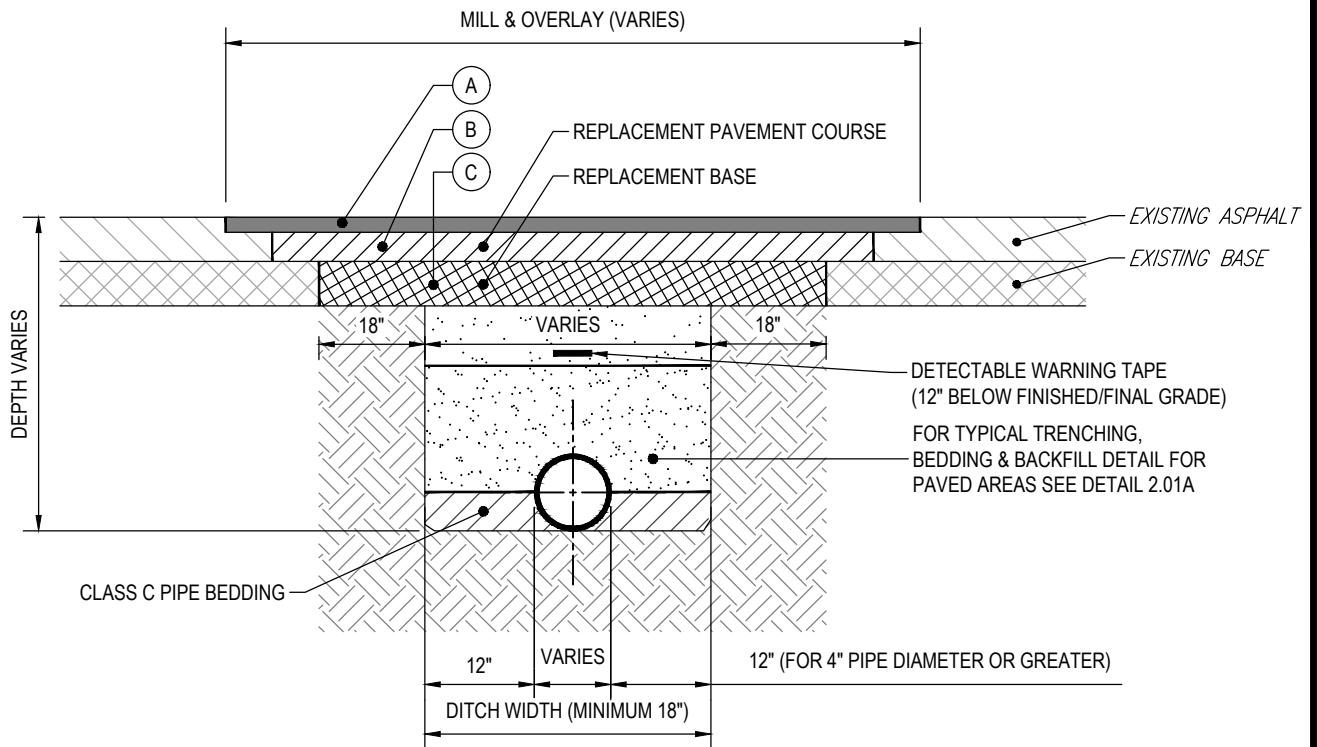


**NOTES:**

1. TRENCH IS DEFINED AS A FLAT-BOTTOM TRENCH. LIGHTLY CONSOLIDATE BACKFILL TO CENTERLINE OF PIPE.
2. THIS STANDARD SHALL BE UTILIZED IN THE ABSENCE OF SPECIFIC STANDARDS. THE STANDARD OF THE AGENCY CONTROLLING THE RIGHT-OF-WAY SHALL GOVERN UNLESS OTHERWISE DIRECTED BY CITY ENGINEER.
3. SUITABLE BACKFILL SHALL BE DEFINED AS MATERIAL FREE FROM CINDERS, ASHES, REFUSE, CLAY, ORGANIC MATTER, BOULDERS, ROCKS OR STONES, OR OTHER MATERIAL THAT IN THE OPINION OF THE CITY ENGINEER IS UNSUITABLE.
4. NON-PERVIOUS AREAS SHALL MEAN ANY CONCRETE OR ASPHALT CURB, SIDEWALK, TRAIL, DRIVEWAY, OR ROADWAY.

	<p>LAST REVISION MAY 2021</p>	<p>TRENCHING, BEDDING AND BACKFILL DETAIL FOR NON-PERVIOUS (PAVED) AREAS</p>	<p>2.01A</p>
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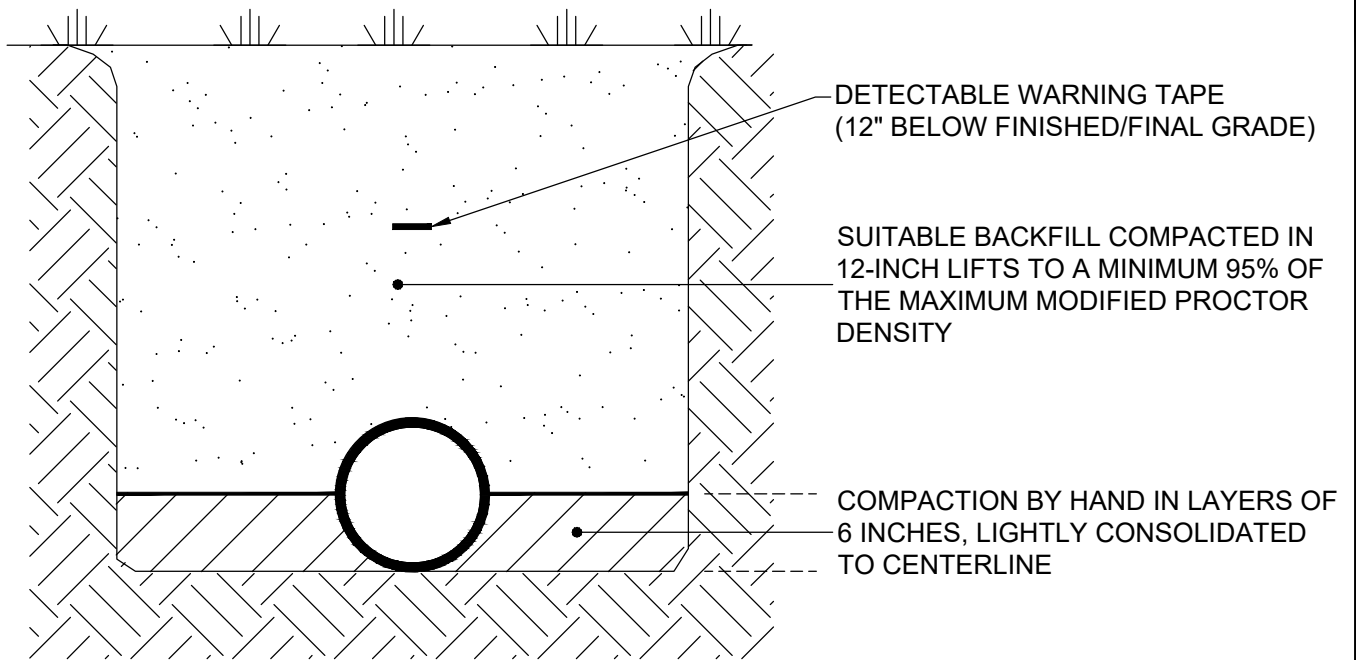


**PAVEMENT LAYERS (SEE SPECIFICATIONS)**

- A. TYPE SP 9.5 ASPHALT (1") MILL & OVERLAY
- B. TYPE SP 9.5 OR SP 12.5 ASPHALT (1" FOR CLASS I, 2" FOR CLASS II)
- C. CRUSHED CONCRETE BASE (8" FOR CLASS I, 12" FOR CLASS II)

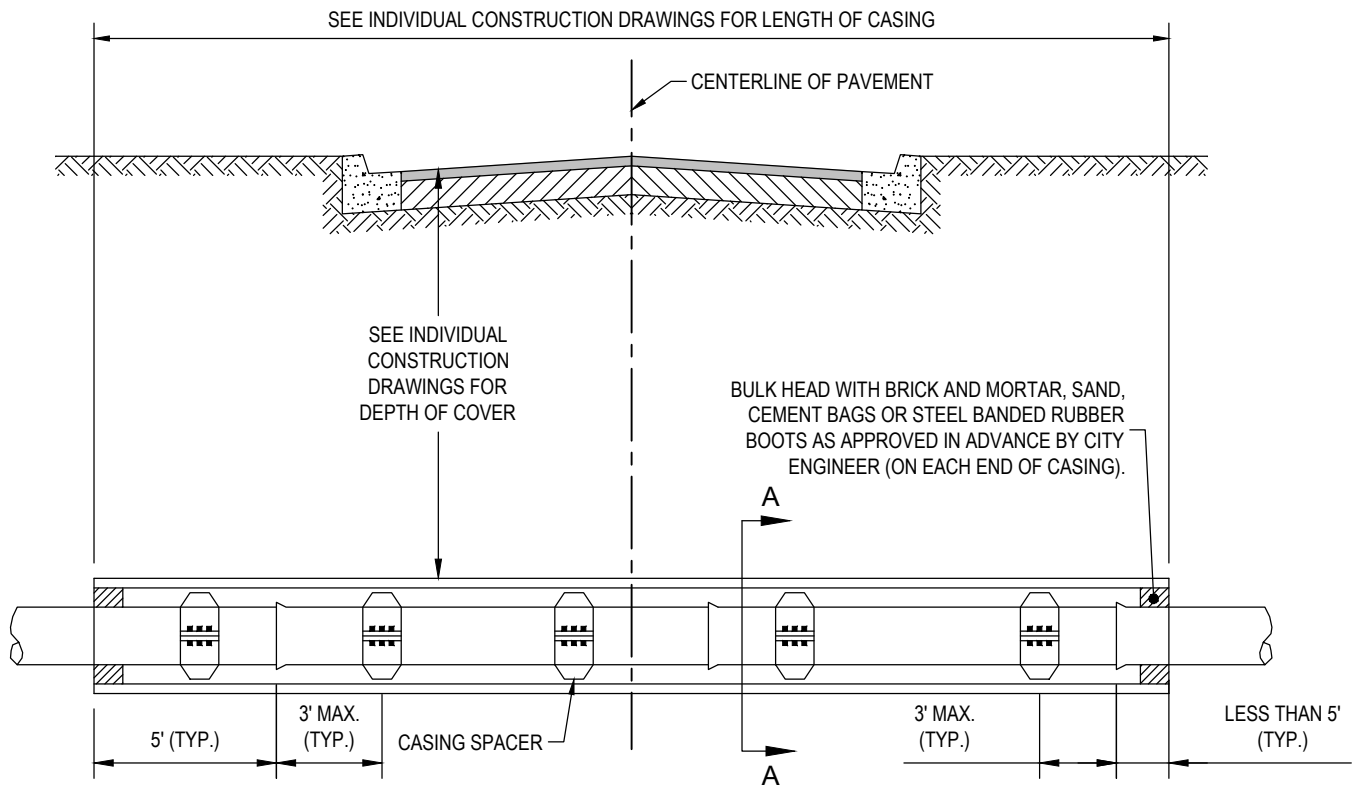
**NOTES:**

1. PAVEMENT SHALL BE MECHANICALLY SAWED.
2. CLASS I = RESIDENTIAL ROAD AND CLASS II = COLLECTOR/ARTERIAL ROAD.
3. THE MILL AND OVERLAY COURSE (A) SHALL BE 1" THICK AND FDOT TYPE SP 9.5 ASPHALT SHALL BE USED. LIFT TO BE ¾" MIN. AND 1½" MAX. FOR CLASS I AND CLASS II ROADS.  
WHEN TRENCH IS PERPENDICULAR TO THE ROAD: THE WIDTH OF THE REPLACEMENT BASE LIMIT ± 10' ON EACH SIDE  
WHEN TRENCH IS PARALLEL TO THE ROAD: THE FULL WIDTH OF THE ROAD (CURB TO CURB)
4. THE REPLACEMENT PAVEMENT COURSE (B) SHALL EXTEND ± 12" ON EACH SIDE OF THE REPLACEMENT BASE LIMIT AND BE FDOT TYPE SP 9.5 OR SP 12.5 WITH A THICKNESS EQUAL TO THE EXISTING OR AS INDICATED, WHICHEVER IS GREATER. LIFT TO BE ¾" MIN. AND 1½" MAX. FOR SP 9.5 AND 1¼" MIN. TO 3" MAX. FOR SP 12.5.
5. THE REPLACEMENT BASE (C) MATERIALS SHALL BE EITHER OF THE SAME TYPE AND COMPOSITION AS THE MATERIALS REMOVED OR OF EQUAL OR GREATER STRUCTURAL ADEQUACY. BASE SHALL BE INSTALLED TO A THICKNESS OF THE EXISTING BASE OR AS INDICATED, WHICHEVER IS GREATER. BASE SHALL EXTEND 18" IN EACH SIDE OF THE TRENCH LIMIT. CRUSHED CONCRETE BASE SHALL FOLLOW FDOT STANDARD SPECIFICATIONS FOR RECYCLED CONCRETE AGGREGATES, LATEST EDITION. LAYER COEFFICIENT (SN) SHALL BE 0.18 WITH LIMEROCK BEARING RATIO (LBR) 150 OR GREATER. GRADATION AND SIZE REQUIREMENTS SHALL CONFORM TO FDOT LATEST SPECIFICATIONS.



**NOTES:**

1. TRENCH IS DEFINED AS A FLAT-BOTTOM TRENCH. LIGHTLY CONSOLIDATE BACKFILL TO CENTERLINE OF PIPE.
2. THIS STANDARD SHALL BE UTILIZED IN THE ABSENCE OF SPECIFIC STANDARDS. THE STANDARD OF THE AGENCY CONTROLLING THE RIGHT-OF-WAY SHALL GOVERN UNLESS OTHERWISE DIRECTED BY CITY ENGINEER.
3. SUITABLE BACKFILL SHALL BE DEFINED AS MATERIAL FREE FROM CINDERS, ASHES, REFUSE, CLAY, ORGANIC MATTER, BOULDERS, ROCKS OR STONES, OR OTHER MATERIAL THAT IN THE OPINION OF THE CITY ENGINEER IS UNSUITABLE.
4. NON-PAVED AREA IS A PERVIOUS AREA. IF ANY PART OF THE TRENCH IS WITHIN A CONCRETE OR ASPHALT CURB, SIDEWALK, DRIVEWAY, OR ROADWAY, THEN STANDARD DETAIL 2.01 APPLIES.

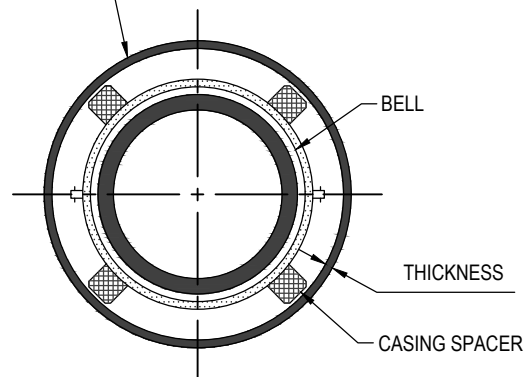


SEE INDIVIDUAL CONSTRUCTION DRAWINGS FOR LENGTH OF CASING

SEE INDIVIDUAL CONSTRUCTION DRAWINGS FOR DEPTH OF COVER

BULK HEAD WITH BRICK AND MORTAR, SAND, CEMENT BAGS OR STEEL BANDED RUBBER BOOTS AS APPROVED IN ADVANCE BY CITY ENGINEER (ON EACH END OF CASING).

STEEL CASING - DIAMETER AS SHOWN IN TABLE OR AS DIRECTED IN PLANS. (ASTM A139 GRADE B)



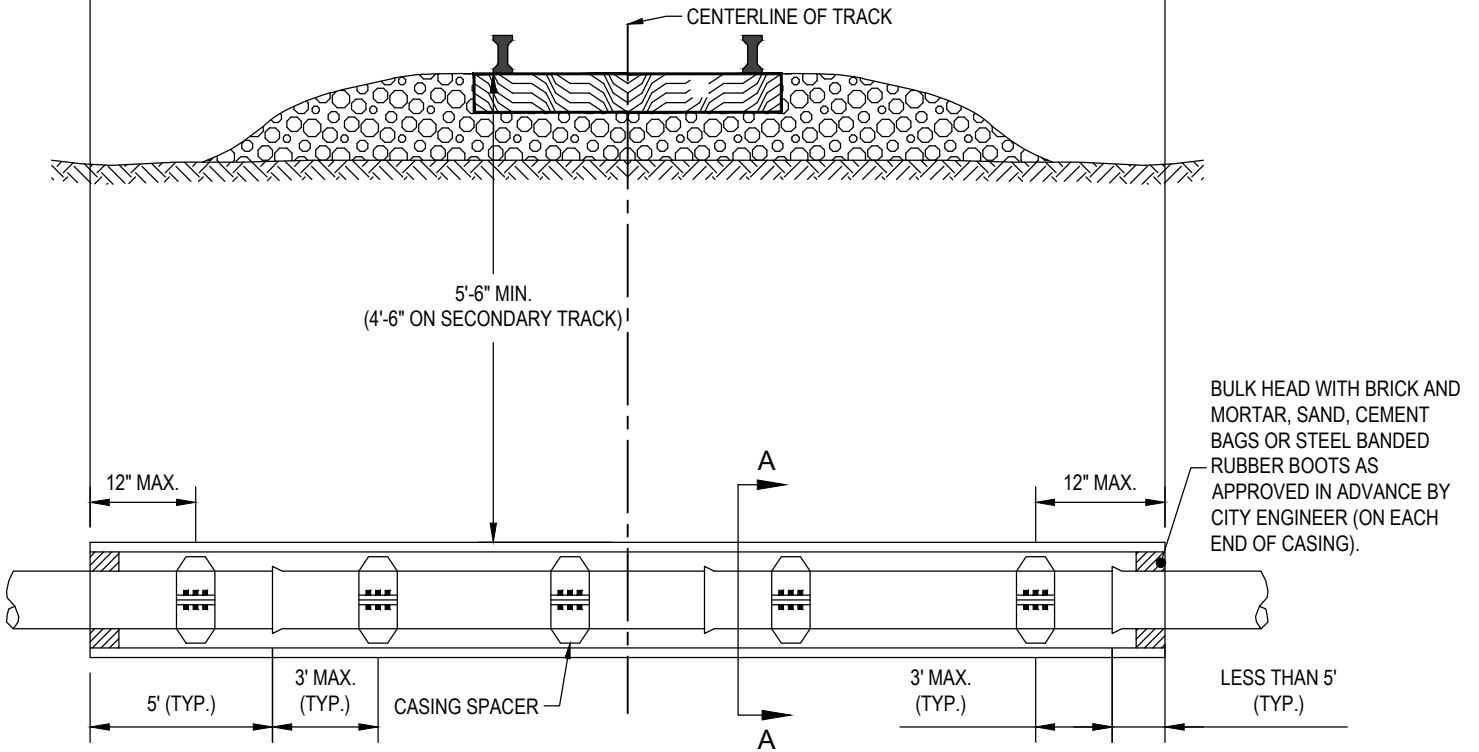
SECTION A - A

D.I.P. CARRIER PIPE (P.O.) NOMINAL DIAMETER (INCHES)	CASING O.D. (INCHES)	THICKNESS
2	4	1/4" (.250)
4	12	1/4" (.250)
6	14	9/32" (.281)
8	16	9/32" (.281)
12	20	11/32" (.344)
16	24	13/32" (.406)
20	30	15/32" (.469)
24	36	17/32" (.531)
30	42	9/16" (.563)
36	48	9/16" (.563)
42	54	9/16" (.563)

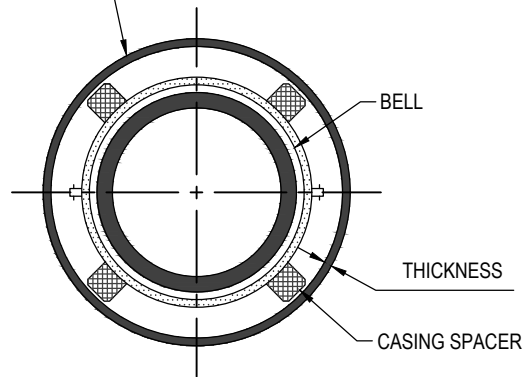
**NOTES:**

1. PIPELINES WITH BENDS LESS THAN 20' FROM CASING ENTRANCE SHALL BE SECURED BY BOTH MECHANICAL RESTRAINTS AND THRUST BLOCKS.
2. CASING PIPE SIZES LISTED ARE FOR PUSH-ON JOINT CARRIER PIPE ONLY.
3. TWO SPACERS PER JOINT MINIMUM SPACED AS SHOWN OR AS DIRECTED BY CITY ENGINEER.

SEE INDIVIDUAL CONSTRUCTION DRAWINGS FOR LENGTH OF CASING



STEEL CASING - DIAMETER AS SHOWN IN TABLE OR AS DIRECTED IN PLANS. (ASTM A139 GRADE B)



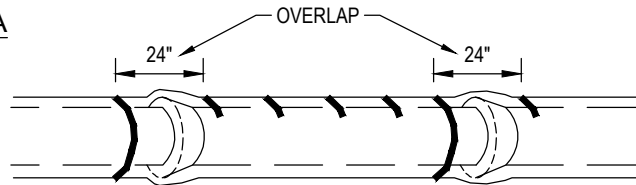
SECTION A - A

**NOTES:**

1. PIPELINES WITH BENDS LESS THAN 20' FROM CASING ENTRANCE SHALL BE SECURED BY BOTH MECHANICAL RESTRAINTS AND THRUST BLOCKS.
2. CASING PIPE SIZES LISTED ARE FOR PUSH-ON JOINT CARRIER PIPE ONLY.
3. TWO SPACERS PER JOINT MINIMUM SPACED AS SHOWN OR AS DIRECTED BY CITY ENGINEER.

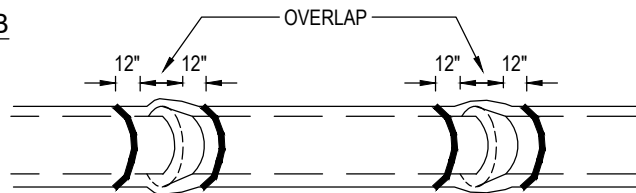
D.I.P. CARRIER PIPE (P.O.) NOMINAL DIAMETER (INCHES)	CASING O.D. (INCHES)	THICKNESS
2	4	1/4" (.250)
4	12	1/4" (.250)
6	14	9/32" (.281)
8	16	9/32" (.281)
12	20	11/32" (.344)
16	24	13/32" (.406)
20	30	15/32" (.469)
24	36	17/32" (.531)
30	42	5/8" (.625)
36	48	11/16" (.688)
42	54	25/32" (.781)

METHOD A



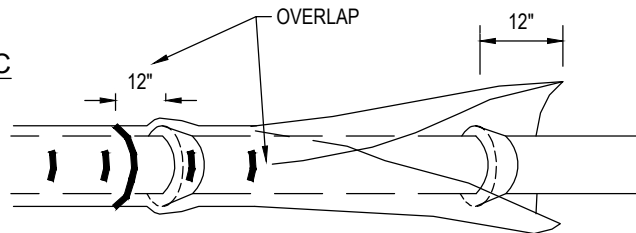
POLYETHYLENE TUBE IS CUT INTO LENGTHS APPROXIMATELY TWO FEET LONGER THAN THE PIPE SECTION AND PLACED AROUND IT. AFTER THE PIPE JOINT IS ASSEMBLED, THE POLYETHYLENE TUBE IS MADE TO OVERLAP THE JOINT AND THE OVERLAP SECURED IN PLACE. SINCE THE TUBE IS CONSIDERABLY LARGER THAN THE BARREL OF PIPE, IT IS MADE TO FIT SNUGLY BY FOLDING OVER AT THE TOP AND SECURING WITH TAPE EVERY 24" ALONG THE PIPE SECTION.

METHOD B



POLYETHYLENE TUBE IS CUT ONE FOOT SHORTER THAN THE LENGTH OF THE PIPE SECTION. AFTER PLACEMENT OF THE PIPE, IT IS FOLDED AND SECURED SNUGLY OVERALL. A THREE FOOT LENGTH OF POLYETHYLENE TUBE PLACED OVER THE END OF THE PRECEEDING SECTION IS THEN PULLED IN PLACE OVER THE JOINT AFTER ASSEMBLY AND SECURED.

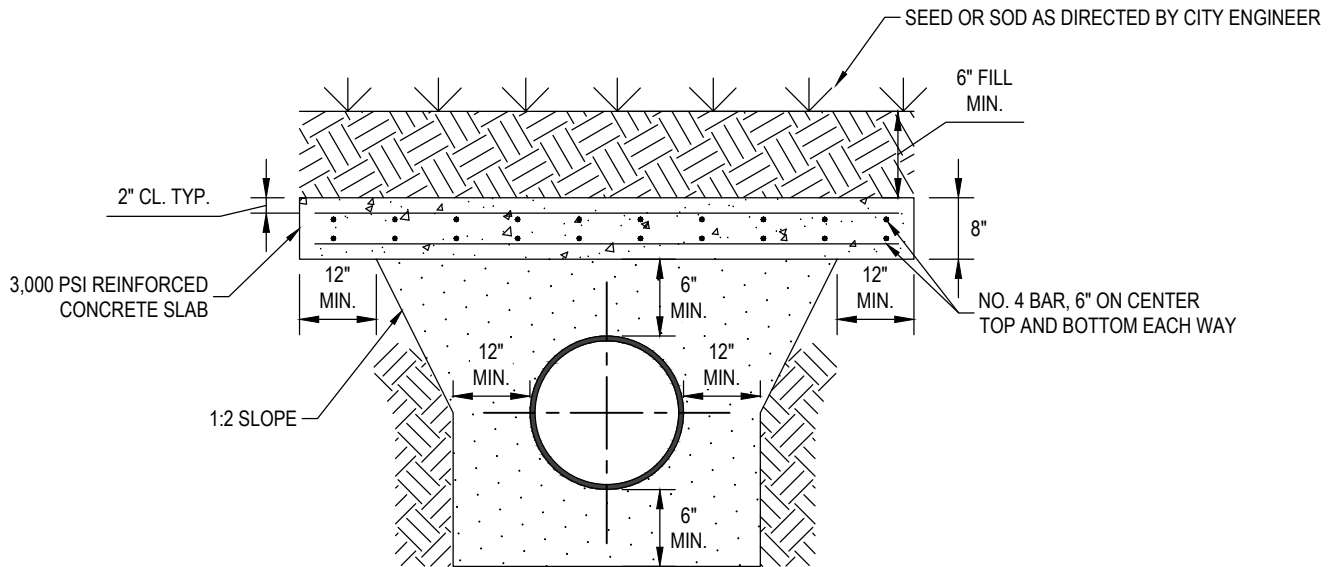
METHOD C



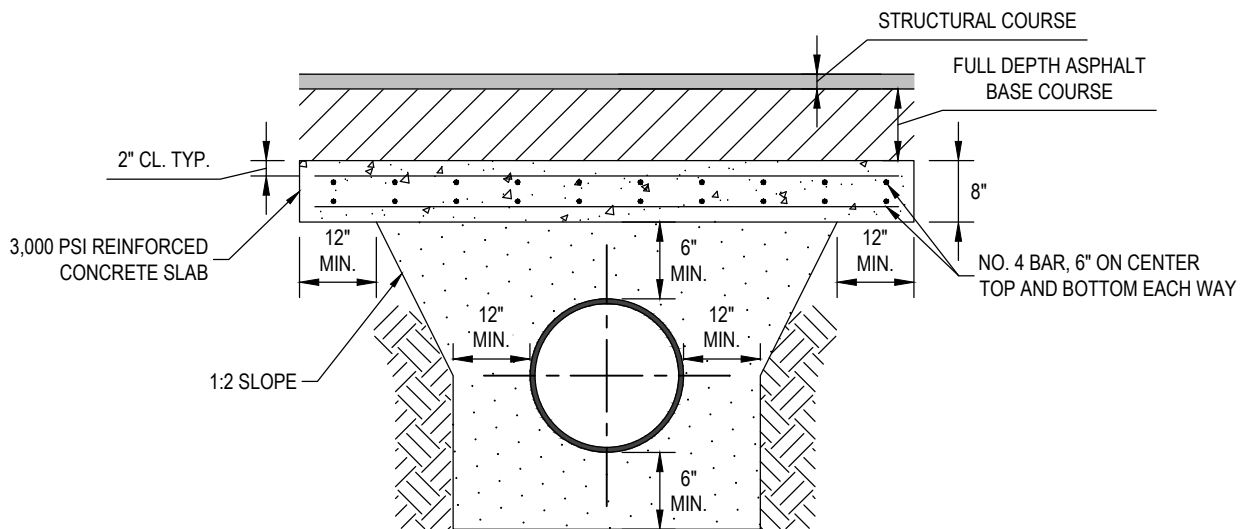
POLYETHYLENE SHEET IS CUT TO A LENGTH TWO FEET LONGER THAN THE PIPE SECTION. THE SHEET IS WRAPPED AROUND THE PIPE SO THAT IT OVERLAPS CIRCUMFERENTIALLY OVER THE TOP QUADRANT OF THE PIPE, THEN SECURED. AFTER JOINT ASSEMBLY, THE SURPLUS LENGTH OF POLYETHYLENE FILM IS SECURED AROUND THE JOINT, PROVIDING AN OVERLAP OF EACH JOINT. TAPE AT EACH JOINT AND AT 3' INTERVALS IN BETWEEN.

NOTES:

1. USE BLUE POLYETHYLENE FILM AND TAPE ONLY.
2. POLYETHYLENE FILM SHALL BE A MINIMUM OF 8 MIL. THICKNESS.
3. SPIRAL WRAP NOT REQUIRED WITH POLYWRAP.



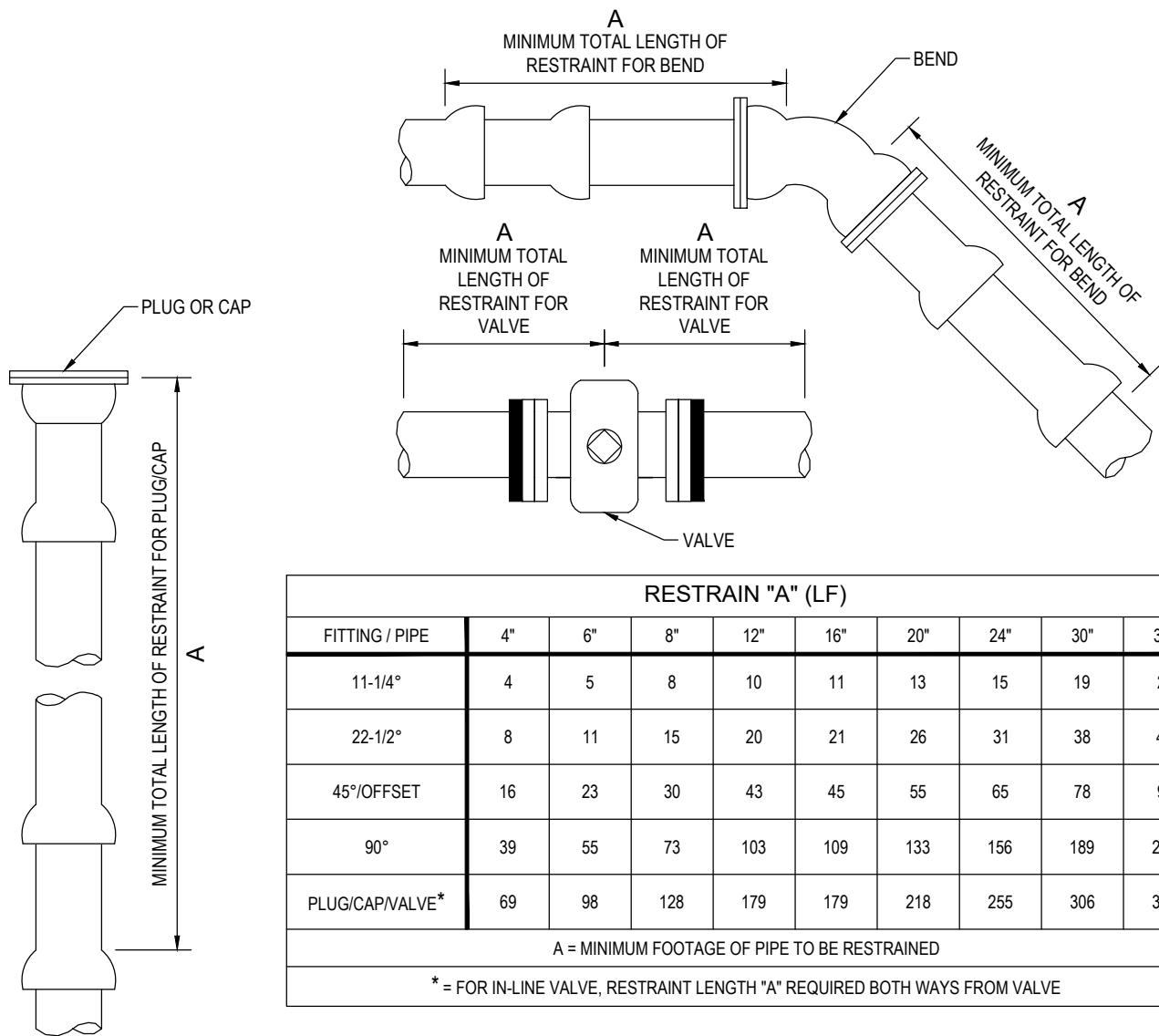
GRASSED SECTION



ROADWAY SECTION

**NOTES:**

1. STRUCTURAL COURSE AND BASE COURSE REQUIREMENT SHALL BE ESTABLISHED BY THE AGENCY HAVING JURISDICTION.
2. SHOCK PADS FOR MAINS TOO SHALLOW FOR THE ABOVE CONFIGURATION SHALL BE DESIGNED ON A CASE-BY-CASE BASIS.



RESTRAIN "A" (LF)									
FITTING / PIPE	4"	6"	8"	12"	16"	20"	24"	30"	36"
11-1/4°	4	5	8	10	11	13	15	19	21
22-1/2°	8	11	15	20	21	26	31	38	44
45°/OFFSET	16	23	30	43	45	55	65	78	91
90°	39	55	73	103	109	133	156	189	220
PLUG/CAP/VALVE*	69	98	128	179	179	218	255	306	356
A = MINIMUM FOOTAGE OF PIPE TO BE RESTRAINED									
* = FOR IN-LINE VALVE, RESTRAINT LENGTH "A" REQUIRED BOTH WAYS FROM VALVE									

**NOTES:**

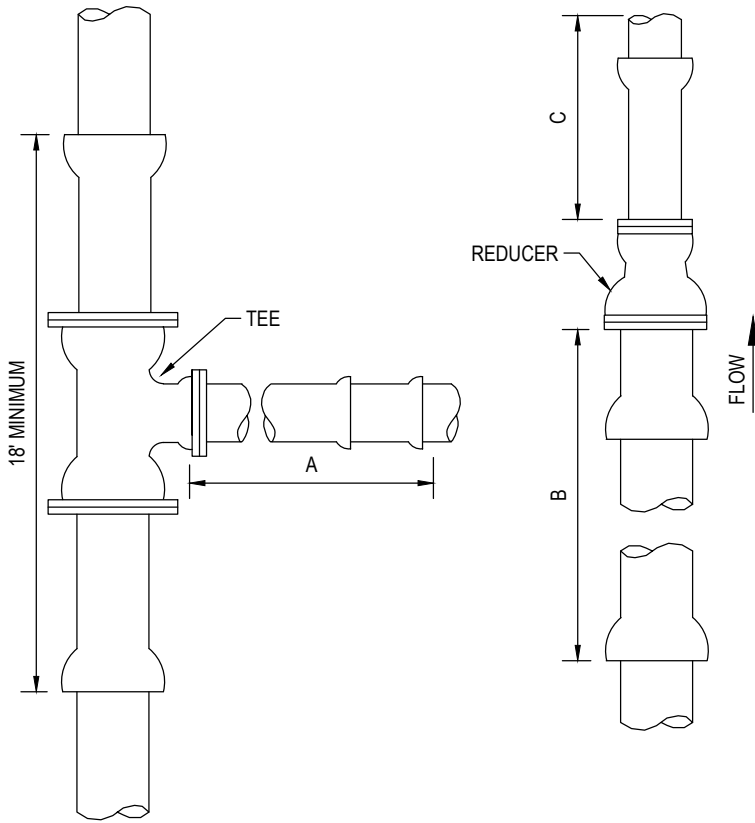
1. THIS TABLE IS BASED ON:
  - a. MAXIMUM TEST PRESSURE OF 190 PSI
  - b. LAYING CONDITION TYPE 2 (SEE DETAILS 2.01 AND 2.02)
  - c. POOR SOIL CONDITIONS
  - d. USING D.I.P.
  - e. 3 FEET OF COVER FOR 12" AND SMALLER MAINS; 4 FEET OF COVER FOR 16" AND LARGER MAINS
  - f. HORIZONTAL BENDS ONLY - ENGINEER TO SUBMIT CALCULATIONS FOR VERTICAL RESTRAINTS
2. "RESTRAINED" PIPE SHALL BE MANUFACTURED RESTRAINED JOINT PIPE, PUSH-ON JOINT PIPE RESTRAINED W/GASKET-TYPE "GRIPPER RESTRAINTS", OR MECHANICAL JOINT PIPE RESTRAINED BY MEGALUG (OR APPROVED EQUIVALENT).
3. ANY ADDITIONAL FITTINGS WITHIN THE RESTRAINED SECTION SHALL BE RESTRAINED ACCORDINGLY.



LAST REVISION  
MAY 2021

RESTRAINED JOINT STANDARD FOR  
BENDS, PLUGS, CAPS, AND VALVES





FITTING SIZE	RESTRAIN (LF)		UNRESTRAINED STRAIGHT RUN (LF)
	TEE "A"	REDUCER "B"	REDUCER "C"
4x4	31	*	*
6x4	14	50	74
6x6	60	*	*
8x4	A.T.	91	178
8x6	48	54	70
8x8	90	*	*
12x4	A.T.	155	455
12x6	24	130	260
12x8	71	95	144
12x12	143	*	*
16x6	A.T.	151	401
16x8	34	130	265
16x12	96	76	103
16x16	148	*	*
20x6	A.T.	195	659
20x8	18	180	461
20x12	85	136	233
20x16	139	76	96
20x20	186	*	*
24x6	A.T.	236	971
24x8	A.T.	224	700
24x12	74	188	391
24x16	130	139	215
24x20	180	76	93
24x24	224	*	*
30x6	A.T.	293	1534
30x8	A.T.	283	1130
30x12	56	255	678
30x16	118	216	426
30x20	169	168	260
30x24	215	108	138
30x30	275	*	*
36x6	A.T.	345	2230
36x8	A.T.	336	1660
36x12	38	314	1030
36x16	104	283	689
36x20	159	244	466
36x24	206	195	306
36x30	269	108	133
36x36	326	*	*

A.T. = RESTRAINT REQUIRED AT TEE ONLY. \* = NOT APPLICABLE

**NOTES:**

1. THIS TABLE IS BASED ON:
  - a. MAXIMUM TEST PRESSURE OF 190 PSI
  - b. LAYING CONDITION TYPE 2 (SEE DETAILS 2.01 AND 2.02)
  - c. POOR SOIL CONDITIONS
  - d. USING D.I.P.
  - e. 3 FEET OF COVER FOR 12" AND SMALLER MAINS; 4 FEET OF COVER FOR 16" AND LARGER MAINS
  - f. HORIZONTAL BENDS ONLY - ENGINEER TO SUBMIT CALCULATIONS FOR VERTICAL RESTRAINTS
2. RESTRAINT FOR REDUCERS: IF "C" STRAIGHT RUN OF PIPE DOWNSTREAM OF REDUCER NOT AVAILABLE, THE RESTRAIN "B" UPSTREAM OF REDUCER.
3. "RESTRAINED" PIPE SHALL BE MANUFACTURED RESTRAINED JOINT PIPE, PUSH-ON JOINT PIPE RESTRAINED W/GASKET-TYPE "GRIPPER RESTRAINTS", OR MECHANICAL JOINT PIPE RESTRAINED BY MEGALUG (OR APPROVED EQUIVALENT).
4. ANY ADDITIONAL FITTINGS WITHIN THE RESTRAINED SECTION SHALL BE RESTRAINED ACCORDINGLY.

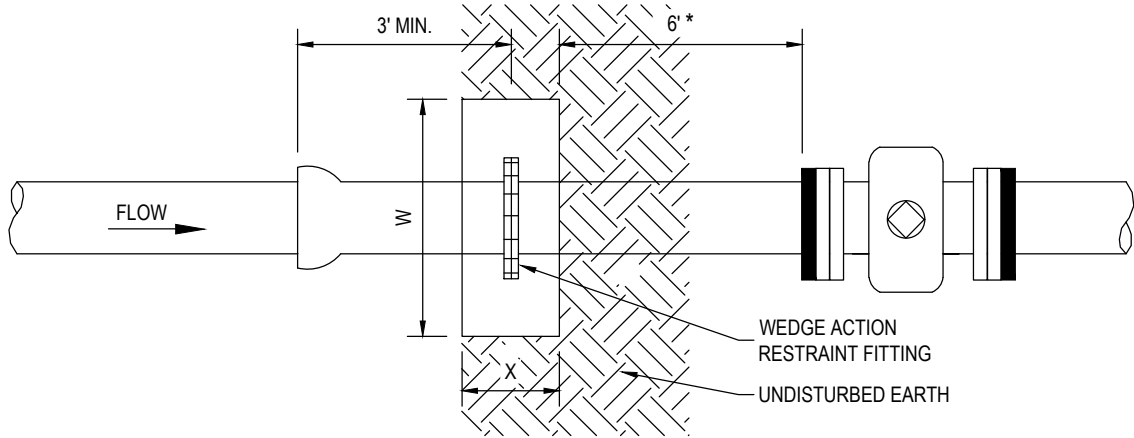


LAST REVISION  
MAY 2021

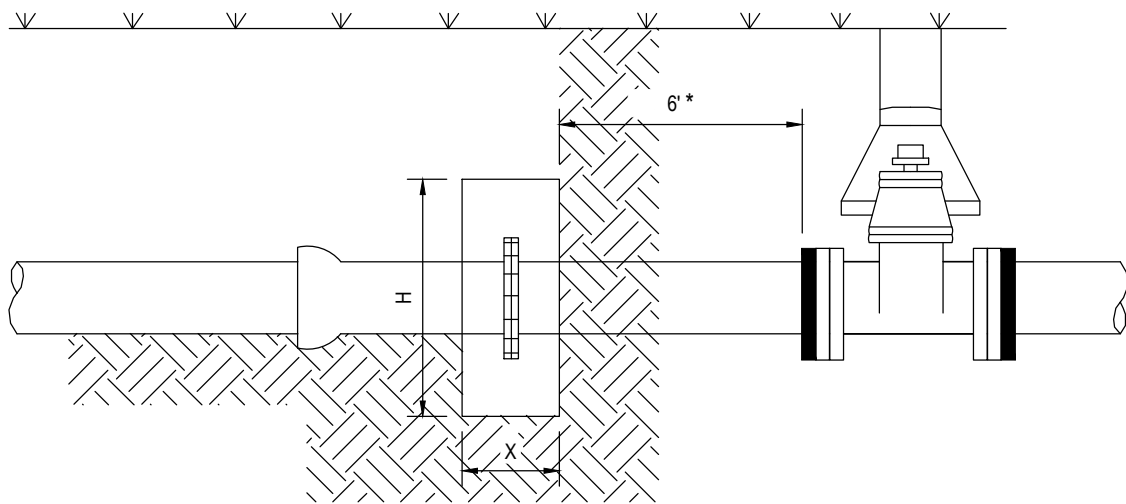
RESTRAINED JOINT STANDARD  
FOR TEES AND REDUCERS

2.12A

**PLAN VIEW**



**PROFILE**



SIZE (D)	4"	6"	8"	12"	16"	20"	24"
THRUST (LBS.)	3,439	7,104	12,223	26,002	45,180	69,624	99,330
BEARING AREA (FT. <sup>2</sup> )	2.58	5.33	9.17	19.50	33.89	52.22	74.50
CONCRETE (YDS. <sup>3</sup> )	0.15	0.31	0.71	1.51	3.29	5.07	7.23
H (FT.)	1.6	2.4	3.1	4.5	6.0	7.4	8.8
W (FT.)	1.6	2.4	3.1	4.5	6.0	7.4	8.8
X (FT.)	1.5 MIN.	1.5 MIN.	2.0 MIN.	2.0 MIN.	2.5 MIN.	2.5 MIN.	2.5 MIN.

**NOTES:**

1. CONCRETE SHALL BE KEPT AT SUFFICIENT DISTANCE FROM JOINT FOR REMOVAL OF ALL JOINT ACCESSORIES INCLUDING BOLTS.
2. ALL BEARING SURFACES TO BE CARRIED TO UNDISTURBED SOIL.
3. THIS TABLE SHOWS THE MINIMUM SIZE THRUST BLOCKS FOR SOIL BEARING PRESSURE OF 2000 PSF AND AN INTERNAL PRESSURE OF 190 PSI. COVER TO T.O.P. IS 3 FEET FOR 12" AND SMALLER MAINS; 4 FEET FOR 16" AND LARGER MAINS.
4. POOR AND WET SOIL (SILTY SOILS, CLAY, MUCK AND PEAT) WILL REQUIRE LARGER THRUST BLOCKS, AS DIRECTED BY CITY ENGINEER.
5. FITTINGS SHALL BE COMPLETELY POLYWRAPPED PRIOR TO POURING THRUST BLOCKS.

\* CLOSEST DISTANCE TO VALVE FOR DEADMAN TO REMAIN EFFECTIVE.

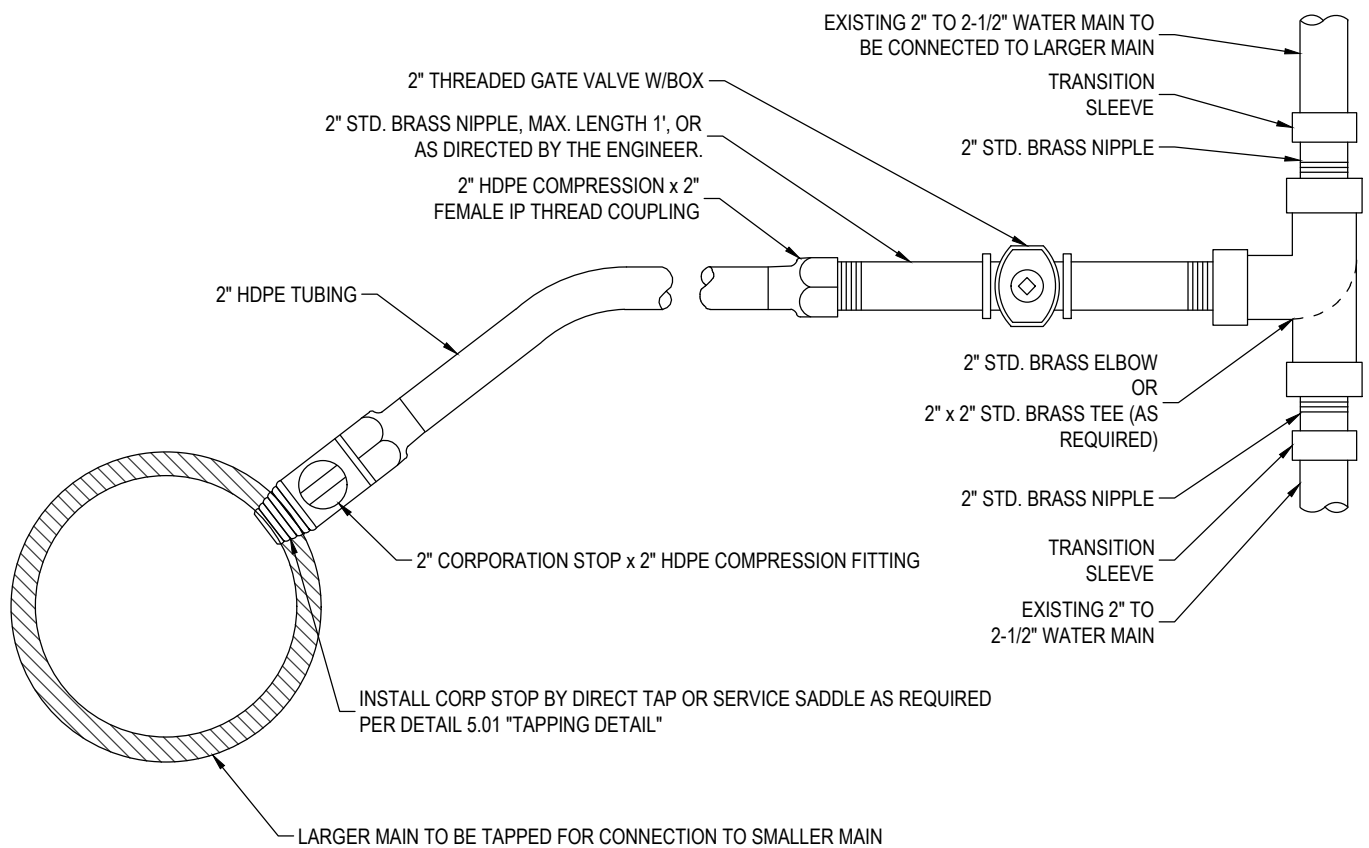


LAST REVISION


MAY 2021

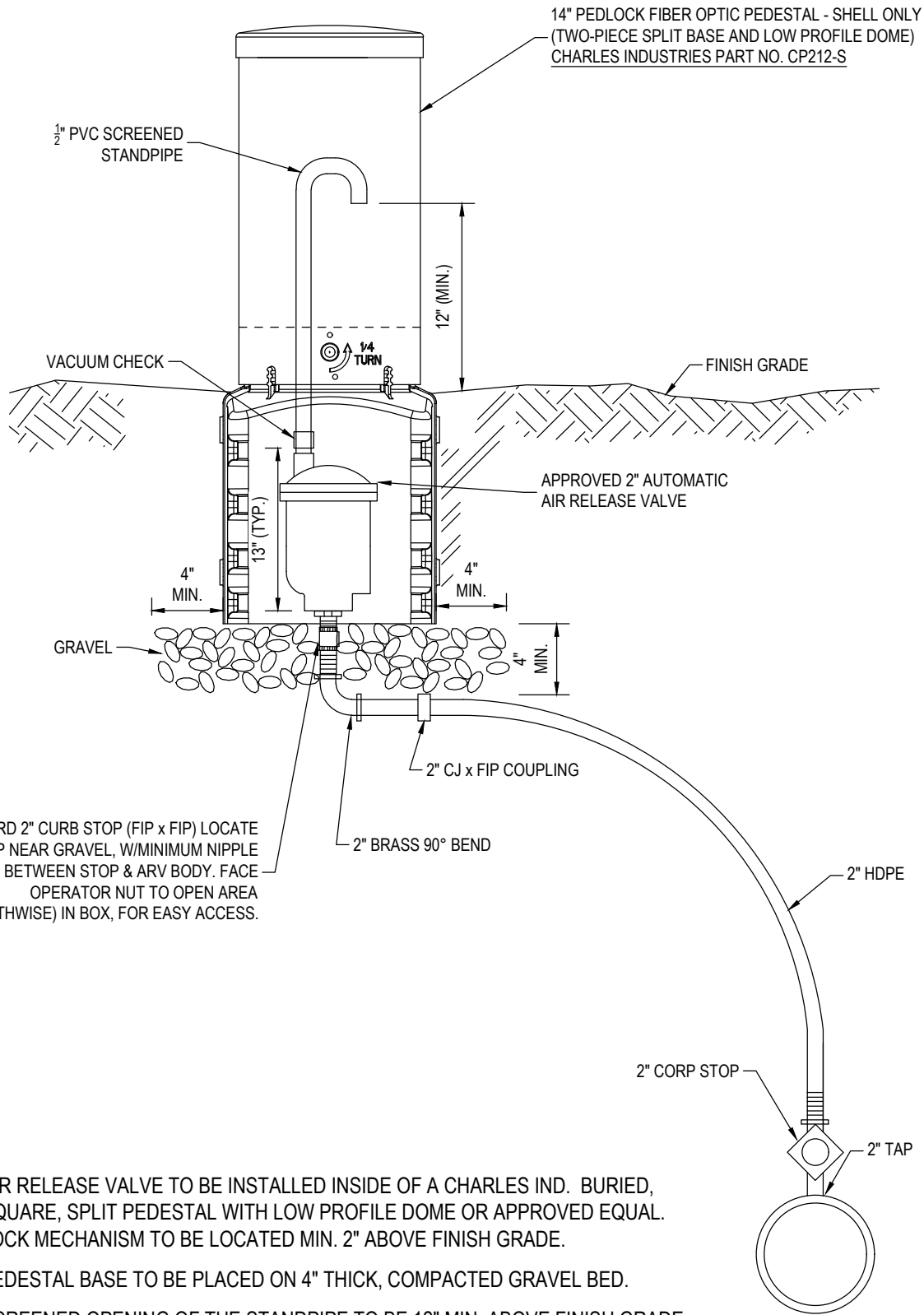
DEADMAN THRUST BLOCK

2.12B



NOTE:  
 SEE DETAIL 5.01 TO DETERMINE WHEN SADDLES ARE REQUIRED FOR CORP INSTALLATION. VALVE SHALL BE SET IN ACCORDANCE WITH DETAIL 3.01.

	<p>LAST REVISION          MAY 2021</p>	<p>TAPPED CONNECTION FROM DI, CI,          OR PVC PIPE TO &lt;4" WATER MAINS</p>	<p>2.13A</p>
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NOTES:

1. AIR RELEASE VALVE TO BE INSTALLED INSIDE OF A CHARLES IND. BURIED, SQUARE, SPLIT PEDESTAL WITH LOW PROFILE DOME OR APPROVED EQUAL. LOCK MECHANISM TO BE LOCATED MIN. 2" ABOVE FINISH GRADE.
2. PEDESTAL BASE TO BE PLACED ON 4" THICK, COMPACTED GRAVEL BED.
3. SCREENED OPENING OF THE STANDPIPE TO BE 12" MIN. ABOVE FINISH GRADE.

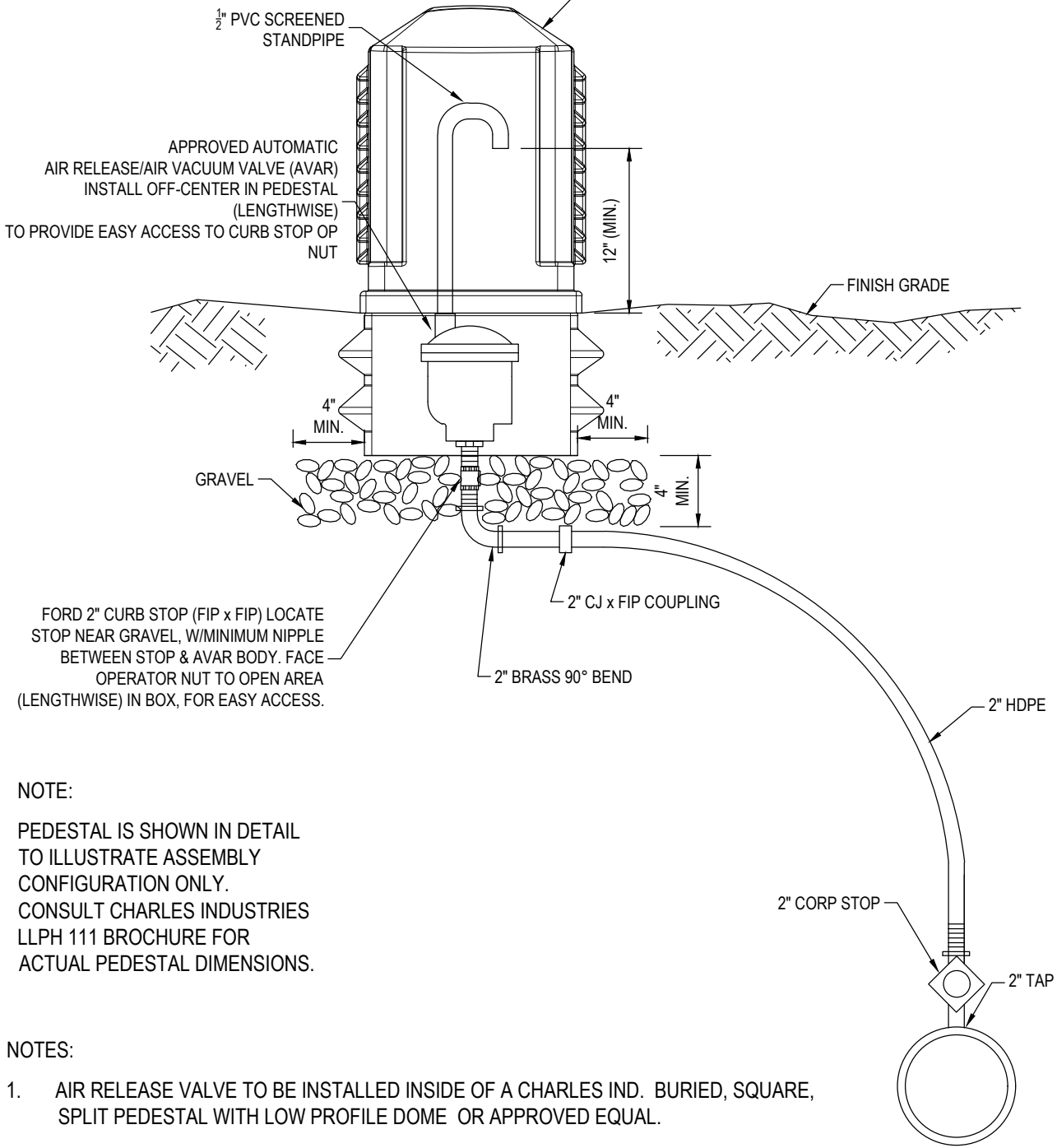


LAST REVISION  
MAY 2021

AUTOMATIC AIR RELEASE VALVE

2.14A

CHARLES INDUSTRIES LLPH MODEL 111  
 (TWO-PIECE, SPLIT BASE AND LOW PROFILE DOME)  
 CHARLES INDUSTRIES PART NO. 111 SS07-10002 BK



**NOTE:**

PEDESTAL IS SHOWN IN DETAIL TO ILLUSTRATE ASSEMBLY CONFIGURATION ONLY. CONSULT CHARLES INDUSTRIES LLPH 111 BROCHURE FOR ACTUAL PEDESTAL DIMENSIONS.

**NOTES:**

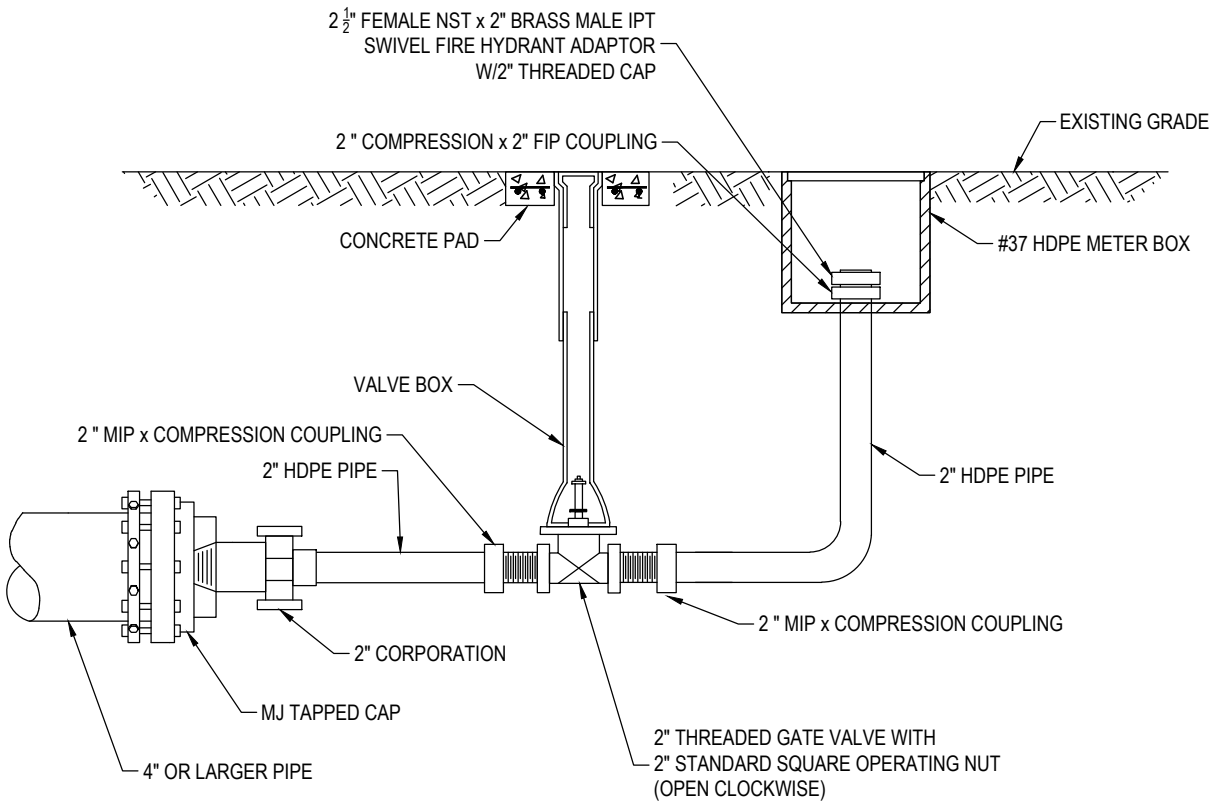
1. AIR RELEASE VALVE TO BE INSTALLED INSIDE OF A CHARLES IND. BURIED, SQUARE, SPLIT PEDESTAL WITH LOW PROFILE DOME OR APPROVED EQUAL.
2. LOCK MECHANISM TO BE LOCATED MIN. 2" ABOVE FINISH GRADE.
3. PEDESTAL BASE TO BE PLACED ON 4" THICK, COMPACTED GRAVEL BED, ON TOP OF 6" THICK 2'X2' CONCRETE PAD.
4. OBTAIN (2) REFLECTIVE WATER STICKERS FROM CITY AND AFFIX TO PEDESTAL.



LAST REVISION  
 MAY 2021

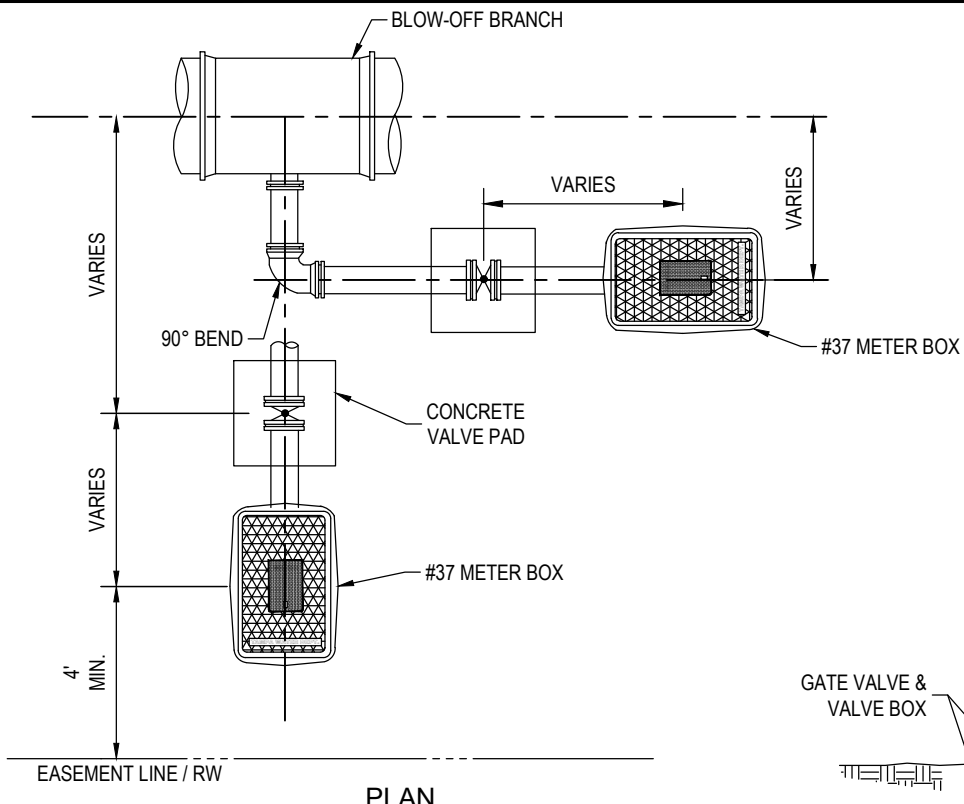
**AUTOMATIC AIR RELEASE/AIR VACUUM VALVE**

2.14B

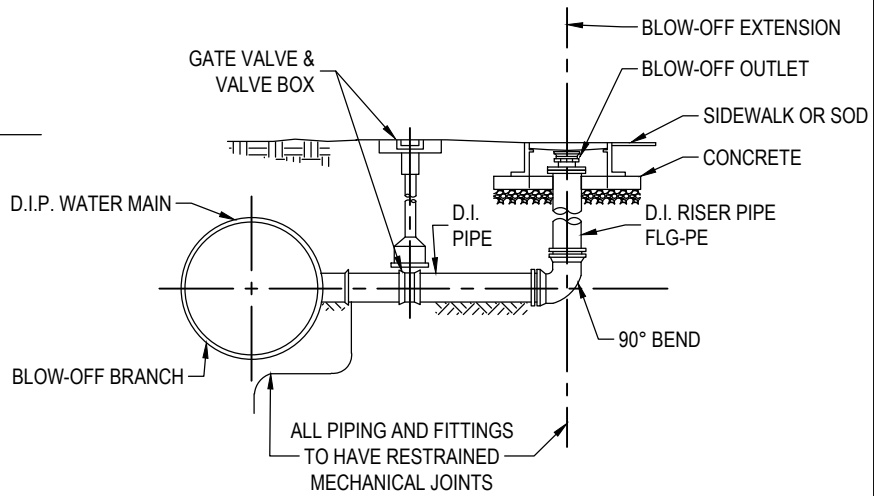


**BLOW-OFF FOR ≥ 4" MAINS**

NO GALVANIZED PIPES OR FITTINGS ALLOWED.  
 SCHEDULE 80 PVC ALLOWED.



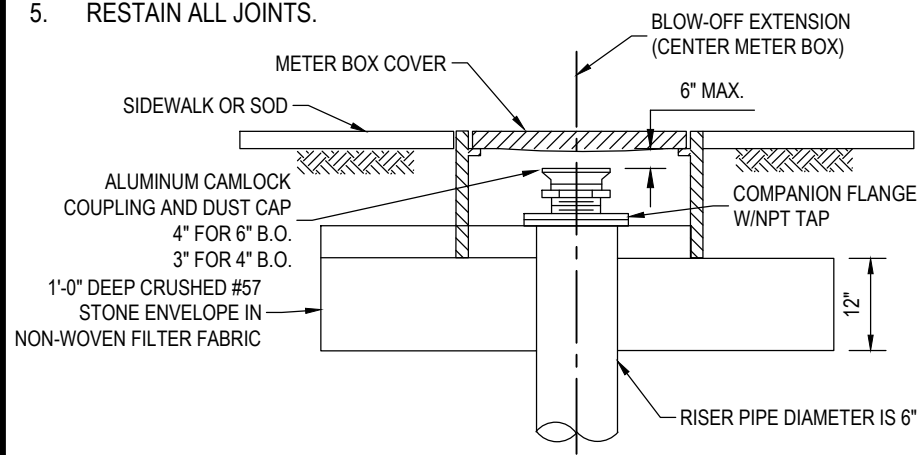
**PLAN**



**PROFILE**

**NOTES:**

1. ASSEMBLY VARIES WITH SITE CONDITIONS
2. ENCASE ALL DUCTILE IRON PIPE AND FITTINGS. IN POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH AWWA-C 105.
3. METER BOX PER STANDARD DETAIL 5.11 OR 5.11A.
4. INSTALL BENDS AS NEED TO CROSS EXISTING UTILITIES.
5. RESTRAIN ALL JOINTS.



**BLOW-OFF OUTLET DETAIL**

NOT TO SCALE

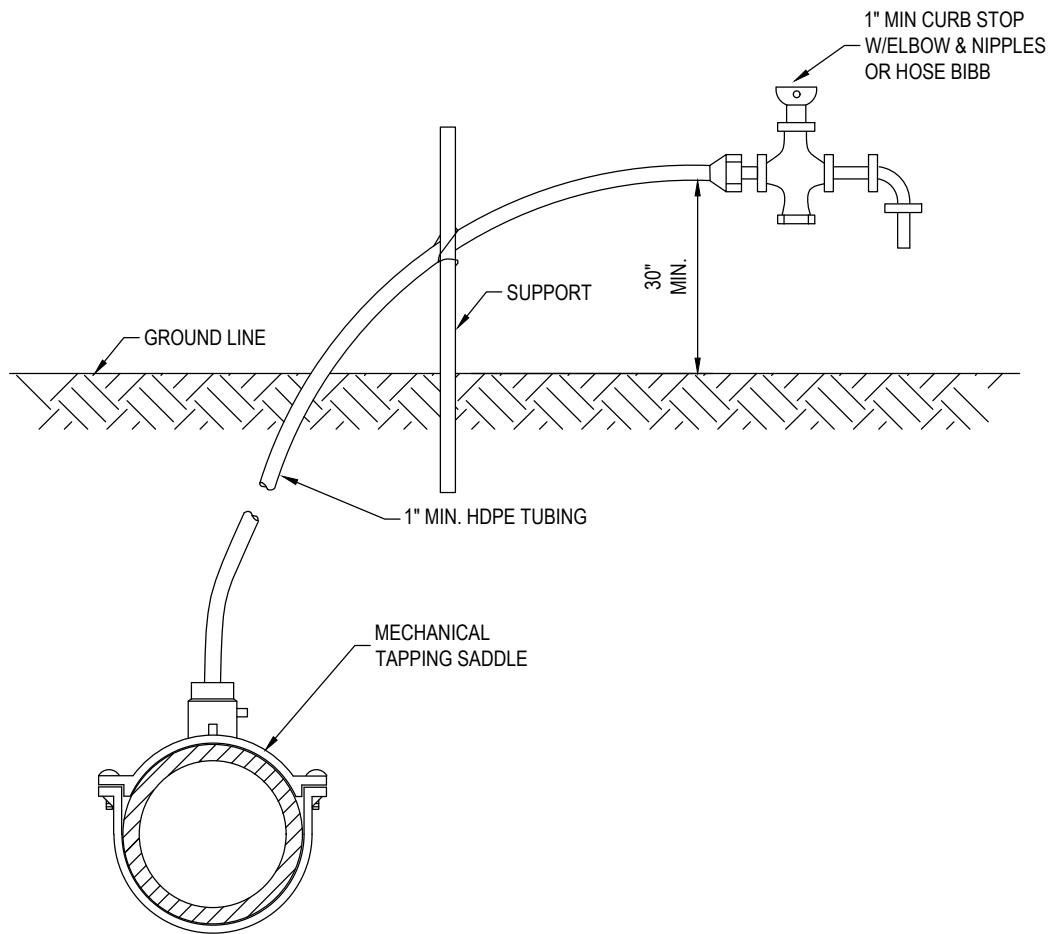
NOTE:  
CONTRACTOR SHALL DRILL 1/4" HOLE IN CENTER OF CAMLOCK DUST CAP.



LAST REVISION  
MAY 2021

BLOW-OFF VALVE ASSEMBLY  
FOR 4" & 6" MAINS W/DI, CI OR PVC PIPE -  
LATERAL CONNECTION

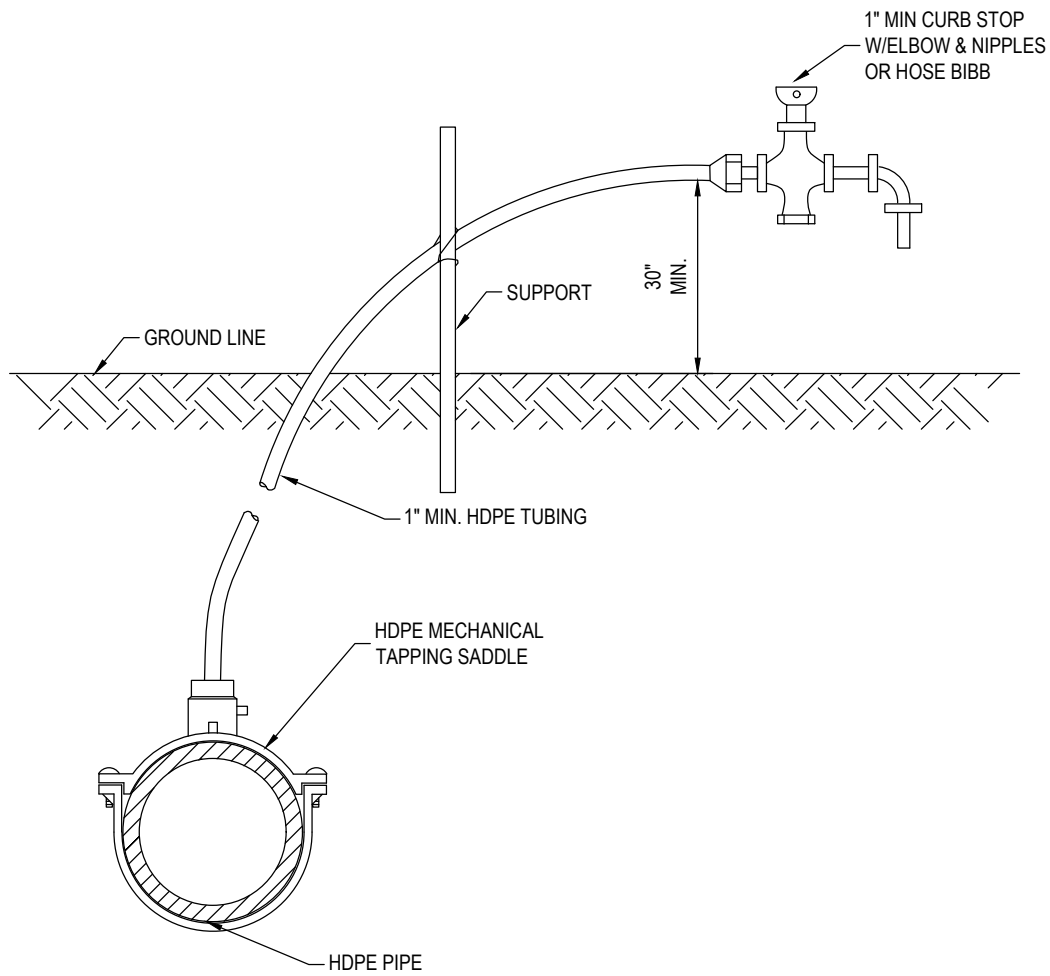
2.17C



**NOTES:**

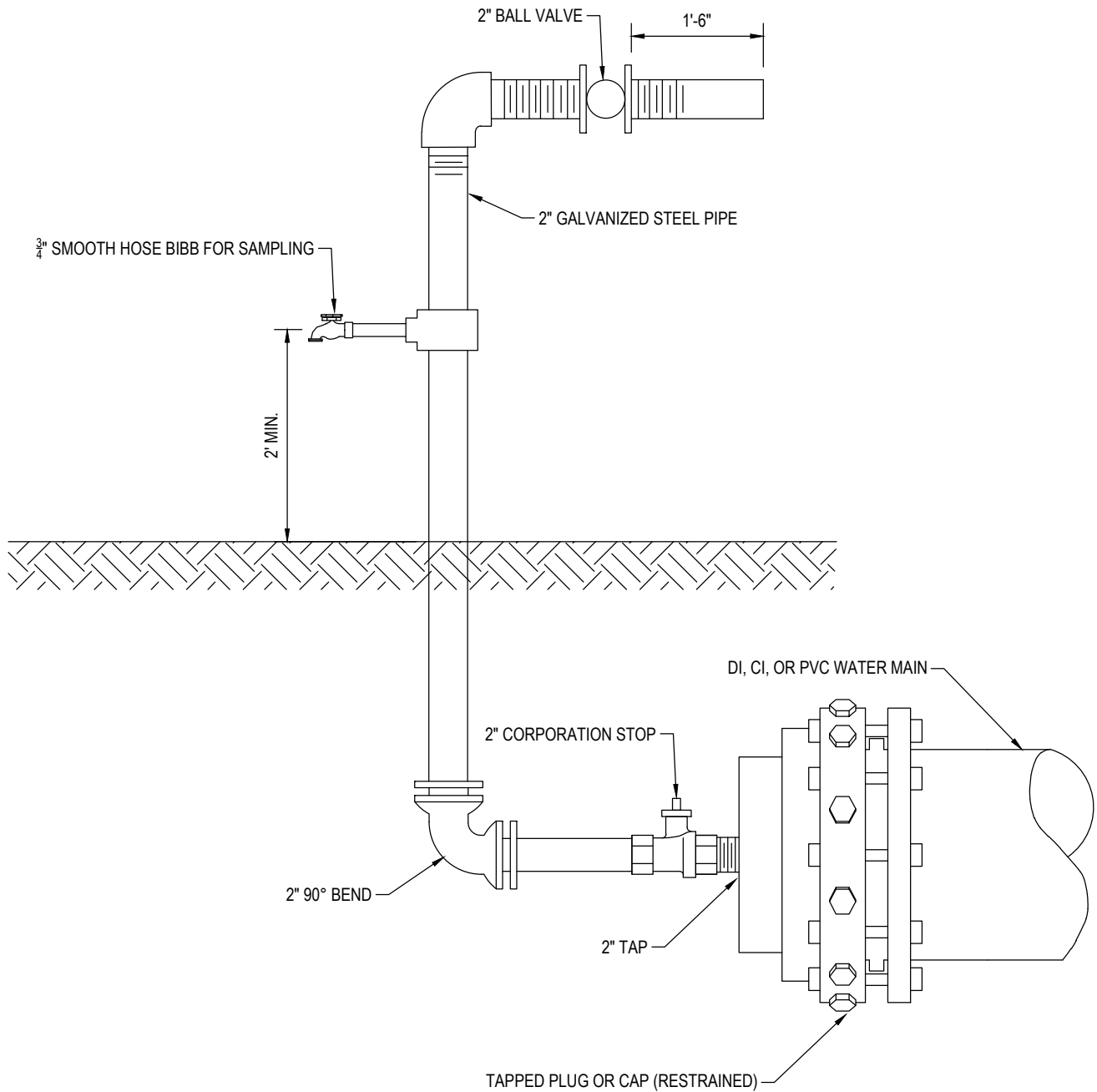
1. WATER OUTLET SHALL BE HELD UP OFF THE GROUND SO AS NOT TO INTERFERE WITH THE SAMPLING PROCESS.
2. CORPORATION STOP TO BE REMOVED AND BRASS PLUG INSTALLED IN TAPPED MAIN AFTER OPERATION.





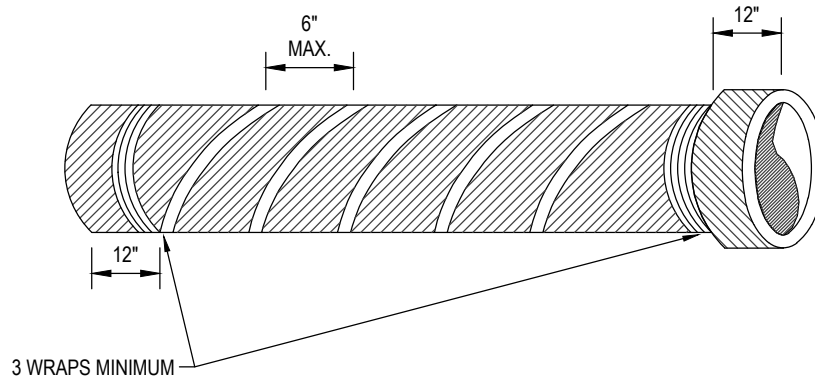
NOTES:

1. WATER OUTLET SHALL BE HELD UP OFF THE GROUND SO AS NOT TO INTERFERE WITH THE SAMPLING PROCESS.
2. CORPORATION STOP TO BE REMOVED AND PLUGGED AFTER OPERATION.



**NOTES:**

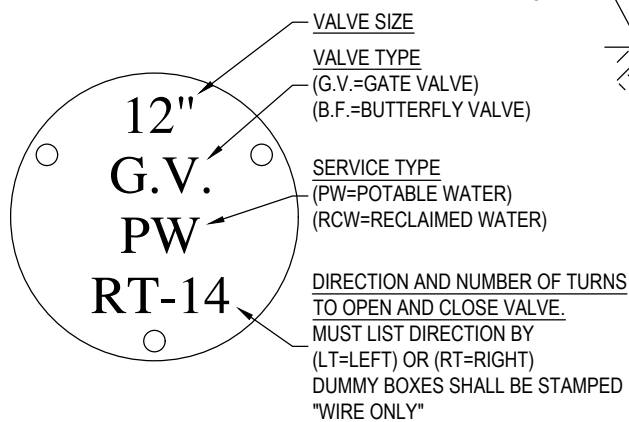
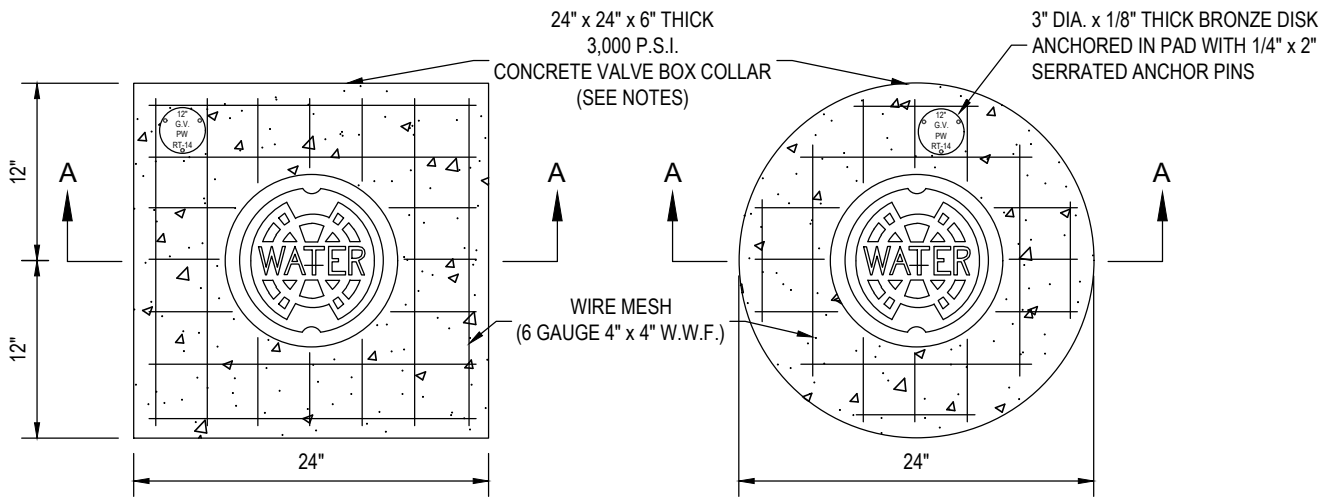
1. FOR DEAD-END MAINS, SAMPLE TAP TO BE INSTALLED ON A 2" TAPPED CAP/PLUG.
2. FLUSHING/SAMPLING ARRANGEMENT TO BE REMOVED AFTER DISINFECTION OF MAIN LINE.
3. AFTER OPERATION COMPLETE, INSTALL BRASS PLUG AT CORPORATION STOP.



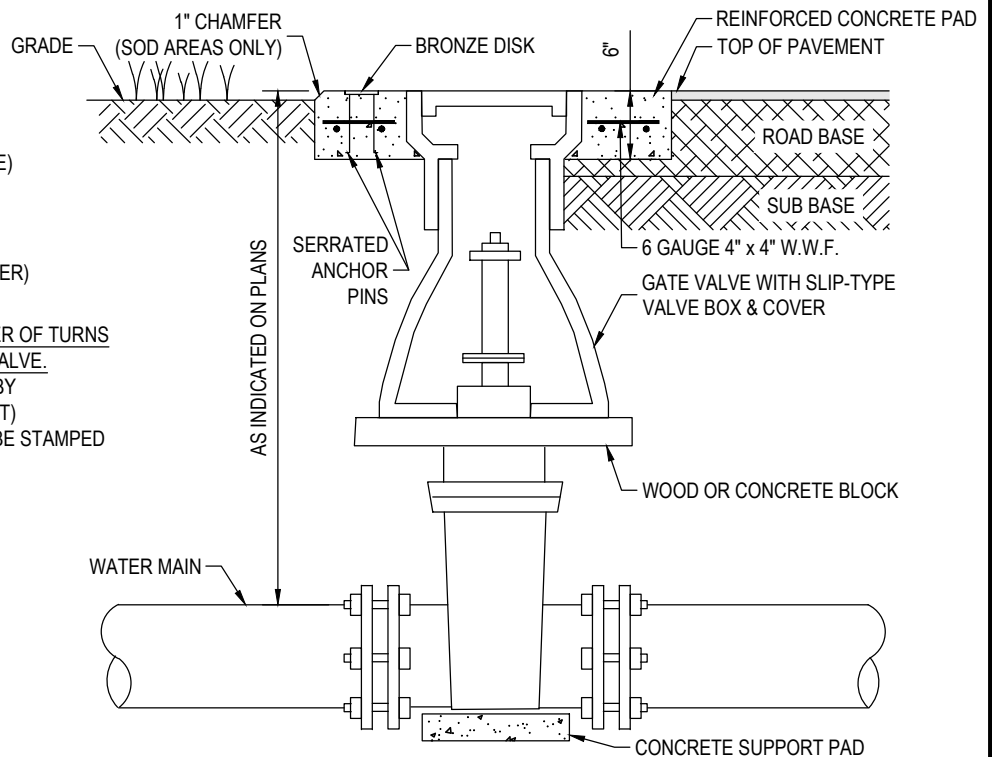
SPIRAL WRAP

NOTES:

1. TO ENSURE PROPER ADHESION, EACH PIPE RUN SHALL BE WRAPPED WITH A CONTINUOUS RUN OF TAPE.
2. ALL TAPE SHALL BE MIN. 2" BLUE VINYL TAPE FOR POTABLE WATER.



**BRONZE DISK DETAIL**



**SECTION A-A**

**NOTES :**

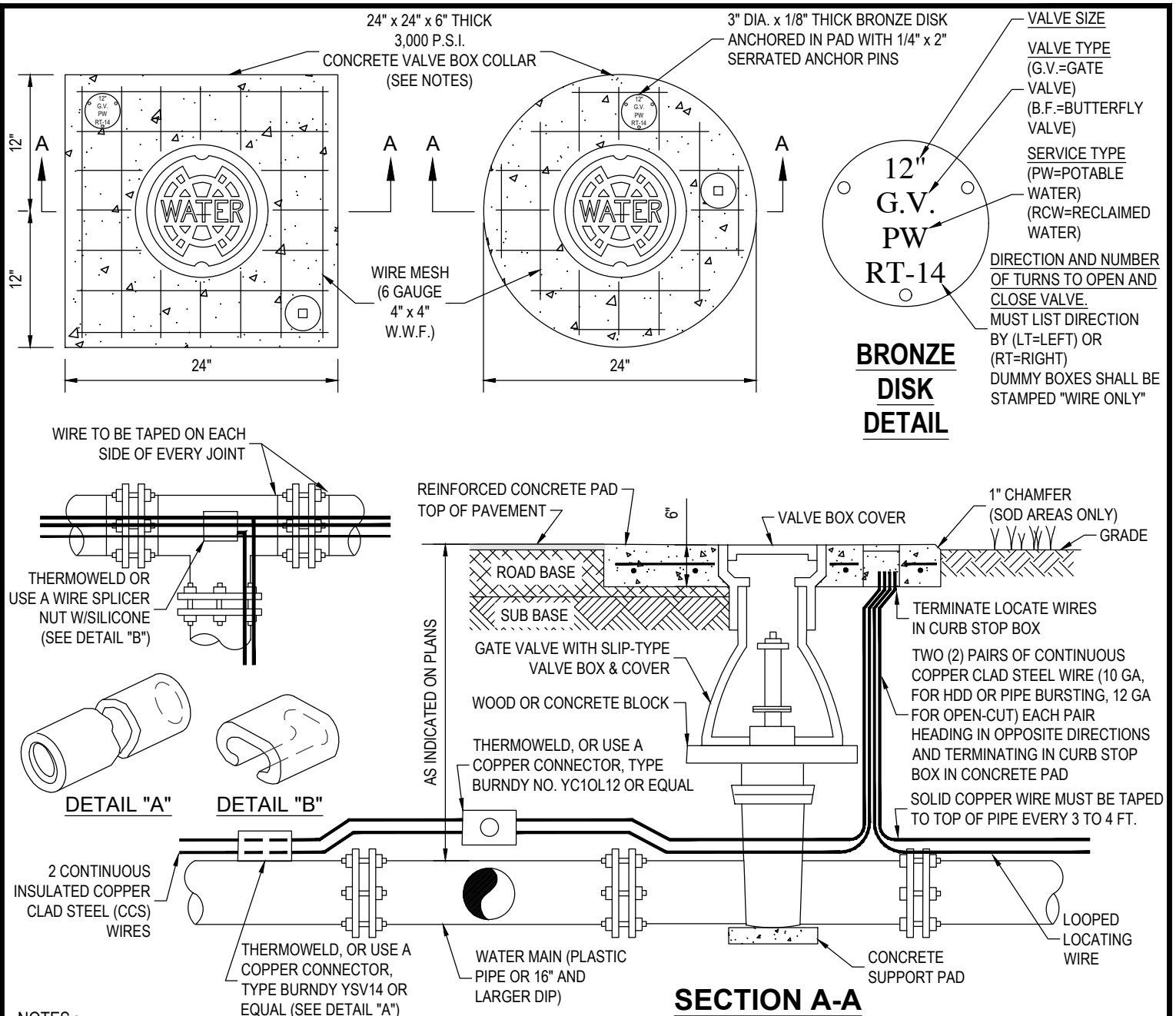
1. CIRCULAR OR SQUARE CONCRETE PAD REQUIRED FOR ALL VALVE BOX INSTALLATIONS IN PERVIOUS AREAS (I.E. OUTSIDE OF ROADWAY PAVEMENT, OUTSIDE OF CONCRETE/ASPHALT DRIVEWAYS, ETC.)
2. CAST IRON VALVE BOXES SHALL BE FIRMLY SUPPORTED AND CENTERED AND PLUMB OVER THE OPERATING NUT OF THE VALVE. VALVE BOX COVER SHALL BE FLUSH WITH THE SURFACE OF THE FINISHED PAVEMENT, OR GRADE OR AT SUCH OTHER LEVEL AS MAY BE DIRECTED BY THE DEPARTMENT.
3. "BLUE" WATER VALVE LOCATE MARKERS REQUIRED FOR ALL VALVE INSTALLATIONS.
4. EMBED BRONZE VALVE INFO DISK INTO CONCRETE VALVE BOX COLLAR.
5. ALL MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST T.W.D. APPROVED MATERIAL SPECIFICATIONS.
6. IF VALVE IS LOCATED WITHIN A SIDEWALK CONCRETE COLLAR MAY BE ELIMINATED AND DISK SET FLUSH DIRECTLY IN SIDEWALK.
7. BRONZE DISK REQUIRED FOR ALL VALVES AND DUMMY BOXES.



LAST REVISION  
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VALVE INSTALLATION  
W/VALVE BOX & PAD  
FOR DI OR CI PIPE

3.01



**NOTES :**

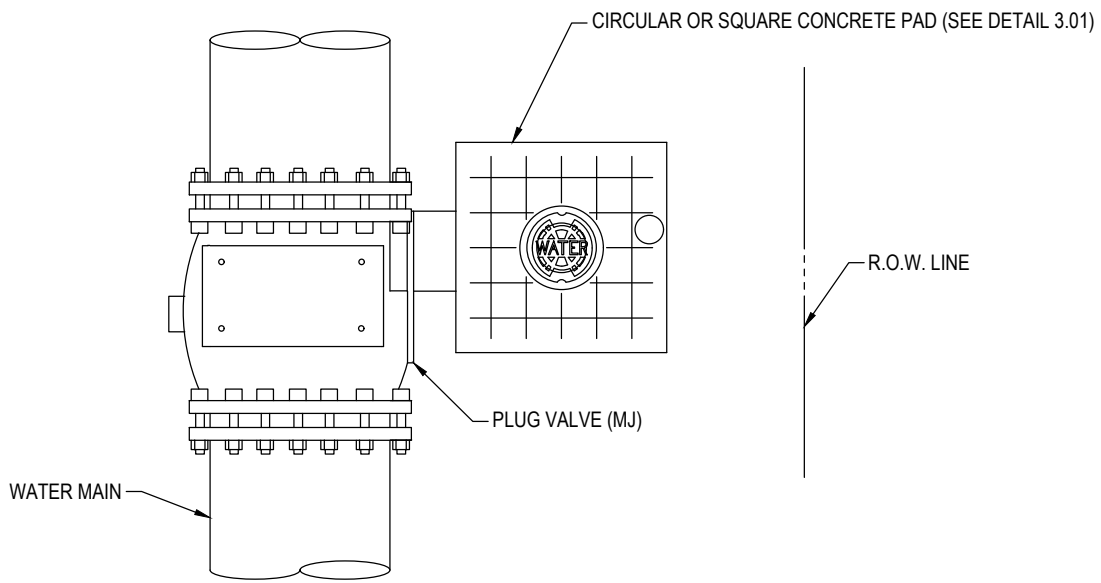
1. CIRCULAR OR SQUARE CONCRETE PAD REQUIRED FOR ALL VALVE BOX INSTALLATIONS IN PERVIOUS AREAS (I.E. OUTSIDE OF ROADWAY PAVEMENT, OUTSIDE OF CONCRETE/ASPHALT DRIVEWAYS, ETC.)
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6. IF VALVE IS LOCATED WITHIN A SIDEWALK CONCRETE COLLAR MAY BE ELIMINATED AND DISK SET FLUSH DIRECTLY IN SIDEWALK.
7. BRONZE DISK REQUIRED FOR ALL VALVES AND DUMMY BOXES.
8. ALL CONNECTIONS SHALL BE SEALED WITH A BITUMINOUS COATING FOR CORROSION PROTECTION.



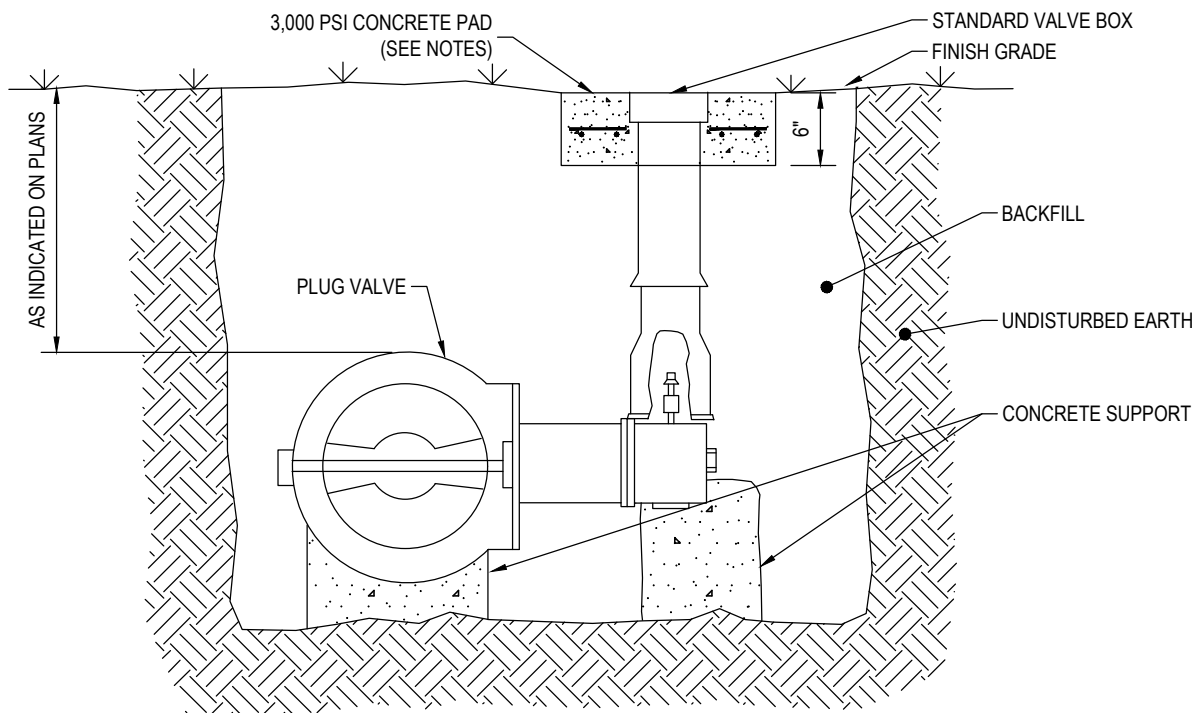
LAST REVISION  
MAY 2021

**VALVE INSTALLATION W/VALVE BOX &  
PAD FOR PLASTIC PIPE WITH DOUBLE  
COPPER TRACER WIRE ON PIPE**

3.02



**PLAN**

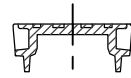


**SECTION**

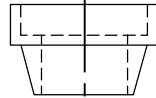
**NOTES:**

1. CIRCULAR OR SQUARE CONCRETE PADS FOR VALVE BOX AND CONCRETE SUPPORTS AS SPECIFIED IN DETAIL ABOVE SHALL BE FURNISHED WITH ALL BUTTERFLY VALVE INSTALLATIONS.
2. ORIENT VALVE SO OPERATOR IS LOCATED ON THE SIDE OF THE PIPE NEAREST THE RIGHT-OF-WAY LINE.

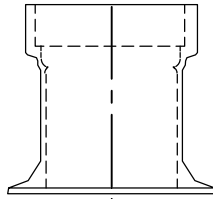
VALVE BOX COVER



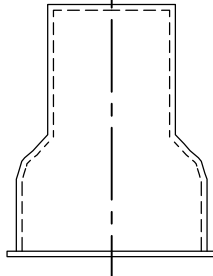
RISER



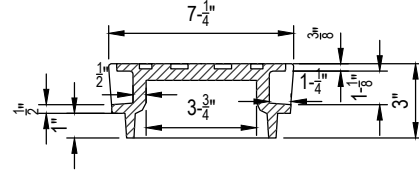
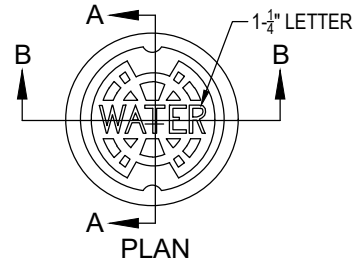
TOP SECTION



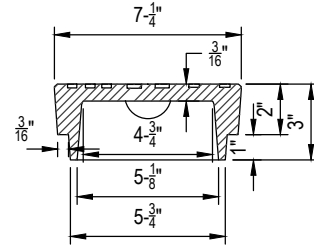
BOTTOM SECTION



**VALVE BOX ASSEMBLY**

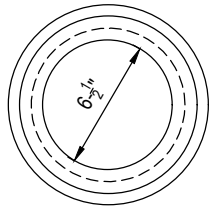


SECTION A-A

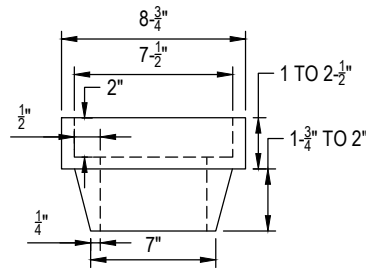


SECTION B-B

**VALVE BOX COVER**

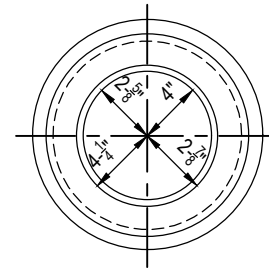


PLAN

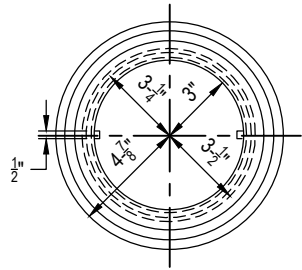


SIDE VIEW

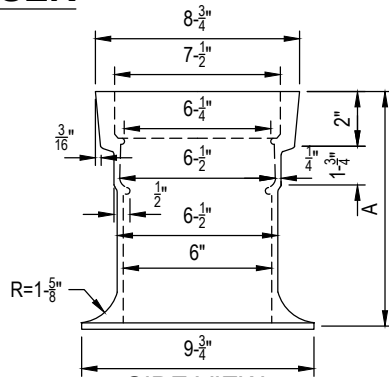
**RISER**



PLAN

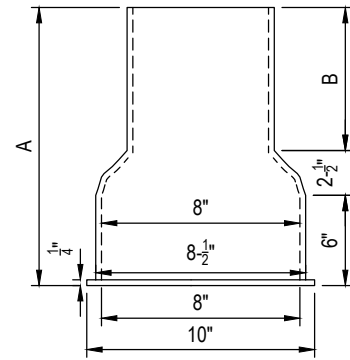


PLAN



SIDE VIEW

**TOP SECTION**



SIDE VIEW

**BOTTOM SECTION**

TOP SECTION	SIZE	A
	10"	10"
	16"	16"

BOTTOM SECTION	SIZE	A	B
	15"	15"	6-1/2"
	24"	24"	15-1/2"
	36"	36"	27-1/2"

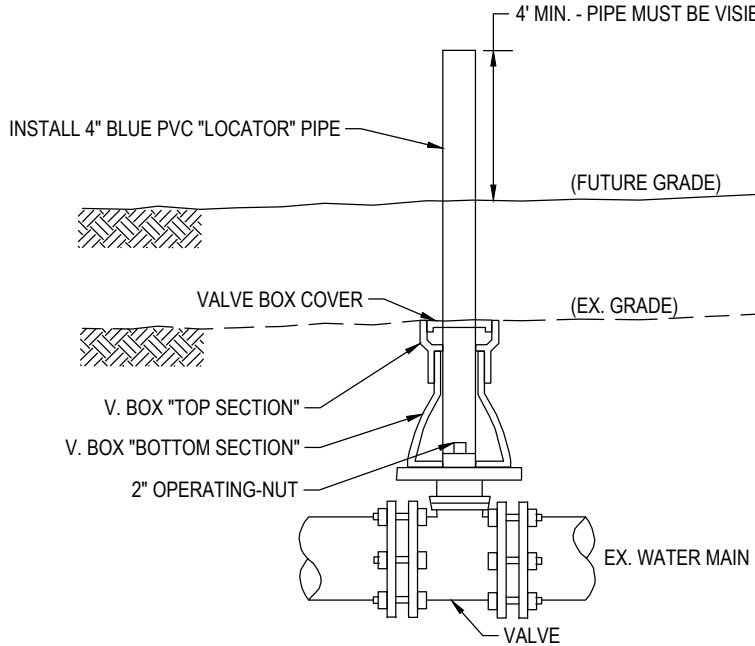


LAST REVISION  
MAY 2021

VALVE BOX, SLIP TYPE

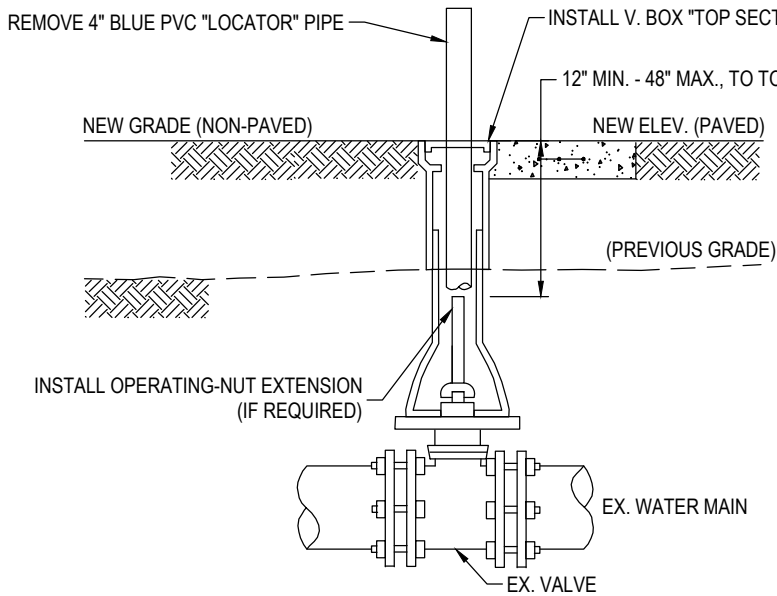
3.04

TO PROTECT VALVE BOX LOCATION DURING CLEARING & GRUBBING



1. REMOVE (OR DO NOT INSTALL) V. BOX COVER & "TOP SECTION".
2. INSTALL 4" BLUE PVC PIPE INTO V. BOX "BOTTOM SECTION", OVER 2" OPERATING- NUT, & TO 4' MIN. ABOVE FUTURE GRADE.
3. PACK ANNULAR SPACE TO PREVENT BACKFILL SOILS ENTERING V. BOX "BOTTOM SECTION".

TO ADJUST HEIGHT OF VALVE BOX FOR CHANGED GRADE

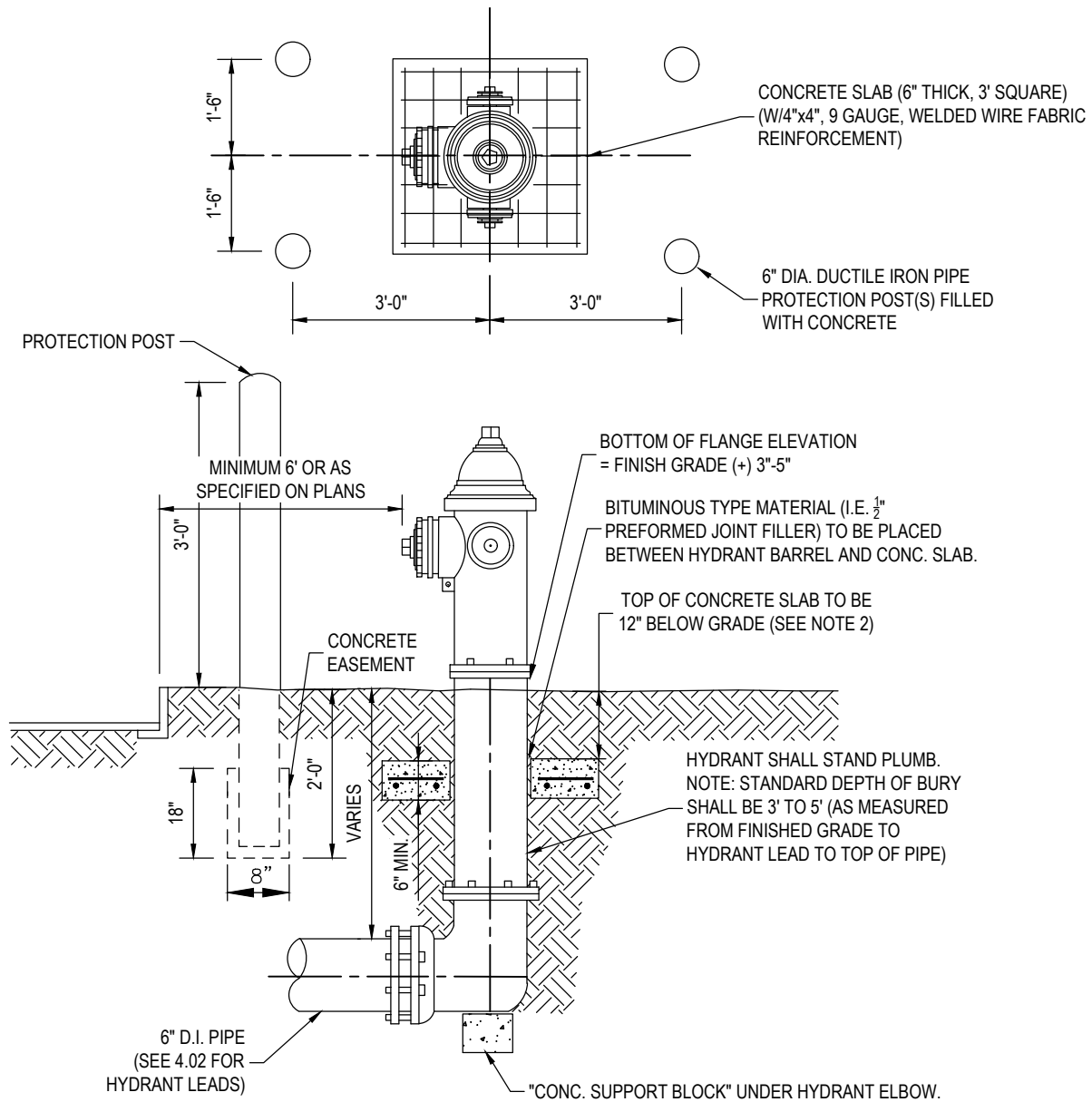


1. REMOVE PVC LOCATOR PIPE.
2. INSTALL APPROVED V. BOX "TOP SECTION" AND/OR RISER & COVER, SUCH THAT TOP OF COVER MATCHES NEW GRADE ELEVATION.
3. INSTALL STD CI OPERATING-NUT EXTENSION IF TOP OF OPERATING-NUT (T.O.N.) > 4' BELOW GRADE.  
FINAL T.O.N. TO BE ≤ 4' DEEP.
4. IN NON-PAVED AREAS, CONSTRUCT 2'X2' (OR 2' DIA.) REINFORCED CONCRETE PAD, PER STD. DETAIL 3.01 (3000 P.S.I. CONCRETE, 6-GAUGE 4"X4" W.W.F.)

**NOTES:**

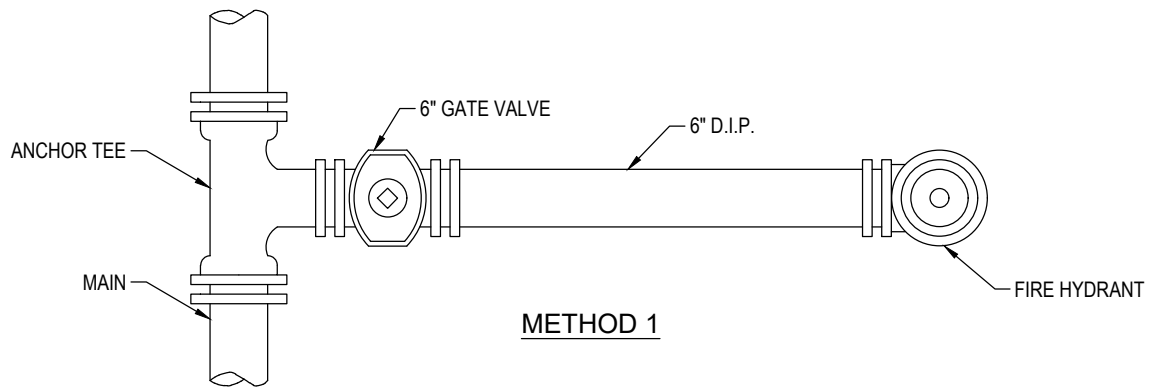
1. MATERIALS FOR & INSTALLATION OF VALVE BOXES & PADS SHALL CONFORM TO TAMPA WATER DEPT. SPECIFICATIONS & STD. CONSTRUCTION DETAILS (DETAILS 3.01 & 3.03)



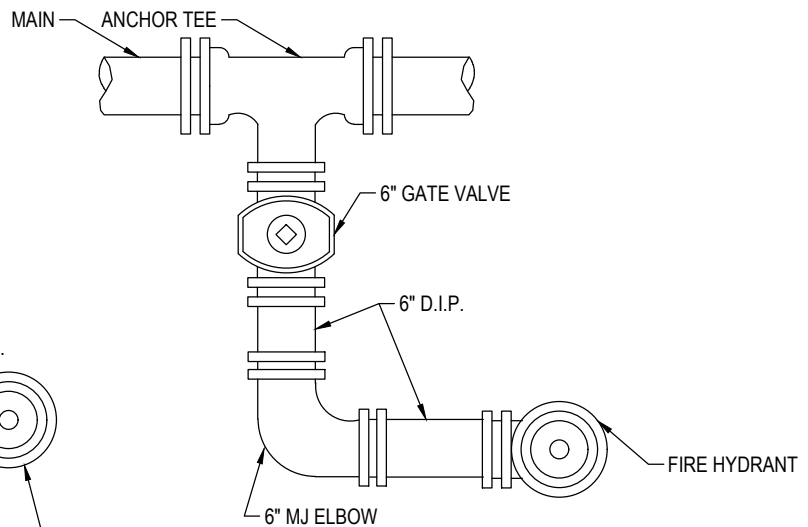


NOTES:

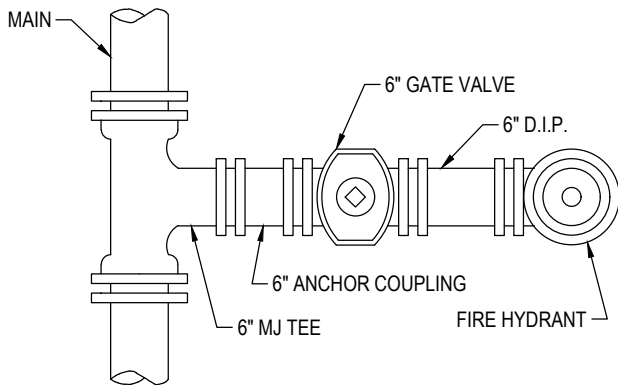
1. FIRE HYDRANT BARREL ABOVE THE GROUND LINE SHALL BE PAINTED WITH A HIGH-GRADE ENAMEL PAINT, FEDERAL SAFETY YELLOW (OSHA APPROVED), AND THE HYDRANT BONNET SHALL BE PAINTED OSHA GREEN.
2. CONCRETE SLAB MAY BE ELIMINATED IN AREAS WHERE HYDRANT IS SET IN SIDEWALK AND SIDEWALK HAS BEEN INSTALLED PRIOR TO FINAL ACCEPTANCE OF THE HYDRANT.
3. THRUST RESTRAINT FOR HYDRANT:
  - a) HYDRANT SHALL BE FIRMLY SUPPORTED UNDER ELBOW IN ALL METHODS BY SUPPORT BLOCK
  - b) ALL BACKFILL SHALL BE THOROUGHLY COMPACTED UNDER SUPPORT BLOCK AND UNDER THRUST COLLAR
  - c) ALL HYDRANT LEADS SHALL BE RESTRAINED BY MEGALUGS OR EQUIVALENT MECHANICAL RESTRAINTS
4. PROTECTION POSTS ARE REQUIRED WHEN HYDRANT IS LESS THAN 6 FEET FROM EDGE OF PAVEMENT, OR AS DIRECTED BY THE ENGINEER.
5. FOR PVC MAINS, INSTALL CONCRETE SUPPORT BLOCK UNDER ALL HYDRANT TEES.



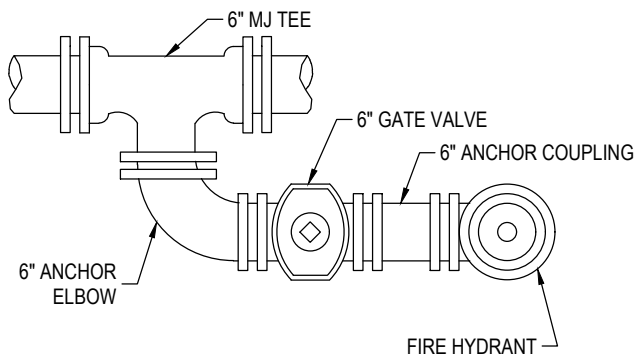
**METHOD 1**



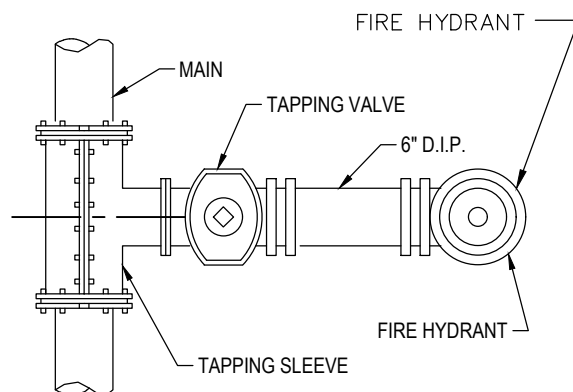
**METHOD 3**



**METHOD 2**



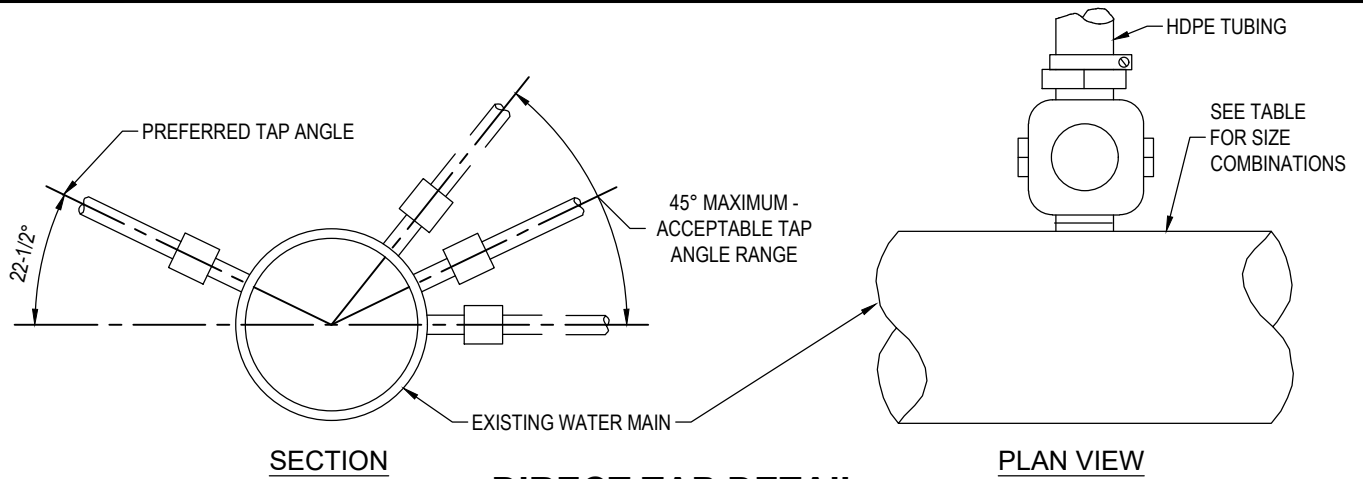
**METHOD 4**



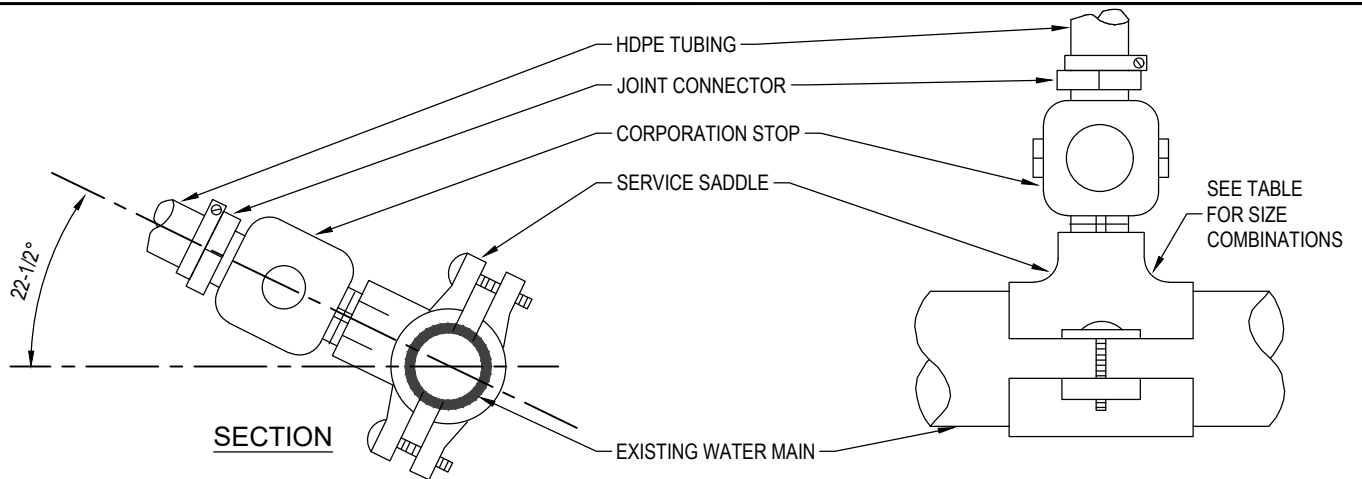
**METHOD 5**

**NOTES:**

1. VALVE SHALL BE SET IN ACCORDANCE WITH DETAIL 3.01. FOR HYDRANT SET, SEE DETAIL 4.01.
2. ALL VALVES SHALL BE ANCHORED TO BRANCH OF TEE ON ALL HYDRANT INSTALLATIONS.
3. ALL HYDRANT LEADS SHALL BE RESTRAINED BY MEGALUGS OR EQUIVALENT.
4. FOR PVC MAINS, INSTALL CONCRETE SUPPORT BLOCK UNDER HYDRANT TEES.



**DIRECT TAP DETAIL**  
FOR APPROVED VARIANCES ONLY



**SADDLE TAP DETAIL**

PIPE	SIZE	CORP. TAP SIZE	
		1"	2"
DI/CI	12"	DT	DT
	8"	DT	SS
	6"	DT	SS
	4"	SS	SS
PVC	2", 2-1/2"	SS	NA
	8", C-900	SS	SS
	6", C-900	SS	SS
	2"-SDR21	SS	NA
OTHER*	12"	SS	SS
	10"	SS	SS
	8"	SS	SS
	6"	SS	SS
	4"	SS	NA
	3"	SS	NA
	2", 2-1/2"	SS	NA

**LEGEND**

DT- DIRECT TAP CAN BE ALLOWED (FOR APPROVED VARIANCES ONLY)

SS- SERVICE SADDLE IS REQUIRED

NA- NOT ALLOWED

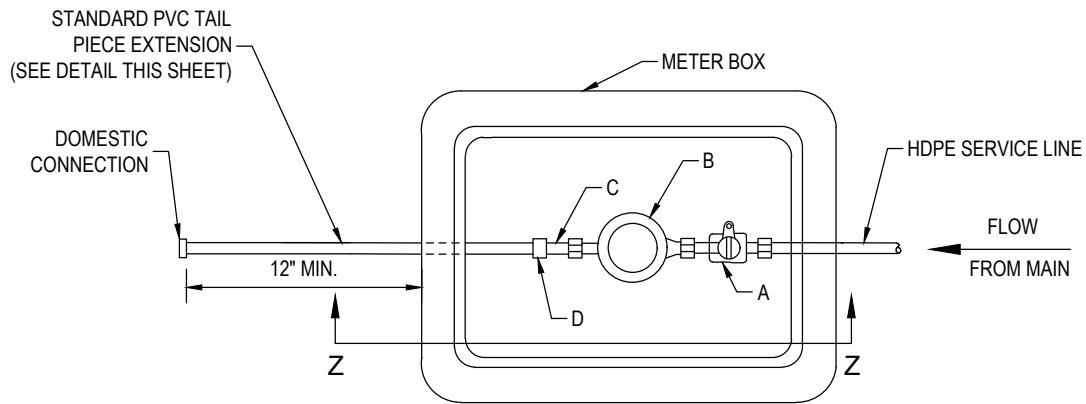
\*ASBESTOS CEMENT, STEEL, GALVANIZED IRON PIPE, NON STD PVC, ETC.



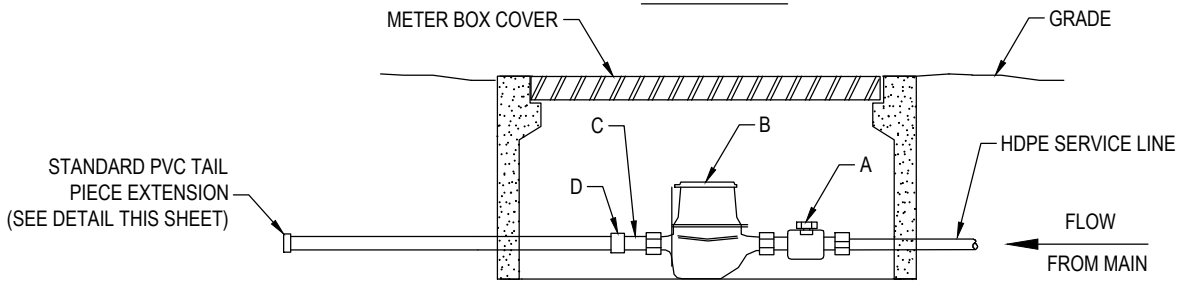
LAST REVISION  
MAY 2021

TAPPING DETAIL FOR 3/4", 1",  
1-1/2" & 2" W/DI, CI, OR PVC PIPE

5.01A

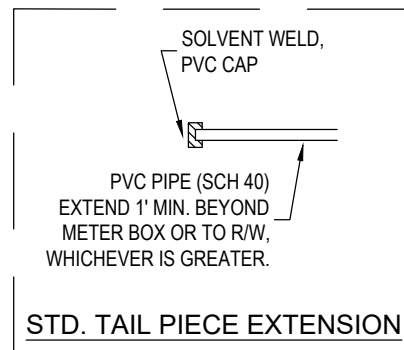


**PLAN VIEW**



**SECTION Z-Z**

METER INSTALLATION PARTS LIST	
ITEM	DESCRIPTION
A	HDPE CJ X METER, SWIVEL NUT (CURB STOP)
B	METER
C	BRASS METER COUPLING
D	*PVC FIP X WELD COUPLING



\* ALL PVC PIPE AND FITTINGS SHALL BE SCH 80 EXCEPT FOR STANDARD TAIL PIECE SECTION WHICH WILL BE SCH 40.

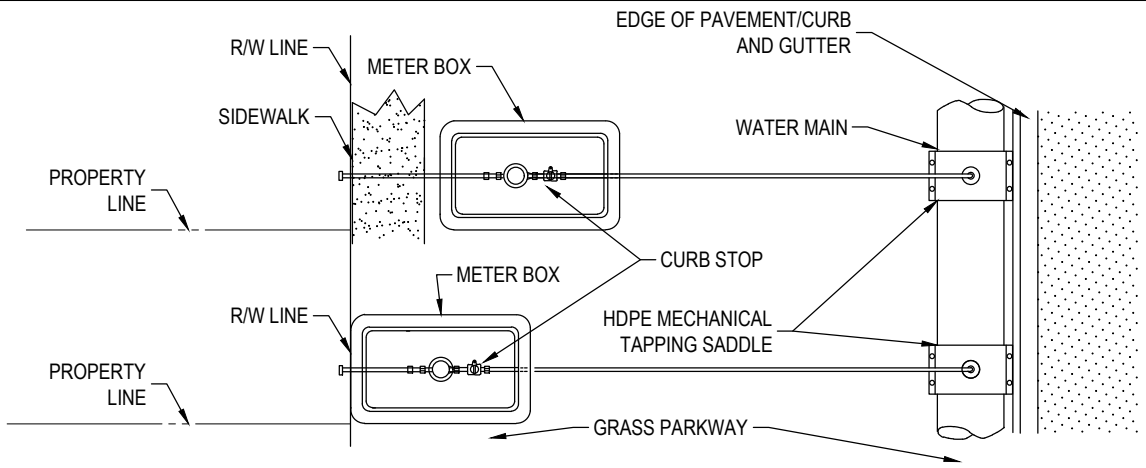
NOTE: PARTS LIST IS FOR STANDARD INSTALLATION; ACTUAL PARTS REQUIRED MAY VARY AS DIRECTED BY THE ENGINEER.



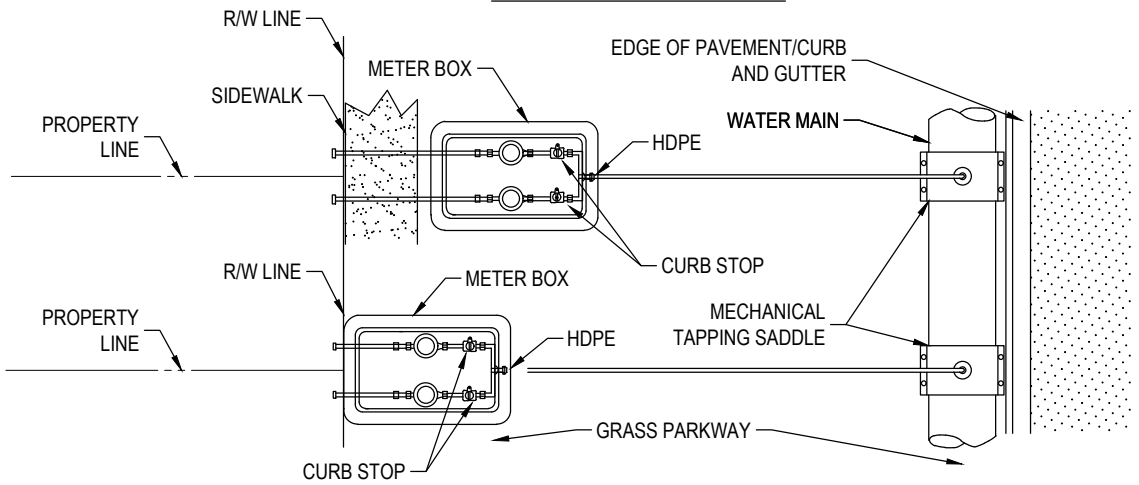
LAST REVISION  
MAY 2021

SINGLE METER SET DETAIL  
3/4", 1", 1-1/2", 2"

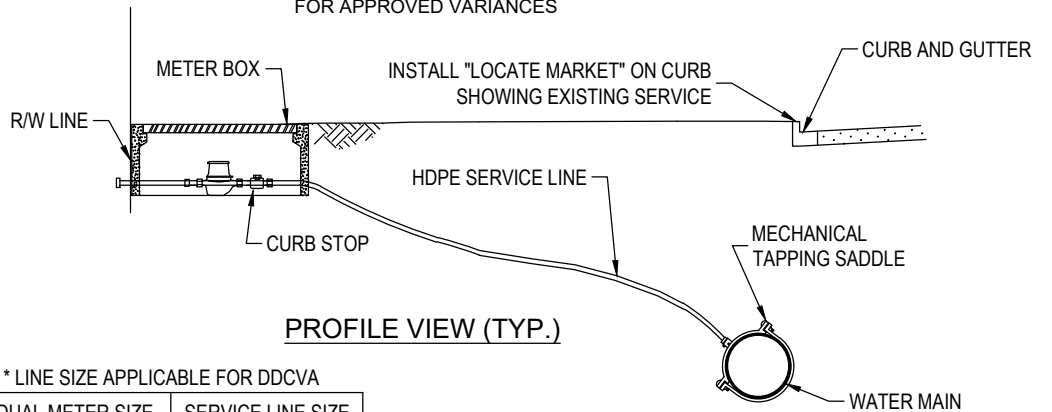
5.02



**PLAN - SINGLE METER**



**PLAN VIEW - DUAL METER  
FOR APPROVED VARIANCES**



**PROFILE VIEW (TYP.)**

DO NOT INSTALL METER WITHIN SIDEWALK. WHEN SIDEWALK EXISTS, INSTALL METER ON STREET SIDE OF SIDEWALK OR WHERE DIRECTED BY CITY ENGINEER.

SINGLE METER SIZE (INCHES)	SERVICE LINE SIZE (INCHES) (0-15')
3/4	1
1	1
1 1/2	2
2*	2

\* LINE SIZE APPLICABLE FOR DDCVA

DUAL METER SIZE (INCHES)**	SERVICE LINE SIZE (INCHES) (0-15')
3/4	2
1	2
1 1/2	N/A
2*	N/A

\*\* FOR APPROVED VARIANCES ONLY

(FEET REFER TO DISTANCE FROM WATER MAIN TO METER)

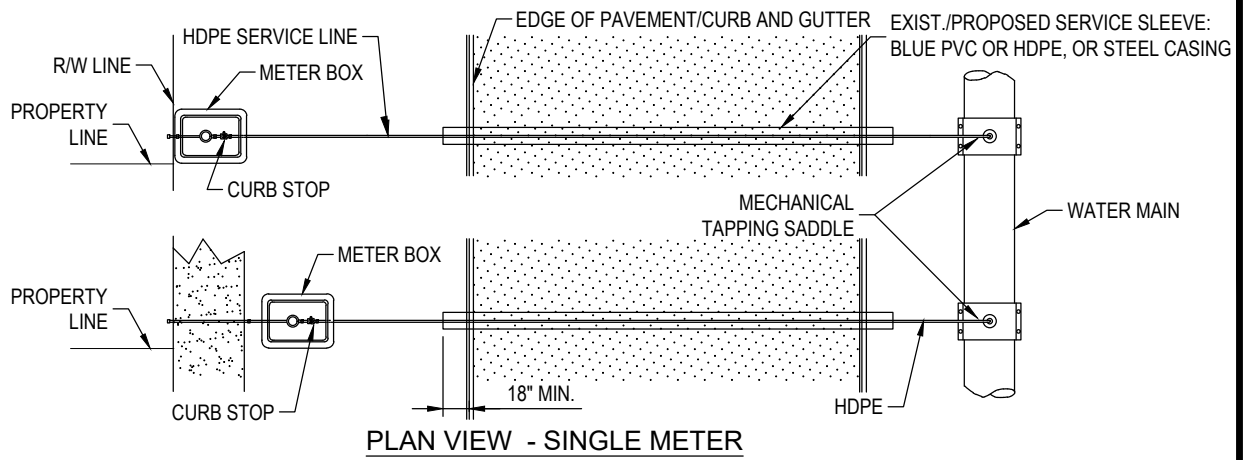


LAST REVISION

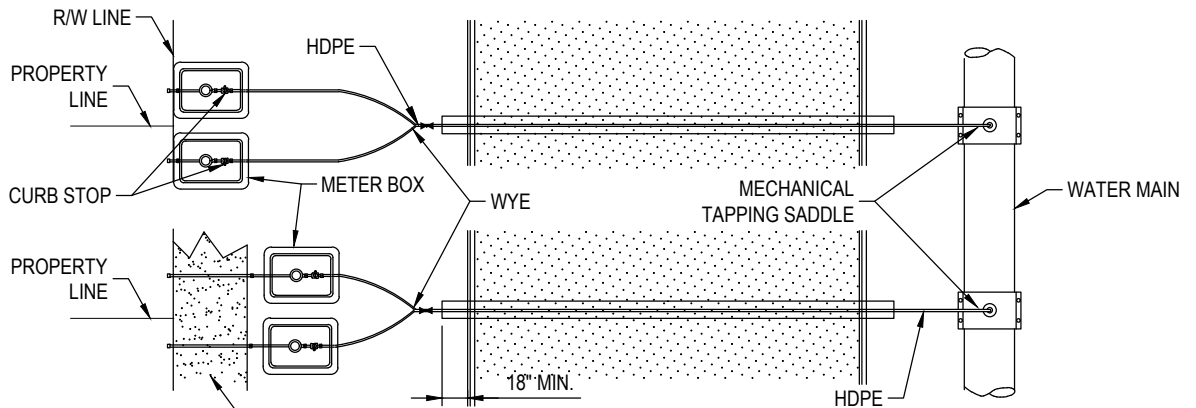
MAY 2021

**SINGLE & DUAL METERED  
SERVICE - SHORT SIDE  
3/4", 1", 1-1/2" & 2"**

5.04A

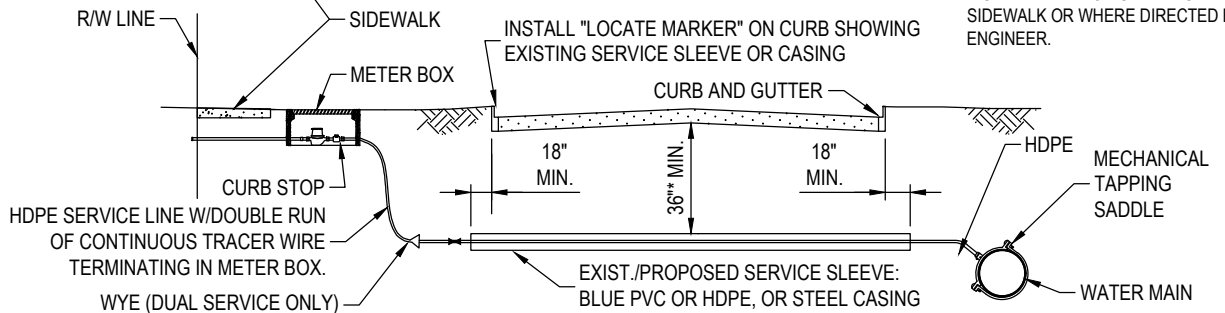


**PLAN VIEW - SINGLE METER**



**PLAN VIEW - DUAL METER  
FOR APPROVED VARIANCES**

DO NOT INSTALL METER WITHIN SIDEWALK. WHEN SIDEWALK EXISTS, INSTALL METER ON STREET SIDE OF SIDEWALK OR WHERE DIRECTED BY ENGINEER.



**PROFILE VIEW (TYP.)**

**CASING SPECIFICATION:**

1. IF PUSHED-SCH 40 STEEL PIPE (MIN.)
2. IF LAYED IN OPEN TRENCH-SCH 40 STEEL PIPE OR SCH 80 PVC SOLVENT WELD PIPE.
3. IF USING HDPE TUBING (UP TO 2")-SDR-9 200 PSI, TYPE III, COLOR AND UV CODE E, CLASS C, PE 4710, AWWA C-901, NSF-61, MIN. CELL CLASSIFICATION OF PE 454474 E
4. IF USING HDPE PIPE (4" OR LARGER)-DR-11 160 PSI, PE 4710, AWWA C-906, NSF-61, MIN. CELL CLASSIFICATION OF PE 454474 C. EXTERIOR COLOR TO BE SOLID BLUE OR BLACK W/BUE STRIPES (90 OR 120 DEGREES APART)

\* OR GREATER, IF REQUIRED BY ROW CONTROLLING AGENCY

\*\* LINE SIZES APPLICABLE FOR 2" DDCV

SINGLE METER SIZE (INCHES)	SERVICE LINE SIZE (INCHES)		CASING SIZE (INCHES)
	(15'-80')	(80'-150')	
3/4	1	2	2 1/4
1	2	2	4
1 1/2	2	2	4
2**	4" D.I.P.	4" D.I.P.	12

(FEET REFER TO DISTANCE FROM WATER MAIN TO METER)

DUAL METER SIZE (INCHES)***	SERVICE LINE SIZE (INCHES)		CASING SIZE (INCHES)
	(15'-80')	(80'-150')	
3/4	2	2	4
1	2	4" D.I.P.	4 / 12
1 1/2	N/A	N/A	N/A
2"	N/A	N/A	N/A

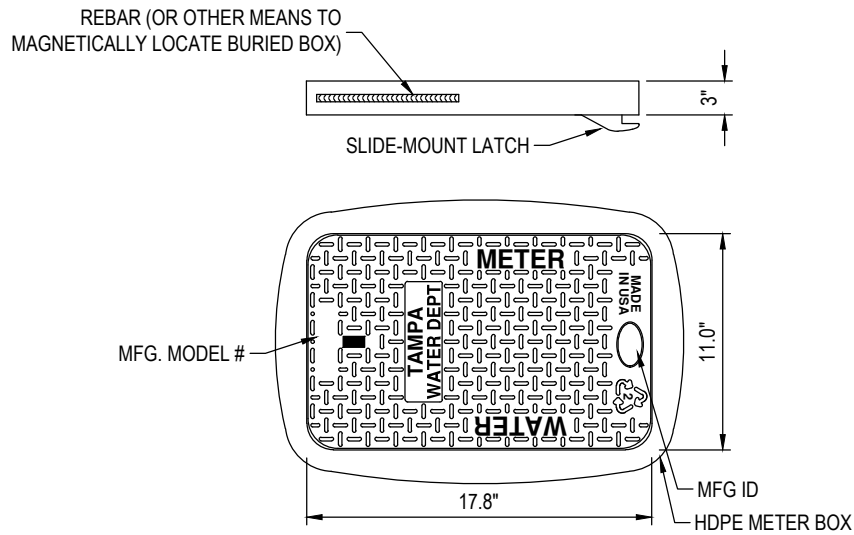
\*\*\* FOR APPROVED VARIANCES ONLY



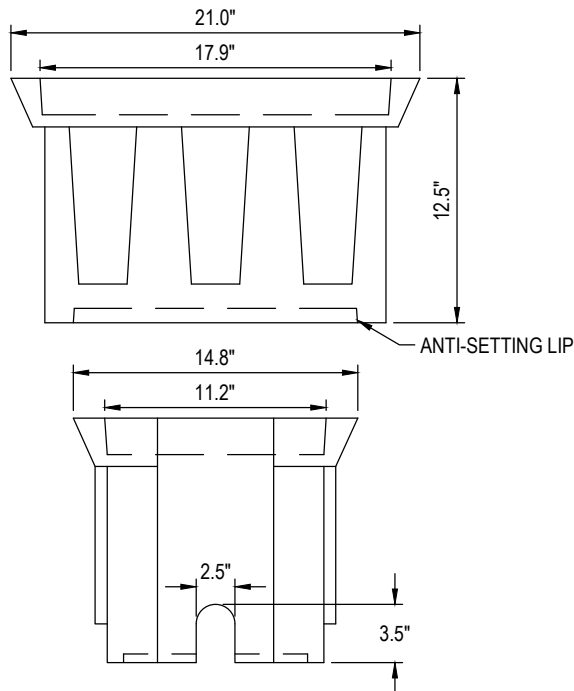
LAST REVISION  
MAY 2021

**SINGLE & DUAL METERED  
SERVICE - LONG SIDE  
3/4", 1", 1-1/2" & 2"**

5.05A



**ANTI-FLOAT LID W/REBAR & AMR SNAP-LOCK SLIDE MOUNT**



**HDPE METER BOX w/LIP**

**#37 HDPE METER BOX W/COVER**

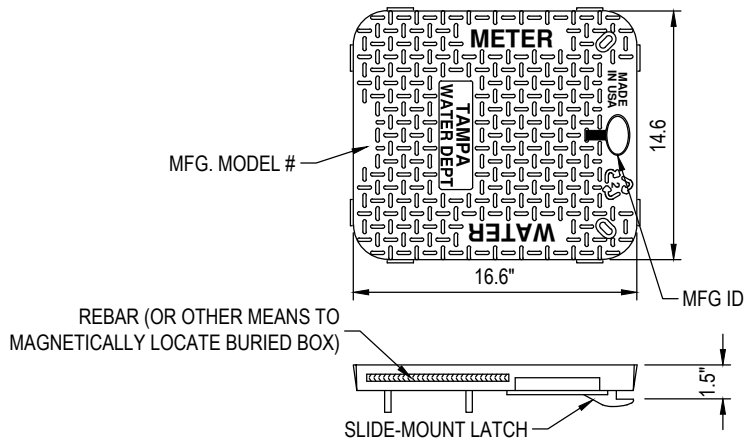
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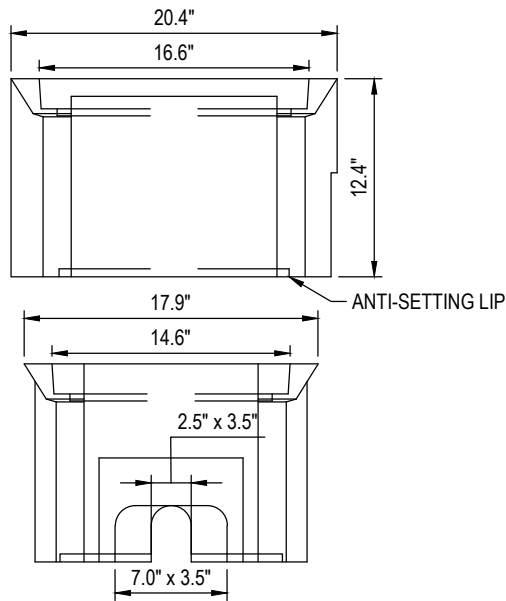
LAST REVISION  
MAY 2021

3/4" OR 1" SINGLE SERVICE  
HDPE METER BOX

5.10



**ANTI-FLOAT LID W/REBAR & AMR SNAP-LOCK SLIDE MOUNT**



**HDPE METER BOX w/LIP**

**"DUAL-H" HDPE METER BOX W/COVER**

N.T.S.



LAST REVISION  
MAY 2021

3/4" OR 1" DUAL SERVICE  
HDPE METER BOX

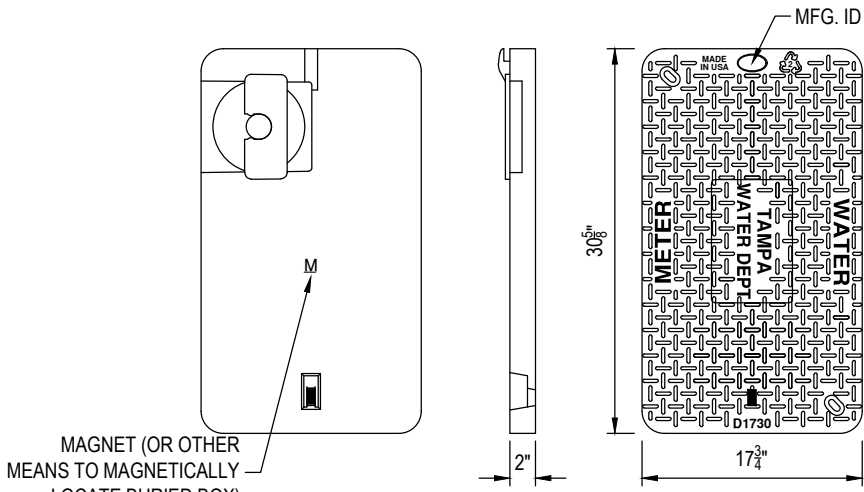
5.11



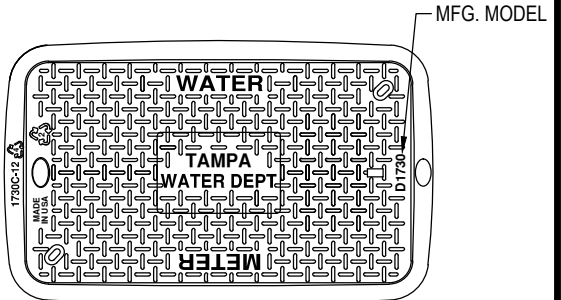
BODY KEY	
H	HEAVY WALL, $\frac{1}{2}$ "

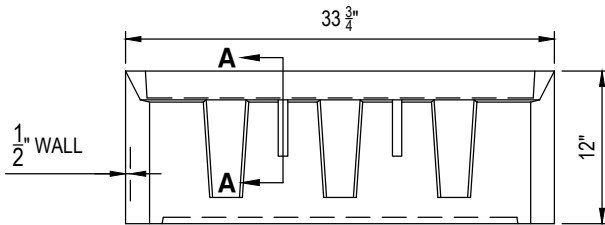
LID KEY	
AF	ANTI-FLOAT MATERIAL
1	BLACK COLOR
M	MAGNET
A	AMR SLIDE MOUNT
TPA	TAMPA WATER



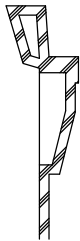
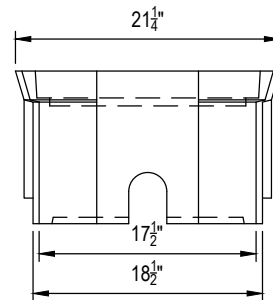
**1730C-AF1MA TPA-LID**



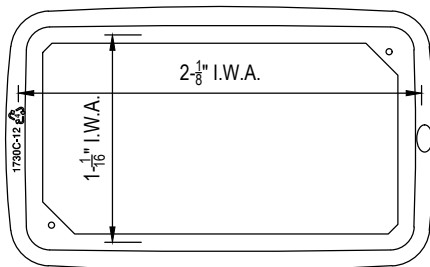
**1730CH-12-AF1MA TPA**



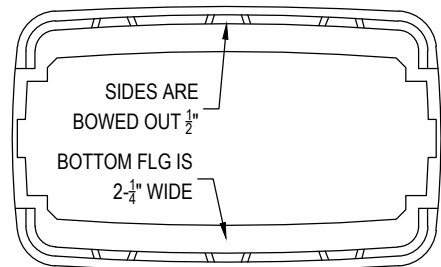
**1730CH-12-BODY**



**LIFT STRUCTURE  
SECTION A-A**



**1730CH-12-BODY**



**BOTTOM VIEW**

**NOTES**

- 1) DIM'S  $\pm 1/8$ " U.N.O.
- 2) LID MATERIAL: HDPE
- 3) BODY MATERIAL: LLDPE
- 4) WALL THICKNESS:  $1/2$ " MINIMUM
- 5) I.W.A. = INSIDE WORK AREA.
- 6) SNAP LOCK POCKET WILL RECEIVE AMR/AMI DEVICE ENDPOINT. SNAP LOCK SLOT IS  $1.80" \pm .015"$  TO ALLOW FOR A FINGER FORCE INSTALL. POCKET HEIGHT IS  $15/16"$  FOR MIN  $1/8"$  AIR GAP.

N.T.S.

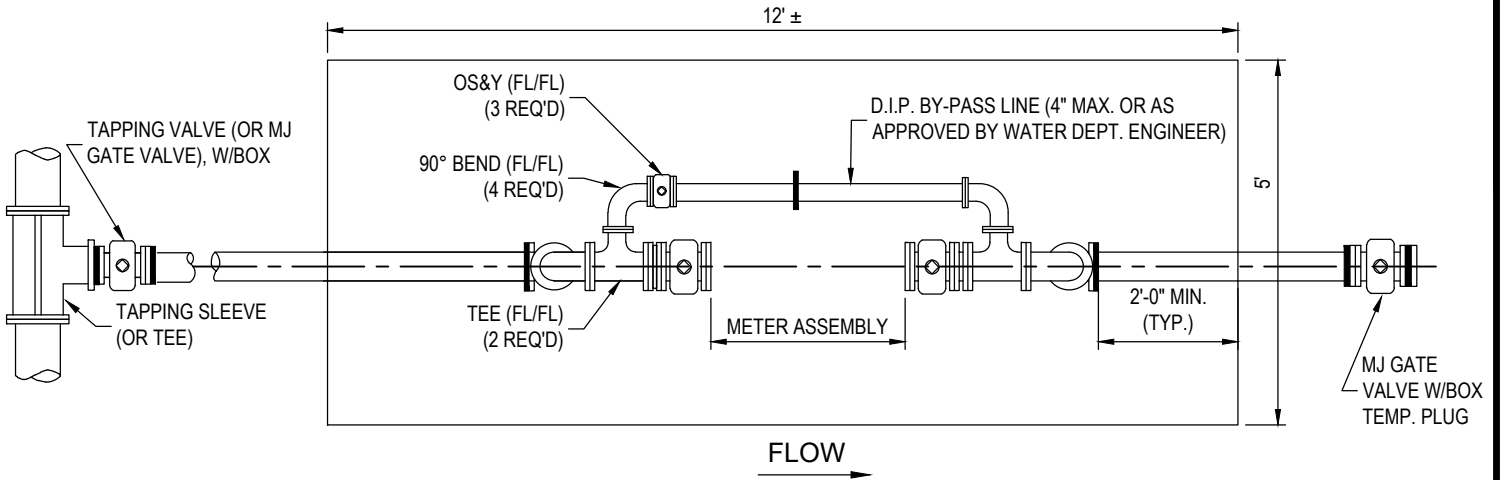
**#66 HDPE METER BOX W/COVER**



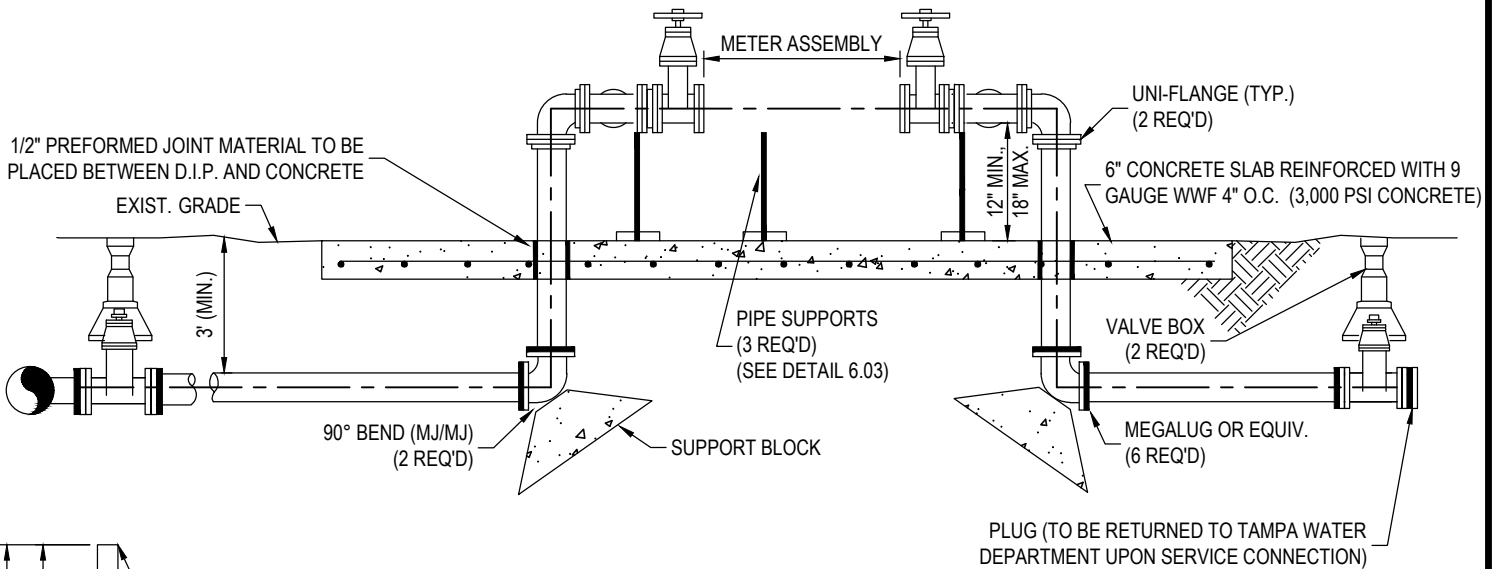
LAST REVISION  
MAY 2021

1-1/2" & 2" SINGLE SERVICE  
HDPE METER BOX

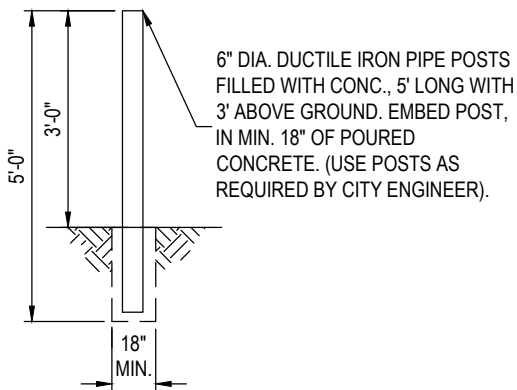
5.12



**PLAN**



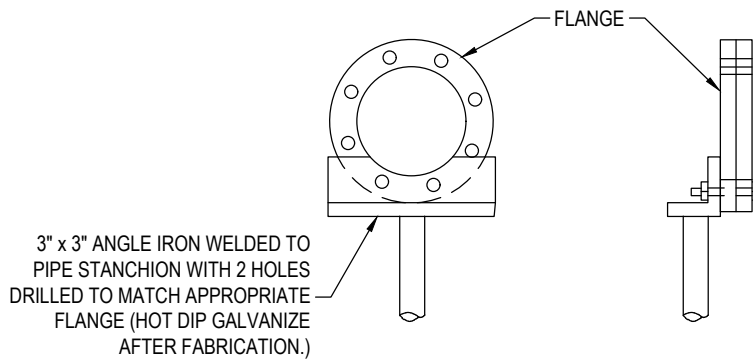
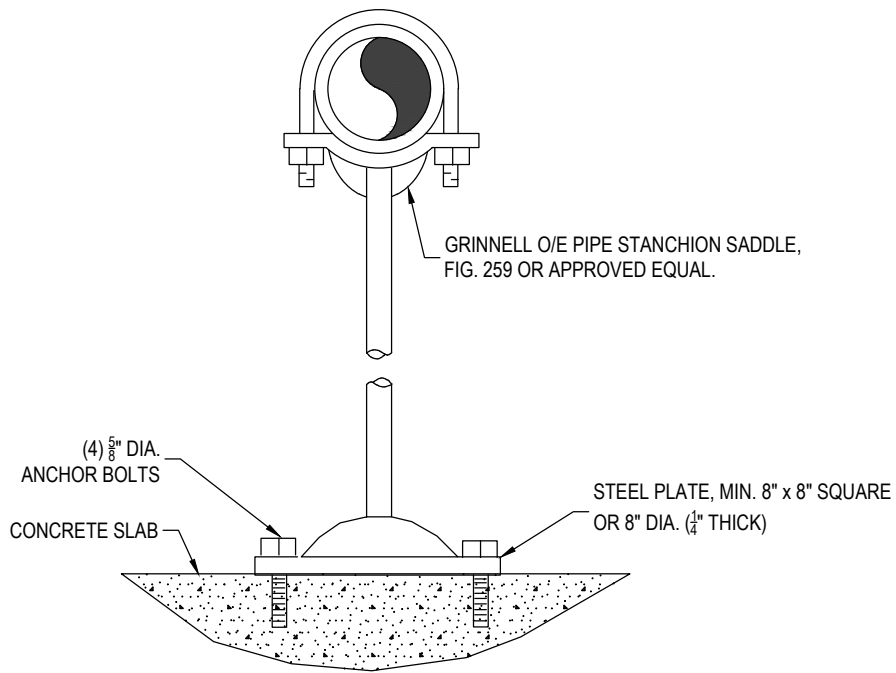
**PROFILE**

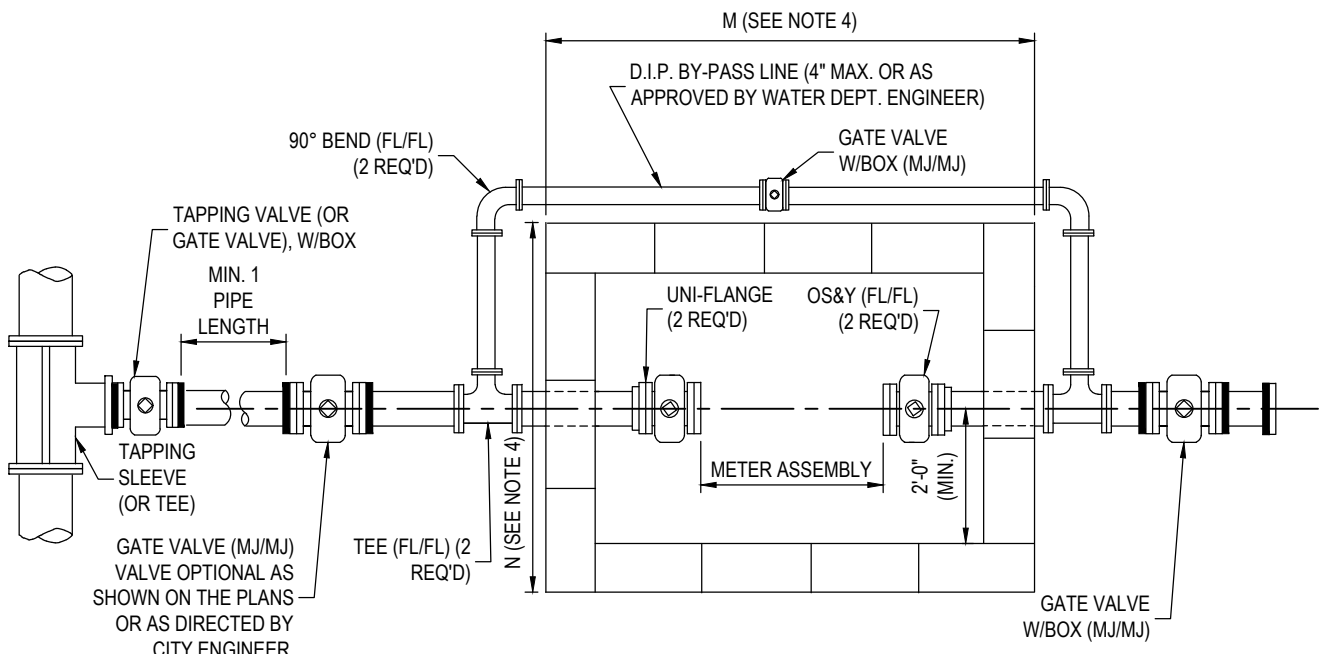


**BOLLARD POST DETAIL**

N.T.S.

	<p>LAST REVISION MAY 2021</p>	<p>ABOVE GROUND LARGE METER ASSEMBLY (3" OR LARGER)</p>	<p>6.01A</p>
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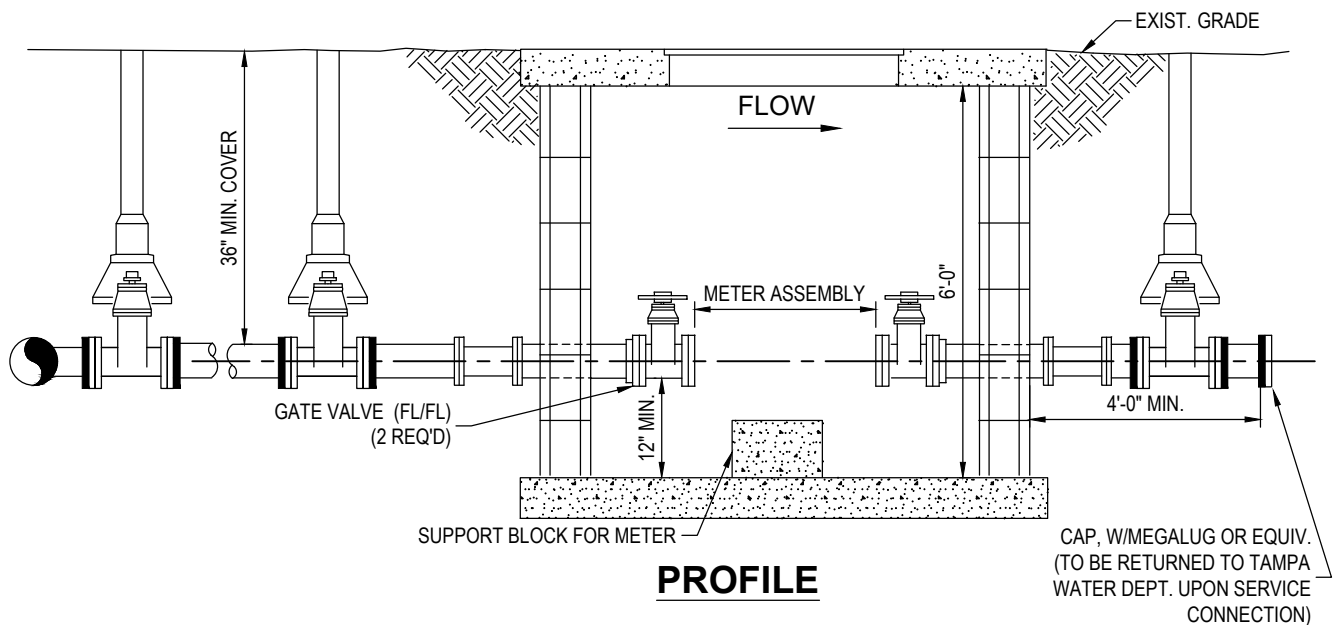




**PLAN**

**NOTE: CONSTRUCTION OF VAULT WITHOUT METER**

1. SET UNIFLANGE AT MINIMUM DISTANCE FROM WALL AND ATTACH ISOLATION VALVES.
2. SPAN DISTANCE BETWEEN ISOLATION VALVES WITH SINGLE PIECE OF PIPE.
3. TO INSTALL METER, REMOVE PIPE BETWEEN VALVES AND ATTACH METER TO ONE VALVE. PIPE SHALL BE CUT TO SIZE TO SPAN THE DISTANCE BETWEEN METER AND SECOND VALVE.
4. SEE DETAILS 6.07 & 6.08 FOR VAULT DETAILS AND DIMENSIONS.



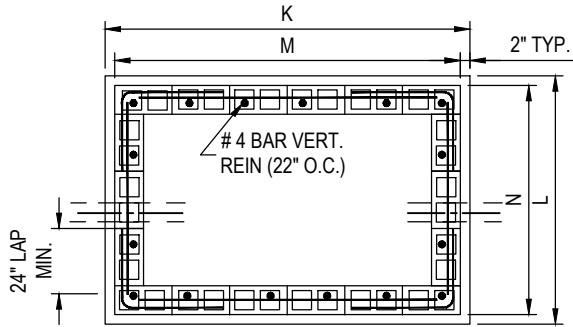
**PROFILE**

METER SIZE	TOP & BOTTOM SLAB SIZE		VAULT SIZE	
	K	L	M	N
3" & 4" COMPOUND METER	6'-4"	6'-4"	6'-0"	6'-0"
3", 4", 6", 8" METER	8'-4"	5'-8"	8'-0"	5'-4"
4" DOUBLE DETECTOR CHECK	6'-4"	6'-4"	6'-0"	6'-0"
6" DOUBLE DETECTOR CHECK	8'-4"	5'-8"	8'-0"	5'-4"
8" DOUBLE DETECTOR CHECK	9'-8"	8'-4"	9'-4"	8'-0"
10" DOUBLE DETECTOR CHECK	11'-0"	8'-4"	10'-8"	8'-0"
4", 6", 8" DDCV & ≥ 3" DOM. METER	8'-4"	9'-8"	8'-0"	9'-4"
10" DDCV & ≥ 3" DOM. METER	8'-4"	11'-0"	8'-0"	10'-8"

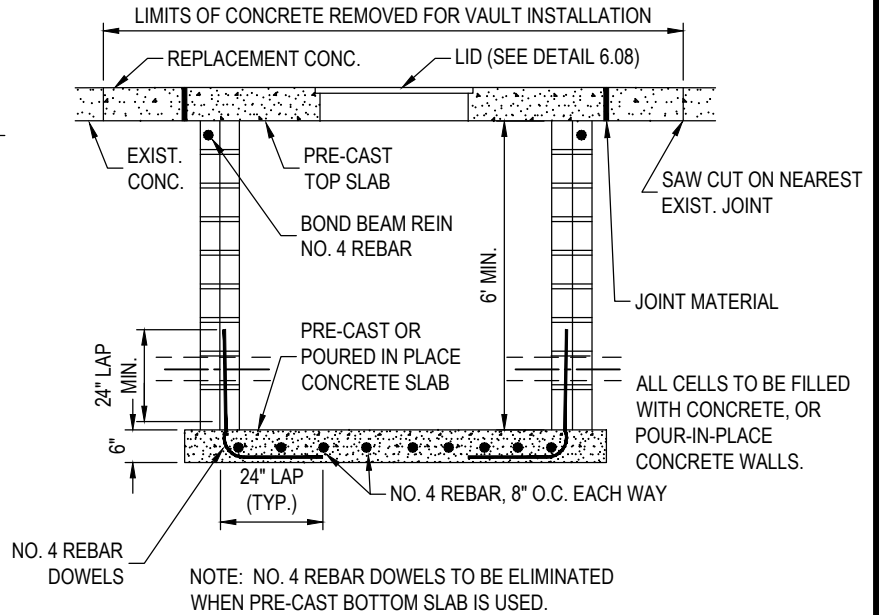
NOTE: VAULT AND SLAB SIZES MAY VARY AS DIRECTED BY THE CITY ENGINEER.

### VAULT DIMENSIONS

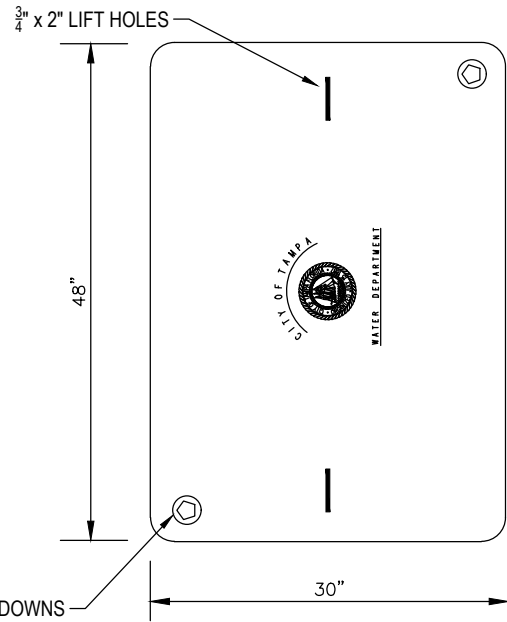
ALL CONCRETE POURED INTO CELLS SHALL BE A MIN. OF 3,000 P.S.I. STRENGTH



NOTE: BITUMINOUS TYPE MATERIAL (1/2" PREFORMED JOINT MATERIAL, TAR PAPER) IS TO BE PLACED BETWEEN PRE-CAST SLAB AND ANY CONCRETE SURFACES WHEN INSTALLED IN SAME



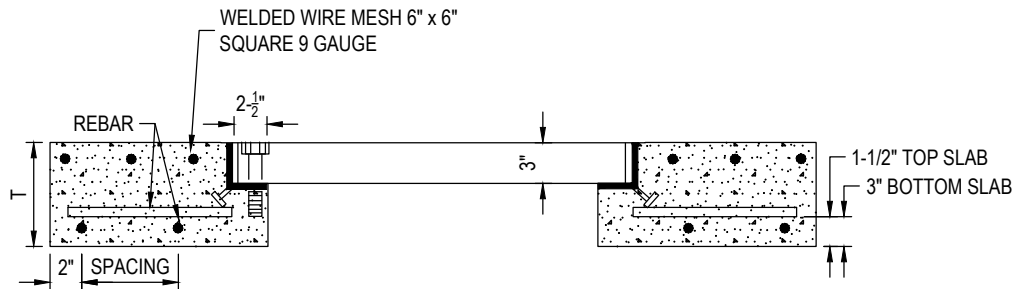
SLAB SIZE			REBAR			
K	L	T	K		L	
			SIZE	SPACING	SIZE	SPACING
<b>TOP SLAB</b>						
6'-4"	6'-4"	6"	NO. 6	7-1/2"	NO. 6	7-1/2"
6'-4"	5'-8"	6"	NO. 6	5-1/4"	NO. 6	8-1/2"
9'-8"	8'-4"	8"	NO. 6	5-1/8"	NO. 6	6"
11'-0"	8'-4"	8"	NO. 6	5-1/8"	NO. 6	6"
<b>BOTTOM SLAB</b>						
6'-4"	6'-4"	6"	NO. 4	8"	NO. 4	8"
6'-4"	5'-8"	6"	NO. 4	8"	NO. 4	8"
9'-8"	8'-4"	8"	NO. 4	8"	NO. 4	8"
11'-0"	8'-4"	8"	NO. 4	8"	NO. 4	8"



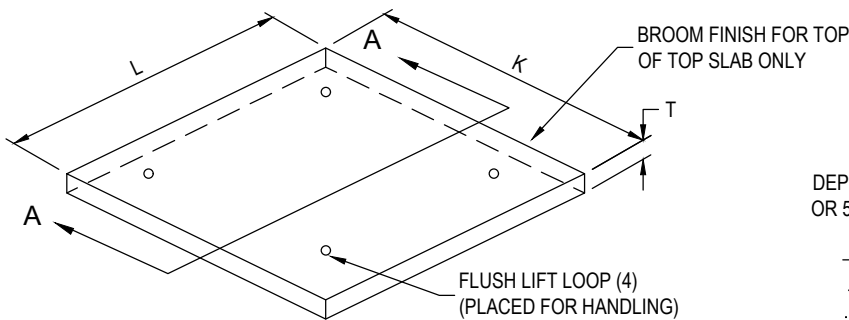
**POLYMER CONCRETE COVER**

CONCRETE - 4,500 PSI 28 DAY STRENGTH  
STEEL - 60 PSI YIELD STRENGTH

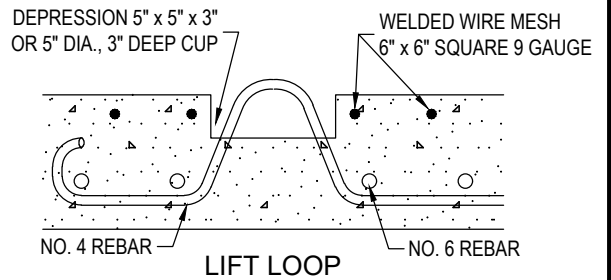
NOTE: SLAB SIZE MAY VARY AS  
DETERMINED BY CITY ENGINEER.

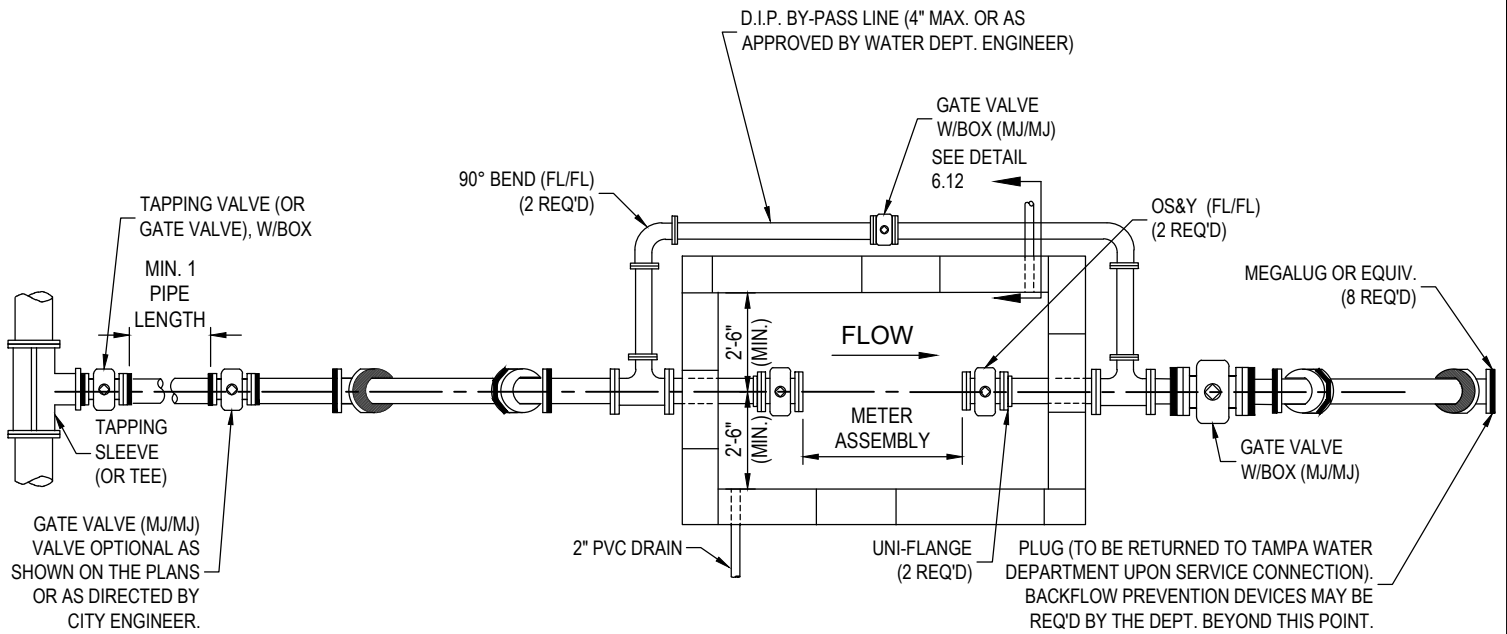


**CROSS SECTION A-A**



**SLAB ISOMETRIC**

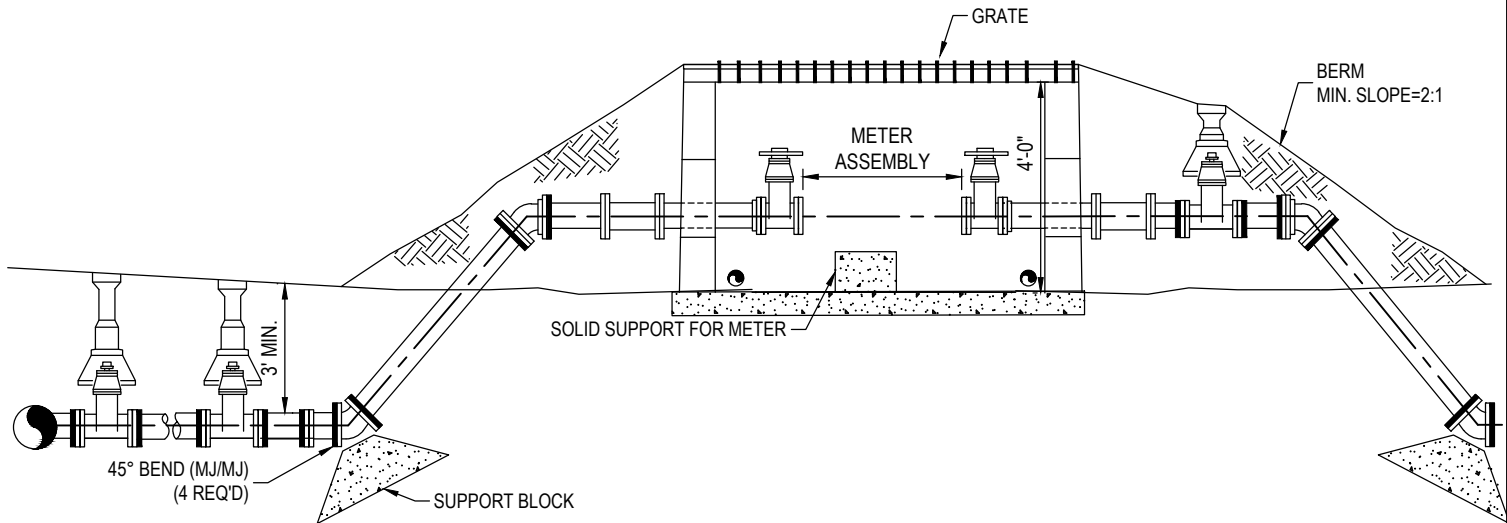




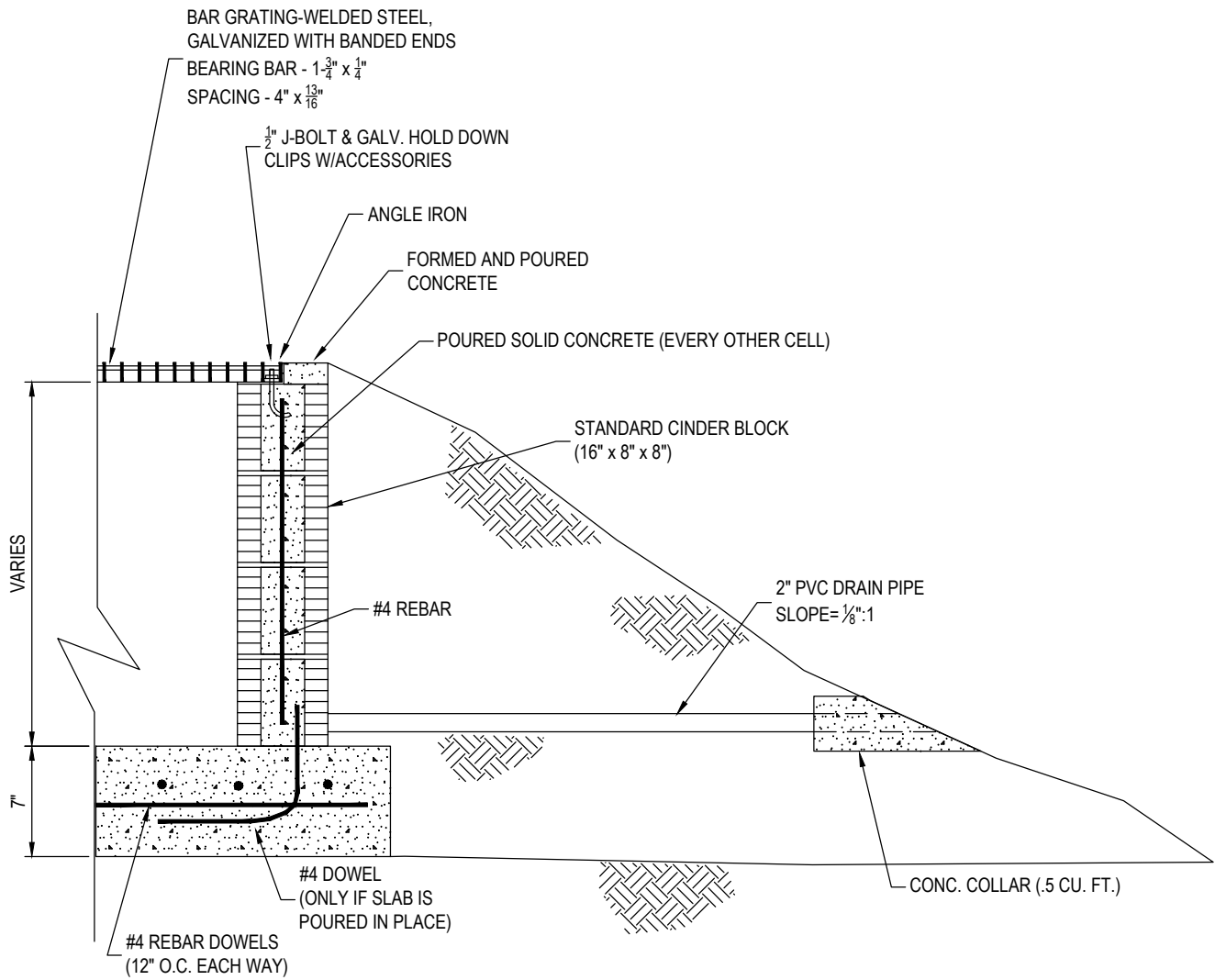
**PLAN**

NOTES:

1. SEE DETAIL 6.12 FOR ABOVE GROUND VAULT DETAILS
2. MINIMUM CLEARANCE FOR ALL INTERNAL AND EXTERNAL FITTINGS SHALL BE 8" FROM ALL WALLS



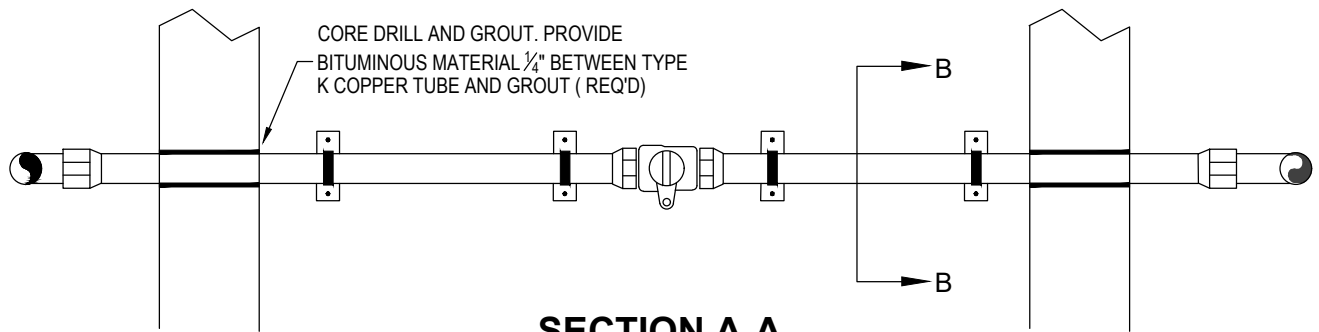
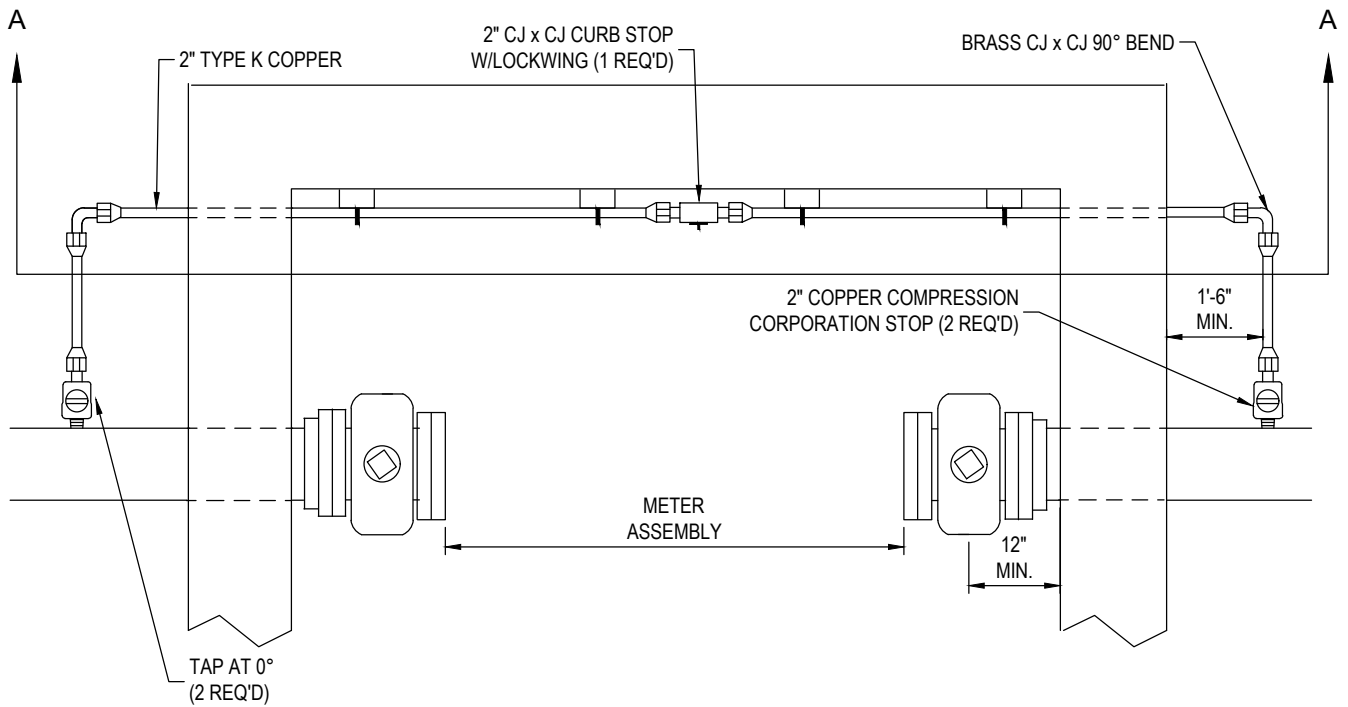
**PROFILE**



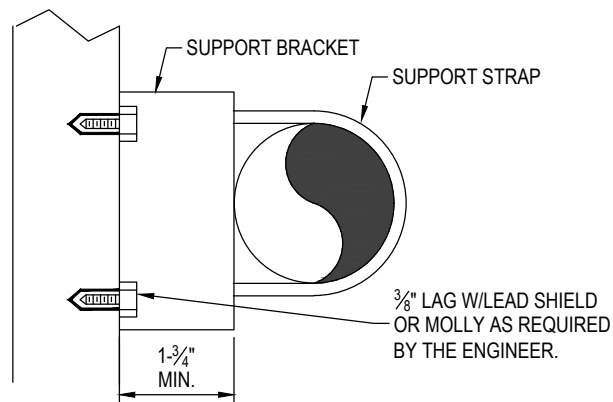
### TYPICAL CROSS SECTION DETAIL

NOTE: ALL CONCRETE SHALL HAVE A MIN. COMPRESSIVE STRENGTH OF 3000 PSI IN 28 DAYS.

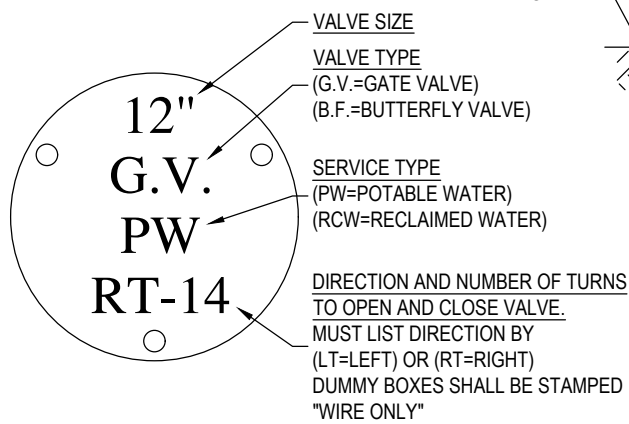
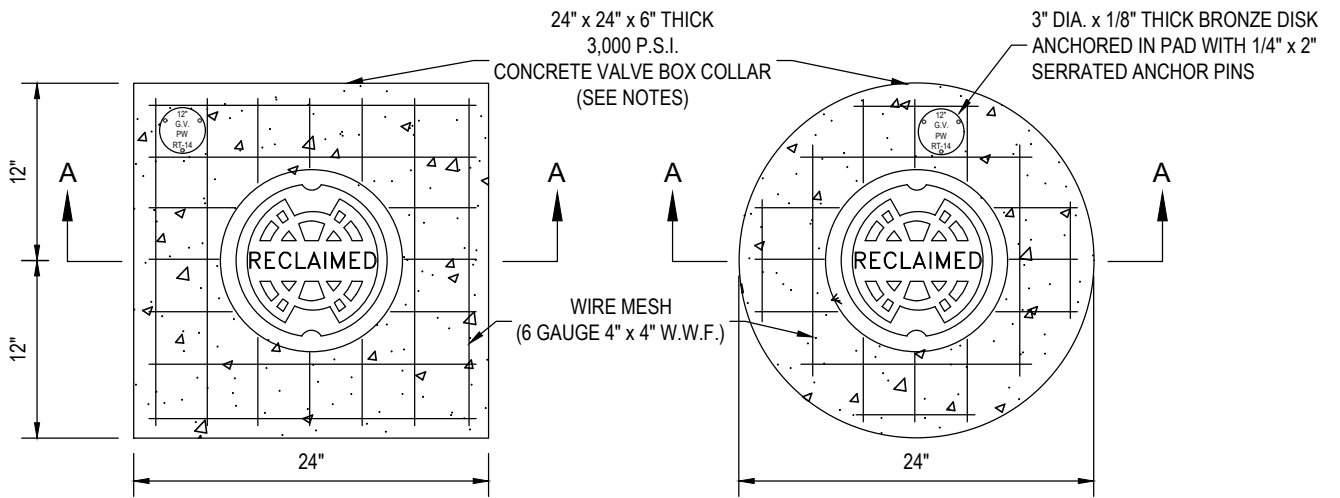




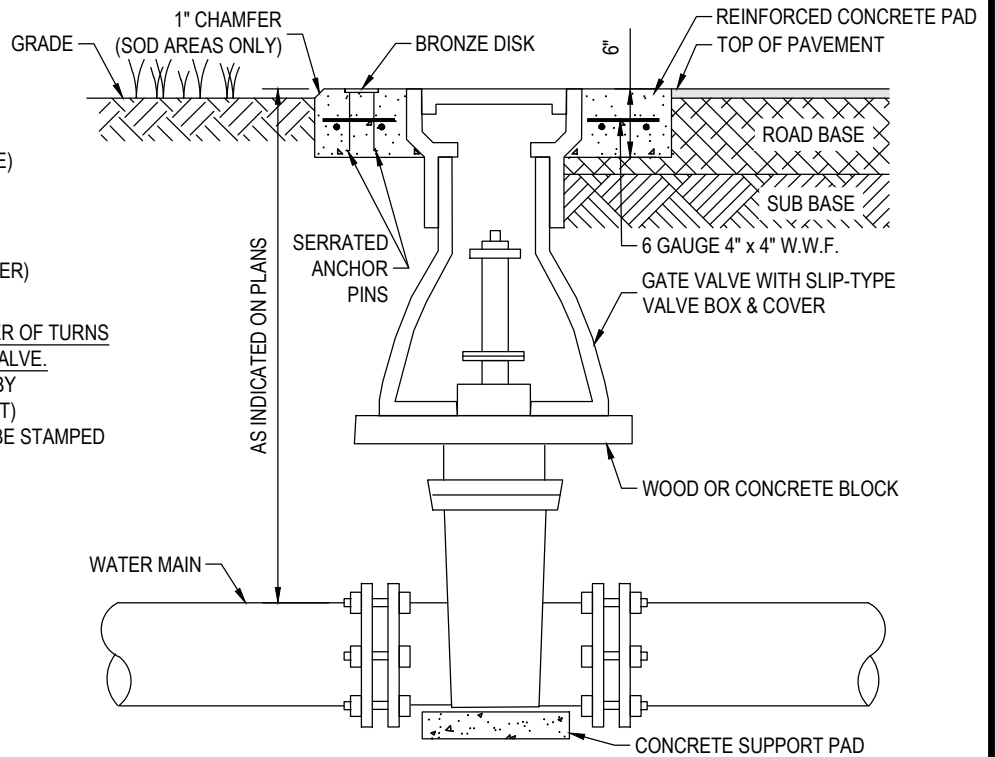
**SECTION A-A**



**SECTION B-B**



**BRONZE DISK DETAIL**



**NOTES :**

1. CIRCULAR OR SQUARE CONCRETE PAD REQUIRED FOR ALL VALVE BOX INSTALLATIONS IN PERVIOUS AREAS (I.E. OUTSIDE OF ROADWAY PAVEMENT, OUTSIDE OF CONCRETE/ASPHALT DRIVEWAYS, ETC.)
2. CAST IRON VALVE BOXES SHALL BE FIRMLY SUPPORTED AND CENTERED AND PLUMB OVER THE OPERATING NUT OF THE VALVE. VALVE BOX COVER SHALL BE FLUSH WITH THE SURFACE OF THE FINISHED PAVEMENT, OR GRADE OR AT SUCH OTHER LEVEL AS MAY BE DIRECTED BY THE DEPARTMENT.
3. "BLUE" WATER VALVE LOCATE MARKERS REQUIRED FOR ALL VALVE INSTALLATIONS.
4. EMBED BRONZE VALVE INFO DISK INTO CONCRETE VALVE BOX COLLAR.
5. ALL MATERIALS SHALL BE IN ACCORDANCE WITH THE LATEST T.W.D. APPROVED MATERIAL SPECIFICATIONS.
6. IF VALVE IS LOCATED WITHIN A SIDEWALK CONCRETE COLLAR MAY BE ELIMINATED AND DISK SET FLUSH DIRECTLY IN SIDEWALK.
7. BRONZE DISK REQUIRED FOR ALL VALVES AND DUMMY BOXES.



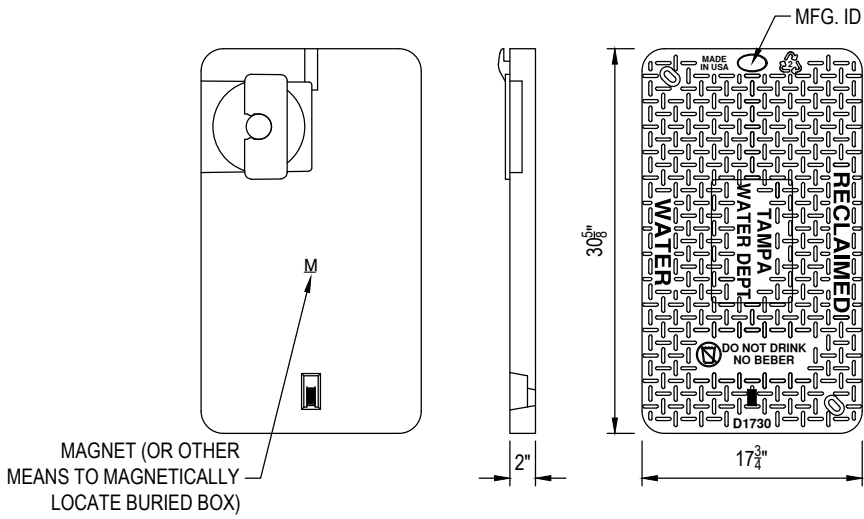
LAST REVISION  
MAY 2021

VALVE INSTALLATION W/VALVE BOX & PAD FOR DI OR CI PIPE - RECLAIMED

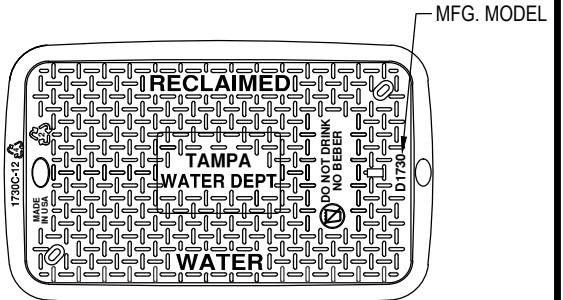
7.01R

BODY KEY	
H	HEAVY WALL, $\frac{1}{2}$ "

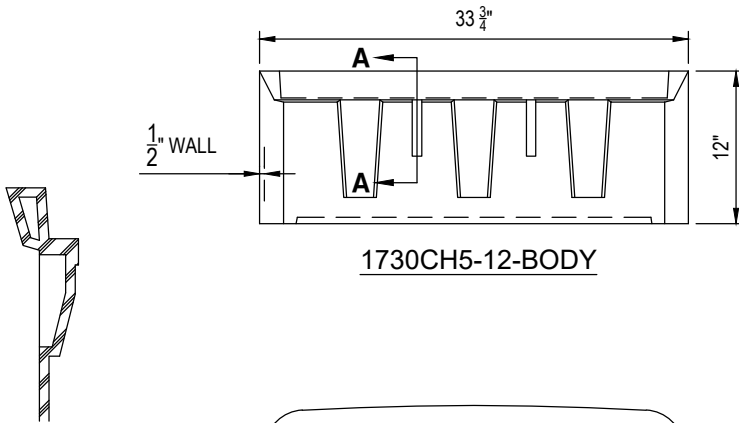
LID KEY	
AF	ANTI-FLOAT MATERIAL
5	PURPLE COLOR
M	MAGNET
A	AMR SLIDE MOUNT
TPA	TAMPA WATER



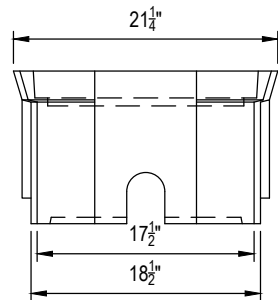
**1730C-AF5MA TPA-LID**



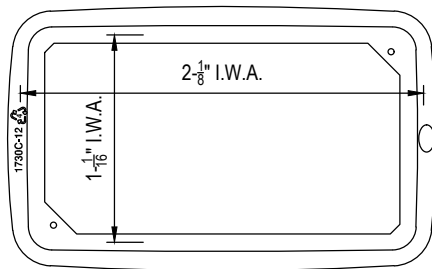
**1730CH5-12-AF5 MA TPA**



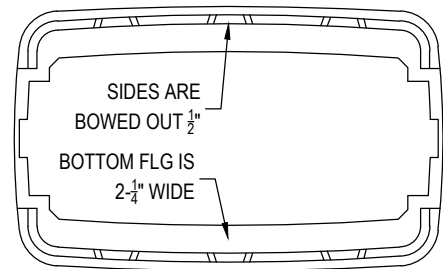
**1730CH5-12-BODY**



**LIFT STRUCTURE SECTION A-A**



**1730CH5-12-BODY**



**BOTTOM VIEW**

**NOTES**

- 1) DIM'S  $\pm 1/8$ " U.N.O.
- 2) LID MATERIAL: HDPE
- 3) BODY MATERIAL: LLDPE
- 4) WALL THICKNESS:  $1/2$ " MINIMUM
- 5) I.W.A. = INSIDE WORK AREA.
- 6) SNAP LOCK POCKET WILL RECEIVE AMR/AMI DEVICE ENDPOINT. SNAP LOCK SLOT IS  $1.80" \pm .015"$  TO ALLOW FOR A FINGER FORCE INSTALL. POCKET HEIGHT IS  $15/16"$  FOR MIN  $1/8"$  AIR GAP.

**#66 HDPE METER BOX W/COVER**

N.T.S.



LAST REVISION  
MAY 2021

1-1/2" & 2" SINGLE SERVICE  
HDPE METER BOX - RECLAIMED

7.02R