGLE VALVE AND ONE BACKFLOW PREVENTER.
5. ALL FITTINGS SHALL BE FLARED. (SOLDERED FITTINGS WILL NOT BE PERMITTED)
6. SERVICE LINE LEAVING METER BOX SHALL BE STUBBED OUT AT LEAST 5' WITH TYPE "K" COPPER OR MUNICIPEX PIPE.
7. METER SET BEHIND SIDEWALK - NOT IN DRIVEWAY, WALKWAYS, ETC.
8. THE SERVICE LINE BETWEEN THE MAIN AND THE METER WILL BE ONE CONTINUOUS PIECE OF PIPE. (NO JOINTS WILL BE PERMITTED)
9. ALL YARD IRRIGATION CONNECTIONS WILL BE MADE AT THE END OF THE 5-FOOT STUB ON THE HOUSE SIDE. (NO CONNECTIONS WILL BE PERMITTED INSIDE THE METER BOX)
10. FORD 500P SERIES (OR EQUIVALENT) YOKE AND 1" DIAMETER GALVANIZED STEEL TUBING TO BE USED WITH MUNICIPEX SERVICES.
11. FORD FB600-X-NL CORPORATION STOP TO BE USED WITH COPPER SERVICE.
10. FORD FB1000-XX-NL CORPORATION STOP TO BE USED WITH MUNICIPEX SERVICES.



5/8" X 3/4" RESIDENTIAL METER

N.T.S.

W-1
REV-2018



NOTES:

1. WATER METERS AND ADAPTERS ARE PROVIDED AND INSTALLED BY THE SERVICE AUTHORITY.
2. 36"W x 30"H ONE PIECE BOX MUST BE USED.
3. GASKETS PROVIDED WITH THE WATER METER SETTERS ARE THE CONTRACTOR'S RESPONSIBILITY.
4. METER BOX MATERIAL: CONCRETE, PVC or RIGID FIBERGLASS.
5. COPPER METER SETTER (MUELLER #B-2423 or APPROVED SUBSTITUTE) TO BE USED.
6. NO FIELD ADJUSTMENTS OF METER SETTER IS PERMITTED.
7. ONLY 2" METER SETTER TO BE INSTALLED.



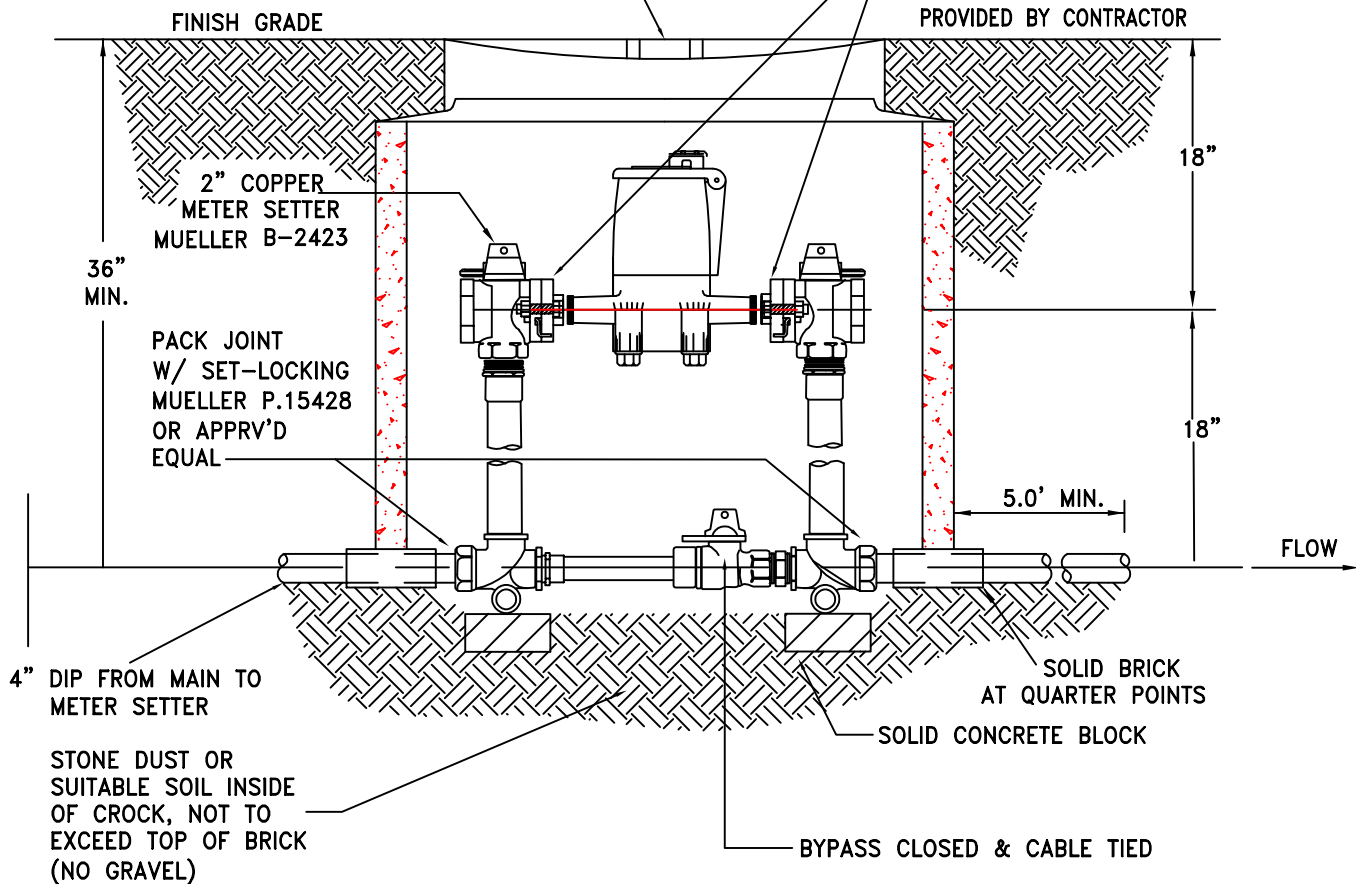
5/8" x 3/4" METER IN 2" COPPER SETTER
for COMMERCIAL USE (ONLY)

N.T.S.

W-3
REV-2020

20" WATER METER BOX COVER (A.Y. McDONALD #74ML20RGP or APPROVED SUBSTITUTE) SET-UP FOR SCHLUMBERGER PRO-READ SYSTEM.

1" TO 2" ADAPTER (2 EACH) A.Y. McDONALD #10J47 or APPROVED SUBSTITUTE PROVIDED BY CONTRACTOR



NOTES:

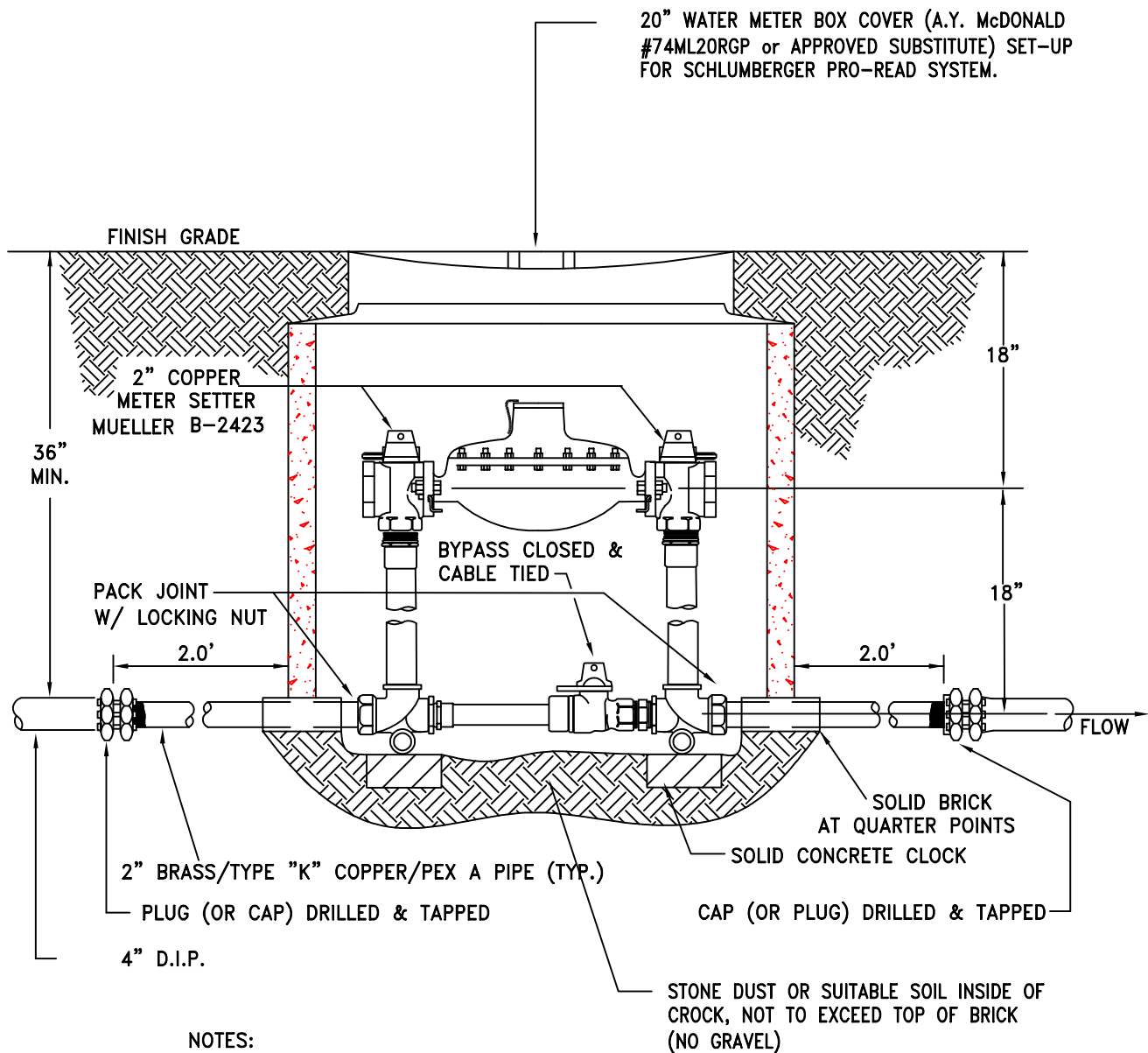
1. WATER METERS AND ADAPTERS ARE PROVIDED AND INSTALLED BY THE SERVICE AUTHORITY.
2. 36"W x 30"H ONE PIECE BOX MUST BE USED.
3. GASKETS PROVIDED WITH THE WATER METER SETTERS ARE THE CONTRACTOR'S RESPONSIBILITY.
4. METER BOX MATERIAL: CONCRETE, PVC or RIGID FRP.
5. COPPER METER SETTER TO BE MUELLER B-2423 OR APPROVED EQUAL.
6. NO FIELD ADJUSTMENT OF METER SETTER IS PERMITTED.
7. ONLY 2" METER SETTER IS TO BE INSTALLED.



1", 1-1/2" AND 2" METER IN 2" COPPER SETTER
for RESIDENTIAL FIRE PROTECTION

N.T.S.

W-4
REV-2020



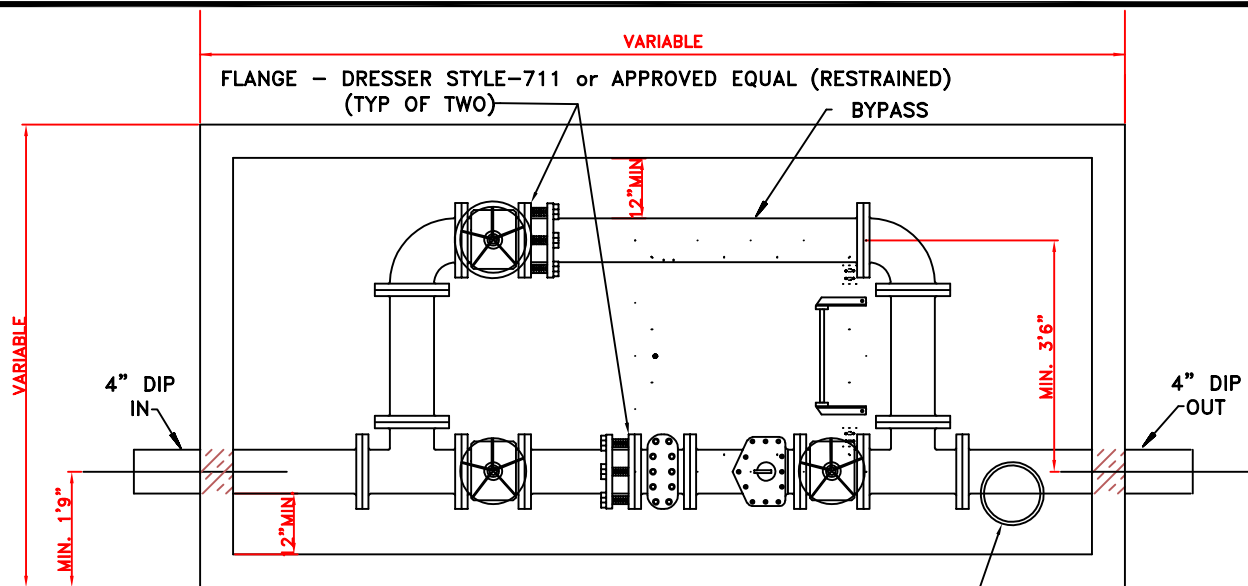
NOTES:

1. WATER METERS ARE PROVIDED AND INSTALLED BY THE SERVICE AUTHORITY.
2. 36"W x 30"H ONE PIECE BOX MUST BE USED.
3. GASKETS PROVIDED WITH THE WATER METER SETTERS ARE THE CONTRACTOR'S RESPONSIBILITY.
4. INSTALLER MAY SUBSTITUTE TYPE "K" SOFT COPPER FOR BRASS SHOWN, PROVIDED APPROPRIATE FITTINGS AND VALVES ARE USED.
5. METER BOX MATERIAL: CONCRETE, PVC or RIGID FRP.
6. COPPER METER SETTER TO BE MUELLER B-2423 OR APPROVED EQUAL.
7. NO FIELD ADJUSTMENT OF METER SETTER OR METER BOX IS PERMITTED. FACTORY CUT LENGTH TO 2" METER.
8. ONLY 2" METER SETTER IS TO BE INSTALLED.



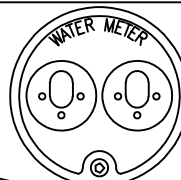
WATER DISTRIBUTION SYSTEM
 1½" & 2" METER WITH D.I.P. SERVICE
 N.T.S.

W-7
 REV-2020

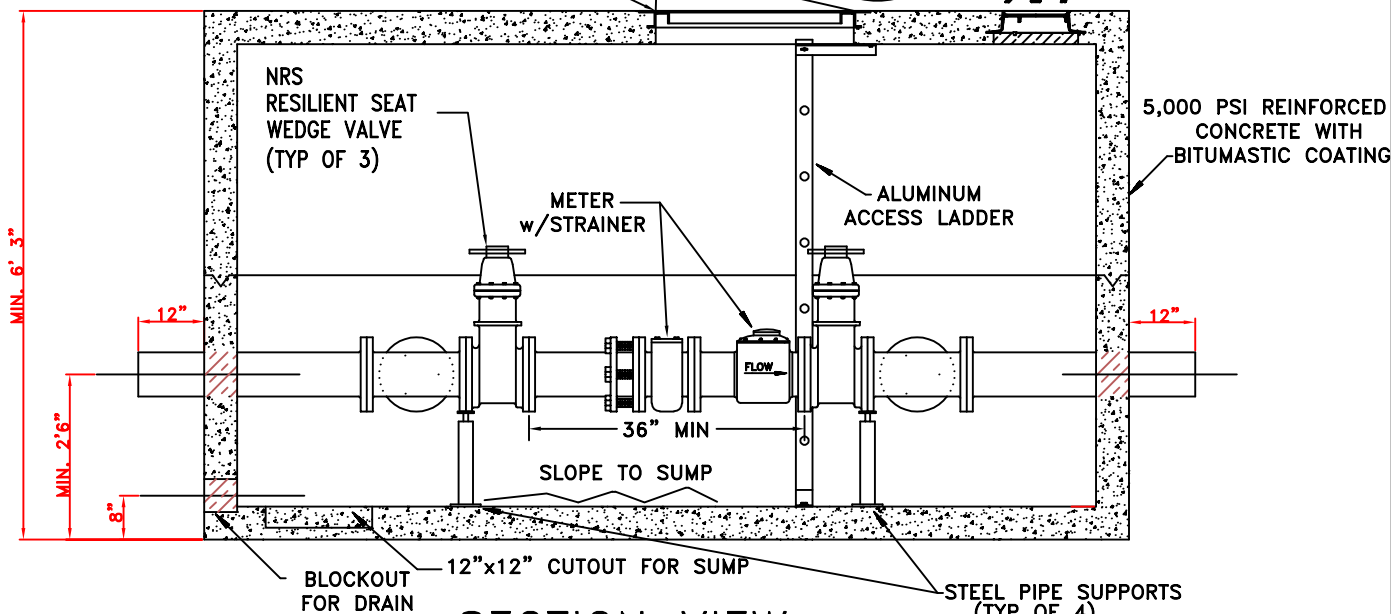


PLAN VIEW

30" x 30" ALUMINUM ACCESS HATCH W/LOCKING HASP (BILCO #J-AL or APPROVED SUBSTITUTE)



18" WATER METER BOX COVER SET-UP FOR 2 SCHLUMBERGER PRO-READ SYSTEMS.



SECTION VIEW

NOTES:

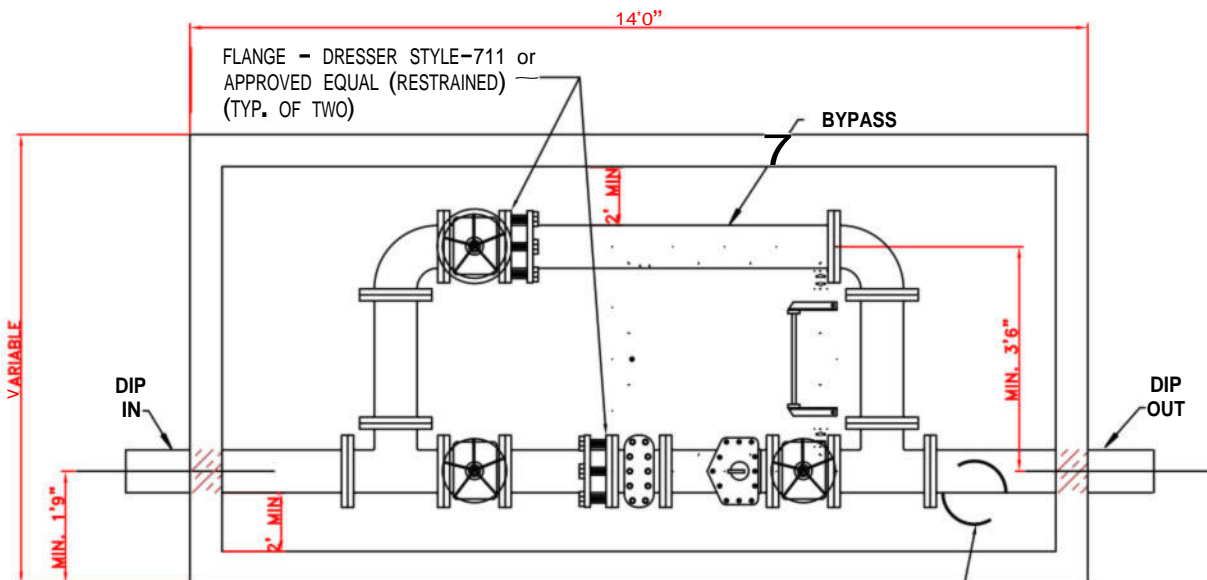
1. PIPING UP TO AND LEADING OUT OF VAULT WILL BE RESTRAINED USING MEGA-LUGS SERIES 1100 or APPROVED SUBSTITUTE. CALCULATIONS FOR RESTRAINT BASED ON DEAD END LINE.
2. SHOP DRAWINGS FOR VAULT AND PIPING MATERIALS WILL BE SUBMITTED TO THE PWCSA FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
3. 4" x 3" REDUCERS REQUIRED BETWEEN VALVES FOR 3" METER APPLICATION.
4. WATER METERS WILL BE PROVIDED AND INSTALLED BY THE SERVICE AUTHORITY.
5. FLOOR WILL BE DESIGNED TO DRAIN TO SUMP AREA. PROVIDE GRAVITY DRAIN TO DAYLIGHT.
6. THE STRUCTURE SHALL NOT BE INSTALLED WHERE SUBJECT TO VEHICULAR OR PEDESTRIAN TRAFFIC.
7. THE EXTERIOR OF ALL METER VAULTS SHALL HAVE A BITUMASTIC COATING.



3" or 4" MASTER METER VAULT

N.T.S.

W-8
REV-2020

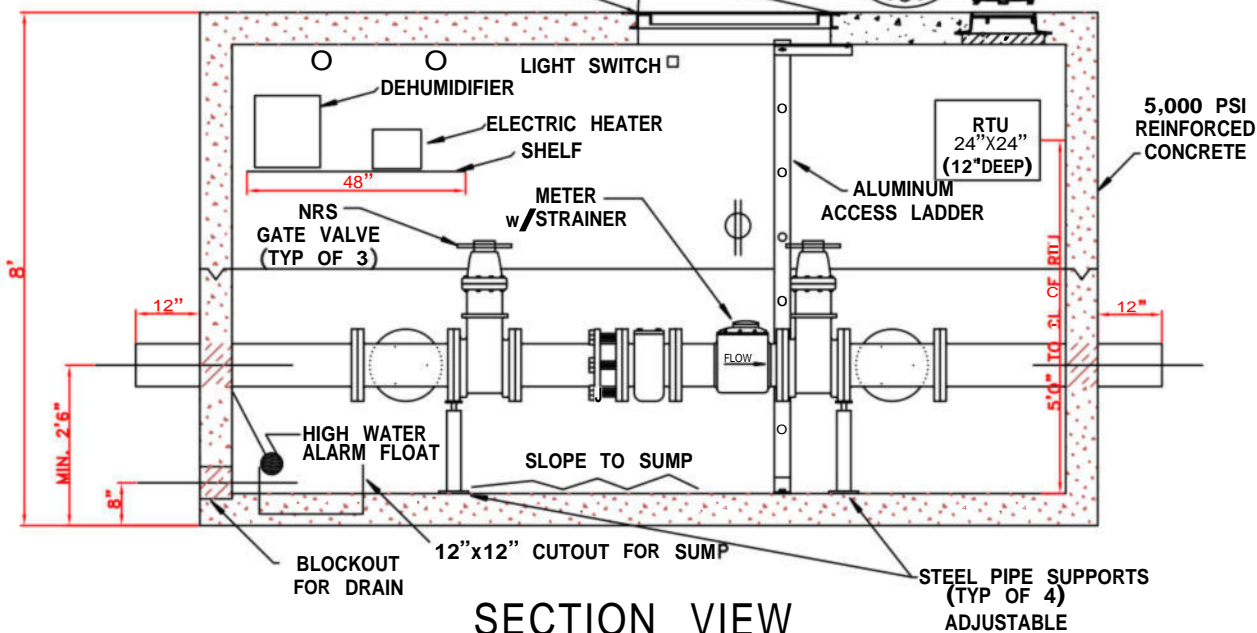


48" x 48" ALUMINUM ACCESS
DOUBLE HATCH W/LOCKING
HASP(H2R/HALLIDAY or
APPROVED SUBSTITUTE)

PLAN VIEW



18" WATER METER BOX COVER
SET-UP FOR 2 SCHLUMBERGER
PRO-READ SYSTEMS.



SECTION VIEW

NOTES:

1. PIPING UP TO AND LEADING OUT OF VAULT WILL BE RESTRAINED USING MEGA-LUGS SERIES 1100 or APPROVED SUBSTITUTE. CALCULATIONS FOR RESTRAINT BASED ON DEAD END LINE.
2. SHOP DRAWINGS FOR VAULT AND PIPING MATERIALS WILL BE SUBMITTED TO THE PWCSA FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION.
3. METER WILL BE PROVIDED BY PWCSA.
4. FLOOR WILL BE DESIGNED TO DRAIN TO SUMP AREA. PROVIDE GRAVITY DRAIN TO DAYLIGHT.
5. THE STRUCTURE SHALL NOT BE INSTALLED WHERE SUBJECT TO VEHICULAR OR PEDESTRIAN TRAFFIC.
6. APPROVED FLEXIBLE JOINT REQUIRED ON ALL PIPE CONNECTIONS IN STRUCTURE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURE'S RECOMMENDATIONS.

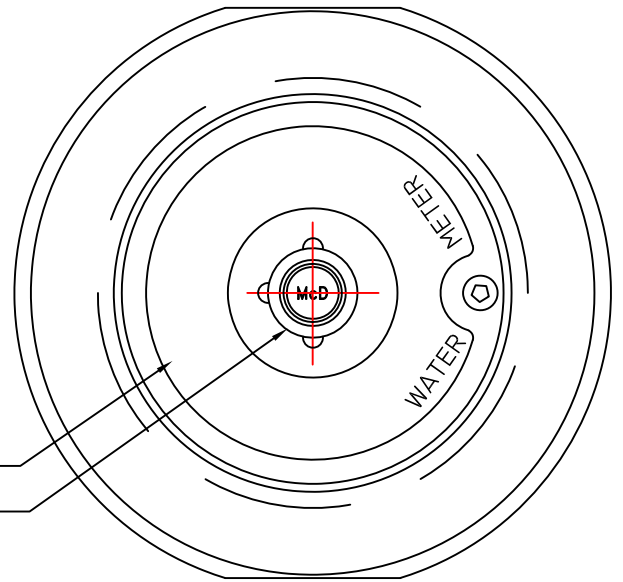
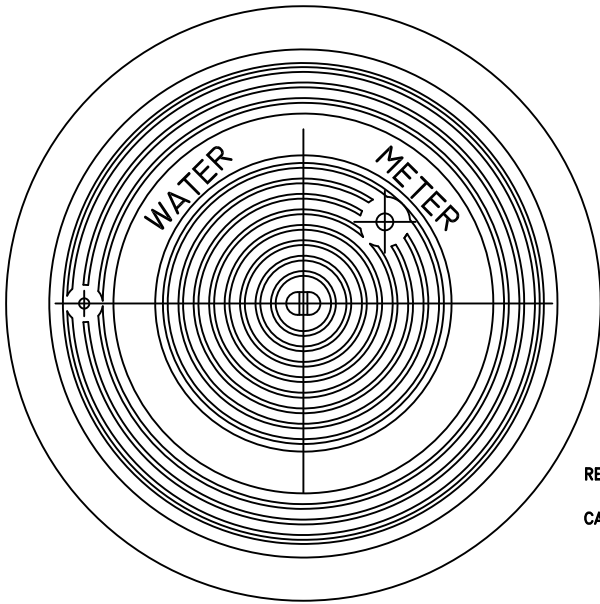
NOTE: METER LAY LENGTH DIMENSIONS SHALL BE PROVIDED TO INSURE ADEQUATE ROOM FOR INSTALLATION

**6", 8", OR 10" MAIN LINE
METER VAULT**

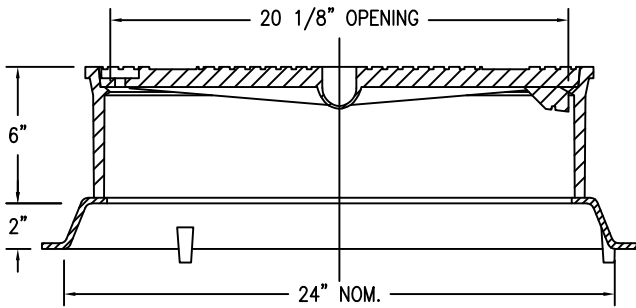
N.T.S.

W-9
REV-2022

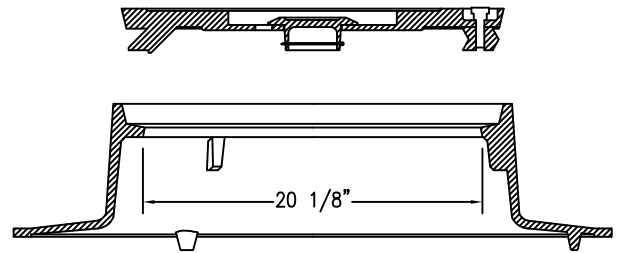




RECESSED COVER
CAST IRON PLUG

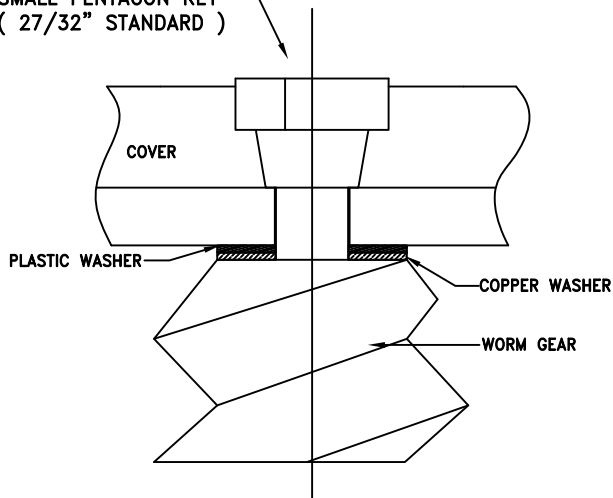


74M24 MONITOR FRAME & COVER

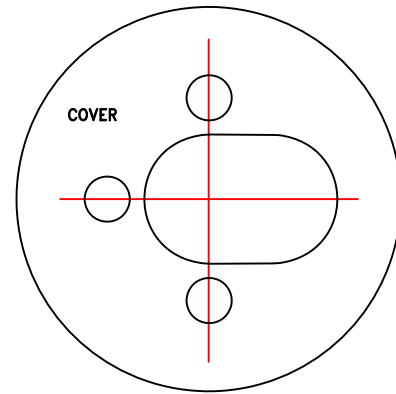


74M32ARGP METER BOX FRAME & COVER

SMALL PENTAGON KEY
(27/32" STANDARD)



WORM GEAR LOCKING ASSEMBLY DETAIL

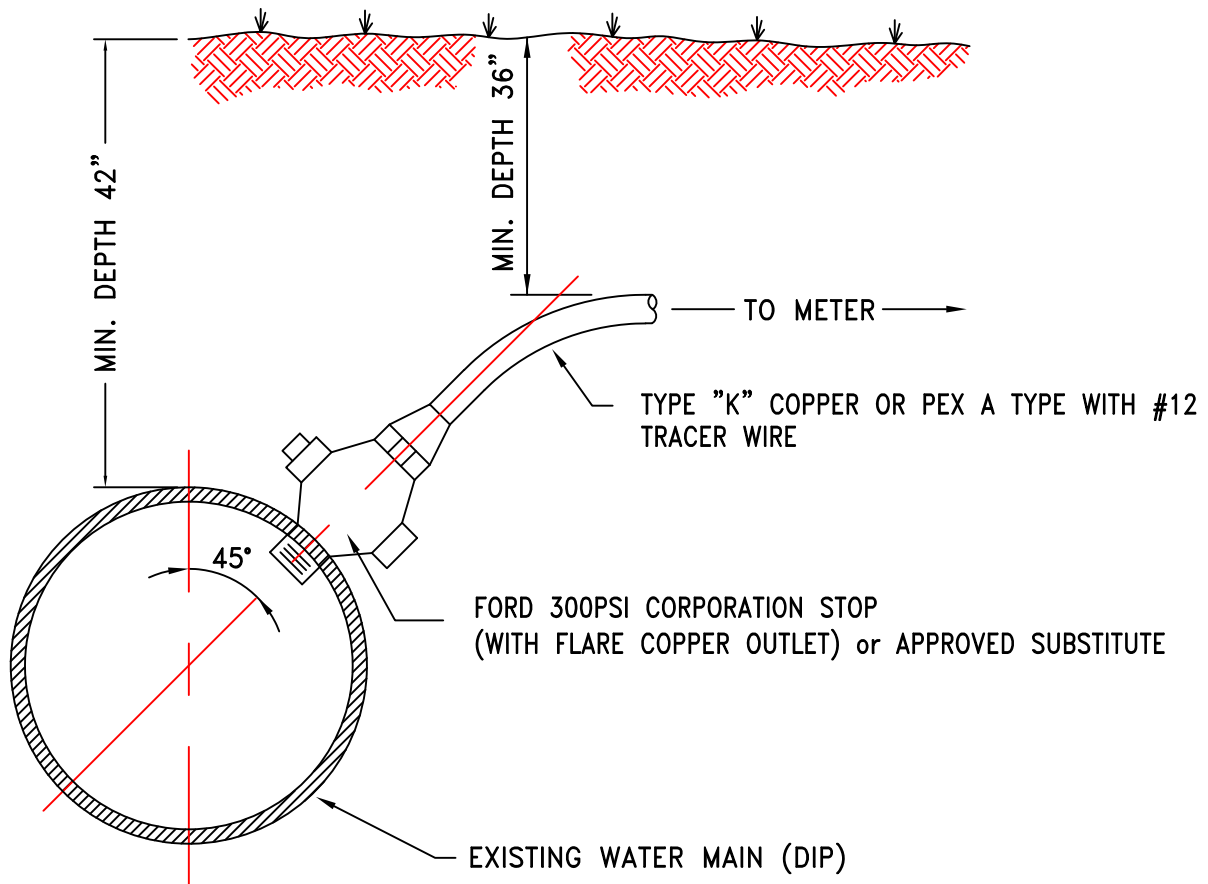


COVER CENTER HOLE DETAIL



5/8" x 3/4" AND 1" WATER METER AND MONITOR
FRAME & COVER DETAIL
N.T.S.

W-10
REV-2018



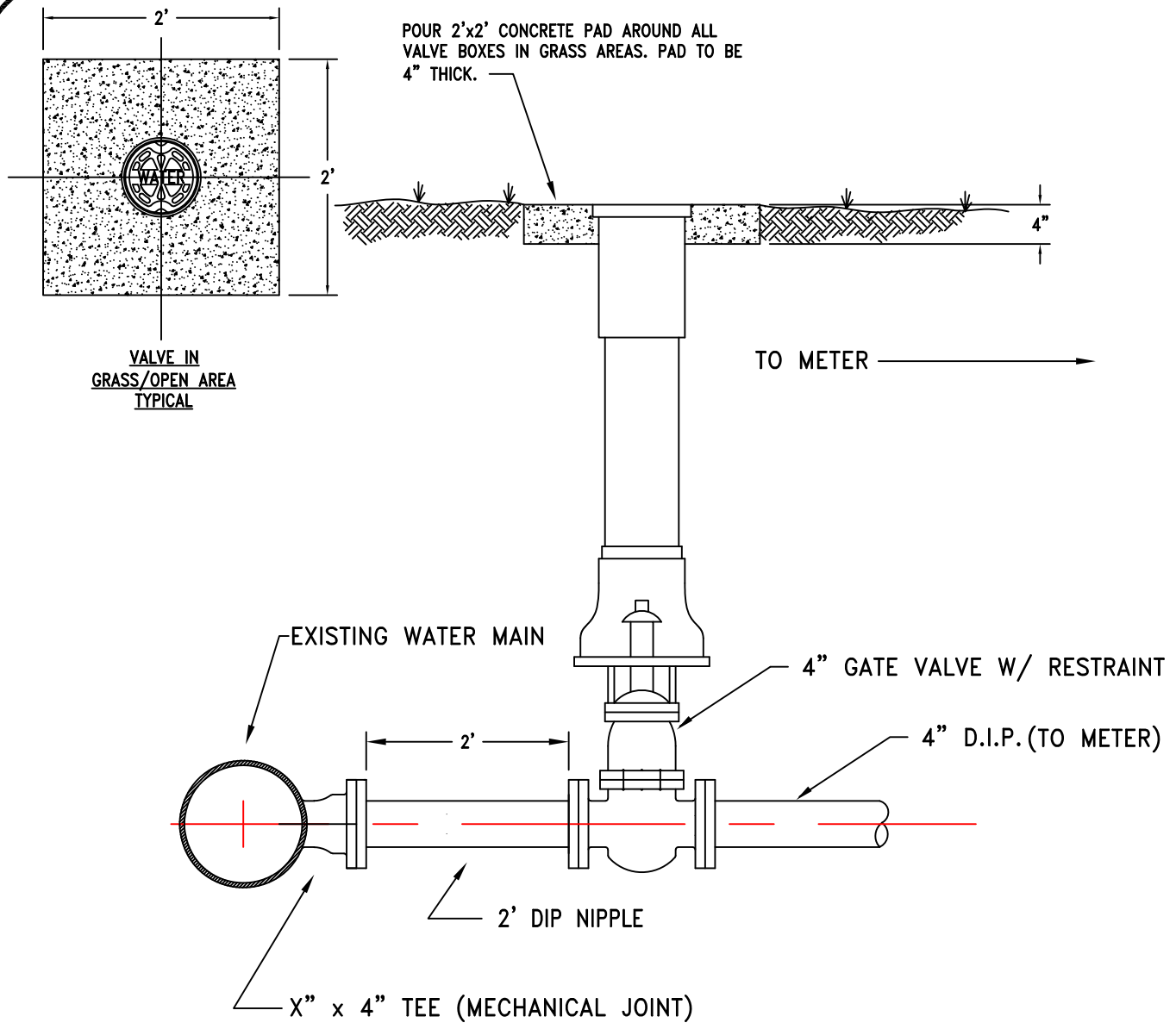
NOTE:

1. THE SERVICE LINE BETWEEN THE MAIN AND THE METER WILL BE ONE CONTINUOUS PIECE OF PIPE. (NO JOINTS WILL BE PERMITTED)
2. BACK TO BACK TAPS ON A WATER MAIN ARE NOT ALLOWED.
3. TAPS SHALL BE SPACED A MINIMUM OF 24 INCHES.
4. IF USE OF C-900 IS PERMITTED BY PWCSA. INJECTION MOLDED TEES SHALL BE USED FOR DOMESTIC TAPS ON C-900 PIPE.
5. FORD FB600-X-NL CORPORATION STOP TO BE USED WITH COPPER SERVICES.
6. FORD FB1000-XX-NL CORPORATION STOP TO BE USED WITH MUNICIPEX SERVICES.



$\frac{3}{4}$ " WATER SERVICE
CONNECTION DETAIL
N.T.S.

W-11
REV-2018



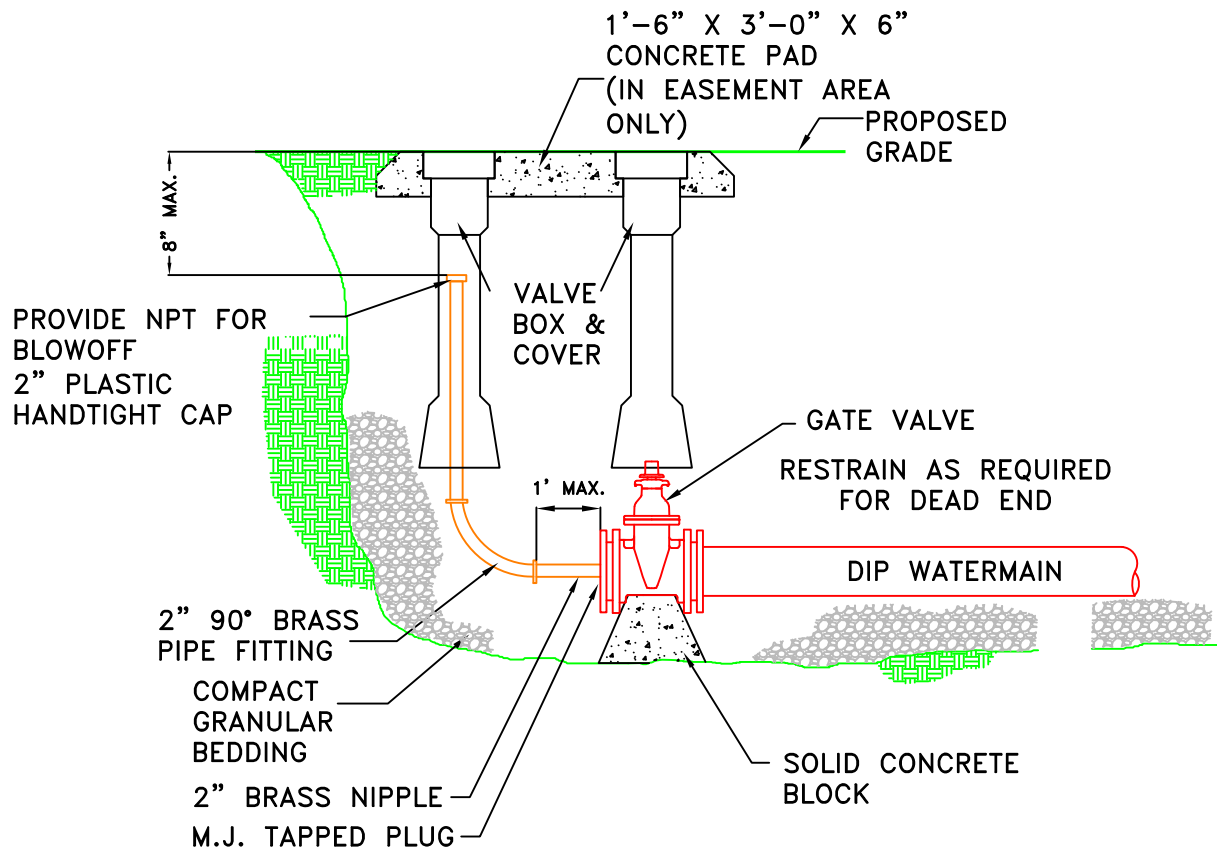
NOTE:

1. ALL JOINTS FROM THE MAIN TO THE METER WILL BE RESTRAINED USING AN APPROVED RESTRAINING GLAND.



4" D.I.P. SERVICE
CONNECTION DETAIL
N.T.S.

W-12
REV-2018



NOTES:

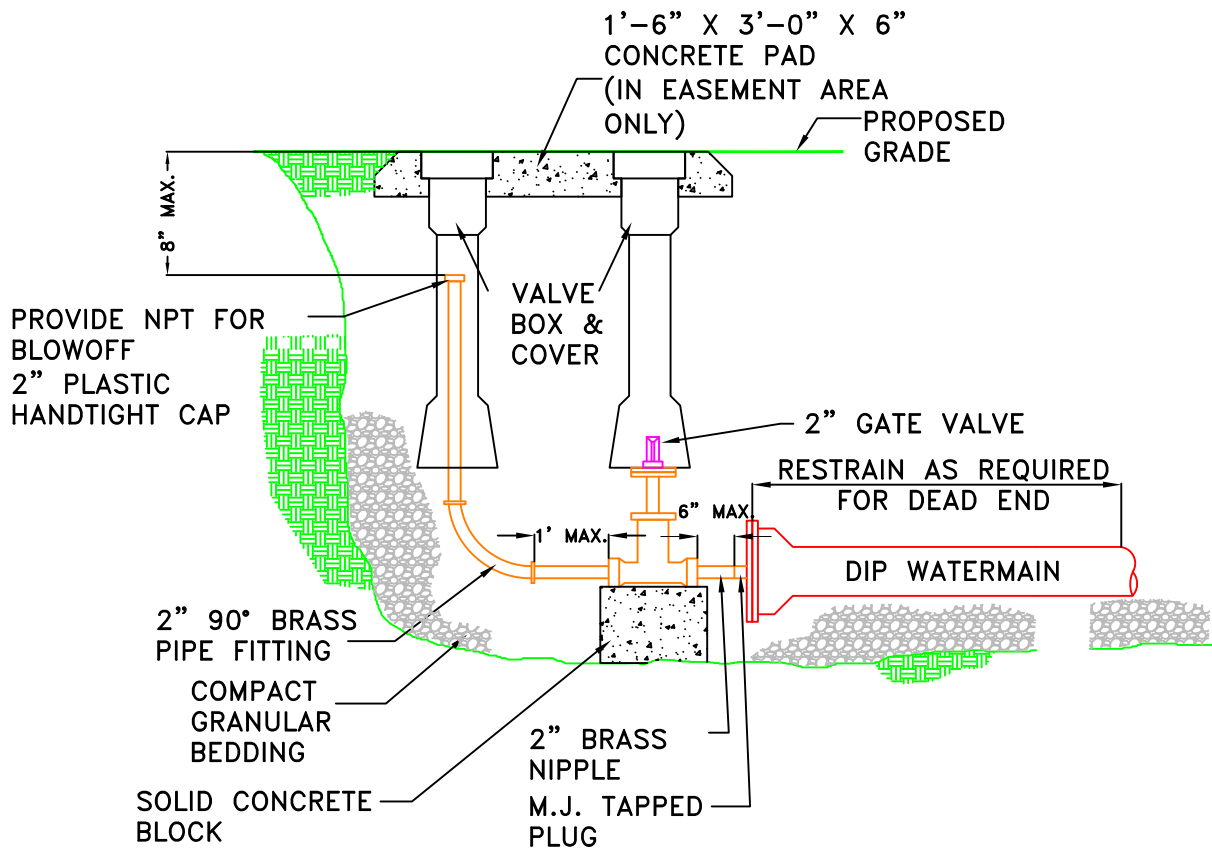
1. ALL 2" PIPE TO BE WITH I.P. THREAD.
2. PROVIDE RESTRAINT IN ACCORDANCE WITH DEAD END LINE, ACCORDING TO MAIN LINE SIZE.



TEMPORARY
BLOW-OFF ASSEMBLY

N.T.S.

W-13
REV-2018



NOTES:

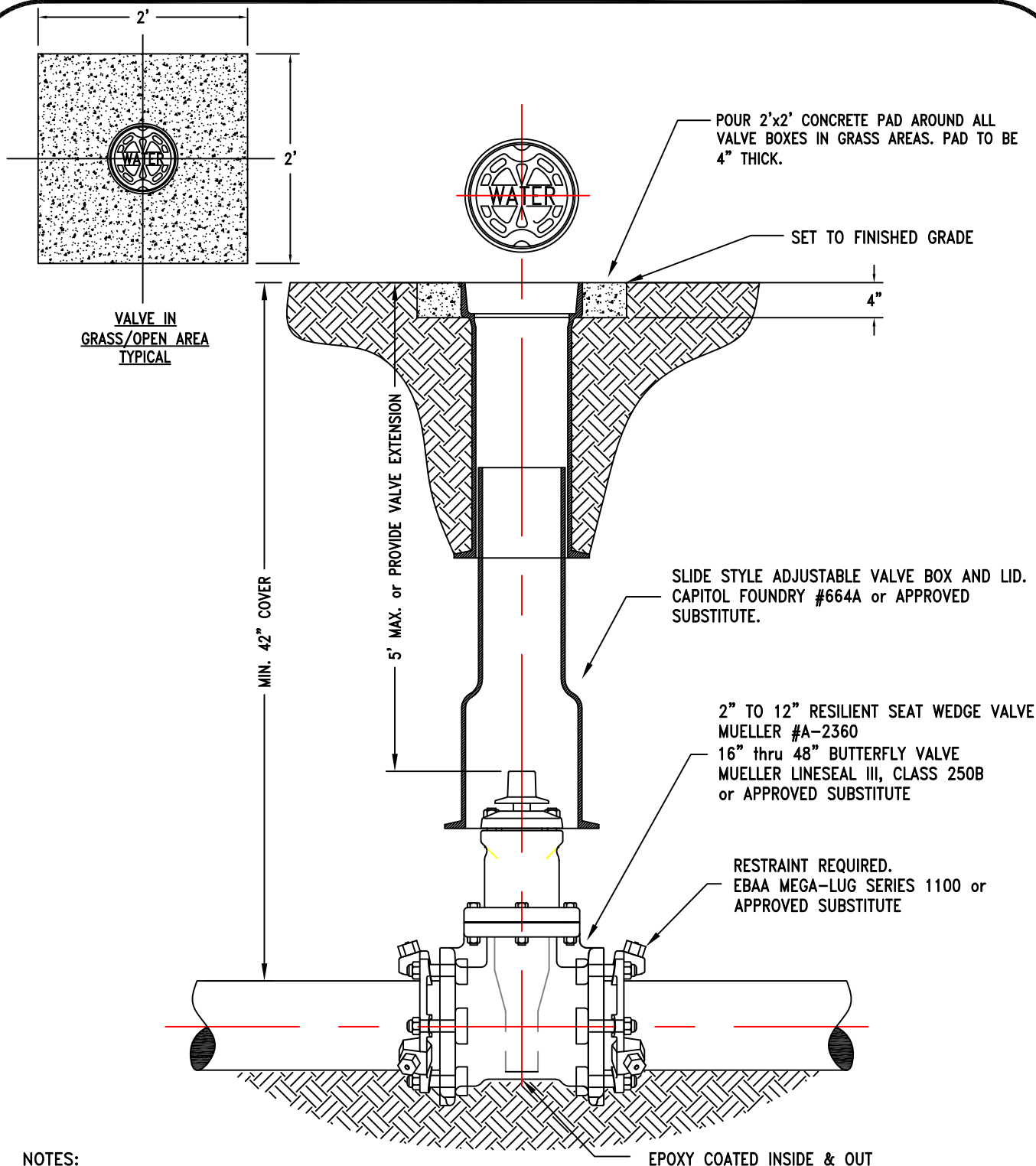
1. ALL 2" PIPE TO BE WITH I.P. THREAD.
2. PROVIDE RESTRAINT IN ACCORDANCE WITH DEAD END LINE, ACCORDING TO MAIN LINE SIZE.



PERMANENT
BLOW-OFF ASSEMBLY

N.T.S.

W-14
REV-2018



NOTES:

1. VALVES THAT ARE NORMALLY CLOSED, PROVIDE ACCESS INSERT AND PAINT TOP OF VALVE BOX RED.
2. VALVE AND PIPE SHALL HAVE SAME NOMINAL DIAMETER.
3. VALVE EXTENSIONS TO BE ONE ROD ONLY, USE OF MULTIPLE EXTENSIONS IS PROHIBITED.

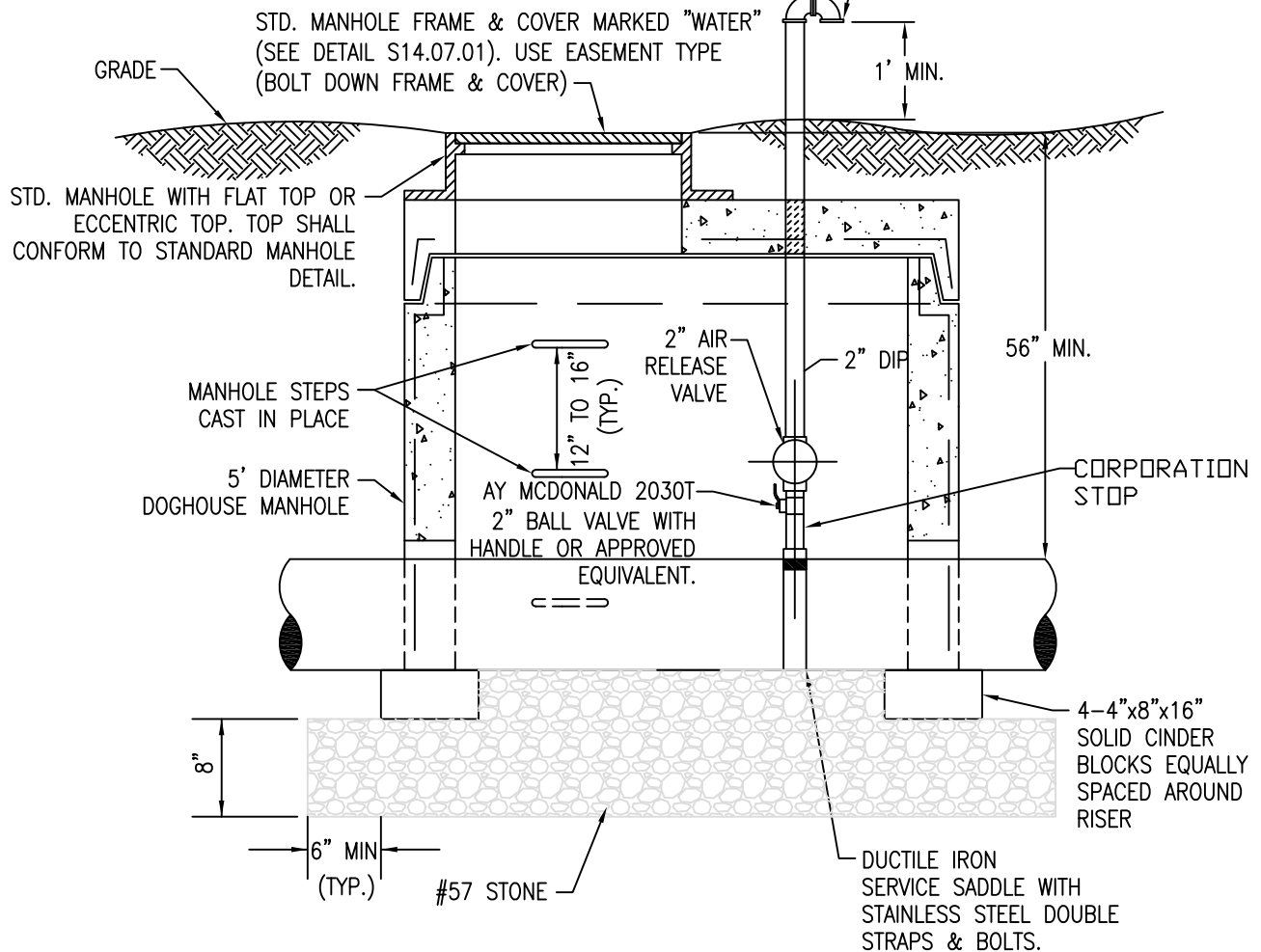
ONLY SERVICE AUTHORITY TO ACCESS AND OPERATE ANY OPERATIONAL VALVE



TYPICAL VALVE
AND VALVE BOX
N.T.S.

W-15
REV-2018

THE OPEN END OF THE BLOWOFF SHALL BE EXTENDED AT LEAST 1-FOOT ABOVE FINISHED GRADE AND HAVE A PROTECTIVE SCREEN. SEE THE VIRGINIA WATERWORKS REGULATIONS SECTION 12 VAC 5-590-1160 FOR COMPLETE REQUIREMENTS.



NOTES:

1. AIR RELEASE VALVE SHALL BE SIMPLEX TYPE "AV" "CRISPIN UNIVERSAL" OR APPROVED SUBSTITUTE. VALVE SHALL HAVE 2" DIAMETER SCREWED CONNECTION AND SHALL FUNCTION AT WORKING PRESSURE UP TO 150 PSI.
2. PIPE TO BE GROUTED IN AT DOG HOUSE OPENINGS.
3. DUCTILE IRON SERVICE SADDLE WITH STAINLESS STEEL DOUBLE STRAPS AND BOLTS SHALL BE "MUELLER DR2S" OR APPROVED SUBSTITUTE.
4. 2" PIPE SHALL BE THREADED DUCTILE IRON MADE BY HARCO OR APPROVED SUBSTITUTE.
5. MANHOLE STEPS TO BE AMERICAN STEP COMPANY ML-10-TDS-SSR OR APPROVED EQUIVALENT.

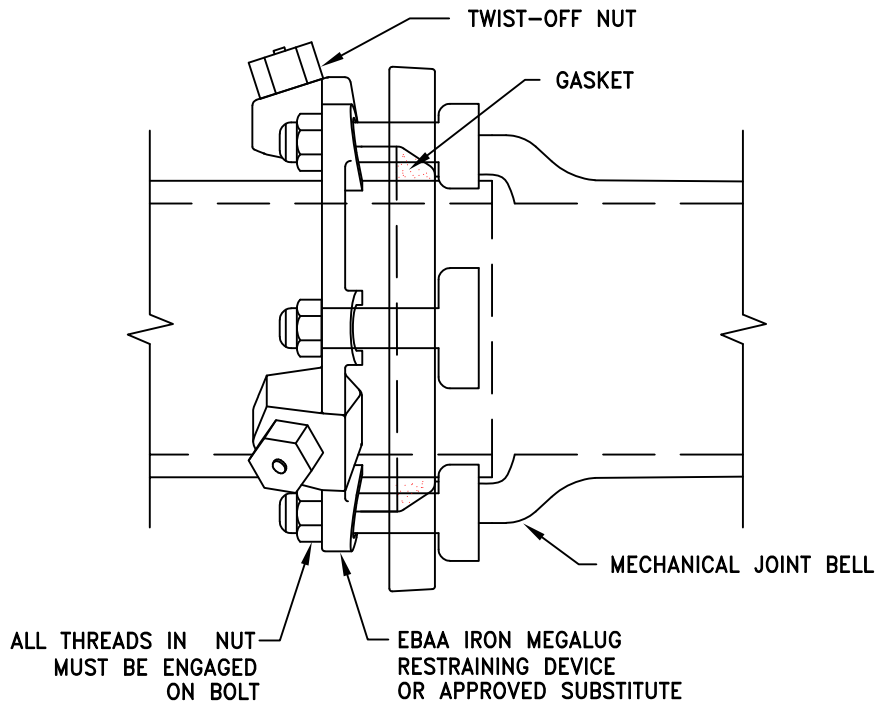
* PWCSA MUST GIVE SPECIFIC PERMISSION AND OR APPROVAL TO USE THIS OR ANY OTHER DESIGN



WATER DISTRIBUTION SYSTEM
AIR RELEASE VALVE

N.T.S.

W-16
REV-2018



NOMINAL PIPE SIZE (INCHES)	NUMBER OF TWIST-OFF NUTS	NUMBER OF T-BOLTS	RATED PRESSURE
3	2	4	350 PSI
4	2	4	350 PSI
6	3	6	350 PSI
8	4	6	350 PSI
10	6	8	350 PSI
12	8	8	350 PSI
16	12	12	350 PSI
18	12	12	250 PSI
24	16	16	250 PSI
30	20	20	250 PSI
36	24	24	250 PSI
42	28	28	250 PSI

NOTES:

1. MAKE ANY JOINT DEFLECTION NECESSARY BEFORE TORQUING THE T-HEAD BOLTS.
2. TIGHTEN T-HEAD BOLTS, BOTTOM FIRST, THEN TOP, SIDES AND REMAINDER.
3. REPEAT NOTE #2 UNTIL ALL T-BOLTS ARE PROPERLY TORQUED.
4. TIGHTEN TWIST-OFF NUTS SO THAT ALL WEDGES FIRMLY CONTACT PIPE.
5. TIGHTEN TWIST-OFF NUTS IN ALTERNATING MANNER, SHEARING OFF NUTS.
6. MEGALUG MAY BE RESET OR REUSED BY ASSEMBLY AS DESCRIBED ABOVE AND TORQUING WEDGE BOLTS TO 90 FT. LBS.



**JOINT RESTRAINT
DEVICE**
N.T.S.

W-17
REV-2018

SOIL PROPERTIES	SIZE	CONCRETE BLOCK DIMENSIONS AT 150 PSI PRESSURE				ADD TO DIMENSION D FOR EACH ADD 50 PSI PRESSURE UP TO 300 PSI	Adjustment For Conc. Area For Different Height HC To Be Measured From Grade to Q _c Of Pipe			
		D	E	F	G		Up To 8'	8'-1" To 12'	12'-1" To 16'	16'-1" To 20'
CS = 1000 PSF φ = 15° SOFT SILTY CLAY OR BETTER	3"	6"	1'-0"	6"	7"	2"	CONC. BLOCK AREA = 1.0 X D X E	CONC. BLOCK AREA = 0.875 X D X E	CONC. BLOCK AREA = 0.75 X D X E	CONC. BLOCK AREA = 0.625 X D X E
	4"	6"	1'-0"	6"	7"	2"				
	6"	8"	1'-2"	6"	8"	2"				
	8"	1'-0"	1'-4"	8"	8"	4"				
	10"	1'-3"	1'-6"	8"	10"	4"				
	12"	1'-6"	1'-8"	1'-0"	1'-0"	6"				
	16"	2'-0"	2'-0"	1'-0"	1'-3"	6"				
	20"	2'-6"	2'-6"	1'-0"	1'-6"	9"				
	24"	3'-0"	3'-0"	1'-0"	1'-6"	9"				
30"	4'-0"	3'-6"	1'-4"	1'-9"	1'-0"					
CS = 0 φ = 15° LOOSE SILTY SAND	3"	1'-0"	1'-6"	6"	9"	2"	CONC. BLOCK AREA = 1.0 X D X E	CONC. BLOCK AREA = 0.5 X D X E	CONC. BLOCK AREA = 0.375 X D X E	CONC. BLOCK AREA = 0.25 X D X E
	4"	1'-6"	2'-0"	6"	9"	2"				
	6"	2'-0"	2'-0"	6"	1'-0"	2"				
	8"	3'-4"	2'-0"	8"	1'-0"	4"				
	10"	4'-2"	2'-3"	8"	1'-0"	4"				
	12"	4'-8"	2'-9"	1'-0"	1'-6"	6"				
	16"	5'-9"	3'-6"	1'-0"	1'-6"	6"				
	20"	7'-10"	4'-0"	1'-0"	2'-0"	9"				
	24"	9'-10"	5'-0"	1'-6"	2'-0"	9"				
	30"	11'-8"	6'-0"	2'-0"	2'-0"	1'-0"				

DIMENSION D & E SHALL BE ADJUSTED FOR REQUIRED AREA.
 DIMENSION F & G SHALL REMAIN SAME.
 DIMENSION D SHALL BE ADJUSTED FOR REQUIRED PRESSURE IN EXCESS OF 150 PSI BEFORE MAKING ADJUSTMENT FOR HEIGHT.

NOTES:

1. FC = 3,000 PSI AT 28 DAYS.
2. CS = SOIL COHESION IN PSF AND φ = ANGLE OF INTERNAL FRICTION.
3. CARRY ALL BEARING SURFACES TO UNDISTURBED GROUND OR FIRM SUB-GRADE.
4. CONCRETE THRUST BLOCKING TO BE USED ONLY AT THE DISCRETION OF THE SERVICE AUTHORITY FIELD INSPECTOR, AND WHEN JOINT RESTRAINT IS INADEQUATE OR INFEASIBLE.



BUTTRESSES FOR 22½° HORIZONTAL BEND

W-18
REV-2018

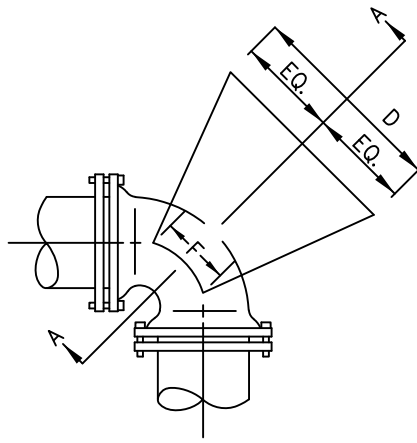
SOIL PROPERTIES	SIZE	Concrete Block Dimensions At 150 PSI Pressure				Add To Dimension D For Each Add 50 PSI Pressure Up To 300 PSI	Adjustment For Conc. Area For Different Height HC To Be Measured From Grade to ϕ Of Pipe			
		D	E	F	G		Up To 8'	8'-1" To 12'	12'-1" To 16'	16'-1" To 20'
CS = 1000 PSF $\phi = 15^\circ$ SOFT SILTY CLAY OR BETTER	3"	9"	1'-0"	6"	6"	4"	CONC. BLOCK AREA 1.0 X D X E	CONC. BLOCK AREA 0.875 X D X E	CONC. BLOCK AREA 0.75 X D X E	CONC. BLOCK AREA 0.625 X D X E
	4"	9"	1'-0"	6"	6"	4"				
	6"	1'-0"	1'-2"	6"	8"	4"				
	8"	1'-6"	1'-4"	8"	9"	6"				
	10"	2'-0"	1'-6"	8"	10"	6"				
	12"	2'-6"	1'-8"	1'-0"	1'-0"	9"				
	16"	3'-6"	2'-6"	1'-0"	1'-3"	9"				
	20"	4'-8"	2'-6"	1'-0"	1'-4"	1'-4"				
	24"	5'-0"	3'-0"	1'-0"	1'-9"	2'-0"				
30"	6'-0"	4'-0"	1'-4"	2'-3"	2'-0"					
CS = 0 $\phi = 15^\circ$ LOOSE SILTY SAND	3"	1'-6"	1'-6"	6"	1'-0"	4"	CONC. BLOCK AREA 1.0 X D X E	CONC. BLOCK AREA 0.5 X D X E	CONC. BLOCK AREA 0.375 X D X E	CONC. BLOCK AREA 0.25 X D X E
	4"	2'-0"	2'-0"	6"	1'-0"	4"				
	6"	3'-0"	2'-0"	6"	1'-0"	4"				
	8"	4'-0"	2'-6"	8"	1'-0"	6"				
	10"	6'-0"	2'-6"	8"	1'-0"	6"				
	12"	7'-0"	3'-0"	1'-0"	1'-6"	9"				
	16"	11'-0"	4'-0"	1'-0"	1'-6"	9"				
	20"	11'-8"	5'-0"	1'-0"	2'-0"	1'-4"				
	24"	12'-6"	6'-0"	1'-6"	2'-0"	2'-0"				
30"	20'-0"	6'-0"	2'-0"	2'-6"	2'-0"					

DIMENSION D & E SHALL BE ADJUSTED FOR REQUIRED AREA.
 DIMENSION F & G SHALL REMAIN SAME.
 DIMENSION D SHALL BE ADJUSTED FOR REQUIRED PRESSURE IN EXCESS OF 150 PSI BEFORE MAKING ADJUSTMENT FOR HEIGHT.
 CONCRETE THRUST BLOCKING TO BE USED ONLY AT THE DISCRETION OF THE SERVICE AUTHORITY FIELD INSPECTOR.

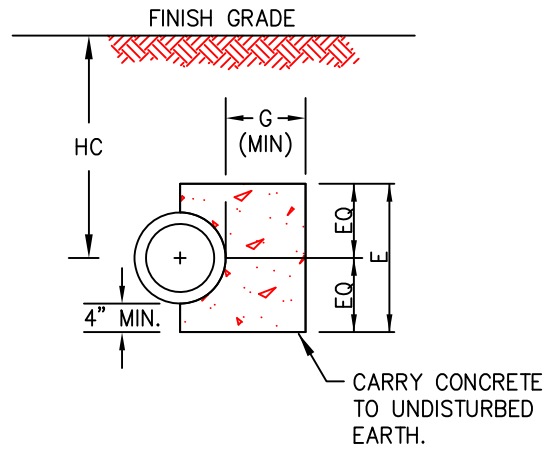


BUTTRESSES FOR 45° HORIZONTAL BEND

W-19
REV-2018



PLAN



SECTION A-A

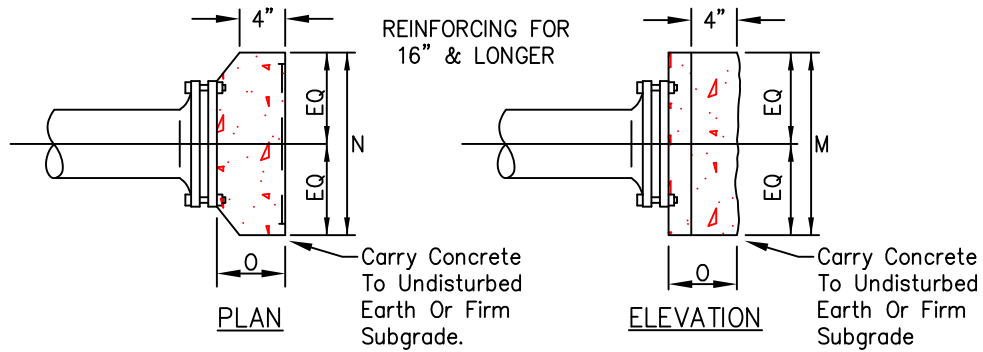
SIZE	Concrete Block Dimensions At 150 PSI Pressure				Add to Dimension "D" For Each Add'l 50 PSI Pressure Up To 300 PSI	Adjustment for Conc. Area For Different Height (HC) To Be Measured From Grade To C of Pipe			
	D	E	F	G		Up To 8'-0"	8'-1" To 12'	12'-1" To 16'	16'-1" To 20'
3"	2'-6"	2'-0"	8"	1'-0"	6"	CONC. BLOCK AREA 1.0 X D X E	C. B. A. 0.5 X D X E	C. B. A. 0.375 X D X E	C. B. A. 0.25 X D X E
4"	3'-4"	2'-0"	8"	1'-0"	6"				
6"	5'-2"	2'-0"	1'-0"	1'-6"	6"				
8"	6'-8"	2'-6"	1'-0"	1'-6"	9"				
10"	10'-0"	3'-0"	1'-6"	1'-6"	9"				
12"	10'-0"	4'-0"	1'-6"	2'-0"	1'-0"				
16"	12'-6"	5'-0"	2'-0"	2'-0"	1'-0"				
20"	15'-10"	6'-0"	2'-0"	2'-0"	2'-0"				

DIMENSION D & E SHALL BE ADJUSTED FOR REQUIRED AREA.
 DIMENSION F & G SHALL REMAIN SAME.
 DIMENSION D SHALL BE ADJUSTED FOR REQUIRED PRESSURE IN EXCESS
 OF 150 PSI BEFORE MAKING ADJUSTMENT FOR HEIGHT.
 SPECIAL DESIGN REQUIRED FOR LINES 24" OR GREATER IN DIAMETER.
 CONCRETE THRUST BLOCKING TO BE USED ONLY AT THE DISCRETION OF THE
 SERVICE AUTHORITY FIELD INSPECTOR.

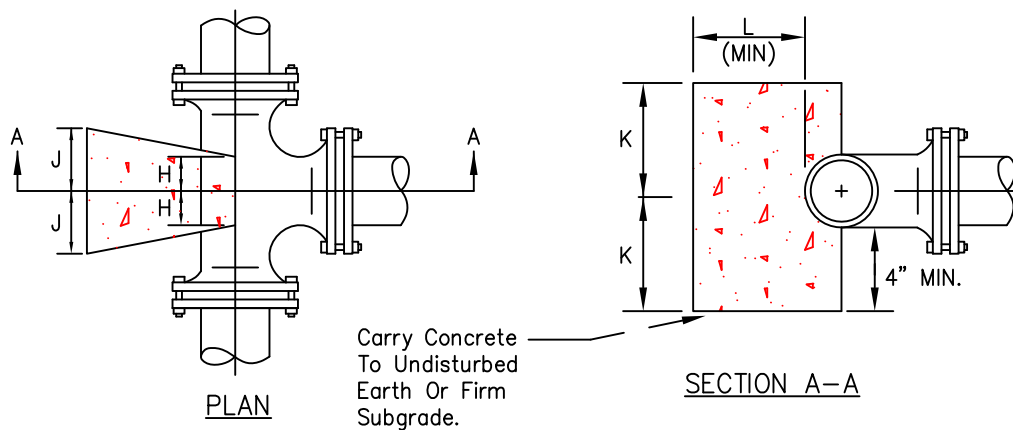


BUTRESSES FOR
 90° HORIZONTAL BEND
 N.T.S.

W-20
 REV-2018



BUTTRESS FOR PLUGS & CAPS										
	SIZE									
	3"	4"	6"	8"	10"	12"	16"	20"	24"	30"
M	*	*	*	2'-6"	2'-8"	3'-6"	4'-8"	6'-0"	6'-8"	8'-0"
N	*	*	*	1'-6"	2'-2"	2'-6"	3'-4"	4'-0"	5'-0"	6'-8"
O	*	*	*	10"	1'-0"	1'-2"	1'-4"	1'-6"	1'-8"	2'-0"
REINFORCE WITH 66" EW										



BUTTRESS FOR TEES										
	SIZE OF BRANCH									
	3"	4"	6"	8"	10"	12"	16"	20"	24"	30"
J	6"	6"	8"	9"	1'-1"	1'-3"	1'-8"	2'-0"	2'-6"	3'-4"
K	6"	8"	10"	1'-3"	1'-4"	1'-9"	2'-4"	3'-0"	3'-4"	4'-0"
L	6"	6"	8"	9"	10"	12"	1'-2"	1'-6"	1'-8"	2'-0"
H	4"	4"	6"	6"	6"	6"	8"	1'-0"	1'-0"	1'-0"

AREA OF BLOCK = 2J X 2K

NOTE: TAPPING ASSEMBLIES & SLEEVES TO BE CONCRETE BLOCKED AS COMPARABLE SIZED TEES

NOTES:

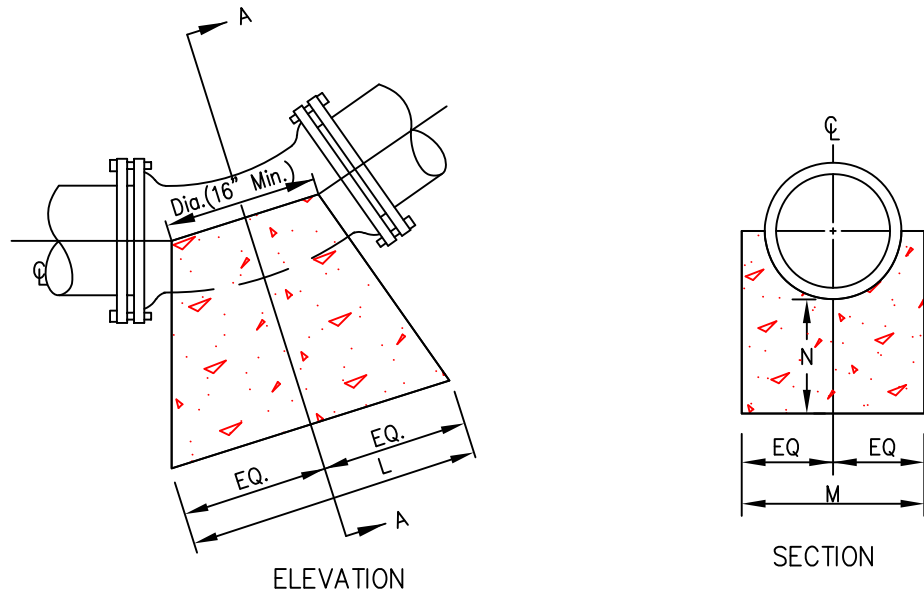
1. $F_c = 3000$ PSI AT 28 DAYS.
2. THE BUTTRESS DIMENSIONS ARE BASED ON THE WATER PRESSURE OF 150 PSI WHERE THE PRESSURE IS DIFFERENT, THE AREA OF BLOCK SHALL BE PROPORTIONED TO REQUIRED PRESSURE
3. CARRY ALL BEARING SURFACES TO UNDISTURBED GROUND OR FIRM SUBGRADE
4. CONCRETE THRUST BLOCKING TO BE USED ONLY AT THE DISCRETION OF THE SERVICE AUTHORITY FIELD INSPECTOR.



BUTTRESSES FOR TEES, PLUGS, & CAPS

N.T.S.

W-21
REV-2018



		BUTTRESS FOR LOWER VERTICAL BENDS									
BEND		SIZE									
		3"	4"	6"	8"	10"	12"	16"	20"	24"	30"
11-1/4°	L	6"	6"	6"	8"	8"	8"	1'-1"	1'-5"	1'-10"	2'-8"
	M	1'-0"	1'-0"	1'-2"	1'-4"	1'-6"	2'-0"	2'-4"	2'-8"	3'-0"	3'-4"
	N	8"	8"	8"	8"	8"	8"	9"	10"	12"	1'-2"
22-1/2°	L	6"	6"	10"	11"	1'-3"	1'-4"	2'-1"	2'-9"	3'-7"	3'-3"
	M	1'-0"	1'-0"	1'-2"	1'-4"	1'-6"	2'-0"	2'-4"	2'-8"	3'-0"	3'-2"
	N	8"	8"	8"	8"	9"	9"	12"	1'-2"	1'-4"	1'-6"
45°	L	10"	1'-0"	1'-2"	1'-9"	2'-5"	2'-8"	4'-0"	5'-6"	6'-0"	8'-2"
	M	1'-0"	1'-0"	1'-2"	1'-4"	1'-6"	2'-0"	2'-4"	2'-8"	3'-6"	4'-0"
	N	8"	8"	8"	8"	12"	1'-2"	1'-6"	2'-0"	2'-6"	3'-0"

NOTES:

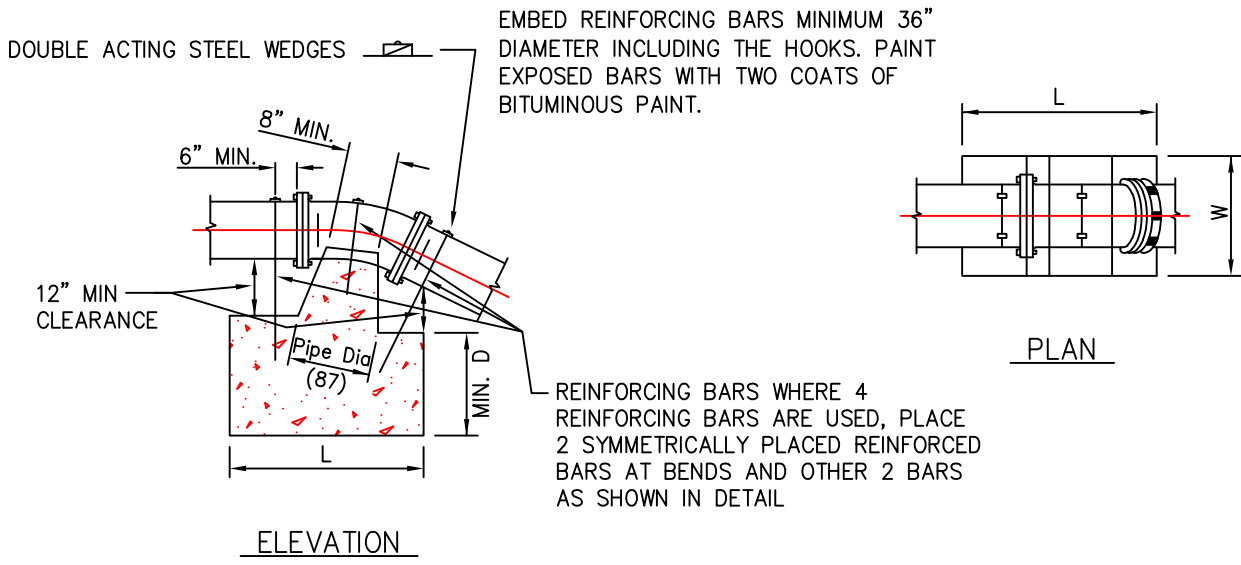
1. $F_c = 3000$ PSI AT 28 DAYS.
2. CARRY ALL BEARING SURFACES TO UNDISTURBED EARTH OR FIRM SUBGRADE.
3. THE BUTTRESS DIMENSIONS ARE BASED ON THE WATER PRESSURE OF 150 PSI AND SOIL BEARING PRESSURE OF 2500 PSI. WHERE THE WATER PRESSURE AND SOIL BEARING PRESSURE ARE DIFFERENT, THE AREA OF CONCRETE BLOCK (I.E. L & M) SHALL BE PROPORTIONED ACCORDINGLY. AREA ADJUSTMENT FOR REQUIRED PRESSURE SHALL BE MADE FIRST BEFORE MAKING ADJUSTMENT FOR SOIL BEARING PRESSURE.
4. CONCRETE THRUST BLOCKING TO BE USED ONLY AT THE DISCRETION OF THE SERVICE AUTHORITY FIELD INSPECTOR.



BUTTRESS FOR 11¼°, 22½°, & 45° LOWER VERTICAL BENDS

N.T.S.

W-22
REV-2018



BEND		SIZE									
		3"	4"	6"	8"	10"	12"	16"	20"	24"	30"
11-1/4°	L	1'-6"	1'-6"	2'-0"	2'-0"	2'-3"	2'-6"	3'-3"	4'-0"	4'-6"	5'-0"
	W	1'-6"	1'-6"	2'-0"	2'-0"	2'-3"	2'-6"	3'-3"	4'-0"	4'-6"	5'-0"
	D	1'-6"	1'-6"	1'-6"	2'-0"	2'-0"	2'-3"	2'-6"	2'-6"	3'-0"	3'-0"
	REINFOR. BARS NO & SIZE	3 #5	3 #5	3 #5	3 #6	3 #6	3 #6	3 #6	3 #8	3 #8	3 #8
22-1/2°	L	1'-6"	2'-0"	2'-6"	2'-9"	3'-6"	4'-0"	4'-6"	5'-6"	6'-0"	7'-0"
	W	1'-6"	2'-0"	2'-6"	2'-9"	3'-6"	4'-0"	4'-6"	5'-6"	6'-0"	7'-0"
	D	1'-6"	1'-6"	2'-0"	2'-3"	2'-3"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"
	REINFOR. BARS NO & SIZE	3 #5	3 #5	3 #5	3 #6	3 #6	4 #6	4 #6	3 #8	4 #8	4 #8
45°	L	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	6'-0"	7'-6"	8'-6"	10'-0"
	W	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	6'-0"	7'-6"	8'-6"	10'-0"
	D	1'-6"	2'-0"	2'-0"	2'-6"	2'-9"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"
	REINFOR. BARS NO & SIZE	3 #5	3 #5	3 #5	3 #6	4 #6	4 #6	4 #8	4 #8	4 #8	4 #9

NOTES:

1. F_c=3000 PSI AT 28 DAYS.
2. CARRY ALL BEARING SURFACES TO UNDISTURBED EARTH OR FIRM SUBGRADE.
3. THE ANCHORAGE DIMENSIONS ARE BASED ON THE WATER PRESSURE OF 150 PSI. WHERE THE PRESSURE IS DIFFERENT, THE VOLUME OF THE CONCRETE (I.E. L x W x D) SHALL BE PORPORTIONED TO REQUIRED PRESSURE.
4. CONCRETE THRUST BLOCKING TO BE USED ONLY AT THE DISCRETION OF THE SERVICE AUTHORITY FIELD INSPECTOR.



ANCHORAGE FOR 11¼°, 22½° and 45° UPPER VERTICAL BENDS
N.T.S.

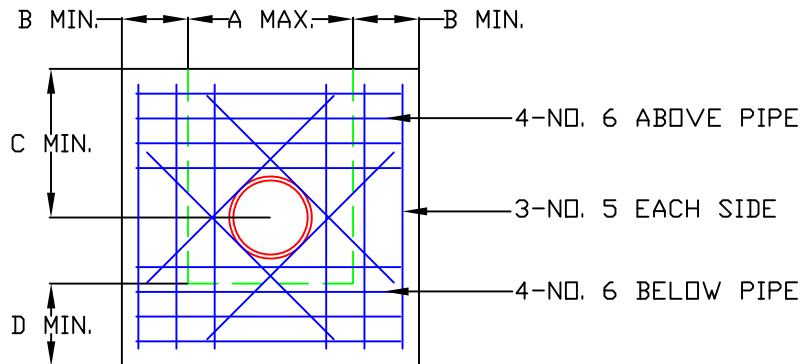
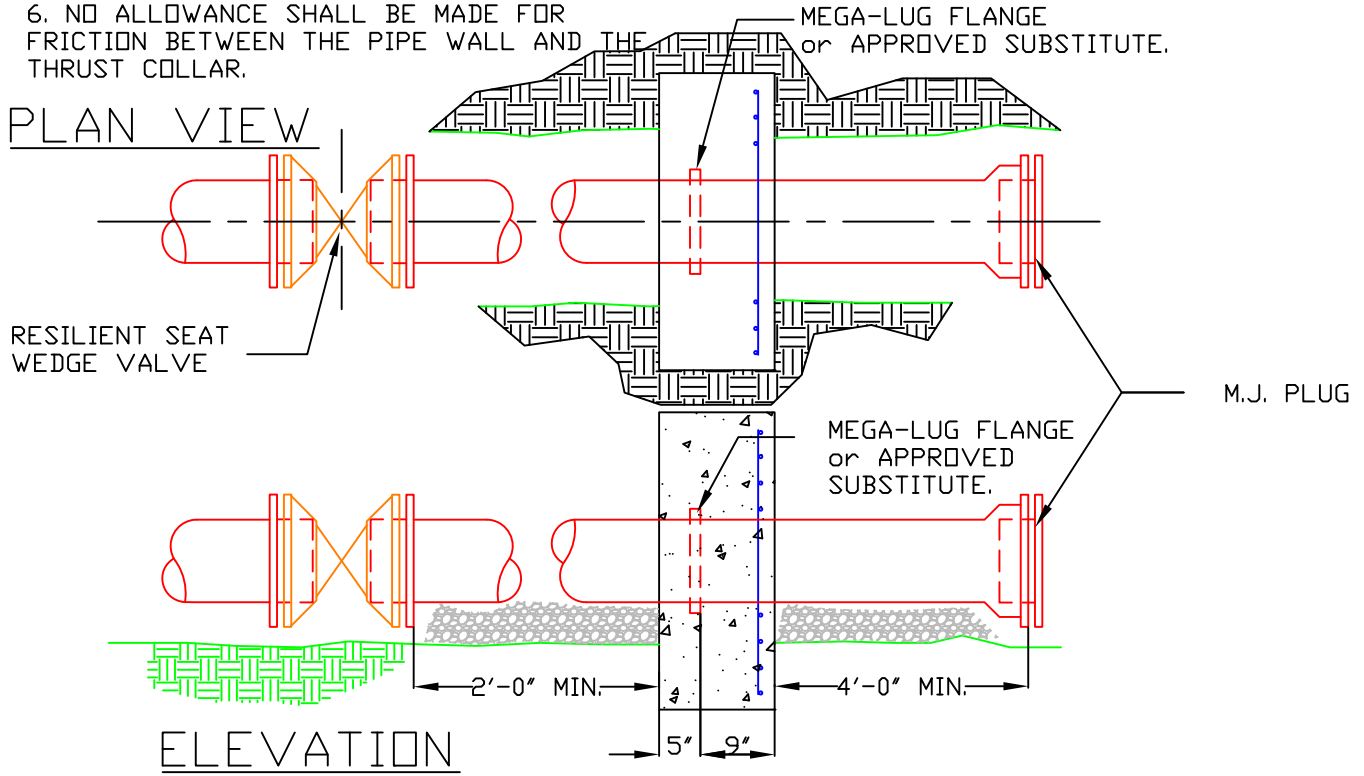
W-23
REV-2018

NOTES:

1. BEARING AREA IS BASED ON 200 PSI TEST PRESSURE OF 2,000 LBS. PER SQUARE FOOT. INCREASE BLOCK DIMENSIONS AS REQUIRED IN SOILS WITH LOWER BEARING VALUES.
2. EXTEND DEAD END ANCHOR AS NECESSARY INTO UNDISTURBED SOIL AS INDICATED ON CHART.
3. ADDITIONAL REINFORCEMENT SHALL BE AS SPECIFIED BY THE DESIGN ENGINEER AND APPROVED BY THE SERVICE AUTHORITY.
4. ALL FORM BOARDS SHALL BE REMOVED PRIOR TO BACK FILL.
5. ANCHOR SCHEDULE TO BE COMPLETED BY THE DESIGN ENGINEER.
6. NO ALLOWANCE SHALL BE MADE FOR FRICTION BETWEEN THE PIPE WALL AND THE THRUST COLLAR.

DEAD END ANCHOR SCHEDULE

LINE SIZE	A	B	C	D
6"				
8"				
10"				
12"				



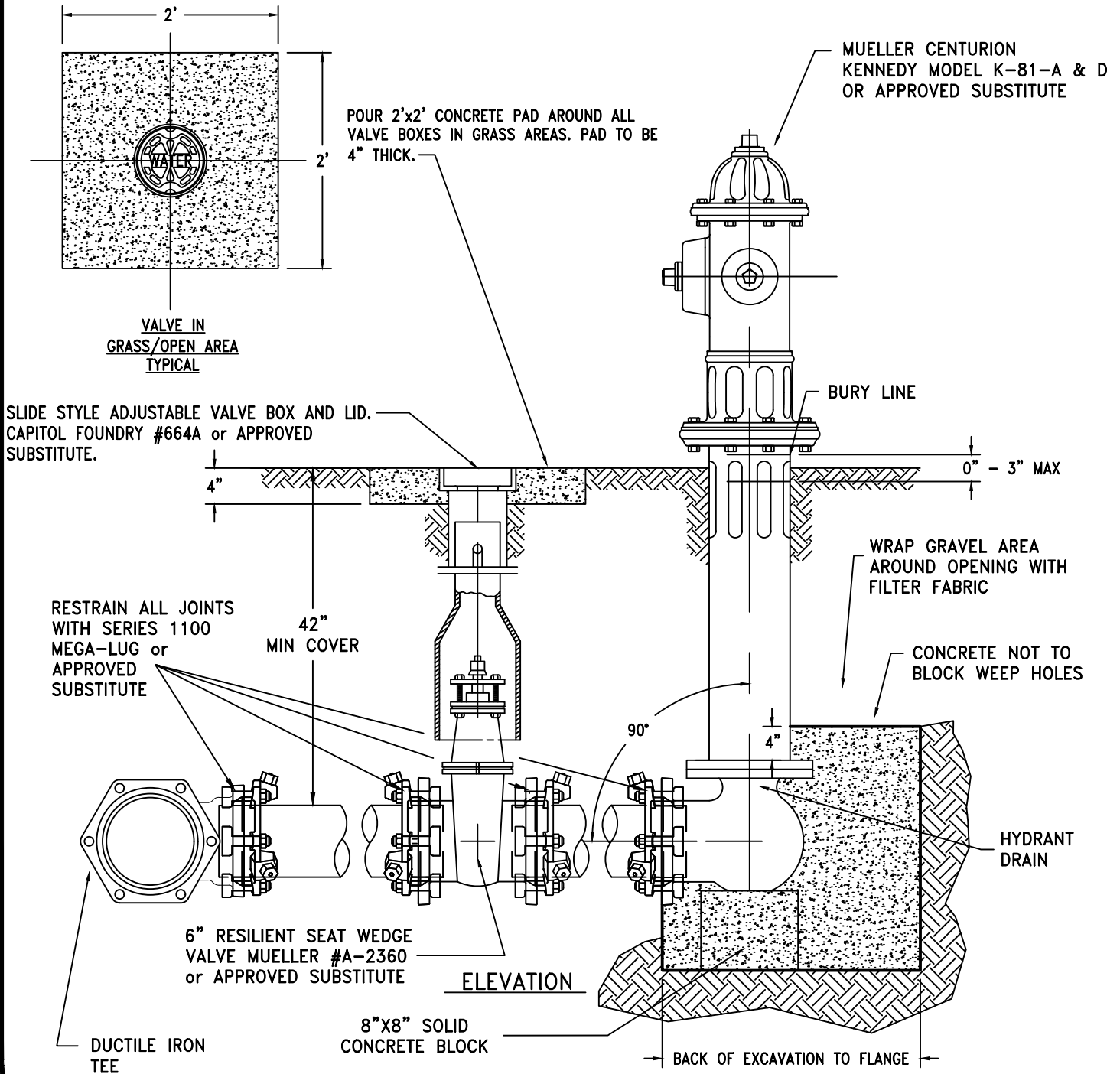
DEAD END ANCHOR DETAIL

N.T.S.

W-24
REV-2018

NOTES:

1. FIRE HYDRANT TO BE SET PLUMB.
2. FINISHED GRADE NOT TO EXCEED 0 to 3" BELOW THE BURY LINE ON HYDRANT BARREL.
3. FIRE HYDRANT LEADS 50' OR GREATER SHALL HAVE AN ADDITIONAL VALVE WITHIN 6' OF HYDRANT.
4. HYDRANT BARRELS SHALL BE PAINTED SAFETY YELLOW WITH EITHER MCCORMICK COTE-ALL #335031P OR RUST-OLEUM #K7744402.



TYPICAL FIRE HYDRANT INSTALLATION
 DEPTHS BETWEEN 3.5 & 5.0 FEET

N.T.S.

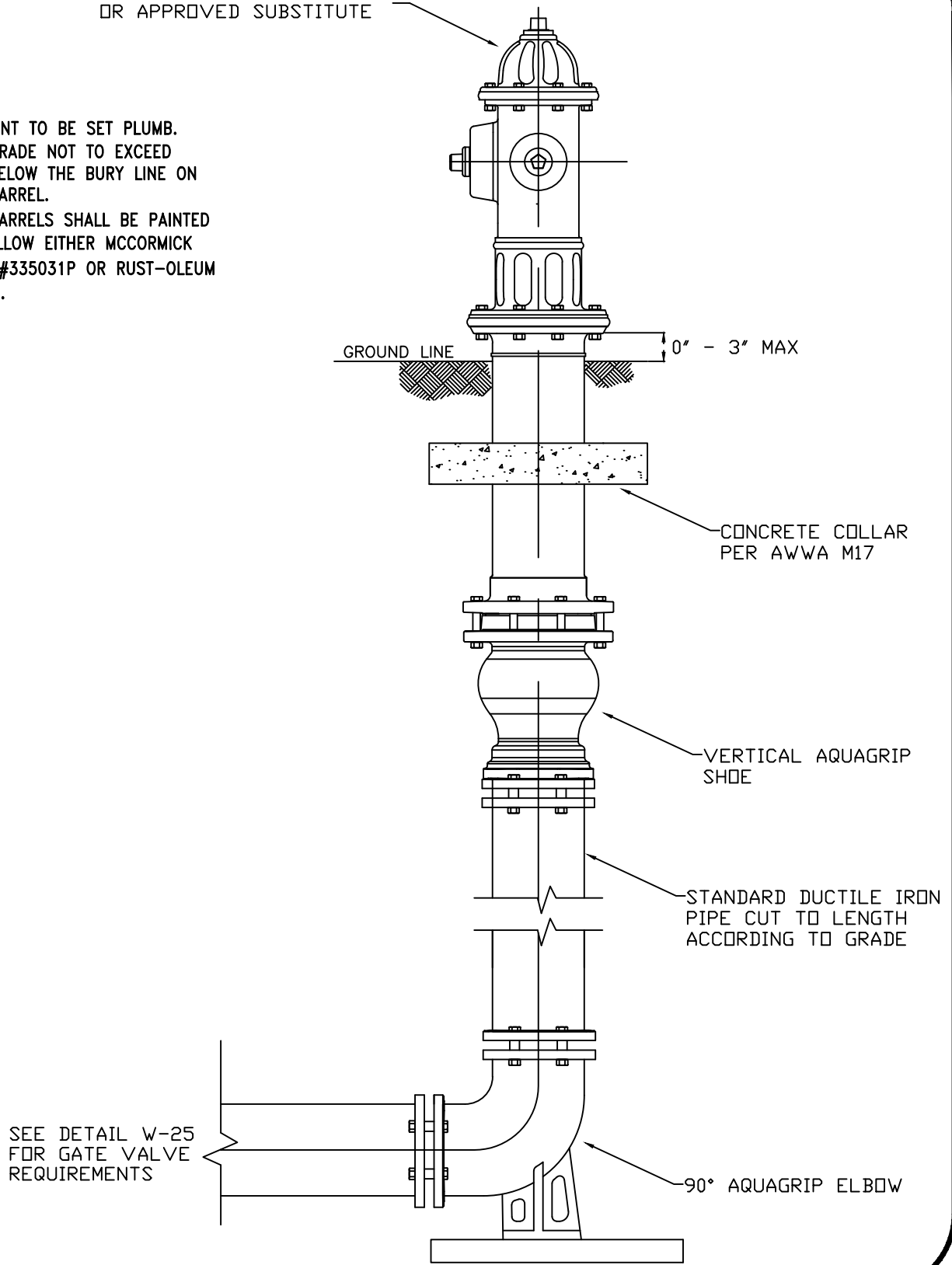
W-25
 REV-2020



MUELLER CENTURION
KENNEDY MODEL K-81-A & D
OR APPROVED SUBSTITUTE

NOTES:

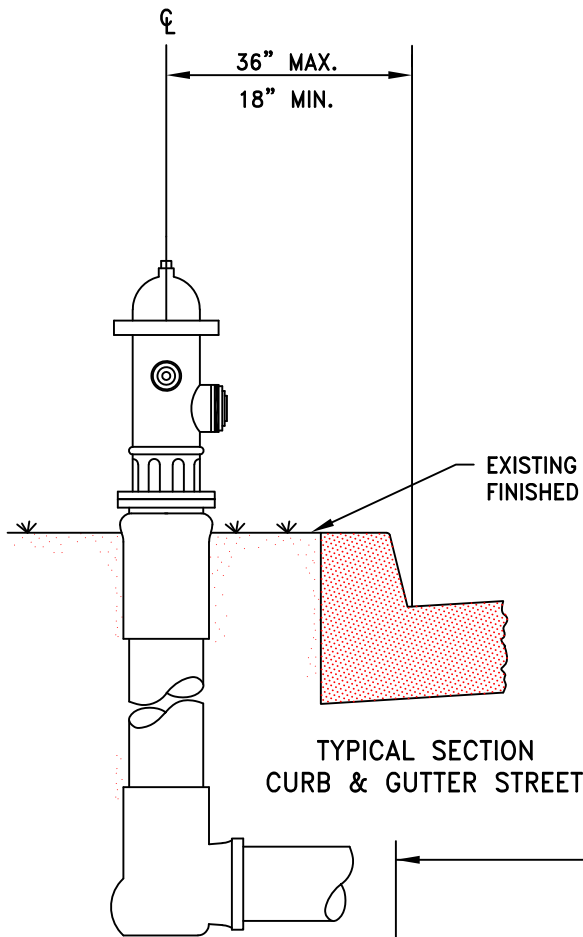
1. FIRE HYDRANT TO BE SET PLUMB.
2. FINISHED GRADE NOT TO EXCEED 0 TO 3" BELOW THE BURY LINE ON HYDRANT BARREL.
3. HYDRANT BARRELS SHALL BE PAINTED SAFETY YELLOW EITHER MCCORMICK COTE-ALL #335031P OR RUST-OLEUM #K7744402.



TYPICAL FIRE HYDRANT INSTALLATION
DEPTHS BETWEEN 5.1 & 10.0 FEET

N.T.S.

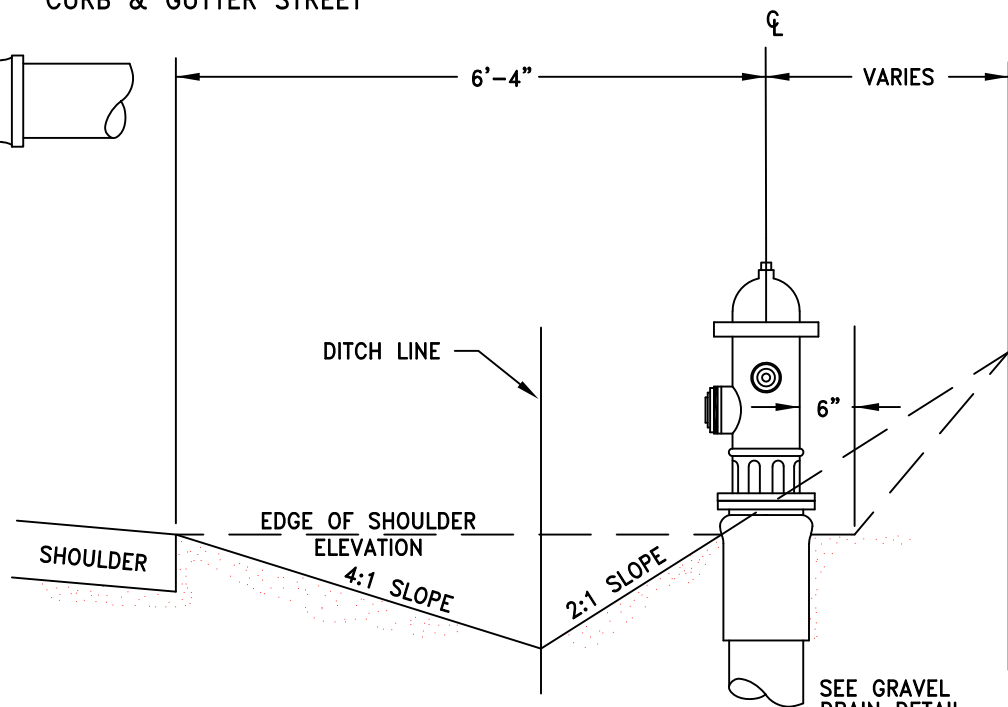
W-25A
REV-2020



TYPICAL SECTION
CURB & GUTTER STREET

NOTE:

HYDRANT SHALL CONFORM IN ALL
RESPECTS TO TYPICAL FIRE
HYDRANT DETAIL.



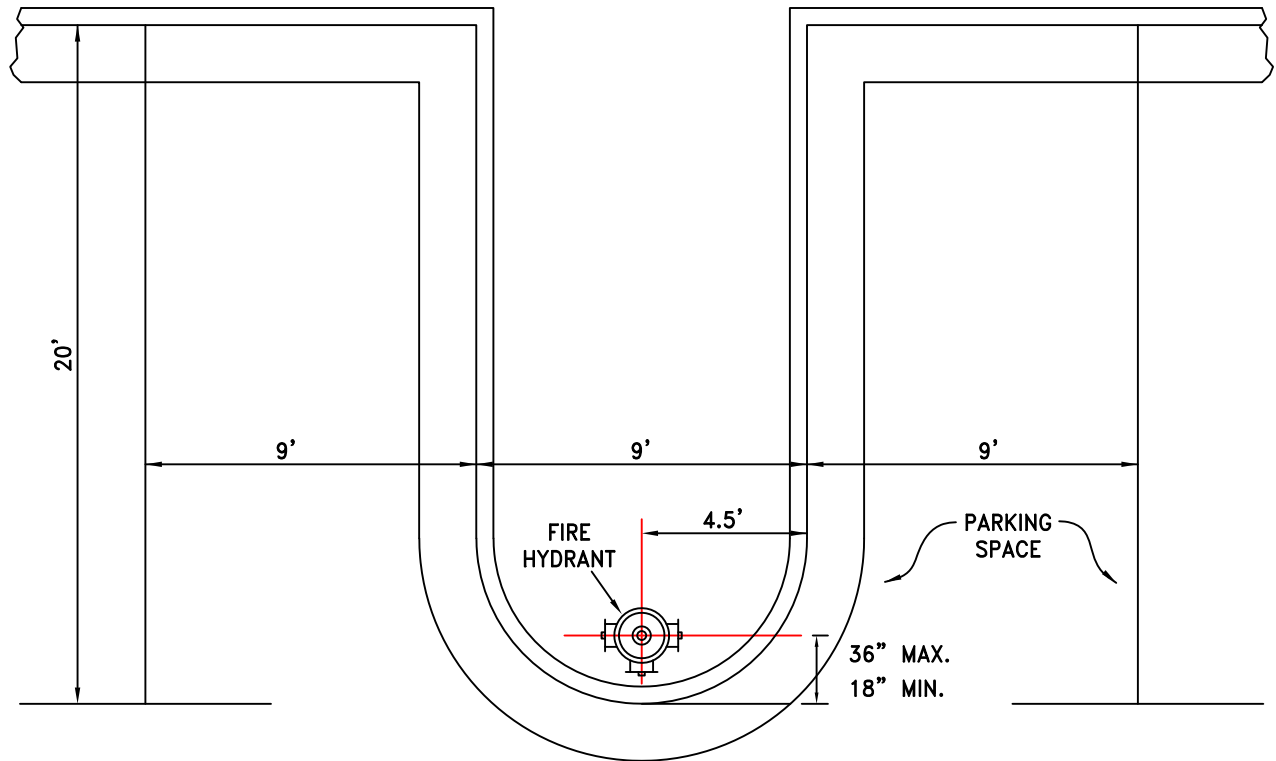
TYPICAL SECTION
STREET WITHOUT CURB & GUTTER



TYPICAL FIRE HYDRANT
LOCATION W/ CURB & GUTTER
OR DITCH LINE

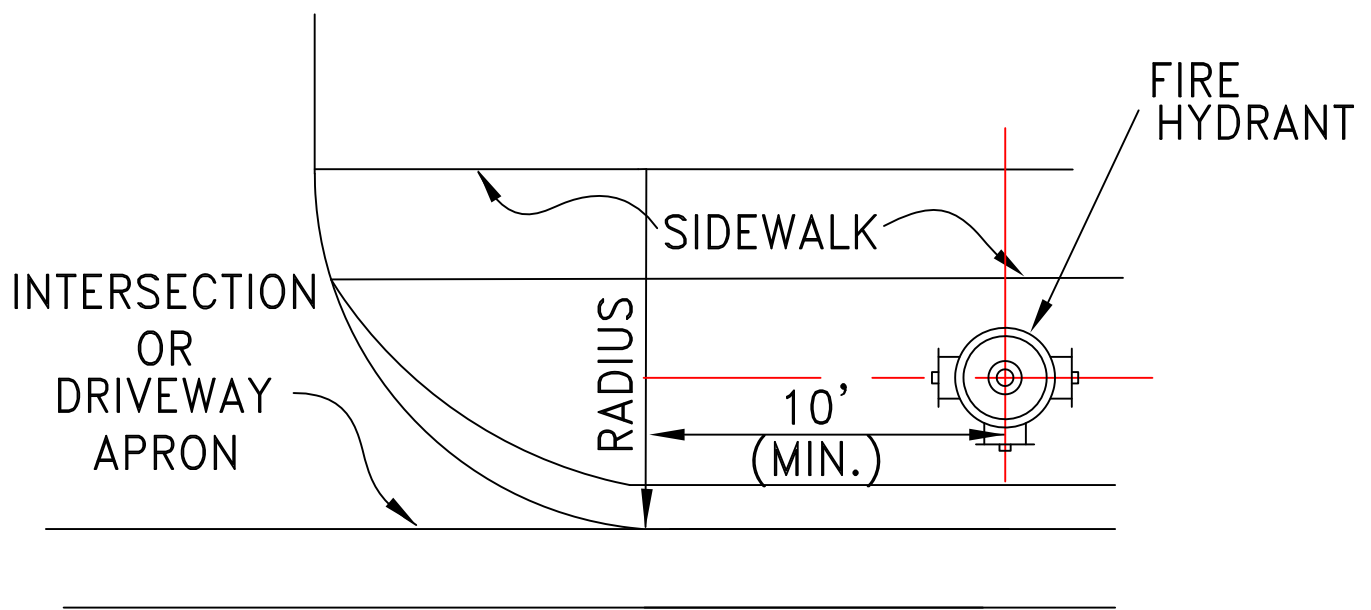
N.T.S.

W-26
REV-2018



TYPICAL FIRE HYDRANT LOCATION IN
ISLAND & PARKING AREA
N.T.S.

W-27
REV-2018



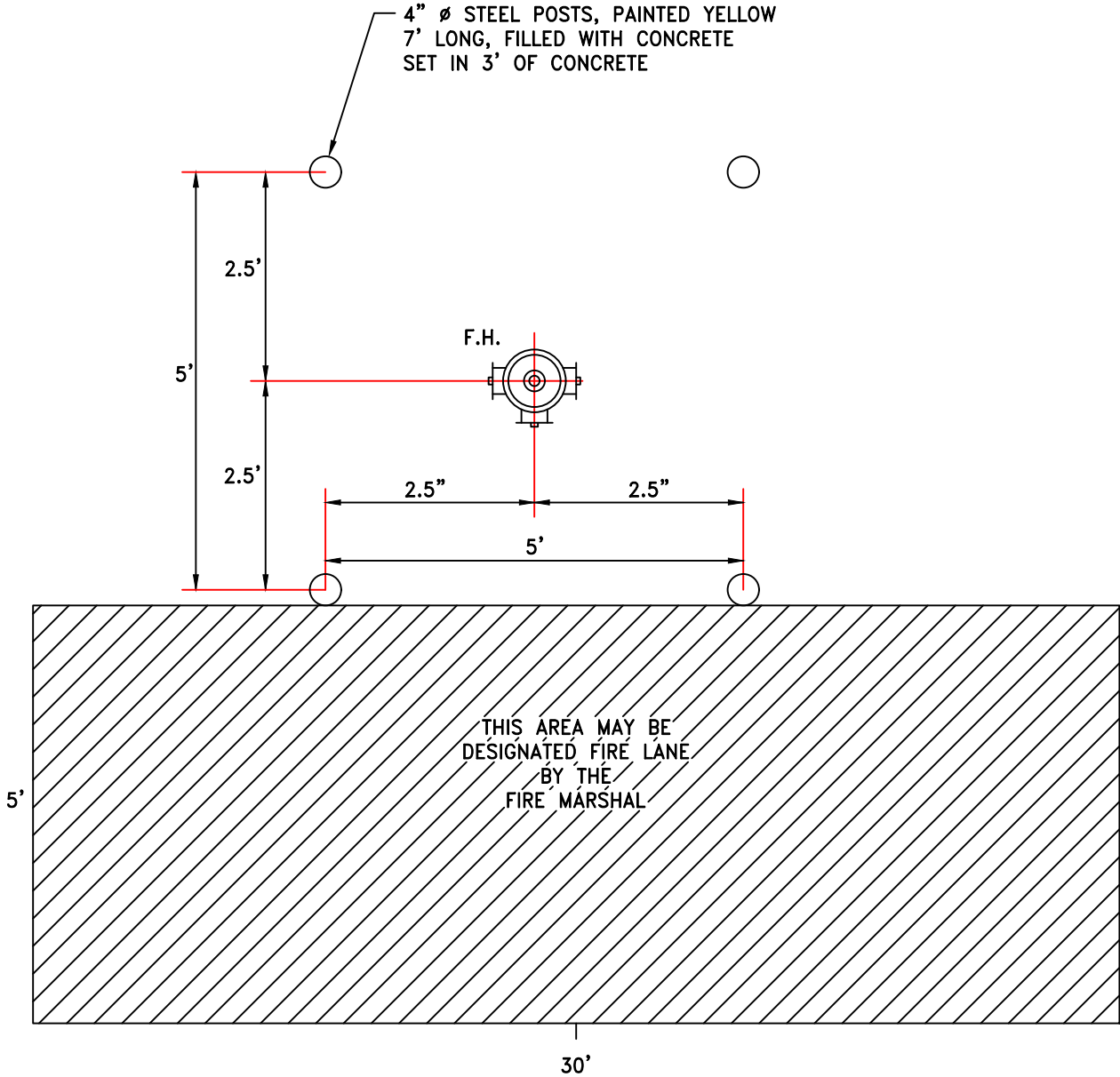
TYPICAL FIRE HYDRANT LOCATION ON STREET

N.T.S.

W-28
REV-2018

FOR INDUSTRIAL AND COMMERCIAL SITES
STEEL POSTS OF A MINIMUM 8" ϕ
SHALL BE PLACED

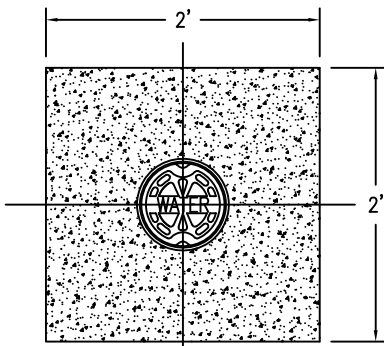
4" ϕ STEEL POSTS, PAINTED YELLOW
7' LONG, FILLED WITH CONCRETE
SET IN 3' OF CONCRETE



TYPICAL FIRE HYDRANT POST PROTECTION

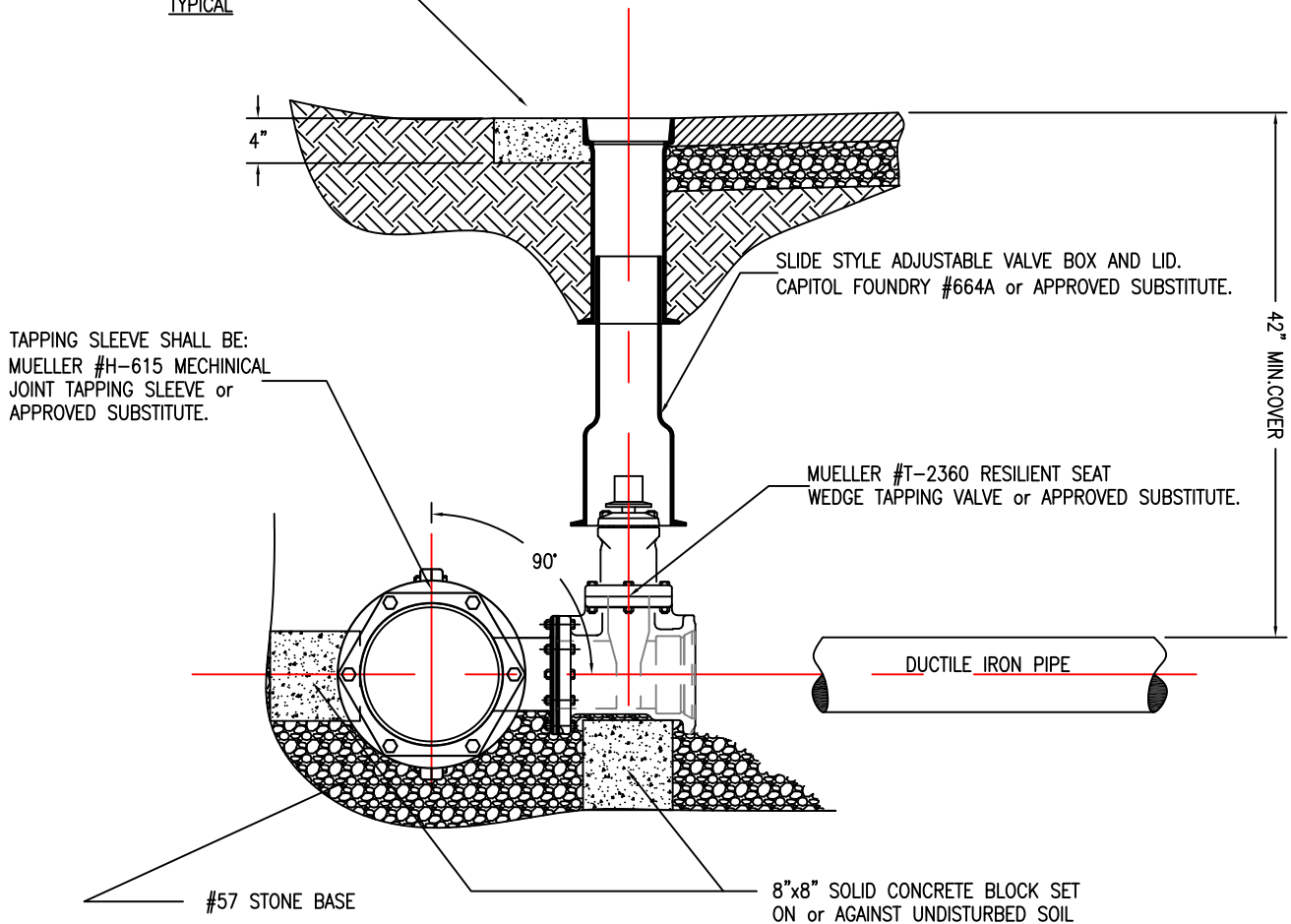
N.T.S.

W-29
REV-2020



POUR 2'x2' CONCRETE PAD AROUND ALL VALVE BOXES IN GRASS AREAS. PAD TO BE 4" THICK.

VALVE IN GRASS/OPEN AREA TYPICAL



NOTES:

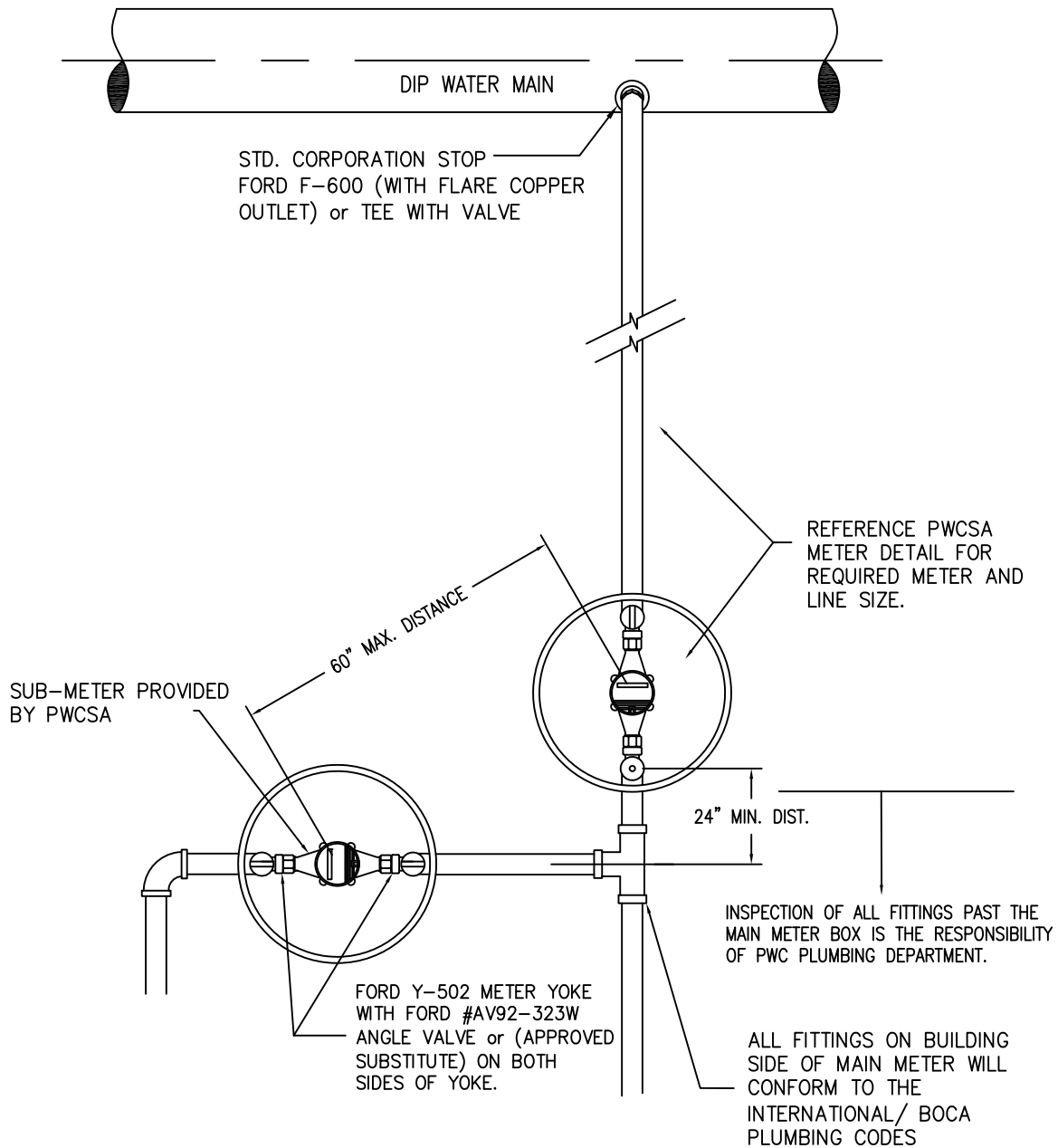
1. TAPPING SLEEVE AND VALVE SHALL BE TESTED FOR 10 MIN. AT 200 PSI FOR SIZES 4" THRU 12" PRIOR TO TAPPING MAIN. TAPS LARGER THAN 12" WILL BE TESTED FOR 10 MIN. AT 150 PSI.
2. 1 PIECE VALVE EXTENSION REQUIRED WHEN VALVE DEPTH FROM TOP OF OPERATING NUT TO FINISHED GRADE IS 5' OR GREATER.



TAPPING SLEEVE & VALVE DETAIL

N.T.S.

W-30
REV-2018



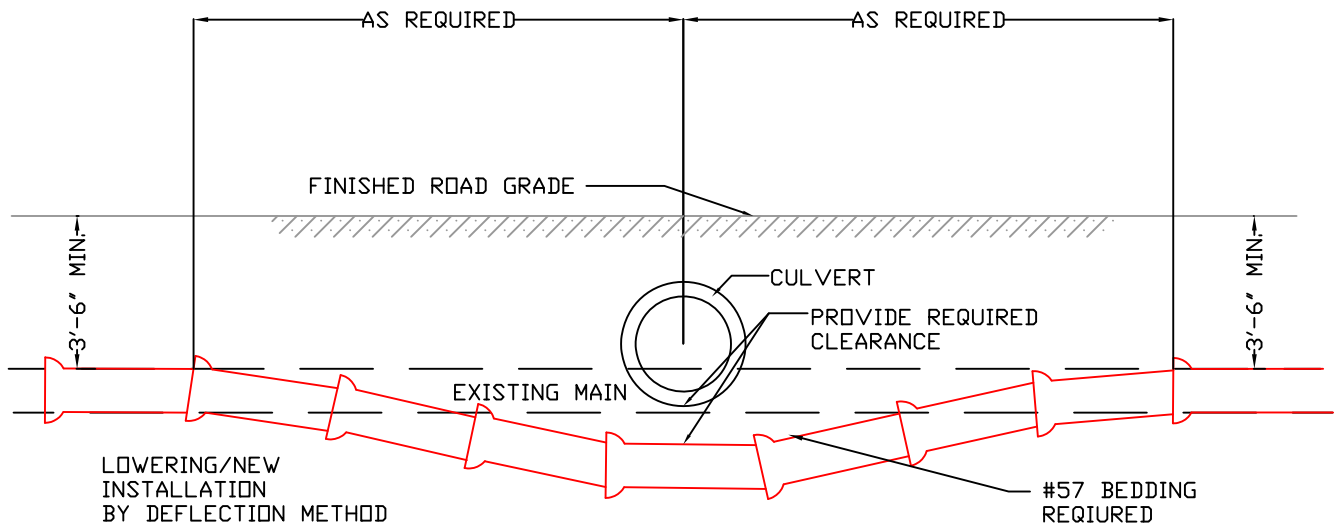
NOTES:

1. SUB-METERS FOR NEW CONSTRUCTION WILL BE LOCATED OUTSIDE WITHIN 5- FEET OF THE MAIN METER, NO EXCEPTION.
2. METERS MUST BE SET IN GRASS AREA. METERS ARE NOT PERMITTED TO BE PLACED IN PEDESTRIAN TRAVEL WAY.
3. METERS WILL BE PROVIDED BY PWCSA AND WILL REGISTER IN GALLONS.
4. METERS MUST BE SET LEVEL.
5. ONLY ONE SUB-METER IS PERMITTED PER ACCOUNT.



5/8" x 3/4" AND 1"
SUB-METER DETAIL
N.T.S.

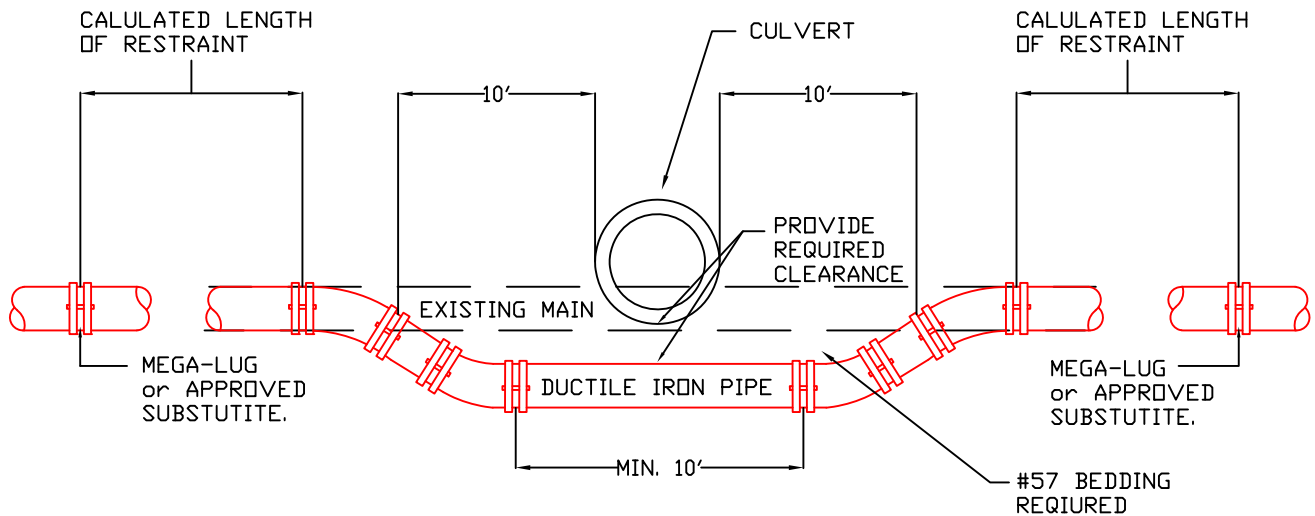
W-31
REV-2018



NOTE:

1. MAXIMUM DEFLECTION FOR EACH JOINT OF PIPE WILL NOT EXCEED MANUFACTURES RECOMMENDATIONS AND APPROVED BY PWCSA.

OR



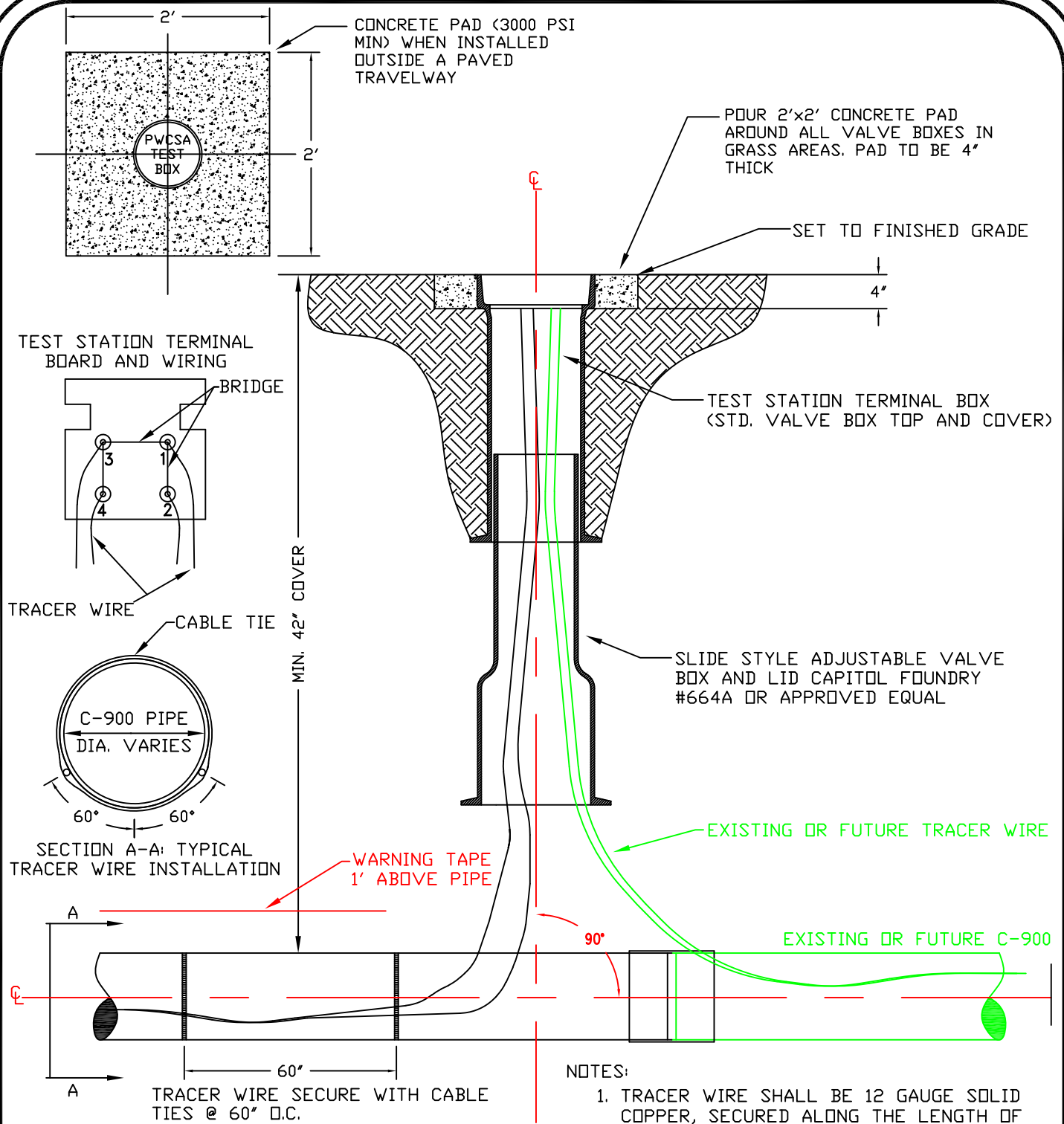
NOTE:

1. LOWERED SECTION TO BE OF DUCTILE IRON MECHANICAL JOINT PIPE WITH RESTRAINED JOINTS. THE ENGINEER SHALL CALCULATE LENGTH OF RESTRAINED SECTION.



LOWERING WATER MAIN
OR
NEW INSTALLATION

W-32
REV-2018



NOTES:

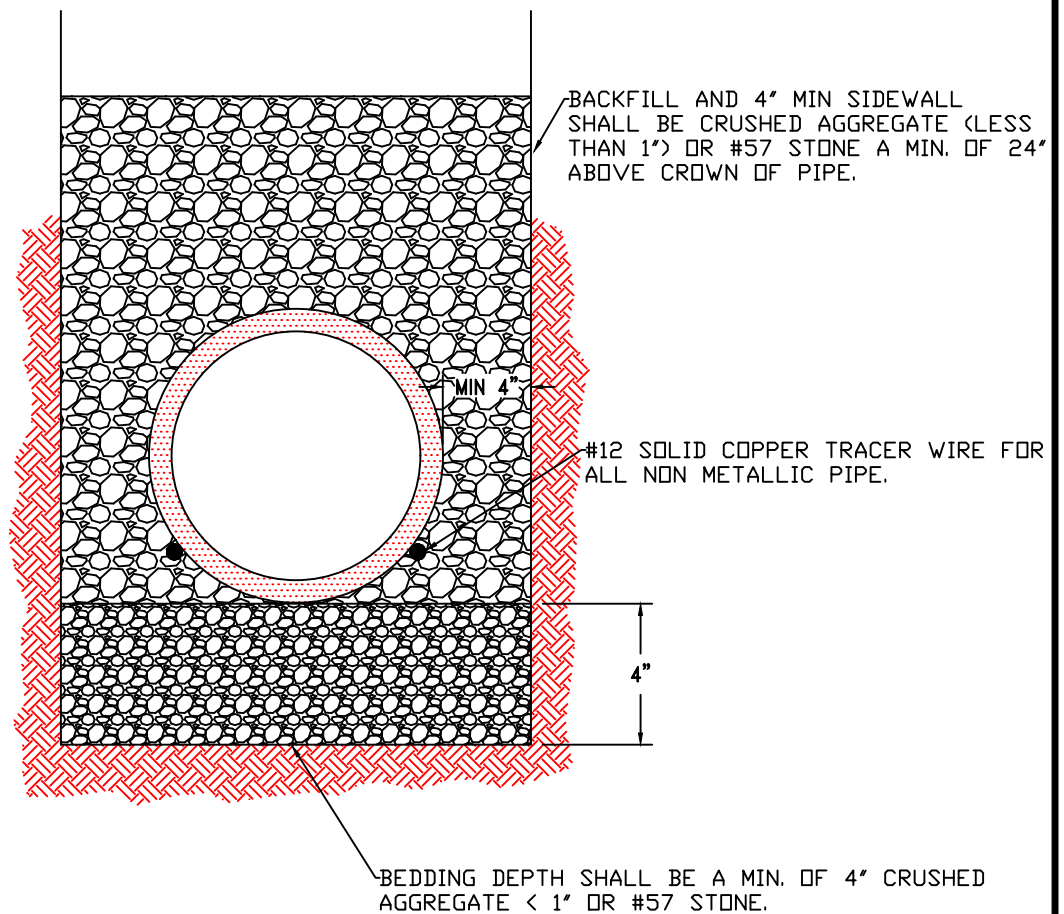
1. TRACER WIRE SHALL BE 12 GAUGE SOLID COPPER, SECURED ALONG THE LENGTH OF THE PIPE WITH CABLE TIES, 60" O.C.
2. TWO TRACER WIRES SHALL BE PROVIDED ALONG THE LENGTH OF THE PIPE, AT THE 4 AND 8 O'CLOCK POSITIONS (BOTH 60° FROM THE BOTTOM OF PIPE).



TRACER WIRE
TEST STATION
N.T.S.

W-33
REV-2018

BEDDING AND BACKFILL FOR ALL C-900 AND POLY-WRAPPED DIP



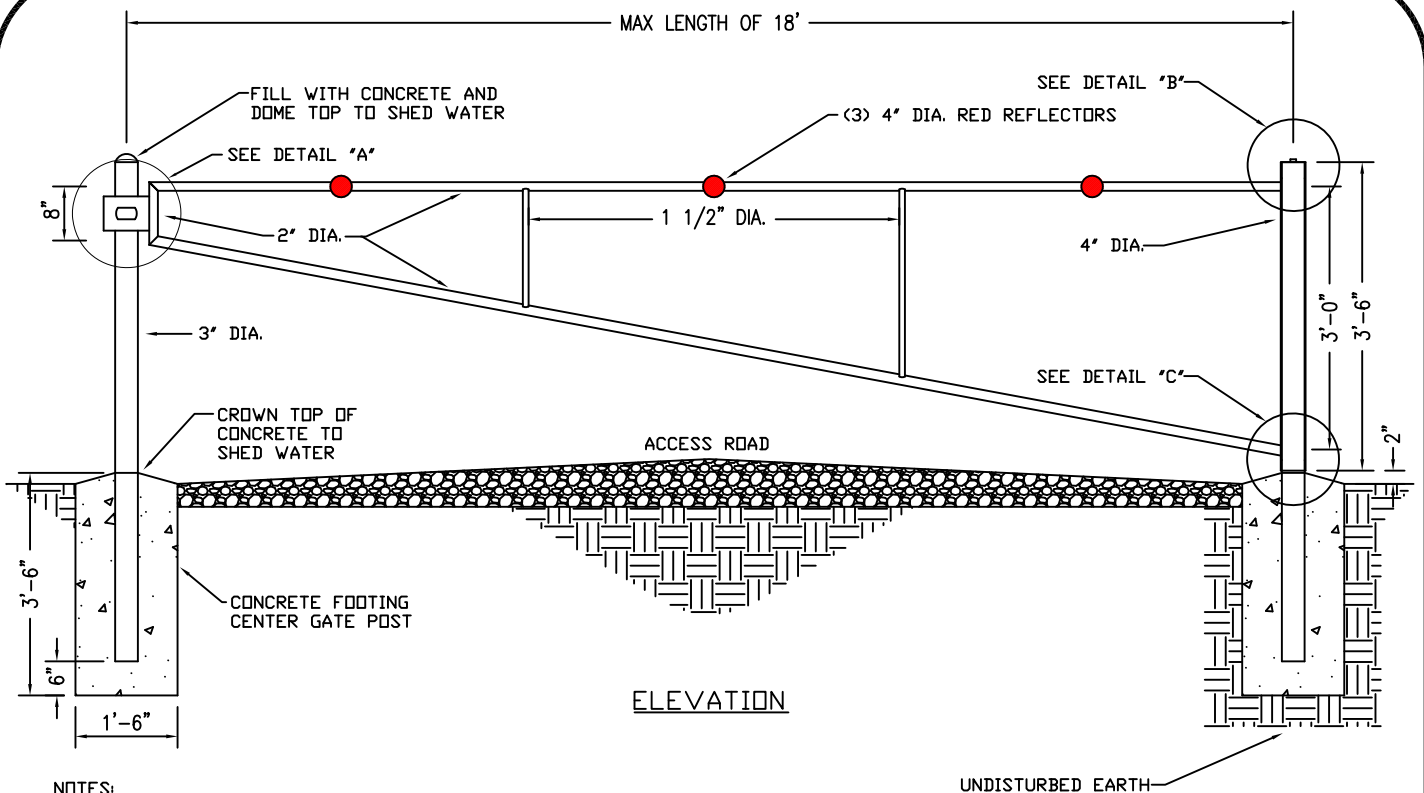
NOTES:

1. WHEN USING C-900 PIPE, MARKER BALLS TO BE PLACED AT ALL BENDS WITH A MAXIMUM DISTANCE OF 100'.
2. 6" WIDE DETECTABLE MARKING TAPE TO BE PLACED 2' ABOVE PIPE.



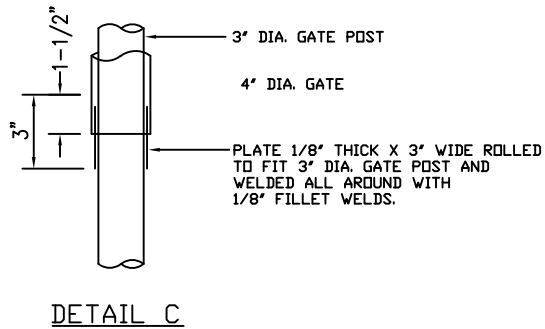
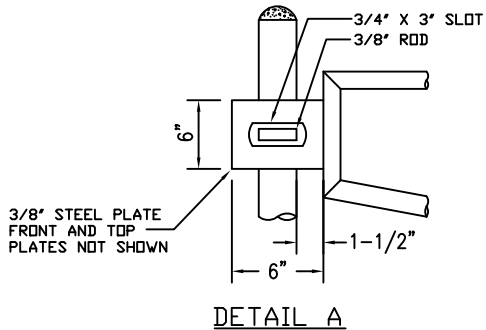
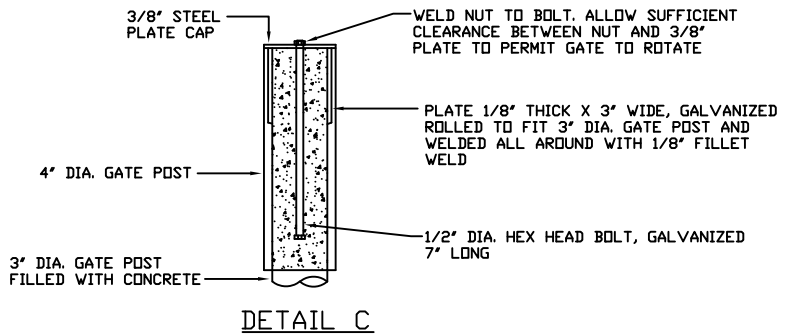
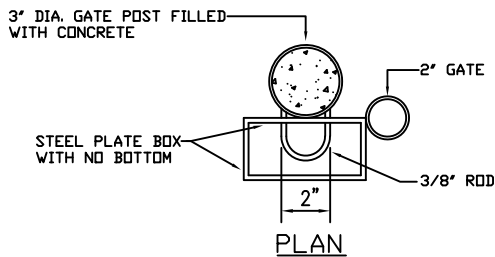
WATER LINE
BEDDING AND BACKFILL
N.T.S.

W-34
REV-2018



NOTES:

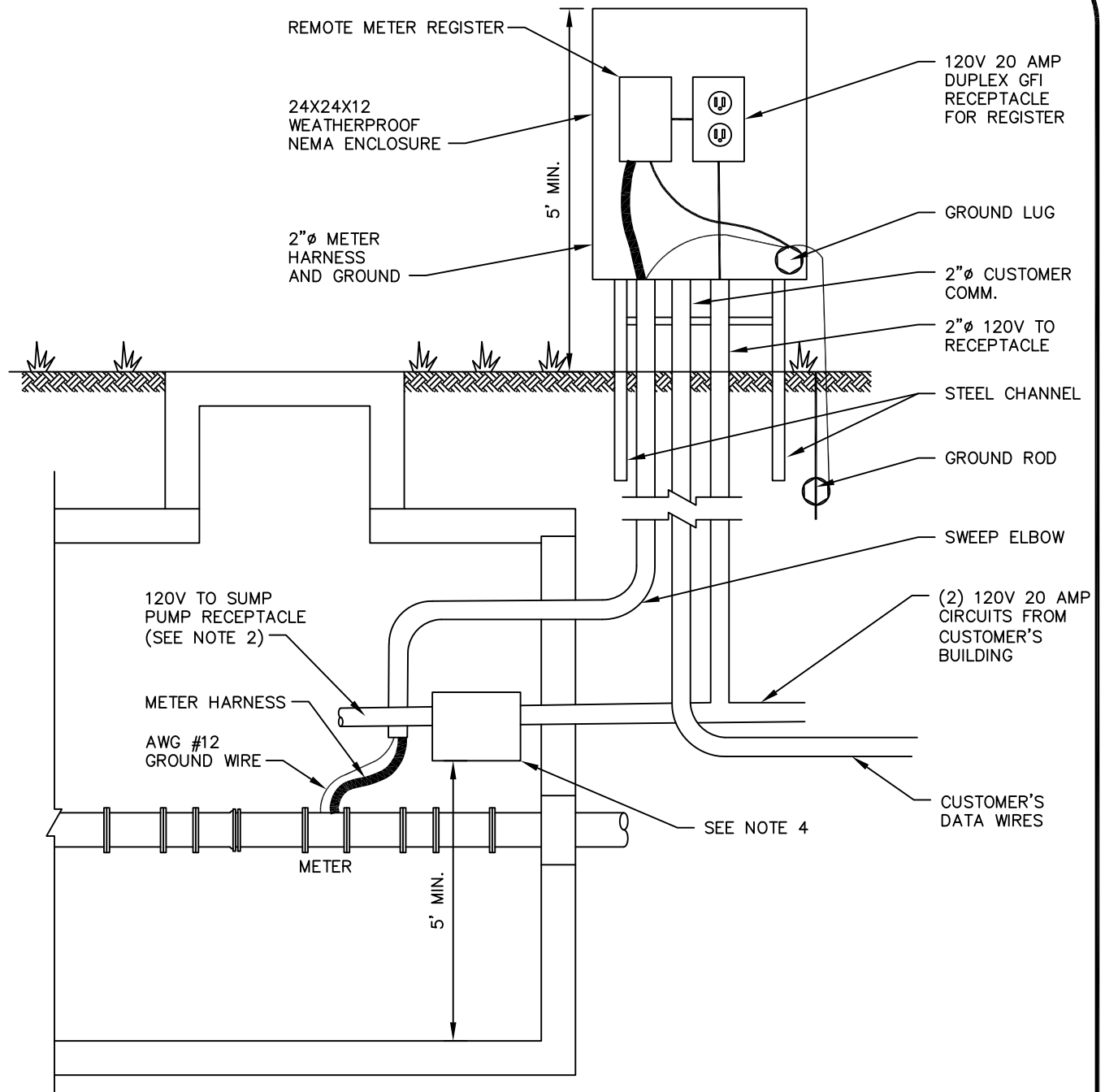
1. ALL METAL USED IN THE MANUFACTURING OF THE ACCESS GATE TO BE HOT DIP GALVANIZED.
ALL WELDS AND PIPE TO BE PAINTED AND TOUCHED UP IN ACCORDANCE WITH MANUFACTURES RECOMMENDATIONS.
2. ALL JOINTS TO BE WELDED ALL AROUND WITH 3/16" WELDS.
3. ALL PIPE TO BE SCHEDULE 40 STEEL; DIAMETERS SHOWN ARE NOMINAL PIPE SIZE.
4. PAD LOCK TO BE FURNISHED.
5. CONTRACTOR TO FURNISH AND INSTALL AN ADDITIONAL 3" DIA. POST WITH 3/8" ROD, LOCATED TO HOLD GATE IN AN OPEN POSITION OF 90°.



ACCESS GATE DETAILS

N.T.S.

W-35
REV-2018



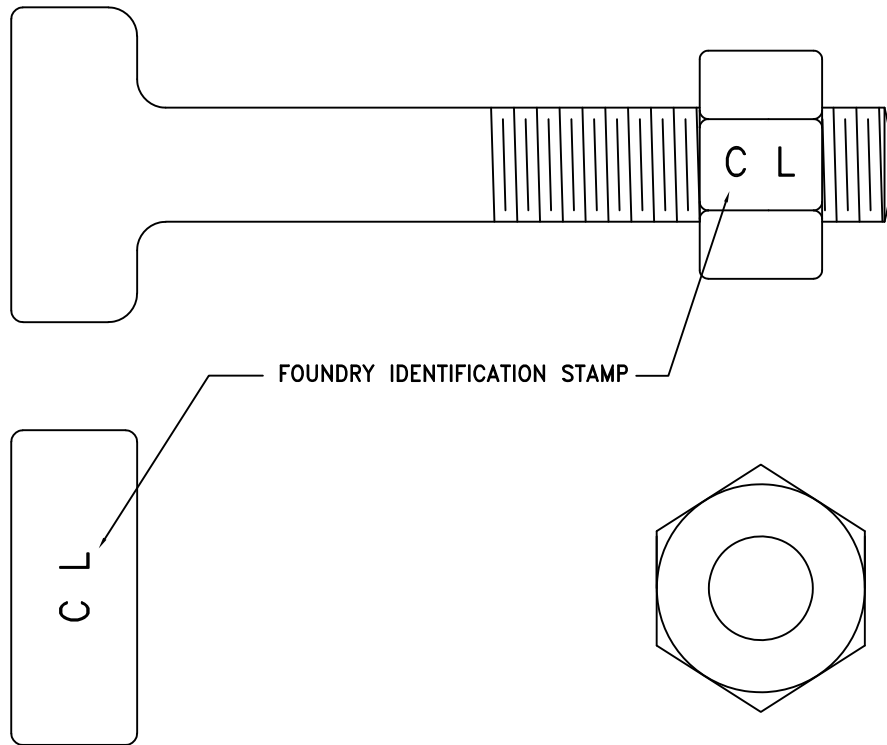
NOTES:

1. CONDUIT TO BE PVC SCHEDULE 40.
2. CONTINUE CIRCUIT TO GFI DUPLEX RECEPTACLE.
3. METER, METER HARNESS, AND CONVERTER ARE SUPPLIED BY PWCSA FOR INSTALLATION BY CONTRACTOR.
4. MUST BE WATERPROOF. MINIMUM 5' FROM BOTTOM; MULTIPLE BOXES ALLOWED.



ELECTRONICS AT
MAGNETIC METER
N.T.S.

W-36
REV-2018



SPECIFICATIONS:

1. BOLTS AND NUTS ARE MANUFACTURED IN ACCORDANCE WITH ANSI/AWWA C111/A21.11
2. MATERIAL IS HIGH STRENGTH LOW ALLOY STEEL PER ANSI/AWWA C111/A21.11
3. THREADS PER ASEM B1.1 UNIFIED STANDARD COARSE (CLASS 2A & 2B)

MECHANICAL PROPERTIES:

1. YIELD STRENGTH 45,000 PSI (MIN)
2. ELONGATION IN 2in. 20% (MIN)

CHEMICAL PROPERTIES:

CARBON	0.20% MAX
MANGANESE	1.25% MAX
SULFUR	0.05% MAX
NICKLE	0.25% MAX
COPPER	0.20% MAX
COMBINED	1.25% MAX (Ni, Cu, Cr)

OPTIONAL COATING:

T-BOLTS & NUTS HAVE A FLUROPOLYMER COATING MATERIAL WHICH IS VOC-COMPLIANT, RESIN-BONDED THERMALLY CURED AND DRYED LUDRICANT

COATING PHYSICAL PROPERTIES:

FILM THICKNESS	.03 TO .04 MIL PER COAT
NUMBER OF COATS	3 TO 4 COATS
ADHESION	1MM CROSS HATCH TEST + 5 PULLS. GOOD KNIF RESISTANCE
CURE TEST	50+ RUBS WITH MEK. NO SUBSTRATE EXPOSURE
PENCIL HARDNESS	4-6H
VOLATILE ORGANIC COMPOUNDS	2.74lbs/gal



T-BOLTS AND NUTS

HSLA STEEL

N.T.S.

W37
REV-2019