

**NOTES:**

1. CONTRACTOR SHALL MEET ALL CURRENT OSHA REQUIREMENTS FOR SAFE TRENCHING.
2. CONTRACTOR SHALL BLUE STAKE, POT HOLE AND LOCATE ALL UNDERGROUND UTILITIES AHEAD OF WATER LINE CONSTRUCTION. CONTRACTOR IS RESPONSIBLE TO COORDINATE ALL UTILITY RELOCATIONS.
3. ANY CHANGES MADE TO THE APPROVED PLANS SHALL BE REVIEWED AND APPROVED BY KID DISTRICT ENGINEER BEFORE CONSTRUCTION.
4. ALL WATER LINES SHALL BE INSTALLED IN A DEDICATED PUBLIC RIGHT-OF-WAY OR WITHIN AN APPROVED AND RECORDED DISTRICT EASEMENT.
5. CONTRACTOR IS REQUIRED TO SCHEDULE PIPE INSPECTIONS. KID INSPECTION OF PIPE BEDDING PLACEMENT AND PIPE ZONE BACKFILL IS REQUIRED PRIOR TO PLACEMENT OF TRENCH BACKFILL.
6. BACKFILL ABOVE THE PIPE ZONE SHALL BE MIN 95% OR GREATER MODIFIED PROCTOR DENSITY OR MEET LOCAL REQUIREMENTS.
7. CONTRACTOR TO INSTALL PIPE IN THE CENTER OF THE TRENCH. USED PIPE IS PROHIBITED. PIPE TO BE LOWERED INTO TRENCH WITH MECHANICAL EQUIPMENT-DO NOT DROP PIPE.
8. CONTRACTOR TO INSTALL LOCATING TAPE 12 INCHES ABOVE ALL WATER LINES

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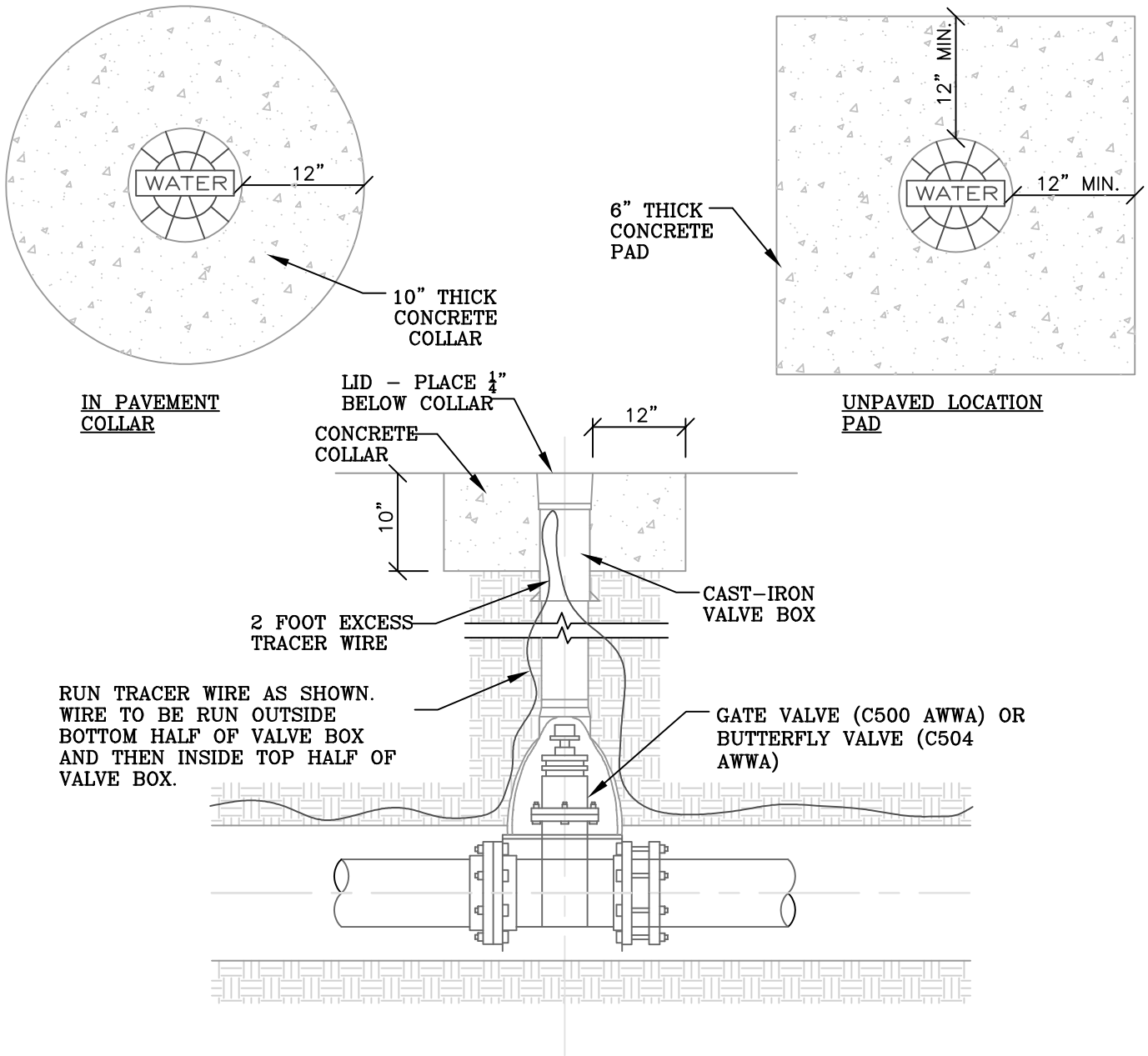
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# Typical Water Line Trench Detail

DATE:  
7-24-24

DRWG NO.:  
**W1**



**NOTES:**

1. DISTRICT TO INSPECT PRIOR TO BACKFILLING AROUND VALVE.
2. INSTALL ALL BACKFILL MATERIAL MIN. 95% MODIFIED PROCTOR DENSITY (ASTM D-1557)
3. APPLY POLY-FM GREASE TO ALL BOLTS AND WRAP WITH 8 MIL THICK POLYETHYLENE SHEET AND TAPE.
4. CONCRETE COLLAR: CONCRETE PER CITY OR COUNTY SPECIFICATIONS.
5. VALVE BOX MUST BE VERTICAL TO ALLOW FOR VALVE KEY ACCESS.
6. PROVIDE VALVE STEM EXTENSIONS FOR VALVES DEEPER THAN 6 FEET.

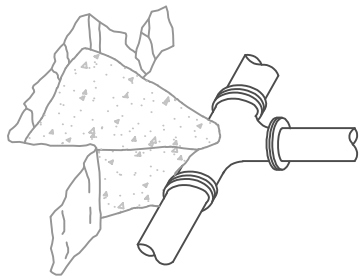
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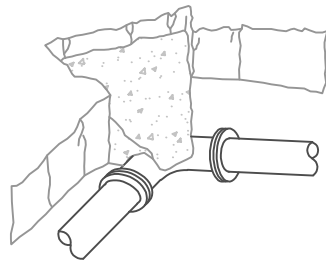
# Typical Valve Detail

## Gate (4-12") Butterfly (14"+)

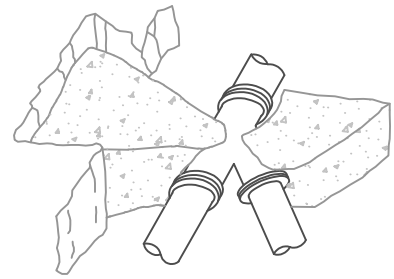
DATE:  
7-24-24  
DRWG NO.:  
W2



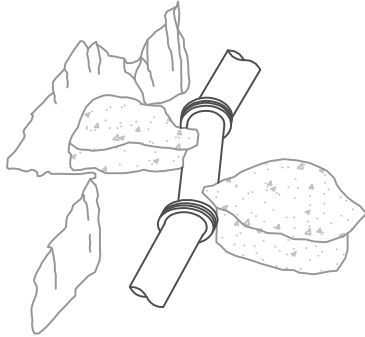
CONDITION I



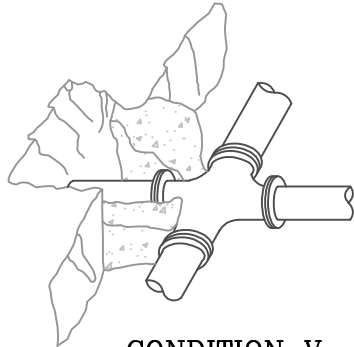
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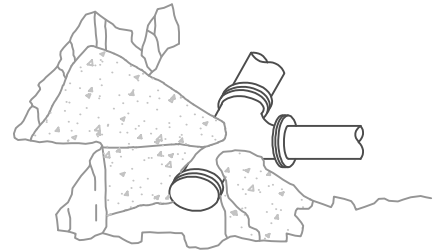
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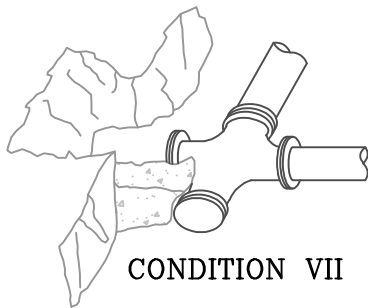
CONDITION IV



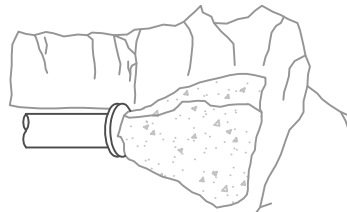
CONDITION V



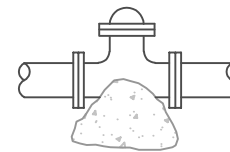
CONDITION VI



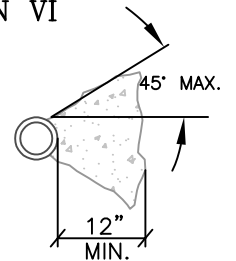
CONDITION VII



CONDITION VIII



VALVE ANCHOR  
REQUIRED FOR  
VALVES 12" OR  
LARGER



TYPICAL SECTION  
THROUGH  
THRUST BLOCKS

## Typical Thrust Block Details

### NOTES:

1. ALL THRUST BLOCK BEARING FACES SHALL BE POURED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL.
2. CONCRETE SHALL BE 4,000 PSI.
3. ALL THRUST BLOCK SIDES SHALL BE FORMED.
4. JOINT RESTRAINTS REQUIRED WITH ALL THRUST BLOCKS.
5. CALCULATED ON 200 LB TEST PRESSURE AND ALLOWABLE BEARING PRESSURE OF 2000 LBS PER SQUARE FOOT.
6. IF BEARING PRESSURE IS LESS THAN 2,000 LBS, CALCULATIONS AND BLOCK DETAIL DESIGN REQUIRED.
7. KID INSPECTION REQUIRED PRIOR TO BACKFILL.

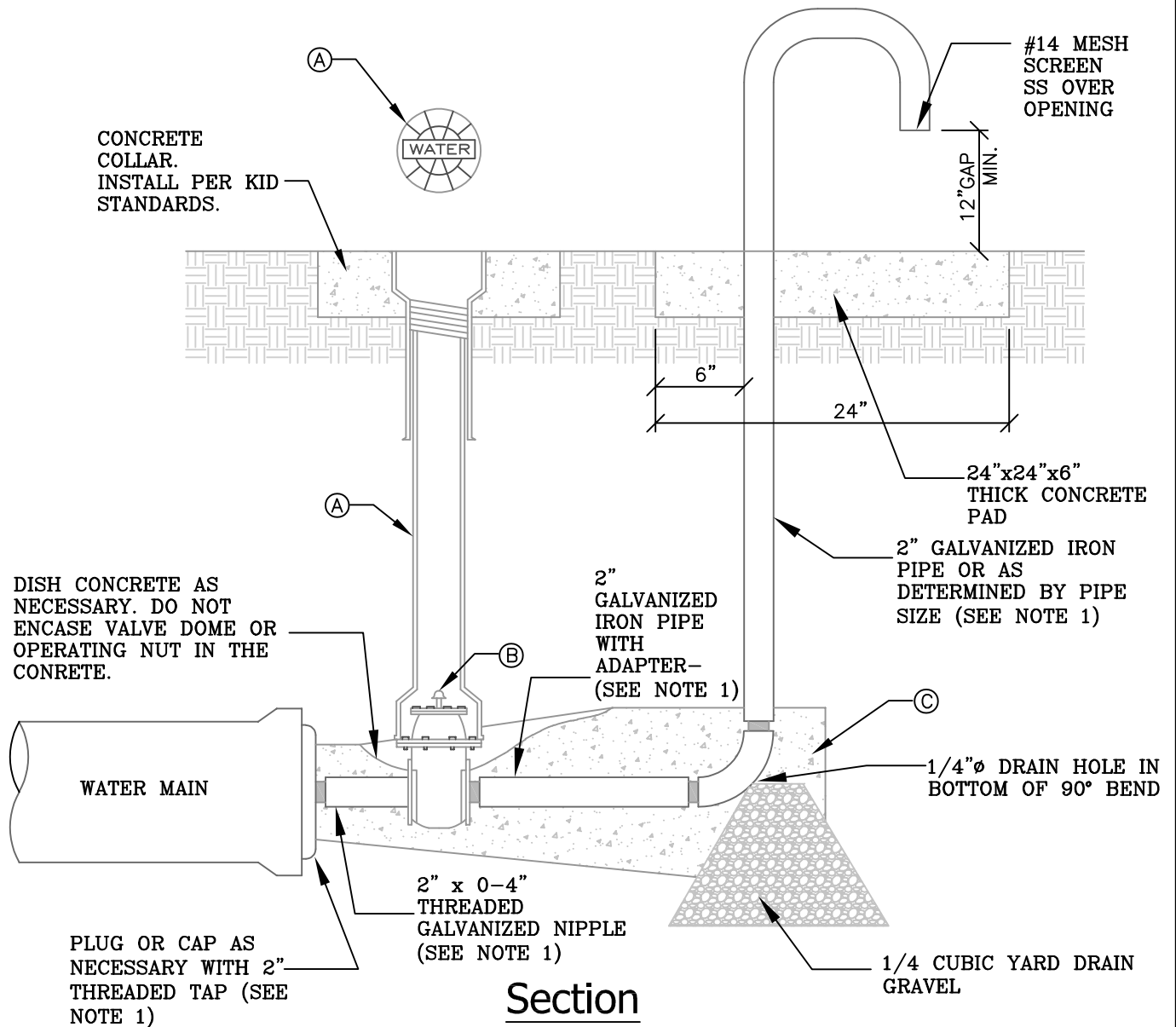
THRUST BLOCK BEARING AREA IN SQ. FEET									
NOMINAL PIPE SIZE (IN.)	DIP I.D. (IN.)	CONDITION							
		I	II	III	IV	V	VI	VII	VIII
4	4.3	2.2	3.1	1.5	1.7	1.1	2.2	3.1	2.2
6	6.4	4.8	6.8	3.4	3.7	2.4	4.8	6.8	4.8
8	8.6	8.6	12.2	6.1	6.6	4.3	8.6	12.2	8.6
10	10.6	13.2	18.6	9.3	10.1	6.6	13.2	18.6	13.2
12	12.6	18.8	26.6	13.3	14.4	9.4	18.8	26.6	18.8
14	14.7	25.6	36.2	18.1	19.6	12.8	25.6	36.2	25.6
16	16.8	33.3	47.0	23.5	25.4	16.7	33.3	47.0	33.3
18	18.9	42.0	59.4	29.7	32.1	21.0	42.0	59.4	42.0
20	20.9	51.7	73.1	36.5	39.5	25.9	51.7	73.1	51.7
24	25.1	74.0	104.6	52.3	56.6	37.0	74.0	104.6	74.0
30	31.2	114.4	161.8	80.9	87.5	57.2	114.4	161.8	114.4
36	37.5	164.4	232.5	116.3	125.9	82.2	164.4	232.5	164.4

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RL  
CHECKED:



# Thrust Block Details

DATE:  
7-24-24  
DRWG NO.:  
W3



**Section**

LEGEND		
NO.	ITEM	DESCRIPTION
(A)	VALVE BOX WITH LID	2 PIECE CAST IRON
(B)	2" GATE VALVE WITH SCREW ENDS	2" x 2" OPERATING NUT
(C)	CONCRETE THRUST BLOCK	

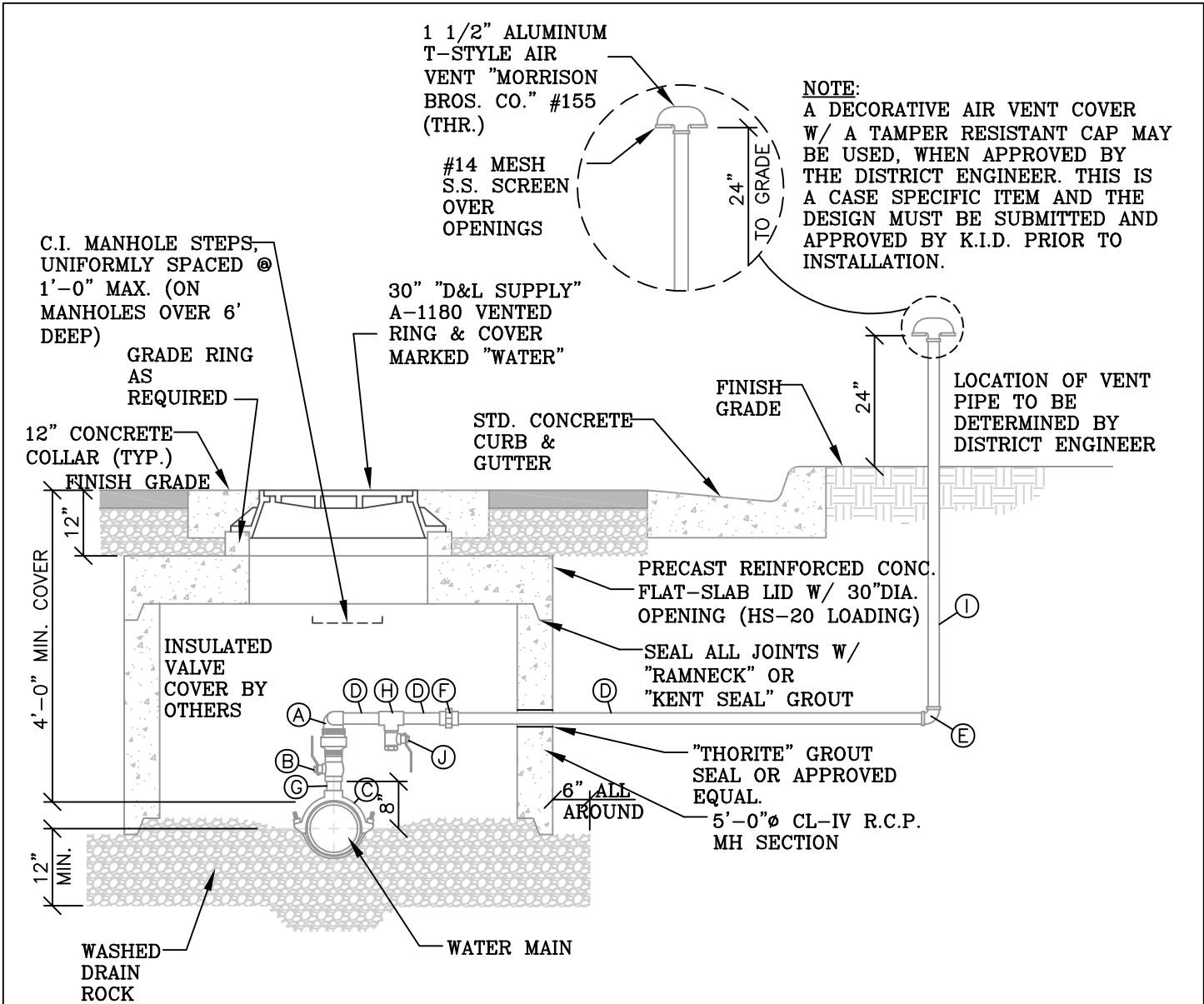
- NOTES:**
1. USE 2-INCH WASHOUT FOR 6-8 INCH WATER MAINS, USE 4-INCH WASHOUT FOR 10-16 INCH WATER MAINS, USE (2) 4-INCH WASHOUTS FOR 20-24 INCH WATER MAINS, AND (3) 4-INCH WASHOUTS FOR 30 INCH MAIN OR HYDRANTS.
  2. INSPECTION: PRIOR TO BACKFILLING AROUND THRUST BLOCK, DISTRICT SHALL INSPECT INSTALLATION.
  3. BACKFILL: INSTALL AND COMPACT ALL BACKFILL MATERIAL PER SPECIFICATIONS.
  4. CONCRETE: TO BE PER SPECIFICATIONS. POUR CONCRETE AGAINST UNDISTURBED SOIL.
  5. WATER MAINS 12" AND LARGER REQUIRE SPECIAL WASH OUT ASSEMBLY DESIGN.
  6. VALVE BOX MUST BE VERTICAL TO ALLOW FOR VALVE KEY ACCESS.

DRAWN:  
JW  
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CHECKED:



**Typical Wash Out Valve  
Detail**

DATE:  
7-24-24  
DRWG NO.:  
**W4**



PIPE & FITTING SCHEDULE		
NO.	DESCRIPTION	FITTING
A	2" COMBINATION AIR-VACUUM RELIEF VALVE "A.R.I." MODEL D-040 P W/ NPT CONNECTIONS	THR.
B	2" BRASS BALL VALVE (1/4 TURN)	THR.
C	2" NYLON COATED W/ DOUBLE S.S. STRAPS SERVICE SADDLE	
D	1 1/2" SCH. 80 PVC PIPE	THR.
E	1 1/2" GALV. STEEL 90° ELBOW	THR.
F	1 1/2" SCH. 80 PVC UNION	THR.
G	2" BRASS PIPE	THR.
H	1 1/2" SCH. 80 PVC TEE	THR.
I	1 1/2" GALV. STEEL PIPE	THR.
J	1 1/2" BALL DRAIN VALVE	THR.

NOTE: USE A 2" HEAVY-DUTY COMBINATION AIR-VACUUM RELIEF VALVE - "APCO" MODEL 145C WHEN SPECIFIED BY THE DISTRICT ENGINEER.

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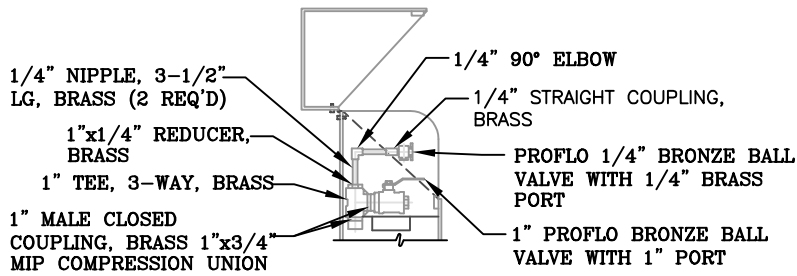


# Air/Vacuum Relief Station

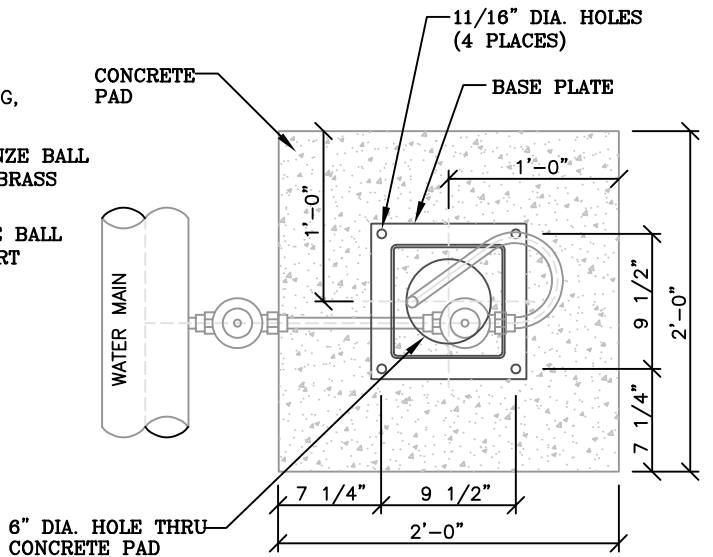
## Detail

DATE:  
7-24-24

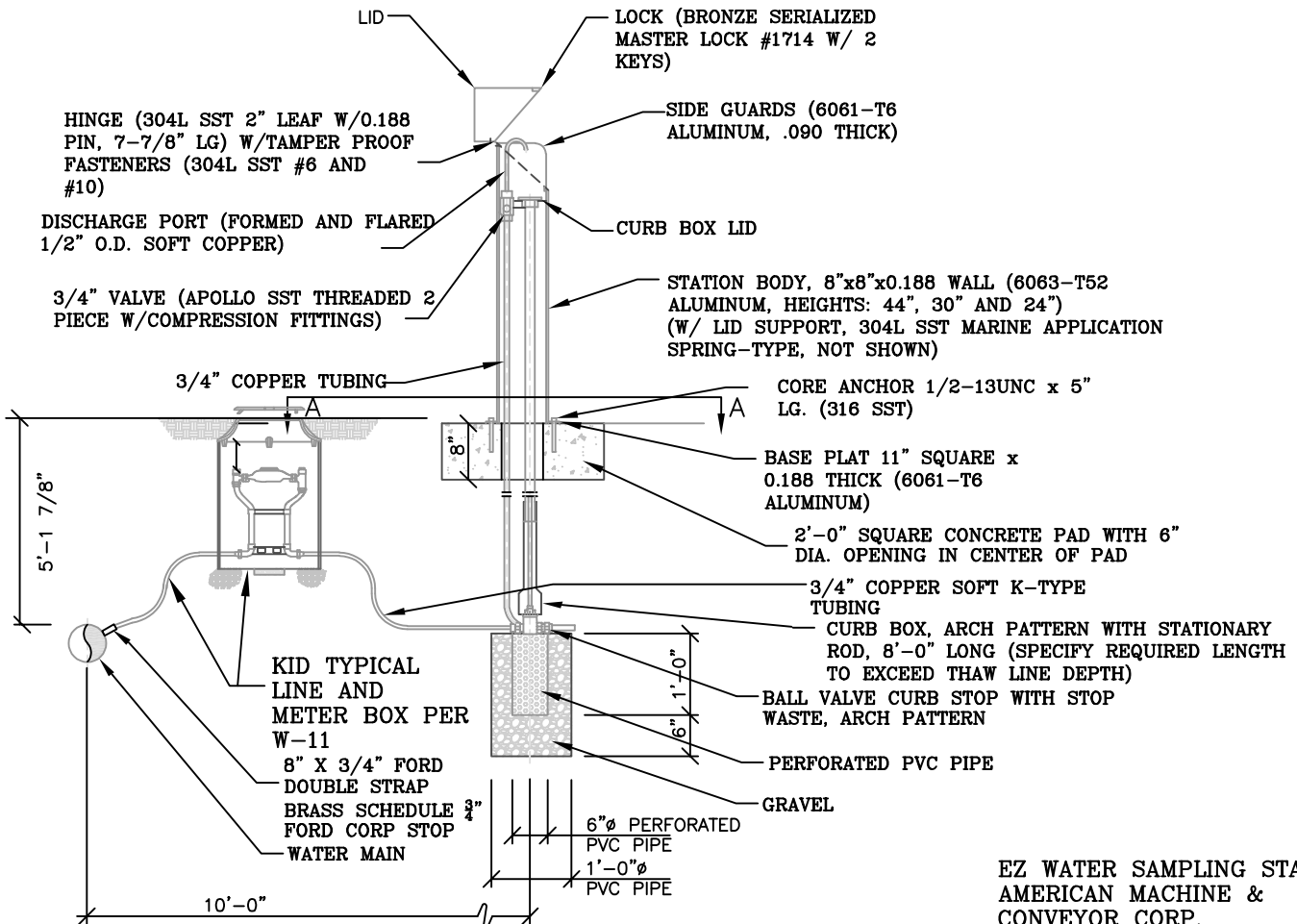
DRWG NO.:  
W5



**1" Flush Valve Assembly**



**Section A-A**



**EZ WATER SAMPLING STATION,  
 AMERICAN MACHINE &  
 CONVEYOR CORP,  
 DWG. EZ-02FCW**

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 RL  
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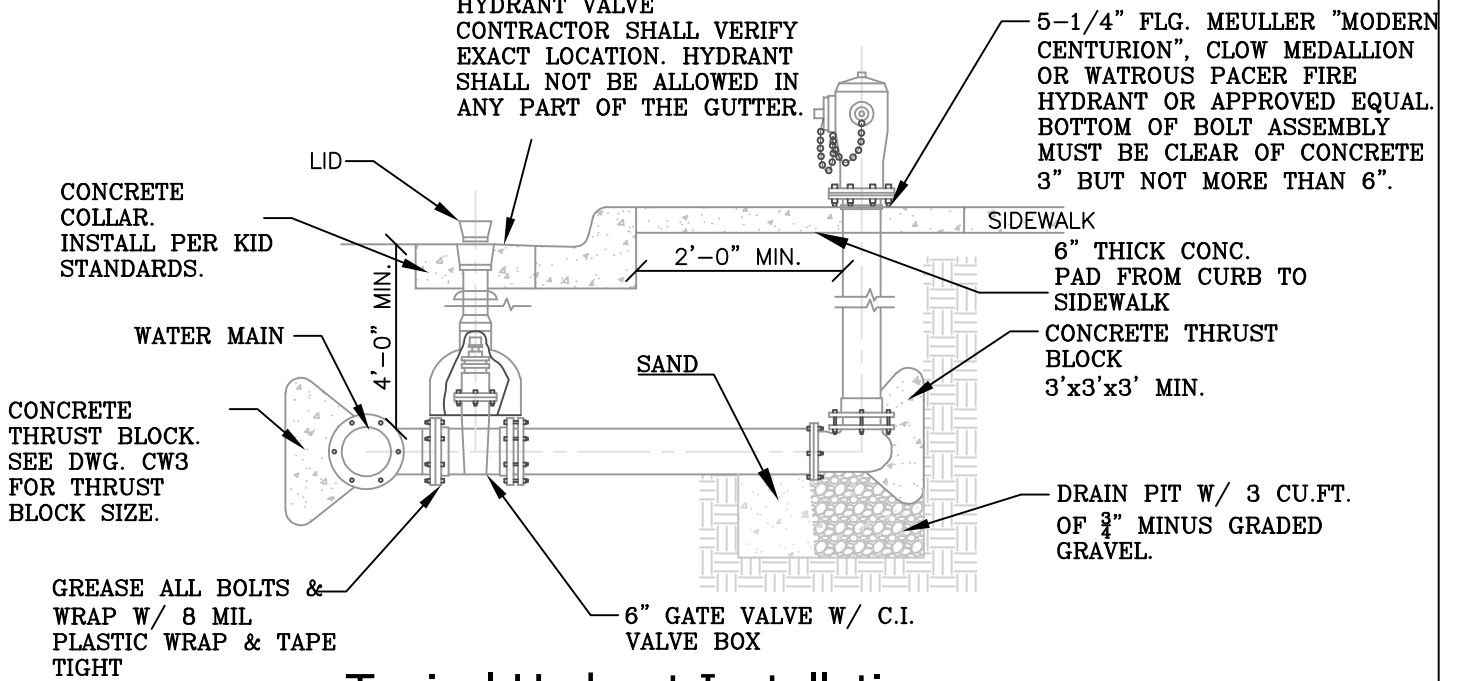


# Typical Water Sampling Station

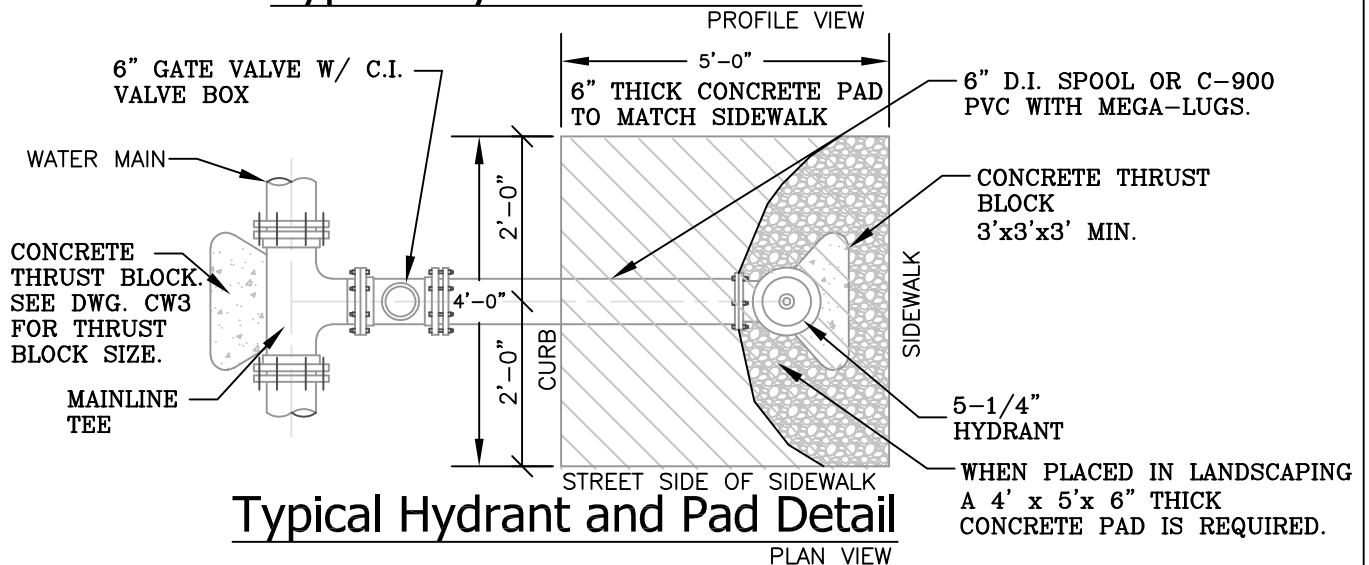
DATE:  
 7-24-24  
 DRWG NO.:  
**W6**



NOTE:  
BEFORE INSTALLING  
HYDRANT VALVE  
CONTRACTOR SHALL VERIFY  
EXACT LOCATION. HYDRANT  
SHALL NOT BE ALLOWED IN  
ANY PART OF THE GUTTER.



### Typical Hydrant Installation



### Typical Hydrant and Pad Detail

1. SPACING BETWEEN HYDRANTS AS APPROVED BY DISTRICT AND FIRE DEPARTMENT.
2. SELECT SAND BEDDING AND BACKFILL IS REQUIRED 6" UNDER, 12" ON SIDES, AND 12" OVER FIRE LINE.
3. FIRE HYDRANT SHALL BE SET THAT THE BARREL OR STANDPIPE FLANGE IS 3" TO 6" ABOVE FINISHED GRADE. MAXIMUM EXTENSION HEIGHT IS 1'-0".
4. GREASE AND WRAP ALL DUCTILE IRON PIPE, EXTERNAL FITTINGS AND BOLTS WITH FM GREASE AND 8-MIL POLYETHYLENE AND DUCT TAPE TIGHT.
5. DRAINAGE PIT MUST HAVE 3 CUBIC FEET (MINIMUM) OF 3/4" MINUS GRAVEL.
6. ALL THRUST BLOCKING MUST BE POURED BY NATIVE SOIL OR A SECURE BANK.
7. INSPECTION REQUIRED BY DISTRICT PRIOR TO BURY OF PIPE.

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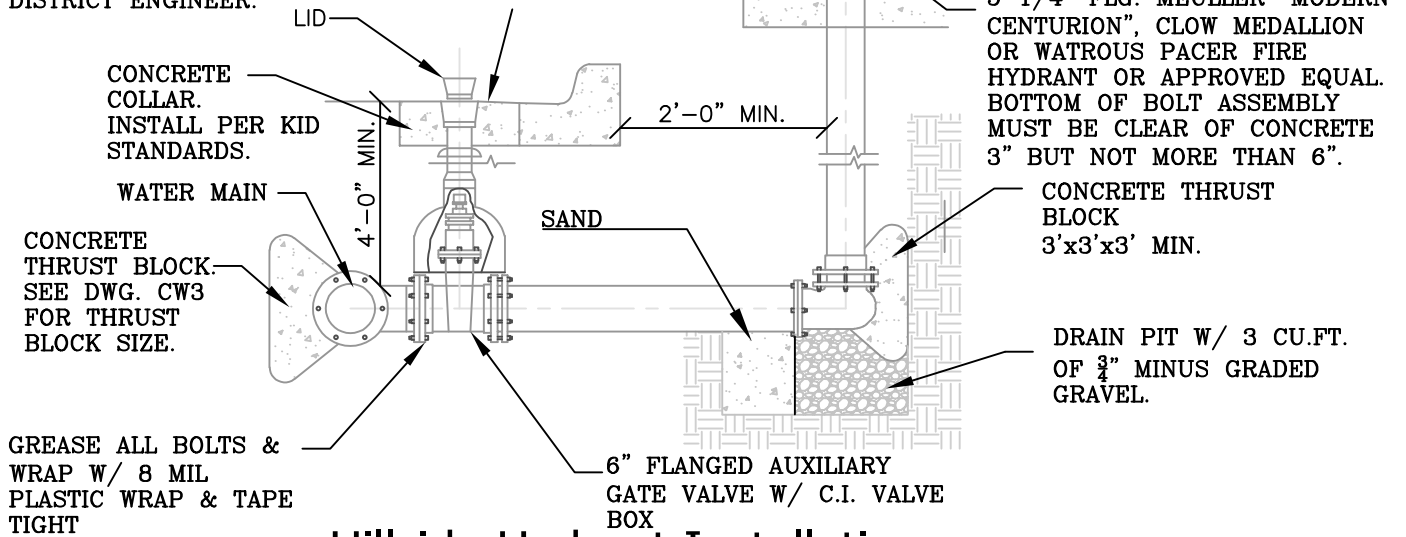


# Fire Hydrant Installation

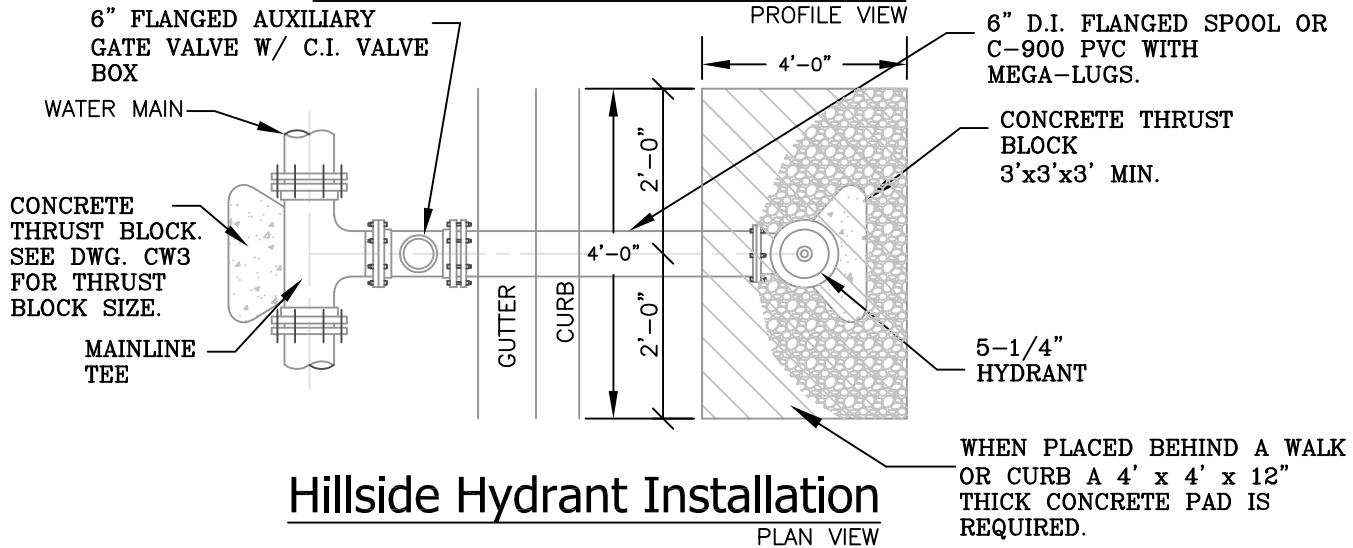
DATE:  
7-24-24  
DRWG NO.:  
W7

NOTE:  
AUXILIARY VALVE AND BOX  
MAY BE LOCATED AT  
HYDRANT WITH THE USE OF  
MEGA-LUG FITTINGS WITH  
THE APPROVAL OF THE  
DISTRICT ENGINEER.

NOTE:  
BEFORE INSTALLING  
HYDRANT VALVE  
CONTRACTOR SHALL VERIFY  
EXACT LOCATION. HYDRANT  
SHALL NOT BE ALLOWED IN  
ANY PART OF THE GUTTER.



### Hillside Hydrant Installation



### Hillside Hydrant Installation

1. AVERAGE SPACING BETWEEN HYDRANTS NOT GREATER THAN 500'.
2. SELECT SAND BEDDING AND BACKFILL IS REQUIRED 6" UNDER, 12" ON SIDES, AND 12" OVER FIRE LINE.
3. MINIMUM TRENCH WIDTH SHALL BE EQUAL TO OUTSIDE PIPE DIAMETER PLUS 1' ON EACH SIDE OF PIPE.
4. IF DAMAGE IS CAUSED TO WATER MAIN, DUE TO FIRE HYDRANT INSTALLATION, CONTRACTOR WILL BE RESPONSIBLE FOR ANY REPAIRS.
5. FIRE HYDRANT SHALL BE SET THAT THE BARREL OR STANDPIPE FLANGE IS 3" TO 6" ABOVE FINISHED GRADE. MAXIMUM EXTENSION HEIGHT IS 1'-0".
6. GREASE AND WRAP ALL EXTERNAL FITTINGS AND BOLTS WITH FM GREASE AND 8-MIL POLYETHYLENE AND DUCT TAPE TIGHT. WRAP D.I. PIPE WITH 8-MIL POLYETHYLENE TUBE WRAP AND DUCT TAPE TIGHT.
7. DRAINAGE PIT MUST HAVE 3 CUBIC FEET (MINIMUM) OF 3/4" MINUS GRAVEL.
8. ALL THRUST BLOCKING MUST BE REINFORCED BY A SECURE BANK.
9. INSPECTION REQUIRED BY DISTRICT PRIOR TO BURY OF PIPE.

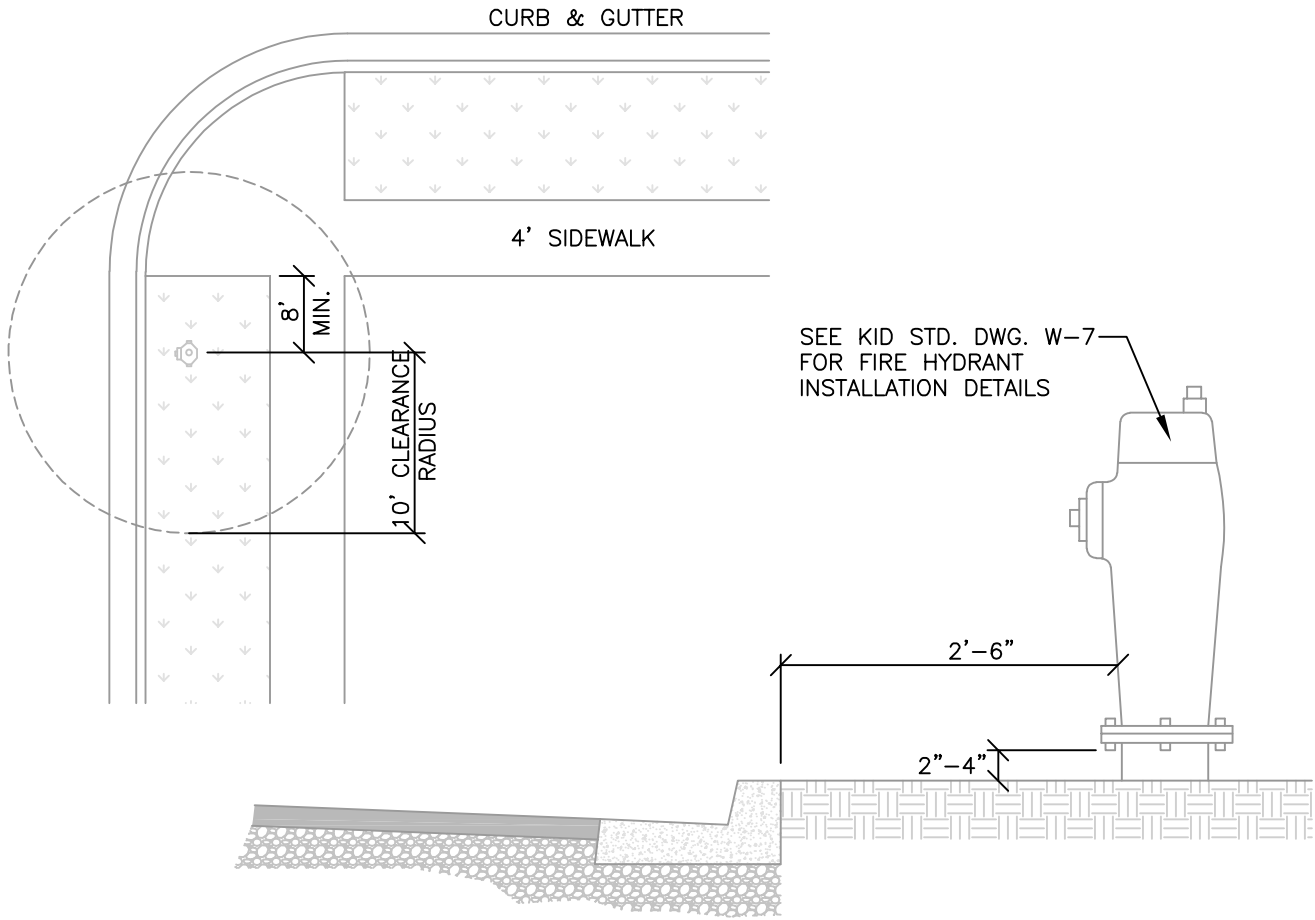
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# Hill Side Fire Hydrant Installation

DATE:  
7-24-24  
DRWG NO.:  
W8





SEE KID STD. DWG. W-7  
FOR FIRE HYDRANT  
INSTALLATION DETAILS

**NOTES:**

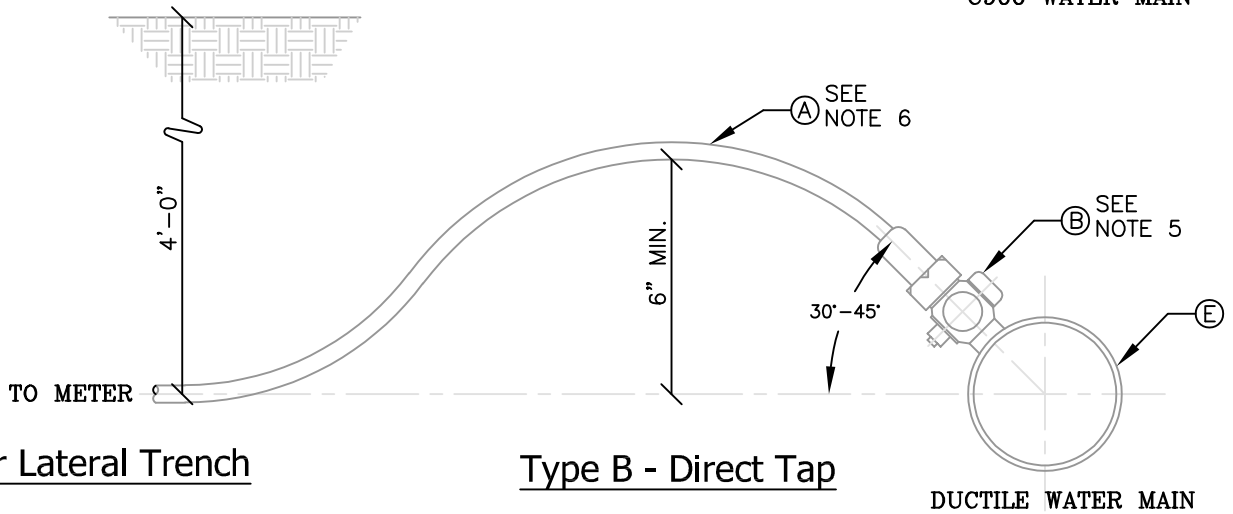
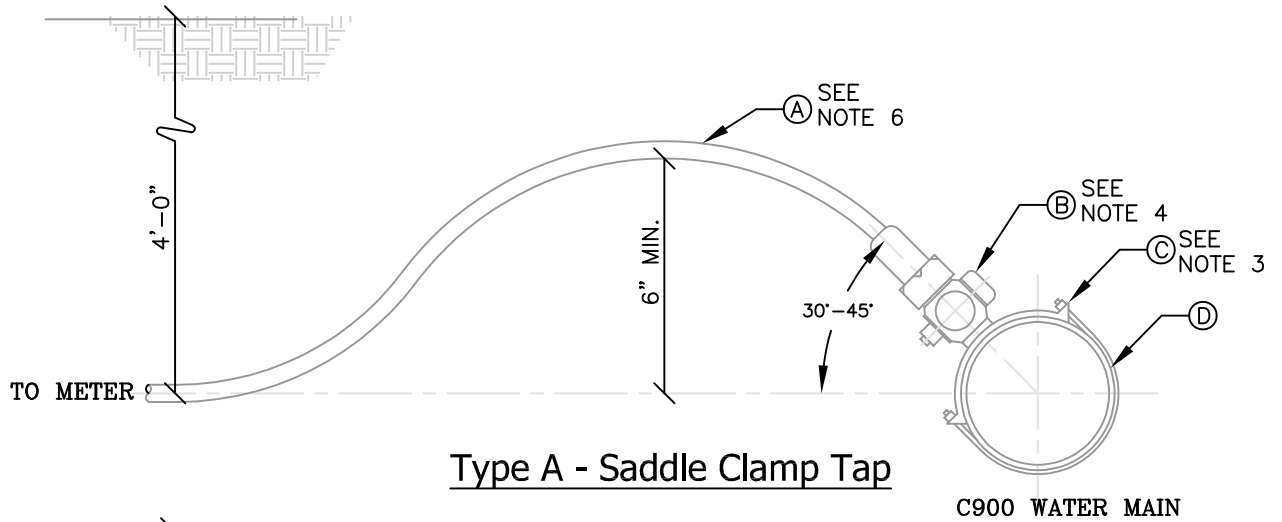
1. PAINT TOP AND FACE OF CURB, 15' ON BOTH SIDES, WITH RED PAINT TO INDICATE NO PARKING.
2. NO TREES, PLANTS, FLOWERS, SHRUBS, OR ANY OTHER ITEM WHICH MAY OBSTRUCT THE VIEW OR ACCESS TO A FIRE HYDRANT, SHALL BE INSTALLED/PLANTED WITHIN 10' OF ANY FIRE HYDRANT.
3. HYDRANT SHALL BE 2'-6" BEHIND BACK OF CURB OR AS SPECIFIED BY THE DISTRICT ENGINEER.
4. MAJOR ROADS SHALL HAVE FIRE HYDRANTS ON BOTH SIDES OF THE ROADWAY.
5. INSTALL A 4'x4'x6" THICK CONCRETE PAD AROUND THE HYDRANT BASE.
6. DISTRICT WILL REVIEW AND APPROVE HYDRANT LOCATIONS AS DETERMINED BY LOCAL FIRE MARSHALL
7. FIRE HYDRANT SPACING SHALL NOT EXCEED A 500' RADIUS IN AREA WITH SINGLE FAMILY DWELLINGS
8. FIRE HYDRANT SPACING SHALL NOT EXCEED A 300' RADIUS IN ALL OTHER AREAS.

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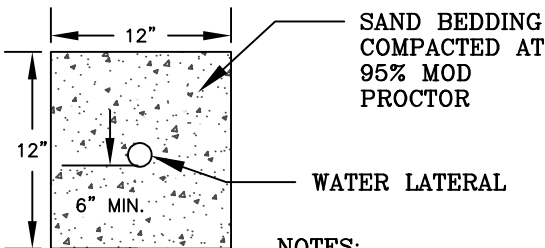


# Fire Hydrant Location Detail

DATE:  
7-24-24  
DRWG NO.:  
**W9**



**Water Lateral Trench**



LEGEND	
NO.	DESCRIPTION
(A)	COPPER PIPE OR HDPE CTS-OD SDR-9 POLY TUBING
(B)	BRASS CORPORATION STOP, SEE NOTE 3
(C)	PVC C900 SADDLE CLAMP SEE NOTE 3
(D)	PVC C900 WATER MAIN PIPE
(E)	DUCTILE WATER MAIN PIPE

**NOTES:**

1. INSPECTION & SURVEY REQUIRED BY KID DISTRICT PRIOR TO BACKFILLING AROUND TAPING SLEEVE
2. BACKFILL WITH APPROVED GRADED SAND COMPACTED TO 95% MODIFIED PROCTOR. SEE WATER LATERAL DETAIL THIS SHEET.
3. PROVIDE BRASS DOUBLE STRAP TAPPING SADDLE FOR TAPPING C900 PVC PIPE, FORD SERIES.
4. DUCTILE WATER MAIN MAY BE DIRECT TAPPED
5. 3/4" FORD FB600 BALL CORP TAPPED AT 2 OR 10 O'CLOCK POSITION, AWWA TAPER THREAD INLET, FLARE OR COMPRESSION FITTINGS ACCEPTED.
6. PROVIDE HORIZONTAL EXPANSION LOOP IN COPPER PIPE OR POLY PIPE
7. TAPPING: PLACE TAPS A MINIMUM OF 24 INCHES APART. USE A TAPPING TOOL WHICH IS SIZED CORRESPONDING TO THE SIZE OF THE SERVICE LINE TO BE INSTALLED. NO TAPS WITHIN 24 INCHES OF END OF PIPE.
8. TAPE: TEFLON TAPE IS REQUIRED ON ALL TAPS.
9. ALL DIRECT TAP TO UTILIZE "CC" THREADS.

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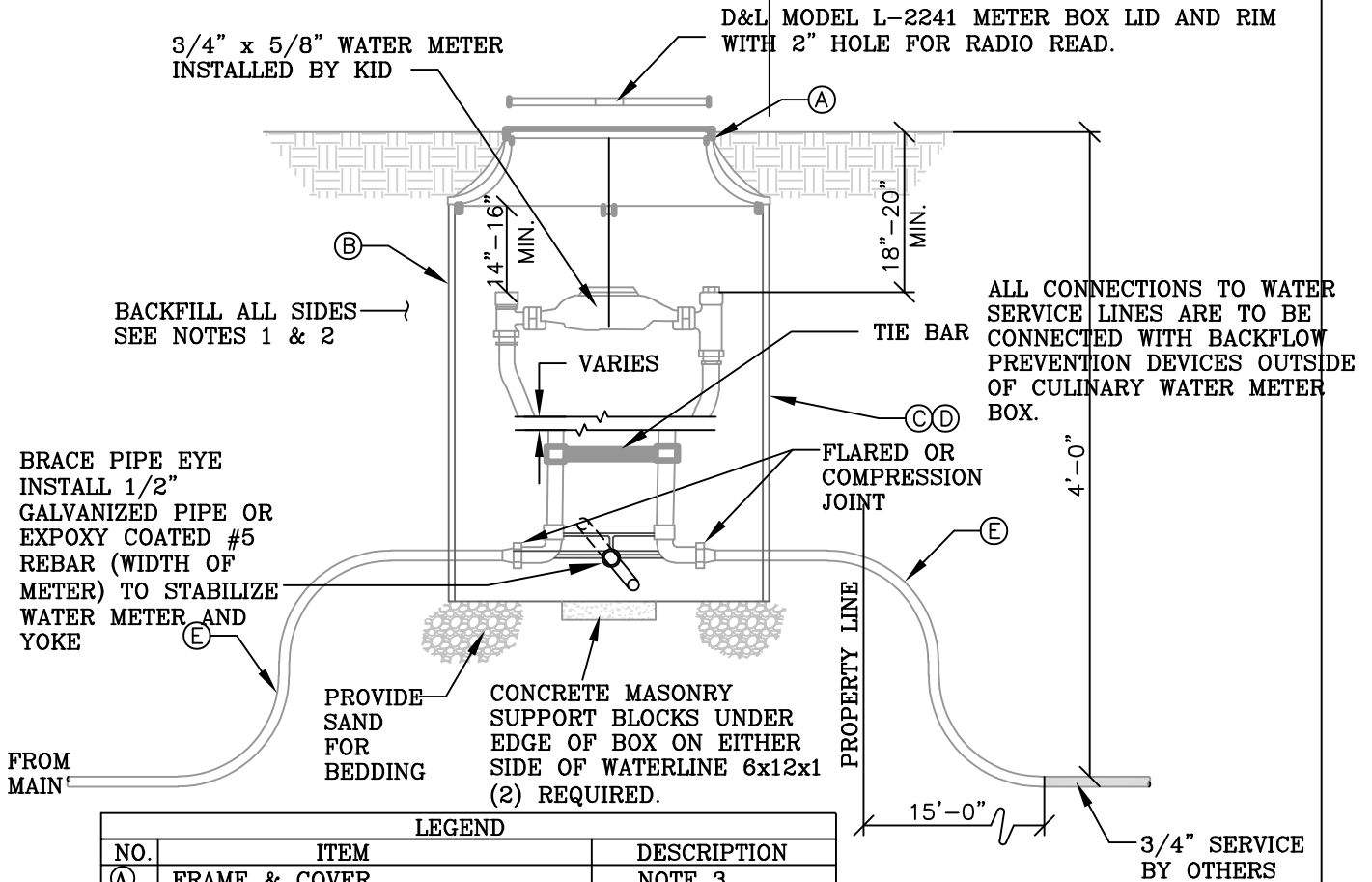
**Typical Service Tap Detail**

**3/4" - 2"**

DATE:  
7-24-24  
DRWG NO.:  
W10

KID OWNS, MAINTAINS, AND REPAIR TO METER. SEE UTAH ADMINISTRATIVE CODE R309-550-7 FOR HORIZONTAL SEPARATION BETWEEN WATER & SEWER SERVICE.

CULINARY WATER SERVICE LATERAL OWNED, MAINTAINED & REPAIRED BY PROPERTY OWNER. SEE UTAH PLUMBING CODE 603 FOR HORIZONTAL SEPARATION BETWEEN WATER & SEWER SERVICE.



LEGEND		
NO.	ITEM	DESCRIPTION
(A)	FRAME & COVER	NOTE 3
(B)	METER BOX (30" DEEP)	C OR D NOTE 3
(C)	3/4" METER (21" BOX)	NOTE 5
(D)	1" METER (24" BOX)	NOTE 6
(E)	3/4" OR 1" CTS SDR9 POLY OR TYPE K COPPER	

**NOTES:**

- DISTRICT TO INSPECT PRIOR TO BACKFILLING AROUND METER.
- INSTALL ALL BACKFILL MATERIAL 6" MAX LIFTS MIN. 95% MODIFIED PROCTOR DENSITY (ASTM D-1557).
- D&L MODEL L-2241 METER BOX LID AND RIM WITH 2" HOLE FOR RADIO READ. BRANDED "WATER METER" CAST IN TOP.
- ADS METER BOX ALLOWED WITH HIGH-BACK CURB. CONCRETE METER BOX (H-20 LOAD RATED) IF LOCATED IN DRIVEABLE SURFACE.
- 5/8" X 3/4" COPPER WATER METER SETTER FORD 70 SERIES SETTER VBHC 72-21W-1133-NL WITH DUAL CHECK VALVE.
- 1" SETTER FORD 70 SERIES VBHC 72-24W-1133-NL WITH DUAL CHECK VALVE.
- PLACEMENT:
  - DO NOT INSTALL METER BOXES UNDER DRIVEWAY APPROACHES, SIDEWALKS, OR CURB AND GUTTER.
  - ALL METER BOXES TO BE INSTALLED IN PARK STRIP OR AS APPROVED BY DISTRICT.

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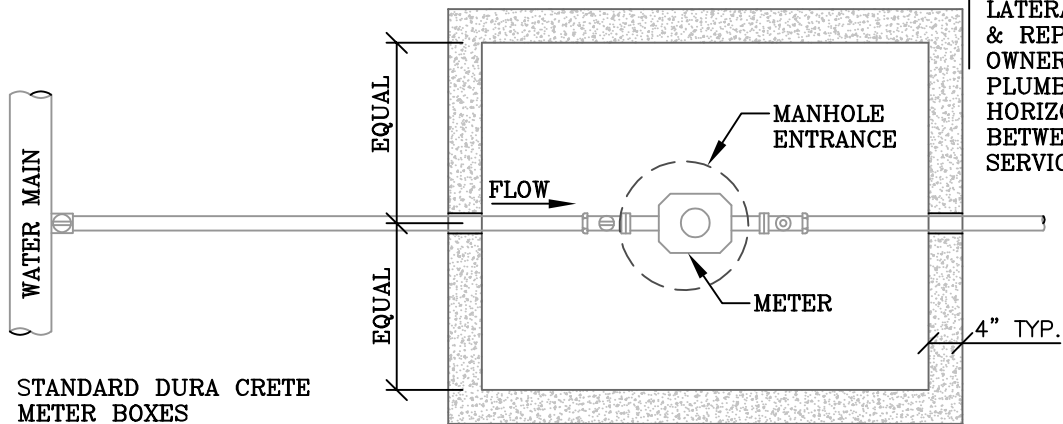
# Typical Meter Box Detail

## 3/4" - 1"

DATE:  
7-24-24  
DRWG NO.:  
W11

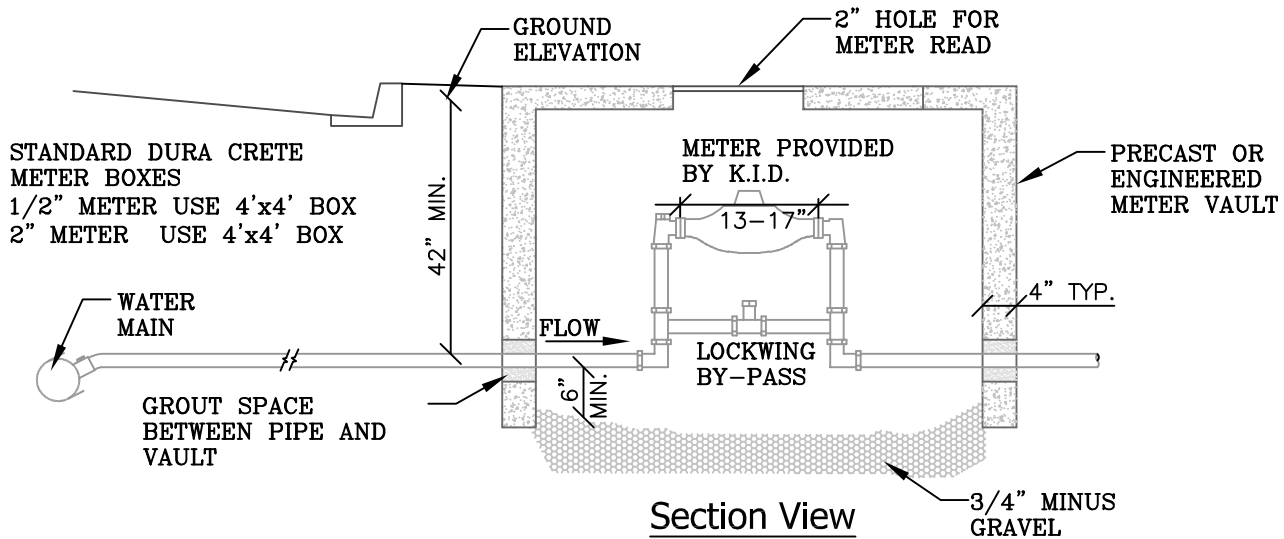
KID OWNS, MAINTAINS, AND REPAIR  
TO METER. SEE UTAH  
ADMINISTRATIVE CODE R309-550-7  
FOR HORIZONTAL SEPARATION  
BETWEEN WATER & SEWER SERVICE.

CULINARY WATER SERVICE  
LATERAL OWNED, MAINTAINED  
& REPAIRED BY PROPERTY  
OWNER. SEE UTAH  
PLUMBING CODE 603 FOR  
HORIZONTAL SEPARATION  
BETWEEN WATER & SEWER  
SERVICE.



STANDARD DURA CRETE  
METER BOXES  
1 1/2" METER - 4'x4' BOX  
2" METER - 4'x4' BOX

Plan View



STANDARD DURA CRETE  
METER BOXES  
1/2" METER USE 4'x4' BOX  
2" METER USE 4'x4' BOX

Section View

1. WATER METER PROVIDED BY KID
2. LOCATE MANHOLE OPENINGS DOWN CENTER LINE OF METER VAULT.
3. METER BOX SHALL BE MIN. 4' DEEP WITH GRAVEL BOTTOM.
4. BACKFLOW ASSEMBLY IS TO BE LOCATED OUTSIDE OF THE METER BOX.
5. METER SETTER FOR 1 1/2" AND 2" METERS ARE AS FOLLOWS:  
FORD SERIES COPPERSETTERS FOR FLANGED METERS  
1 1/2" VBHC76-21B-11-66-NL  
2" VHB77-21B-11-77-NL
6. LID MUST HAVE 2" HOLE CENTERED FOR RADIO READ ASSEMBLY.
7. BACKFLOW ASSEMBLY IS TO BE LOCATED OUTSIDE OF THE METER BOX.

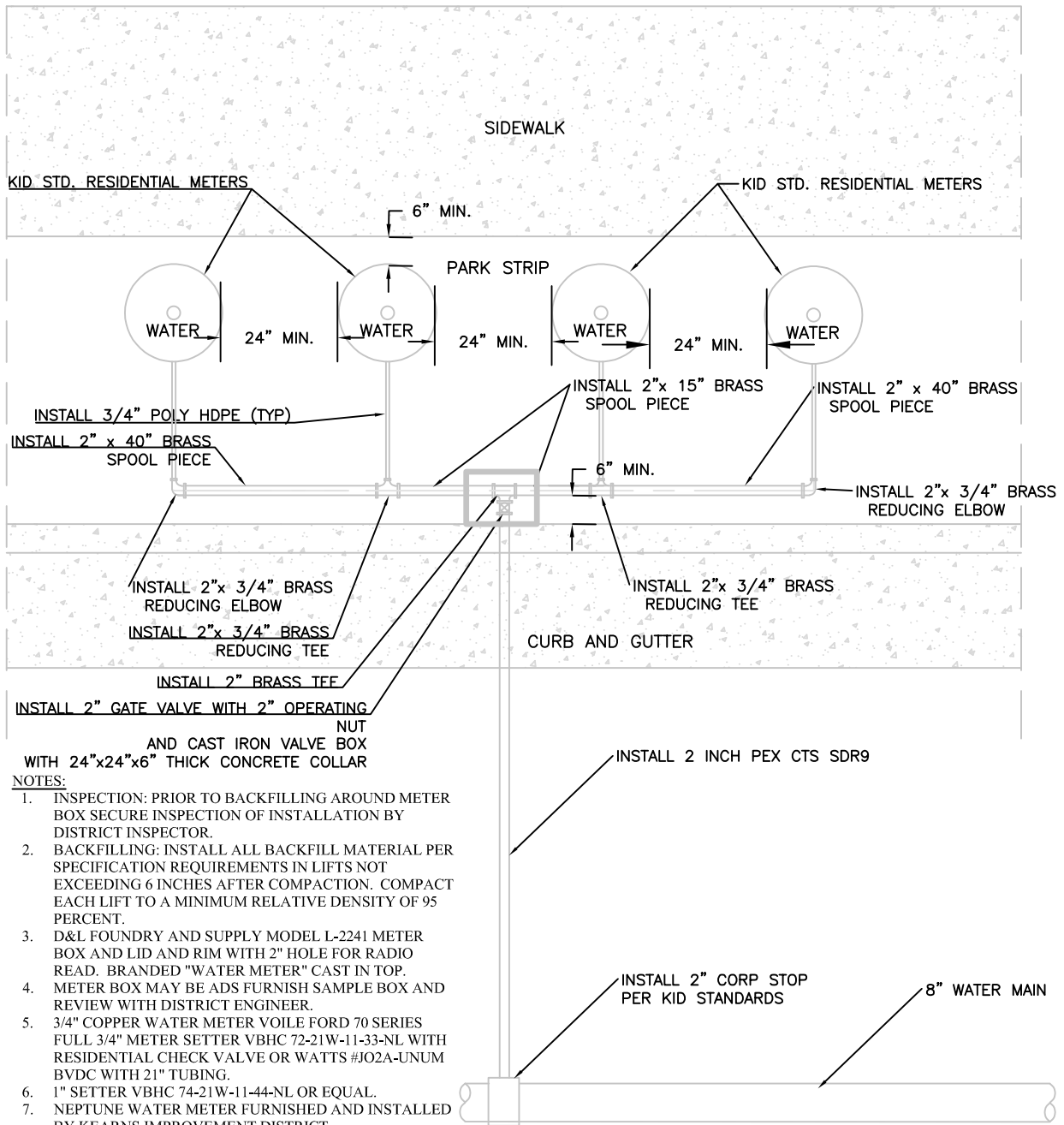
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# Water Meter Vault

## 1 1/2" - 2"

DATE:  
7-24-24  
DRWG NO.:  
W12



**NOTES:**

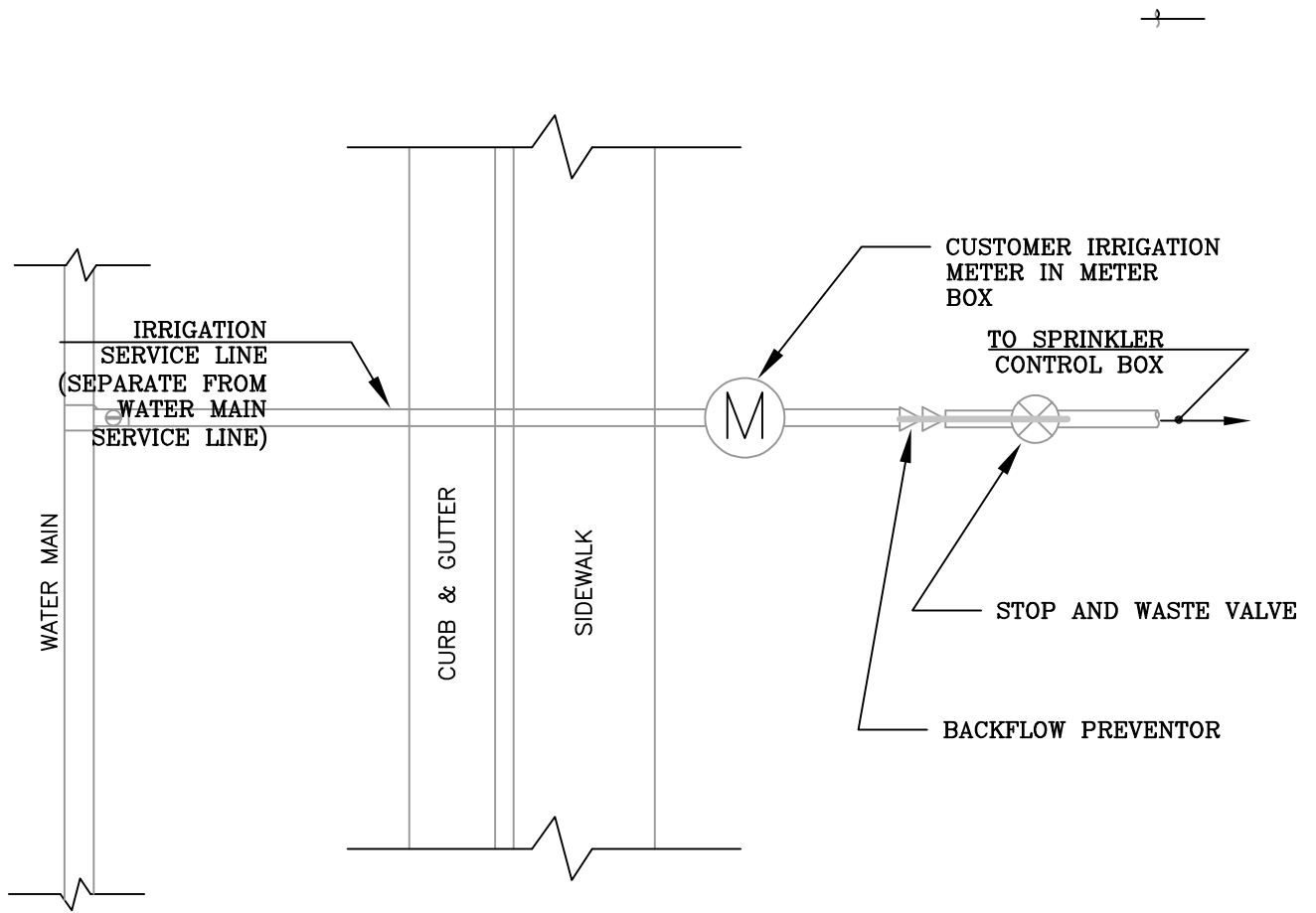
1. INSPECTION: PRIOR TO BACKFILLING AROUND METER BOX SECURE INSPECTION OF INSTALLATION BY DISTRICT INSPECTOR.
2. BACKFILLING: INSTALL ALL BACKFILL MATERIAL PER SPECIFICATION REQUIREMENTS IN LIFTS NOT EXCEEDING 6 INCHES AFTER COMPACTION. COMPACT EACH LIFT TO A MINIMUM RELATIVE DENSITY OF 95 PERCENT.
3. D&L FOUNDRY AND SUPPLY MODEL L-2241 METER BOX AND LID AND RIM WITH 2" HOLE FOR RADIO READ. BRANDED "WATER METER" CAST IN TOP.
4. METER BOX MAY BE ADS FURNISH SAMPLE BOX AND REVIEW WITH DISTRICT ENGINEER.
5. 3/4" COPPER WATER METER VOILE FORD 70 SERIES FULL 3/4" METER SETTER VBHC 72-21W-11-33-NL WITH RESIDENTIAL CHECK VALVE OR WATTS #JO2A-UNUM BVDC WITH 21" TUBING.
6. 1" SETTER VBHC 74-21W-11-44-NL OR EQUAL.
7. NEPTUNE WATER METER FURNISHED AND INSTALLED BY KEARNS IMPROVEMENT DISTRICT
8. DO NOT INSTALL METER BOXES UNDER DRIVEWAY APPROACHES, SIDEWALKS, OR CURB AND GUTTER. ALL METER BOXES TO BE INSTALLED IN PARK STRIP.
9. SEE KID SPECIFICATIONS SEC. 1.2.1.2.
10. ALLOW UP TO 6 METERS FOR RESIDENTIAL TOWN HOMES ON 2-INCH

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:



**2-INCH SERVICE LINE FOR  
MULTIPLE RESIDENTIAL UNITS**

DATE:  
7-24-24  
DRWG NO.:  
**W13**



Typical Irrigation  
Meter Installation  
 SCHEMATIC DETAIL NO SCALE

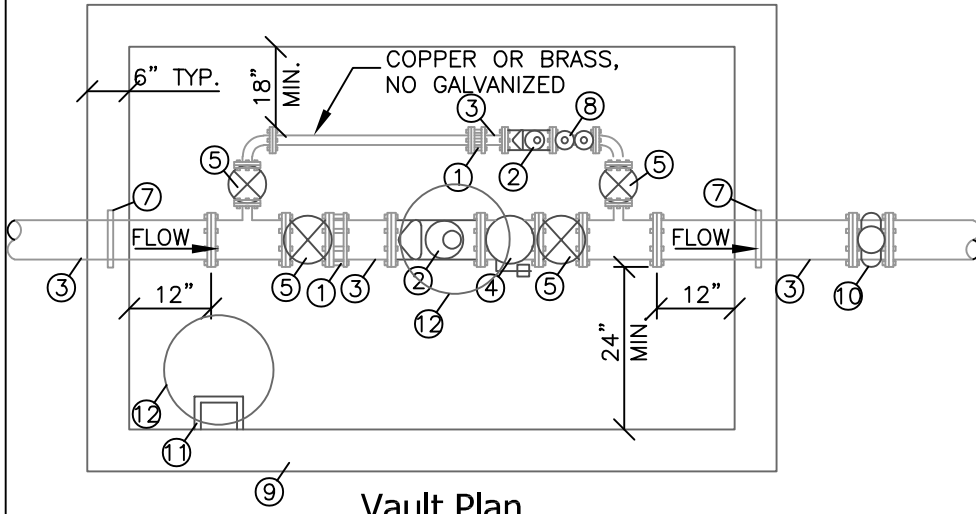
DRAWN:  
 JW  
 CHECKED:  
 RL  
 CHECKED:



# Typical Irrigation Installation

DATE:  
 7-24-24  
 DRWG NO.:  
**W14**

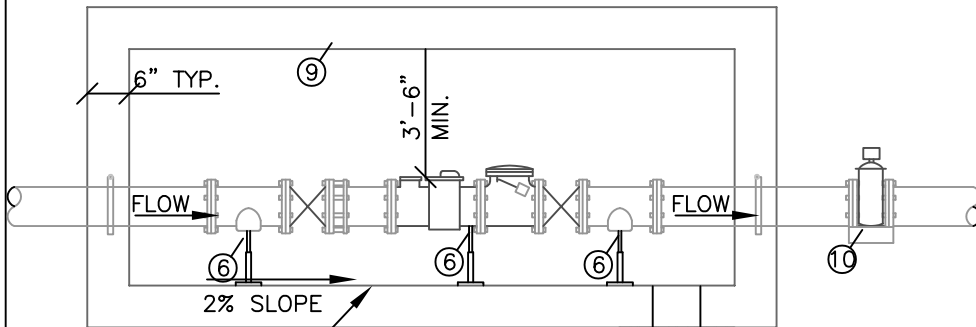




**Vault Plan**

**VAULT DETAILS**

1. FLANGED COUPLING ADAPTER
2. NEPTUNE METERS
3. FLANGED x PLAIN END PIECE
4. SWING CHECK VALVE
5. GATE VALVE
6. ADJUSTABLE PIPE SUPPORTS
7. LINK SEAL WITH PIPE RESTRAINT CAST INTO WALL
8. DUAL CHECK VALVE
9. 6'-0" WIDE X 12'-0" X 6'-0" HIGH INTERIOR PRE-CAST VAULT
10. ISOLATION GATE VALVE
11. 12" POLY LADDER RUNGS @ 12" OC.
12. 30" MH RING & COVER-D&L A-1165 "WATER"



VAULT FLOOR WITH 2% SLOPE OR GRAVEL BOTTOM FOR METER VAULT

**Vault Profile**

18"x18" SUMP WITH 2813 D&L SUPPLY FRAME AND GRATE OR EQUAL 24" GRAVEL SUMP DRAIN

**NOTES:**

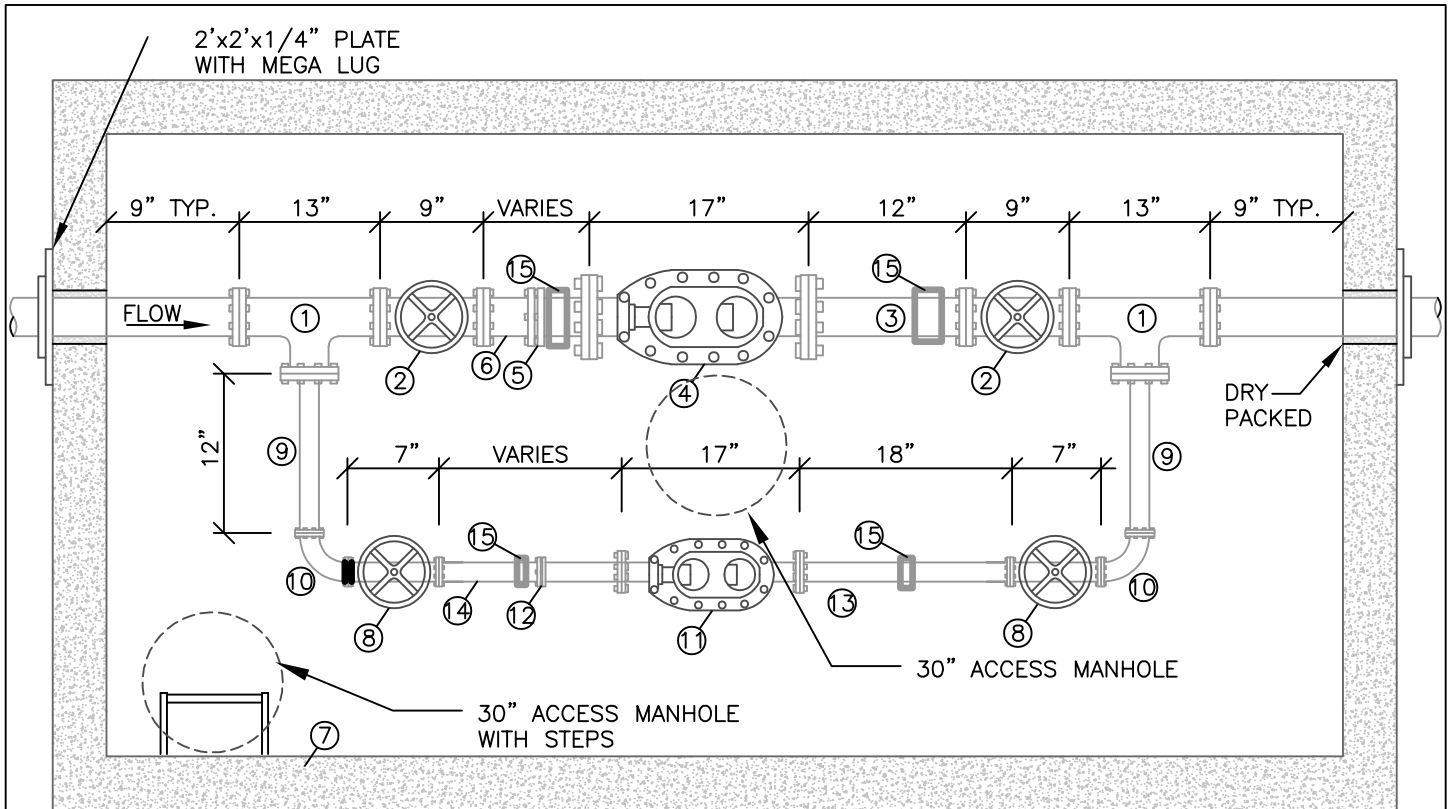
1. ALL MANHOLES SHALL HAVE A CONCRETE COLLAR PER A.P.W.A. PLAN 574.
2. VAULT AND PIPE BEDDING SHALL BE COMPACTED TO 95% MINIMUM ASTM D-1557.
3. NO MORE THAN ONE GRADE RING (12" MAX.) ALLOWED PER LID AND COLLAR.
4. ALL FLANGED x PLAIN END SPOOLS TO BE PRE-CAST INTO VAULT WALLS WITH LINK SEAL
5. GREASE AND WRAP ALL EXTERNAL FITTINGS AND BOLTS WITH F.M. GREASE AND 8-MIL POLYETHYLENE AND DUCT TAPE TIGHT.
6. WRAP ALL DUCTILE IRON PIPE WITH 8-MIL POLYETHYLENE TUBE WRAP.
7. NO BYPASS ON LOOPED SYSTEMS WITH TWO OR MORE MASTER METERS.
8. VAULT SHALL BE SUITABLE FOR H-20 LOADINGS.
9. BYPASS SHALL BE 2" MINIMUM.

DRAWN: JW
CHECKED: RL
CHECKED:



**Typical Large Vault Detail**

DATE: 7-24-24
DRWG NO.: W15



**NOTES:**

1. CONTRACTOR TO PERFORM ALL CONSTRUCTION AND INSTALLATION OF THE WATER METER.
2. PROVIDE AND PLACE BACKFILL PER APWA SECTION 31 23 23. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
3. INSTALL PRECAST 10 FEET X 6 FEET X 6 FEET HIGH INTERIOR VAULT. ALLOW 1" CLEARANCE AROUND THE LINE THROUGH THE VAULT WALL. DRY PACK REMAINING SPACE AROUND PIPE. SUPPORT WATER METER ON LATERAL AND BYPASS.
4. ALL JOINTS MUST BE RESTRAINED.

ITEM	QTY	DESCRIPTION
1	2	3" x 3" x 2" (FL x FL x FL) TEE
2	2	3" GATE VALVE (FL x FL) WITH HANDWHEEL
3	1	2" x 12" LONG (FL x FL) SPOOL
4	1	3 INCH METER
5	1	3 INCH DRESSER
6	1	3 INCH DUCTILE IRON PIPE (FL x CUT TO FIT)
7	1	PRE-CAST CONCRETE VAULT
8	2	2" GATE VALVE (FL x FL) WITH HANDWHEEL
9	2	2" x 12" LONG (FL x FL) SPOOL
10	2	2" 90 DEGREE ELBOW (FL x FL)
11	1	2 INCH METER
12	1	2 INCH DRESSER
13	1	2" X 18" INCH DUCTILE IRON PIPE (FL x FL)
14	1	2 INCH DUCTILE IRON PIPE (FL x CUT TO FIT)
15	4	JACK STANDS

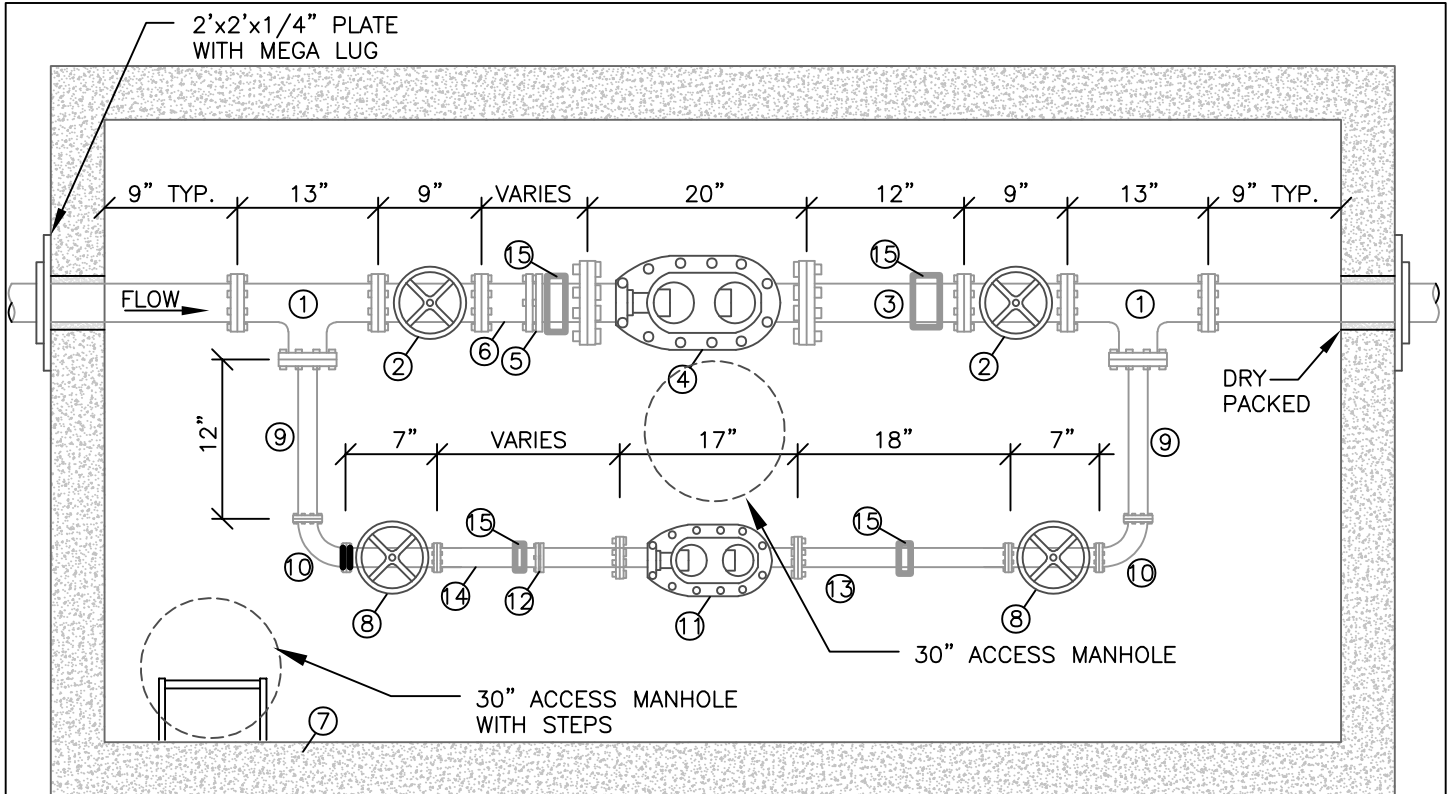
ALL FITTINGS ARE FLANGED UNLESS OTHERWISE NOTED

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:



# 3" Water Meter Vault Detail

DATE:  
7-24-24  
DRWG NO.:  
W16



**NOTES:**

1. CONTRACTOR TO PERFORM ALL CONSTRUCTION AND INSTALLATION OF THE WATER METER.
2. PROVIDE AND PLACE BACKFILL PER APWA SECTION 31 23 23. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
3. INSTALL PRECAST 10 FEET X 6 FEET X 6 FEET HIGH INTERIOR VAULT. ALLOW 1" CLEARANCE AROUND THE LINE THROUGH THE VAULT WALL. DRY PACK REMAINING SPACE AROUND PIPE. SUPPORT WATER METER ON LATERAL AND BYPASS.
4. ALL JOINTS MUST BE RESTRAINED.

ITEM	QTY	DESCRIPTION
1	2	4" x 4" x 2" (FL x FL x FL) TEE
2	2	4" GATE VALVE (FL x FL) WITH HANDWHEEL
3	1	4" x 12" LONG (FL x FL) SPOOL
4	1	4 INCH METER
5	1	4 INCH DRESSER
6	1	4 INCH DUCTILE IRON PIPE (FL x CUT TO FIT)
7	1	PRE-CAST CONCRETE VAULT
8	2	2" GATE VALVE (FL x FL) WITH HANDWHEEL
9	2	2" x 12" LONG (FL x FL) SPOOL
10	2	2" 90 DEGREE ELBOW (FL x FL)
11	1	2 INCH METER
12	1	2 INCH DRESSER
13	1	2" X 18" INCH DUCTILE IRON PIPE (FL x FL)
14	1	2 INCH DUCTILE IRON PIPE (FL x CUT TO FIT)
15	4	JACK STANDS

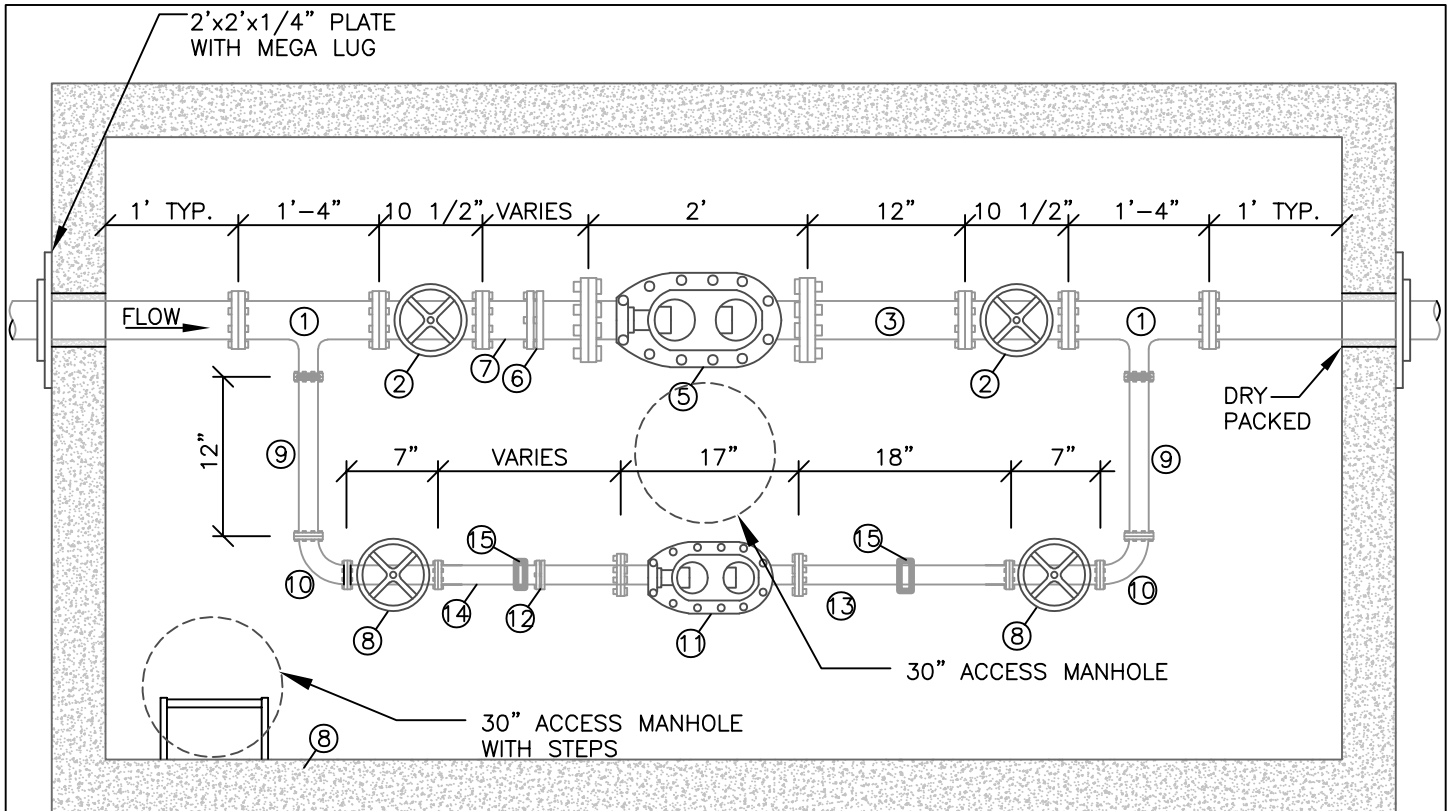
ALL FITTINGS ARE FLANGED UNLESS OTHERWISE NOTED

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:



# 4" Water Meter Vault Detail

DATE:  
7-24-24  
DRWG NO.:  
**W17**



**NOTES:**

1. CONTRACTOR TO PERFORM ALL CONSTRUCTION AND INSTALLATION OF THE WATER METER.
2. PROVIDE AND PLACE BACKFILL PER APWA SECTION 31 23 23. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
3. INSTALL PRECAST 12 FEET X 6 FEET X 6 FEET HIGH INTERIOR VAULT. ALLOW 1" CLEARANCE AROUND THE LINE THROUGH THE VAULT WALL. DRY PACK REMAINING SPACE AROUND PIPE. SUPPORT WATER METER ON LATERAL AND BYPASS WITH JACK STANDS.
4. ALL JOINTS MUST BE RESTRAINED.

ITEM	QTY	DESCRIPTION
1	2	6" x 6" x 3" (FL x FL x FL) TEE
2	2	6" GATE VALVE (FL x FL) WITH HANDWHEEL
3	1	6" x 12" LONG (FL x FL) SPOOL
4	1	6 INCH METER
5	1	6 INCH DRESSER
6	1	6 INCH DUCTILE IRON PIPE (FL x CUT TO FIT)
7	1	PRE-CAST CONCRETE VAULT
8	2	3" GATE VALVE (FL x FL) WITH HANDWHEEL
9	2	3" x 12" LONG (FL x FL) SPOOL
10	2	3" 90 DEGREE ELBOW (FL x FL)
11	1	3 INCH METER
12	1	3 INCH DRESSER
13	1	3" X 18" INCH DUCTILE IRON PIPE (FL x FL)
14	1	3 INCH DUCTILE IRON PIPE (FL x CUT TO FIT)
15	4	JACK STANDS

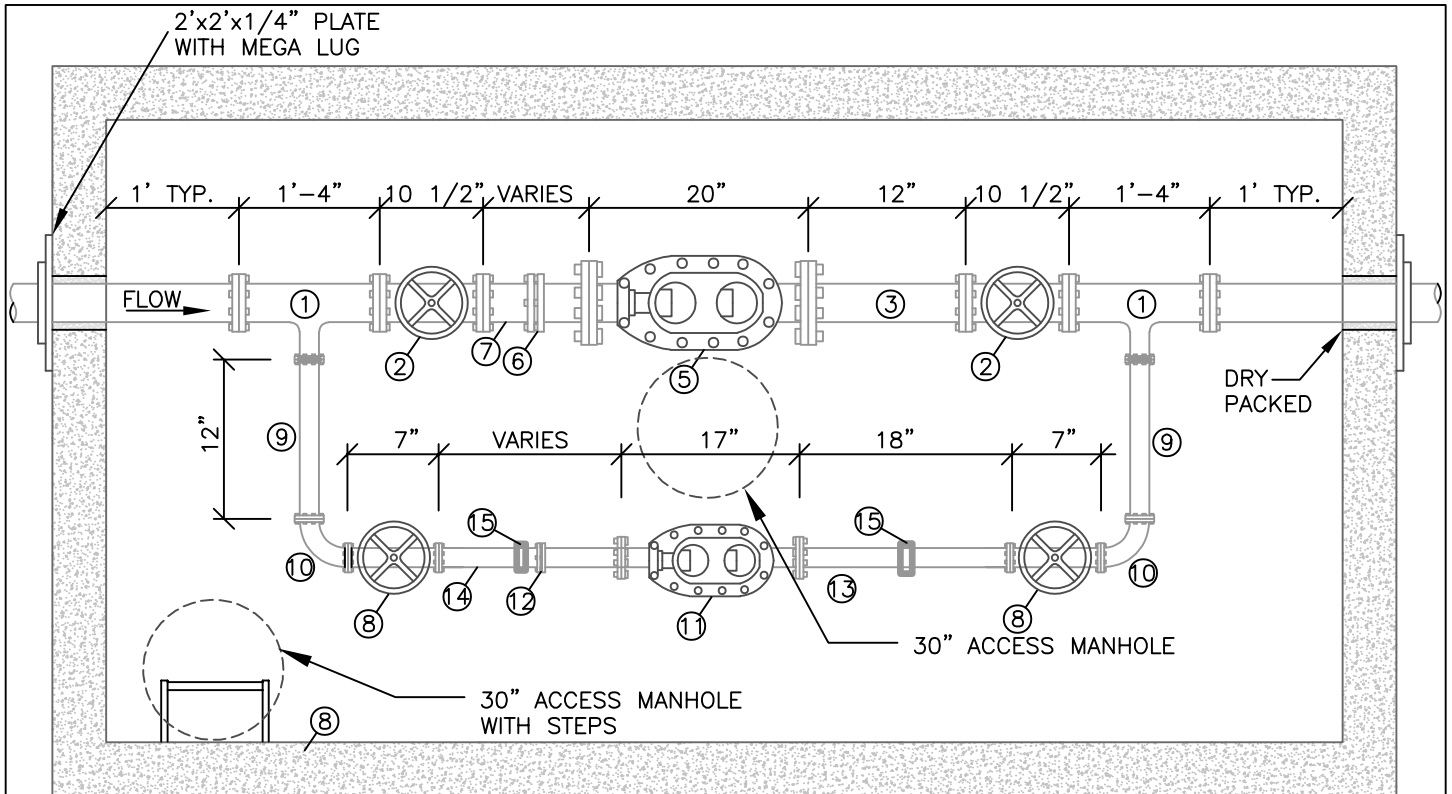
ALL FITTINGS ARE FLANGED UNLESS OTHERWISE NOTED

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:



# 6" Water Meter Vault Detail

DATE:  
7-24-24  
DRWG NO.:  
**W18**



**NOTES:**

1. CONTRACTOR TO PERFORM ALL CONSTRUCTION AND INSTALLATION OF THE WATER METER.
2. PROVIDE AND PLACE BACKFILL PER APWA SECTION 31 23 23. COMPACT PER APWA SECTION 31 23 26 TO A DENSITY OF 95 PERCENT OR GREATER. MAXIMUM LIFT THICKNESS IS 8" WHEN USING RIDING COMPACTION AND 6" WHEN USING HAND HELD COMPACTION EQUIPMENT.
3. INSTALL PRECAST 12 FEET X 6 FEET X 6 FEET HIGH INTERIOR VAULT. ALLOW 1" CLEARANCE AROUND THE LINE THROUGH THE VAULT WALL. DRY PACK REMAINING SPACE AROUND PIPE. SUPPORT WATER METER ON LATERAL AND BYPASS WITH JACK STANDS.
4. ALL JOINTS MUST BE RESTRAINED.

ITEM	QTY	DESCRIPTION
1	2	8" x 8" x 4" (FL x FL x FL) TEE
2	2	8" GATE VALVE (FL x FL) WITH HANDWHEEL
3	1	8" x 12" LONG (FL x FL) SPOOL
4	1	8 INCH METER
5	1	8 INCH DRESSER
6	1	8 INCH DUCTILE IRON PIPE (FL x CUT TO FIT)
7	1	PRE-CAST CONCRETE VAULT
8	2	4" GATE VALVE (FL x FL) WITH HANDWHEEL
9	2	4" x 12" LONG (FL x FL) SPOOL
10	2	4" 90 DEGREE ELBOW (FL x FL)
11	1	4 INCH METER
12	1	4 INCH DRESSER
13	1	4" X 18" INCH DUCTILE IRON PIPE (FL x FL)
14	1	4 INCH DUCTILE IRON PIPE (FL x CUT TO FIT)
15	4	JACK STANDS

ALL FITTINGS ARE FLANGED UNLESS OTHERWISE NOTED

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:



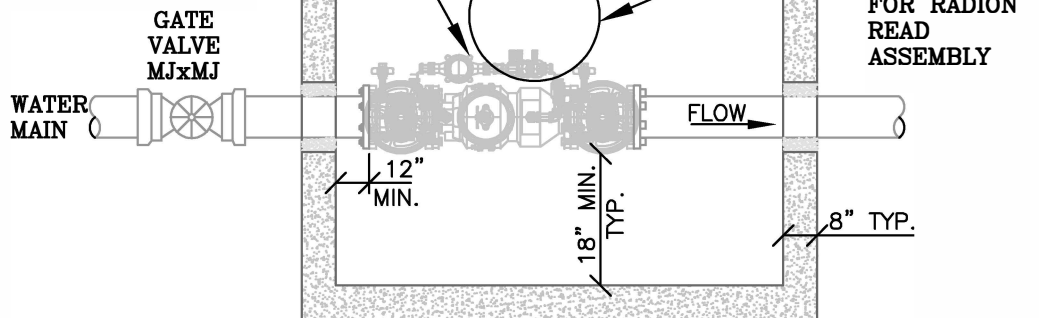
# 8" Water Meter Vault Detail

DATE:  
7-24-24  
DRWG NO.:  
**W19**

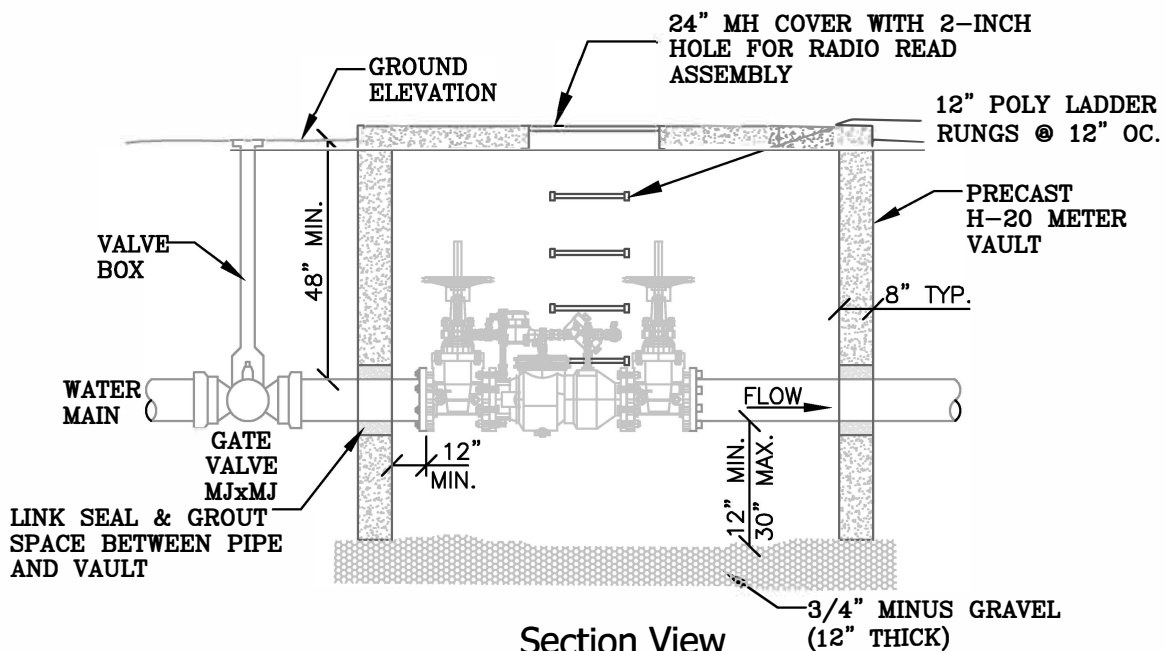


ZURN DOUBLE CHECK  
DETECTOR ASSEMBLY  
MODEL 350DA WITH  $\frac{3}{4}$ "  
BY-PASS BACKFLOW  
ASSEMBLY

12" POLY LADDER  
RUNGS @ 12" OC.



Plan View



Section View

1. PRE-CAST BOX H-20 LOADED 8 FEET LONG X 6 FEET WIDE X 6 FEET HIGH INTERIOR WITH GRAVEL BOTTOM.
2. INSTALL GATE VALVE & VALVE BOX OUTSIDE OF BUT ADJACENT TO VAULT.
3. DETECTOR CHECK TO BE ZURN MODEL 310 DETECTOR CHECK VALVE OR APPROVED EQUAL.
4. 6 INCH FIRE LINE APPROVED FOR ONE (1) FIRE HYDRANT WITH 8-INCH FIRE LINE AND ONE (1) DETECTOR CHECK.
5. WATER/FIRE LINE AFTER DETECTOR CHECK SHALL BE A PRIVATE WATER LINE OWNED, MAINTAINED AND OPERATED BY OWNER. NO ADDITIONAL CONNECTIONS ARE ALLOWED TO THIS LINE

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:



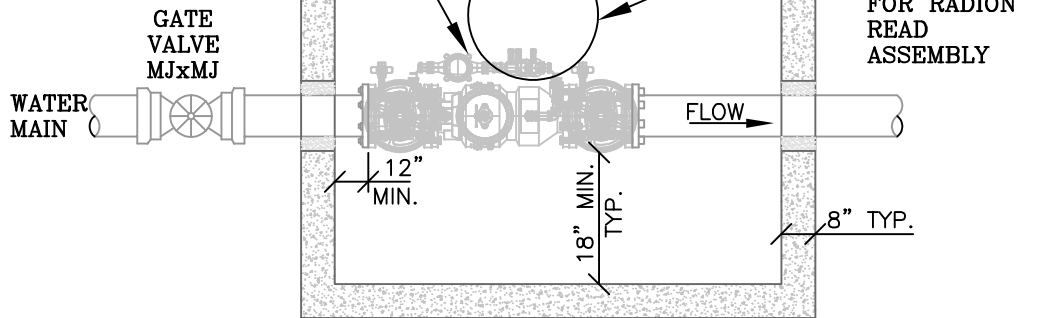
# 4" & 6" Detector Check Vault Detail

DATE:  
7-24-24  
DRWG NO.:  
W20

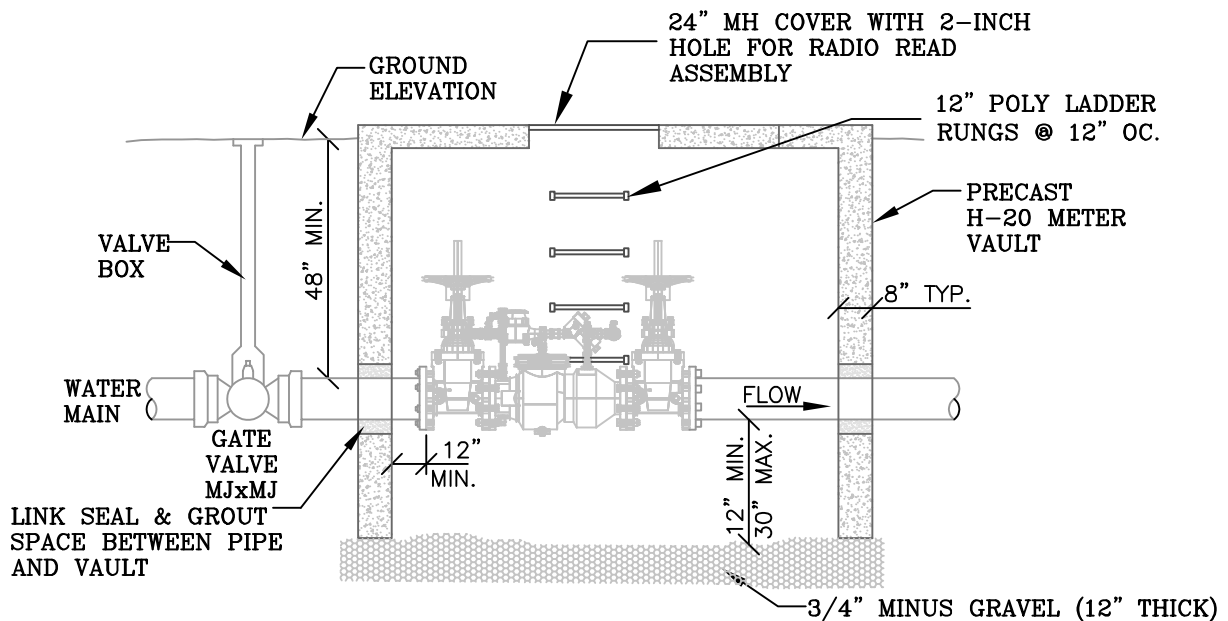


ZURN DOUBLE CHECK  
DETECTOR ASSEMBLY  
MODEL 350DA WITH  $\frac{3}{4}$ "  
BY-PASS BACKFLOW  
ASSEMBLY

12" POLY LADDER  
RUNGS @ 12" OC.



Plan View



Section View

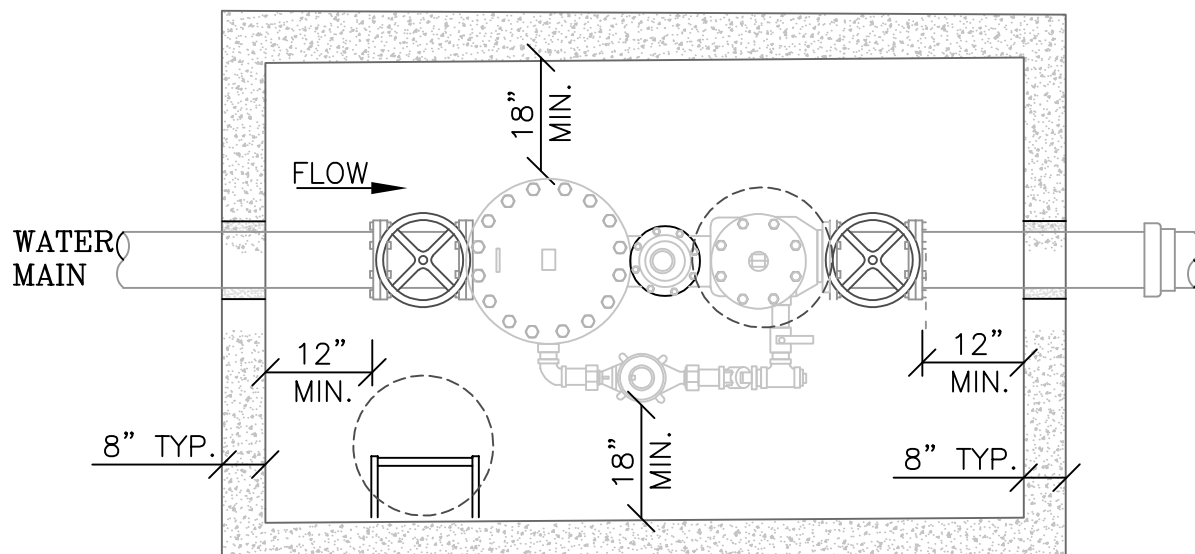
1. PRE-CAST BOX H-20 LOADED 8 FEET LONG X 6 FEET WIDE X 6 FEET HIGH INTERIOR WITH GRAVEL BOTTOM.
2. INSTALL GATE VALVE & VALVE BOX OUTSIDE OF BUT ADJACENT TO VAULT.
3. DETECTOR CHECK TO BE ZURN MODEL 310 DETECTOR CHECK VALVE OR APPROVED EQUAL.
4. APPROVED FOR 2 OR MORE FIRE HYDRANTS WITH LOOPED 8-INCH FIRE LINE WITH TWO (2) DETECTOR CHECKS.
5. WATER/FIRE LINE AFTER DETECTOR CHECK SHALL BE A PRIVATE WATER LINE OWNED, MAINTAINED AND OPERATED BY OWNER. NO ADDITIONAL CONNECTIONS ARE ALLOWED TO THIS LINE

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:

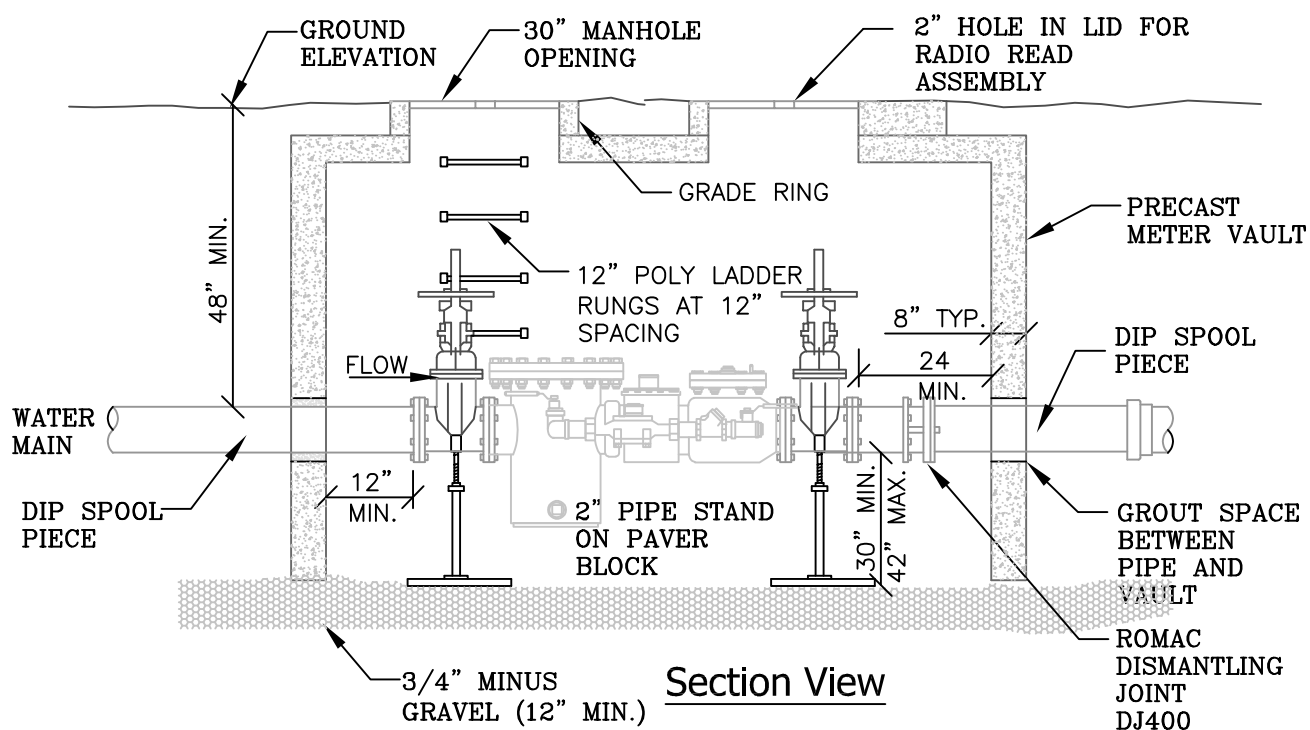


# 8" Detector Check Vault Detail

DATE:  
7-24-24  
DRWG NO.:  
W21



**Plan View**



**Section View**

1. PRE-CAST VAULT BOX SHALL BE 10 FEET LONG X 6 FEET WIDE BY 6 FEET DEEP INTERIOR WITH GRAVEL BOTTOM.
2. FIRE LINE METER ASSEMBLY TO BE NEPTUNE PROTECTUS III STAINLESS STEEL FIRE SERVICE METER WITH SENSUS 6" OR 8" METER.

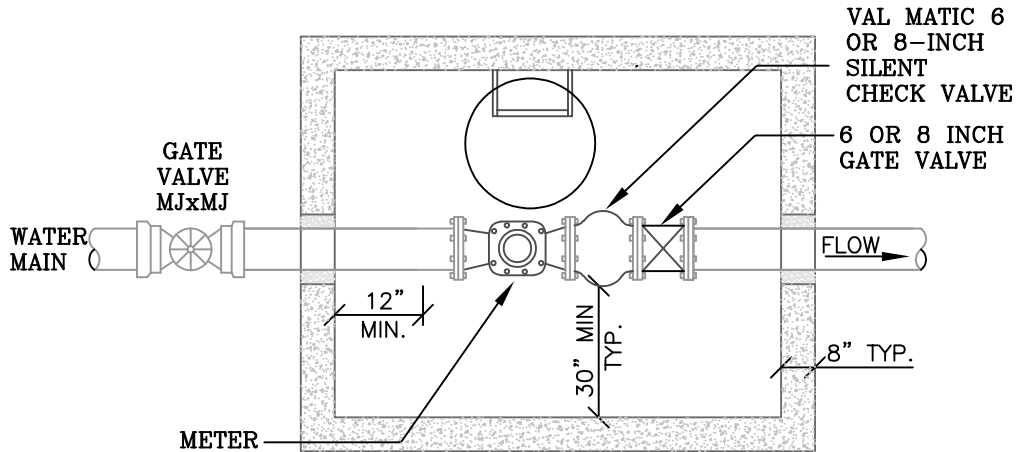
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JW  
CHECKED:  
RL  
CHECKED:



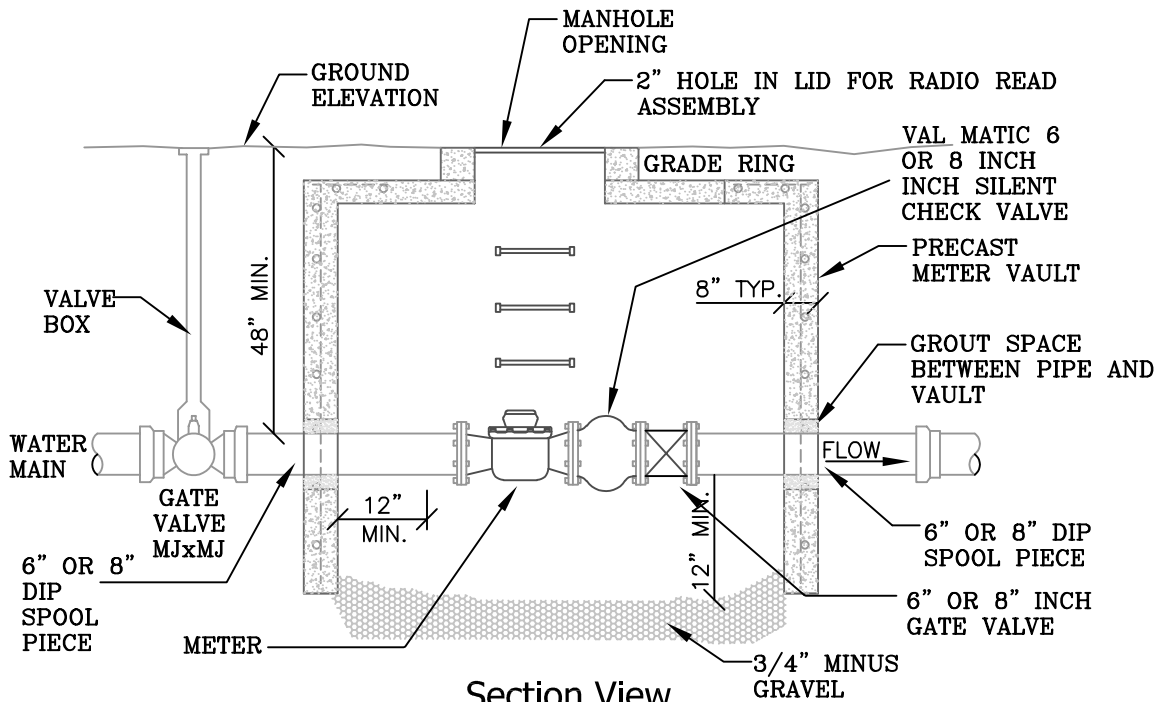
# 6" & 8" Compound Fire Line Vault

DATE:  
7-24-24

DRWG NO.:  
**W22**



**Plan View**



**Section View**

1. LOCATE MANHOLE OPENINGS DOWN CENTER LINE OF VAULT.
2. VAULT BOX SHALL BE 6' X 6' INTERIOR AND MIN. 5' DEEP WITH GRAVEL BOTTOM.
3. CONTRACTOR SHALL PROVIDE A MINIMUM OF 12" CLEARANCE FROM THE GATE VALVES AND THE VAULT WALLS. VAULT SHALL HAVE LADDER RUNGS.
4. INSTALL GATE VALVE & VALVE BOX OUTSIDE OF BUT ADJACENT TO VAULT.
5. WATER METER TO BE NEPTUNE MACH 10 ULTRASONIC METER- PROVIDED BY DISTRICT.

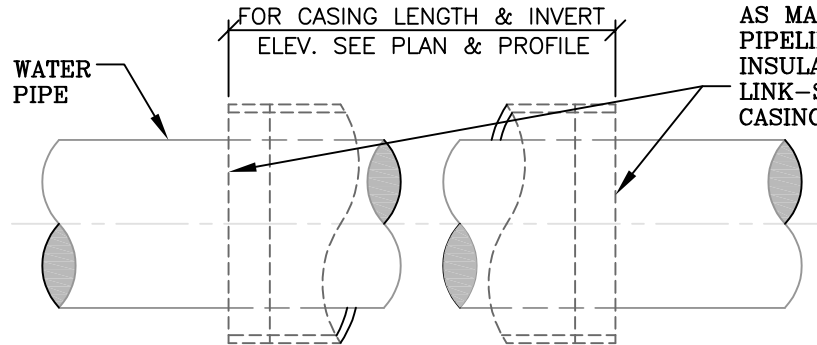
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JW  
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RL  
CHECKED:



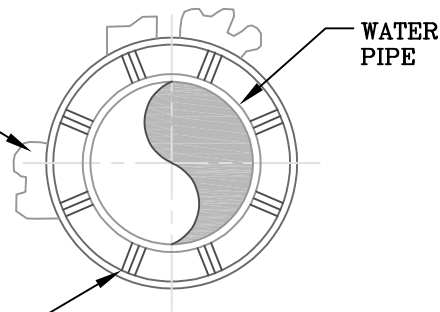
# 6" or 8" Water Meter Vault

DATE:  
7-24-24  
DRWG NO.:  
W23

SEAL EACH END OF CASING WITH 1/8-INCH THICK SYNTHETIC RUBBER, MODEL C PULL-ON TYPE END SEALS, AS MANUFACTURED BY PIPELINE SEAL AND INSULATOR, INC. OR EQUAL, LINK-SEAL AT EACH END OF CASING



ANY VOIDS CREATED BY BORING, JACKING, OR TUNNELING SHALL BE FILLED BY PRESSURE GROUTING



CASING SPACERS MANUFACTURED BY PIPELINE SEAL AND INSULATOR, INC. MODEL 512G-2 SPACED EVERY 5-FT TO CENTER THE PIPE INSIDE THE CASING. PIPE THROUGHOUT THE LENGTH OF THE CASING SHALL BE AT A CONTINUOUS GRADE AS SHOWN ON DRAWINGS.

Section

PIPE SIZE	MINIMUM I.D. CASING SIZE	MINIMUM WALL THICKNESS
4"	12"	0.188"
6"	16"	0.312"
8"	18"	0.312"
12"	24"	0.438"
16"	30"	0.50"
18"	30"	0.50"
24"	36"	0.625"
30"	42"	0.625"

LARGER CASINGS AS DIRECTED BY THE DISTRICT ENGINEER

NOTES:

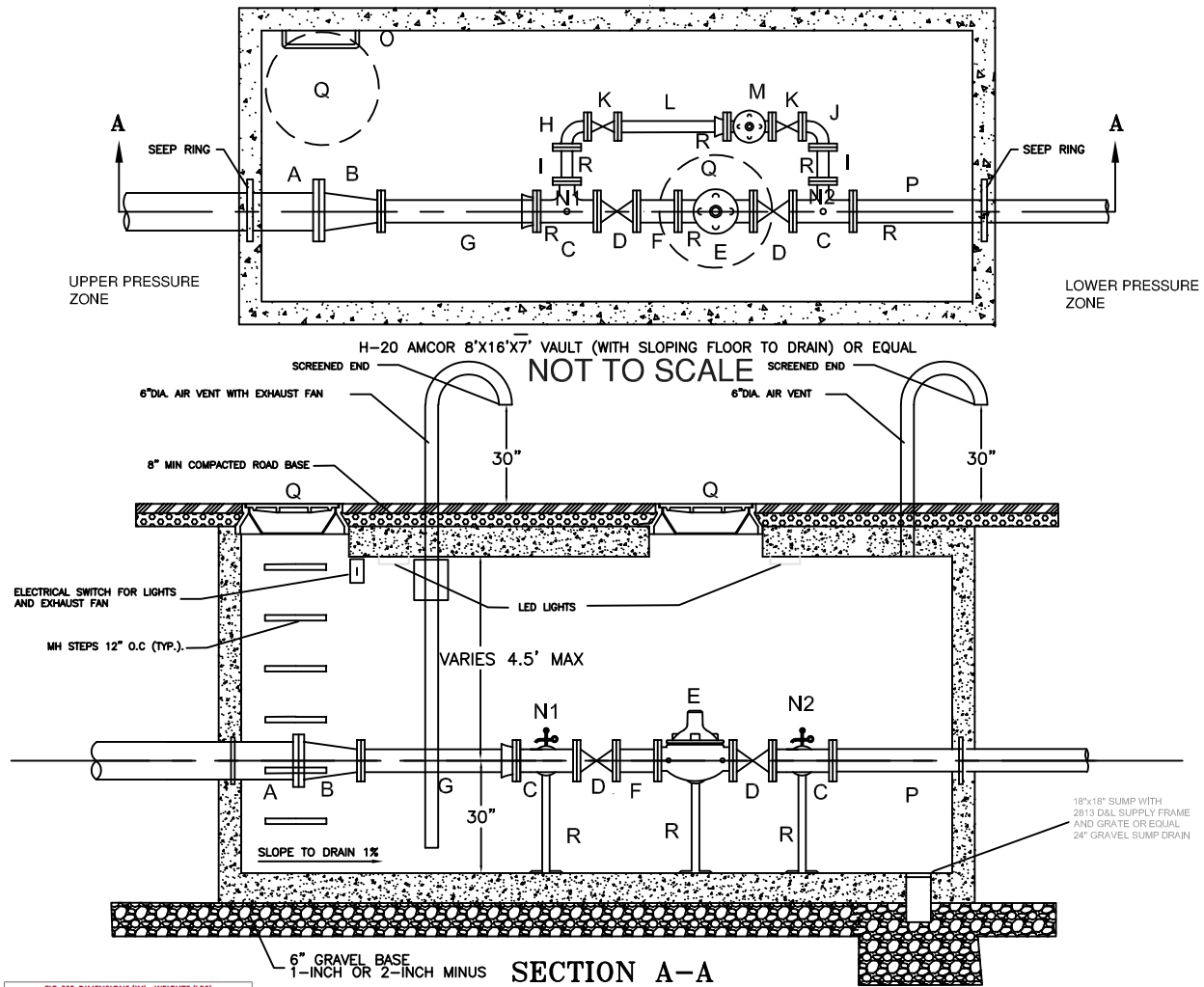
1. CASING PIPES SHALL BE REQUIRED AS INDICATED ON THE DRAWINGS AND/OR WHERE REQUIRED BY THE DISTRICT INSPECTOR OR ENGINEER.
2. CARRIER PIPE SHALL BE TESTED BEFORE SEALING THE ENDS OF THE CASING.
3. SPACERS SHALL BE SECURELY ATTACHED TO THE CARRIER PIPE PER THE MANUFACTURER'S REQUIREMENTS.
4. CASING PIPE SHALL BE WELDED STEEL, ASTM A53, GRADE B OR APPROVED EQUIVALENT.

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:



# Steel Casing For Water Pipe

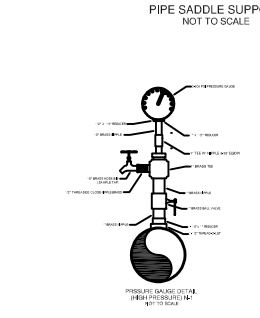
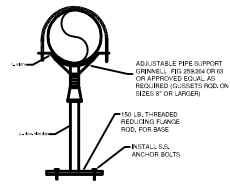
DATE:  
7-24-24  
DRWG NO.:  
W24



**FIG. 259- DIMENSIONS (IN) - WEIGHTS (LBS)**

Pipe Size	Weight	A	B	C	C	Max Load
4	13.8	45%	50%			
6	13.1	45%	45%			
8	12.2	50%	45%			
10	21.3	85%	85%	3%	4	3,800
12	22.2	85%	85%			
14	28.0	85%	85%			
16	31.0	85%	85%			5,300
18	36.0	85%	85%			6,700
20	41.0	85%	85%			
22	46.0	85%	85%			
24	52.0	85%	85%			
26	59.0	85%	85%			
30	69.0	85%	85%			7,300
36	79.0	85%	85%			
42	81.0	85%	85%			

\* Maximum load limit. The above load ratings are applicable to the vaults only and are not applicable to the dimension of other means used to support the vaults.



**SECTION A-A**  
NOT TO SCALE

- GENERAL NOTES:**
- LOCATE MANHOLE OPENINGS OVER THE VAULT LADDER RUNGS AND CENTERED OVER THE COMBINATION PRESSURE REDUCING AND SUSTAINING VALVE.
  - WATERPROOF OUTSIDE WALLS AND TOP OF SLAB PER UBC CODE FOR BURIED VAULTS.
  - PRE-CAST VAULT SHALL BE 17 FEET LONG X 8 FEET WIDE X 6'-8" HIGH (INSIDE DIMENSION) DESIGNED FOR H-20 LOADING AND INSTALLED ON PREPARED SUBGRADE WITH 6 INCHES OF GRAVEL BASE.
  - ALL WORK SHALL CONFORM WITH KEARNS IMPROVEMENT DISTRICT DESIGN STANDARDS, CONSTRUCTION SPECIFICATIONS, AND STANDARD DRAWINGS.
  - PROVIDE POWER FOR EXHAUST FAN AND FOR SCADA.

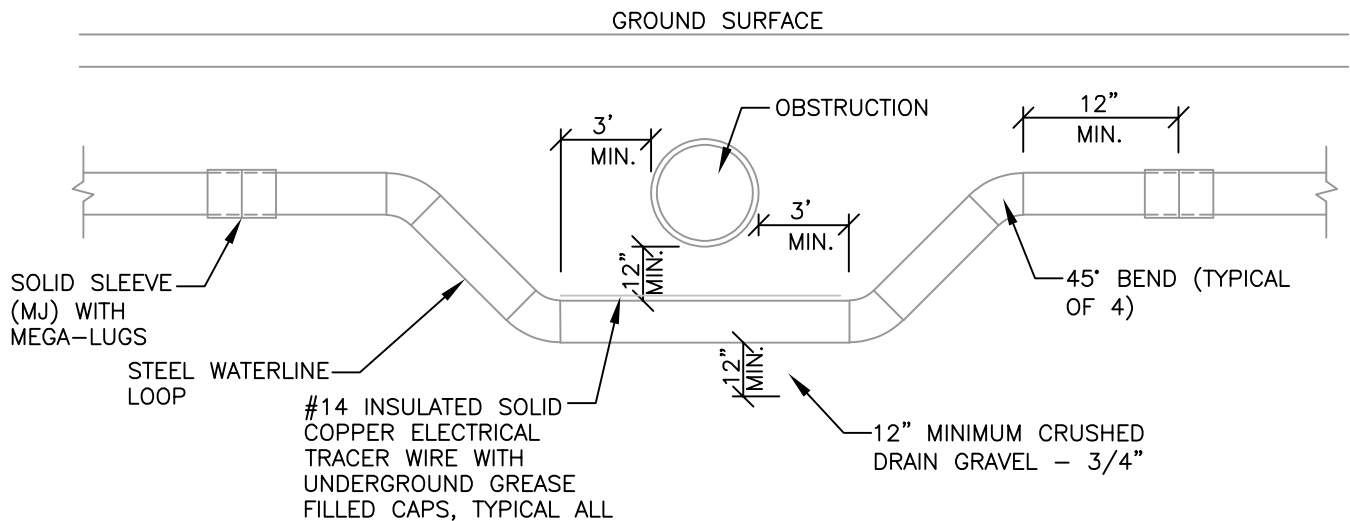
PRESSURE REDUCING STATION	
VALVE AND FITTING SCHEDULE	
ITEM	DESCRIPTION
A	8" Flg x PE DI Spool with Seep Ring (30" ± Long)
B	8" x 6" DI Flanged Reducer
C	3/4"x2" DI Flg Tee with 1/2" Tap for Pressure Gauge
D	8" DI Flg Gate Valve with Hand Wheel
E	8" CLA-VAL 92-01 Combination Pressure Reducing & Pressure Sustaining Valve with Strainers, Flow Control Shut Off Cocks, Flow Stabilizer, Stainless Steel Trim, Flange x Flange, 150# Class
F	8" DI Flg x Flg Spool (12' ± Long)
G	8" DI Flg x PE Spool (32' ± Long with a Flange Coupling Adapter)
H	4" DI Flg Tee
I	4" DI Flg x Flg Spool (12' ± Long)
J	8" DI Flg 90° Bend
K	4" DI Flg Gate Valve with Hand Wheel
L	4" DI Flg x PE Spool (32' ± Long) with a Flange Coupling Adapter
M	8" CLA-VAL 92-01 Combination Pressure Reducing & Pressure Sustaining Valve with Strainers, Flow Control Shut Off Cocks, Flow Stabilizer, Stainless Steel Trim, Flange x Flange, 150# Class
N (1)	High Pressure Gauge Detail (See Detail This Sheet)
N (2)	Low Pressure Gauge Detail (See Detail This Sheet)
P	8" Flg x PE DI Spool with Seep Ring (30" ± Long)
Q	30" Manhole Ring & Cover D&I, A-1165 w/ Pick Hole to read "Water"
R	Adjustable Pipe Saddle Supports- See Detail this Sheet

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:



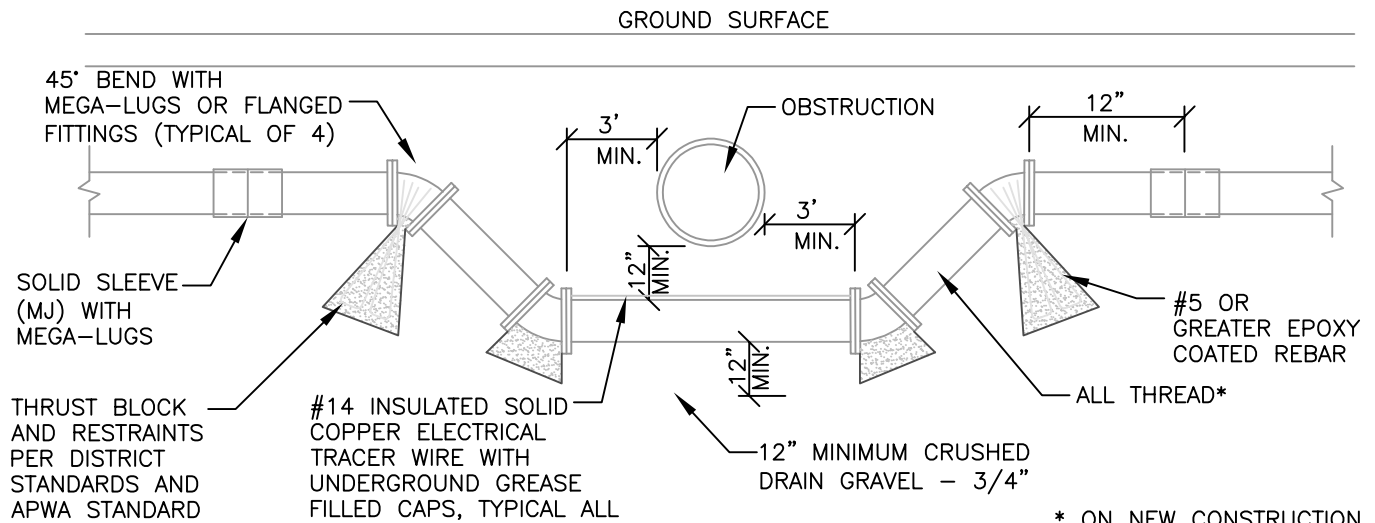
**8 & 10 INCH PRESSURE REDUCING VAULT**

DATE:  
7-24-24  
DRWG NO.:  
**W25**



### PRE-FABRICATED LOOP

STANDARD LOOP



### WATERLINE LOOP

MAY BE USED AT DISCRETION OF DISTRICT ENGINEER

\* ON NEW CONSTRUCTION USE BELL RESTRAINTS IN PLACE OF ALL THREAD

#### NOTES:

1. SAND SHALL BE USED AS BEDDING AND BACKFILL 12" UNDER, ON SIDES AND OVER WATERLINE LOOP.
2. BEDDING SHALL BE COMPACTED TO 95% MIN. ASTM D-1557.
3. MINIMUM TRENCH WIDTH SHALL BE EQUAL TO OUTSIDE PIPE DIAMETER PLUS 1' EACH SIDE OF PIPE.
4. PRE-FAB WATERLINE PIPE AND FITTINGS SHALL BE BUTT WELDED A53 GRADE B SCH 80 STEEL FOR PIPES LESS THAN 12" DIAMETER
5. COPPER ELECTRICAL TRACER WIRE WITH UNDERGROUND GREASE FILLED CAPS.
6. REFER TO APWA SECTION 33 05 09 FOR EPOXY LINING AND COATING DETAILS.
7. GREASE AND WRAP ALL EXTERNAL FITTINGS AND BOLTS WITH F.M. GREASE AND 8-MIL POLYETHYLENE AND DUCT TAPE TIGHT.
8. ALL THRUST BLOCKING POURED AGAINST NATIVE SOIL WITH 4,000 PSI CONCRETE

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:



# Typical Waterline Loop

DATE:  
7-24-24  
DRWG NO.:  
W26



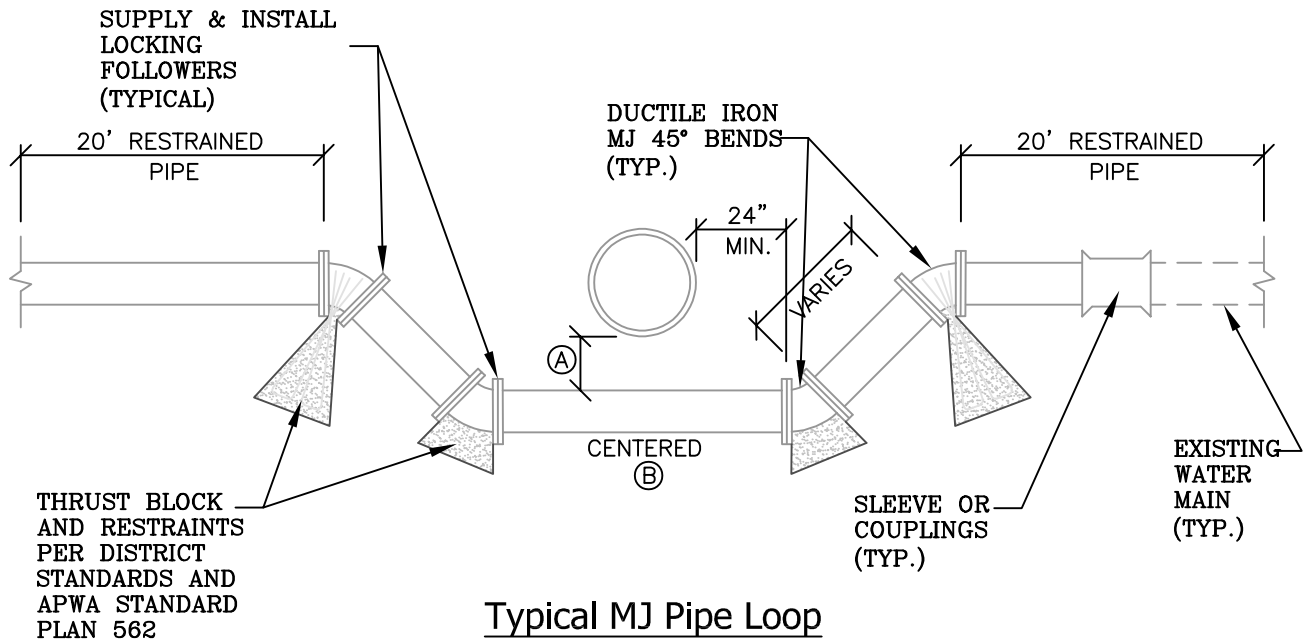


TABLE OF DIMENSIONS		
OBSTRUCTION	A	B
SEWER	18" MINIMUM	20' MINIMUM
OTHER	12" MINIMUM	O.D. + 48"

**NOTES:**

1. BEFORE BACKFILLING, SECURE INSPECTION FROM KID INSPECTOR.
2. ALL DUCTILE IRON PIPE IS TO BE POLY WRAPPED AND ALL FITTING GREASED WITH NON-OXIDE POLY (FM).
3. ALL THRUST BLOCKS POURED AGAINST NATIVE SOIL WITH 4000 PSI CONCRETE.
4. REINFORCEMENT: DEFORMED, 60 KSI YIELD GRADE STEEL. ASTM 615.

DRAWN:  
JW  
CHECKED:  
RL  
CHECKED:



# Typical Water Main MJ Loop Detail

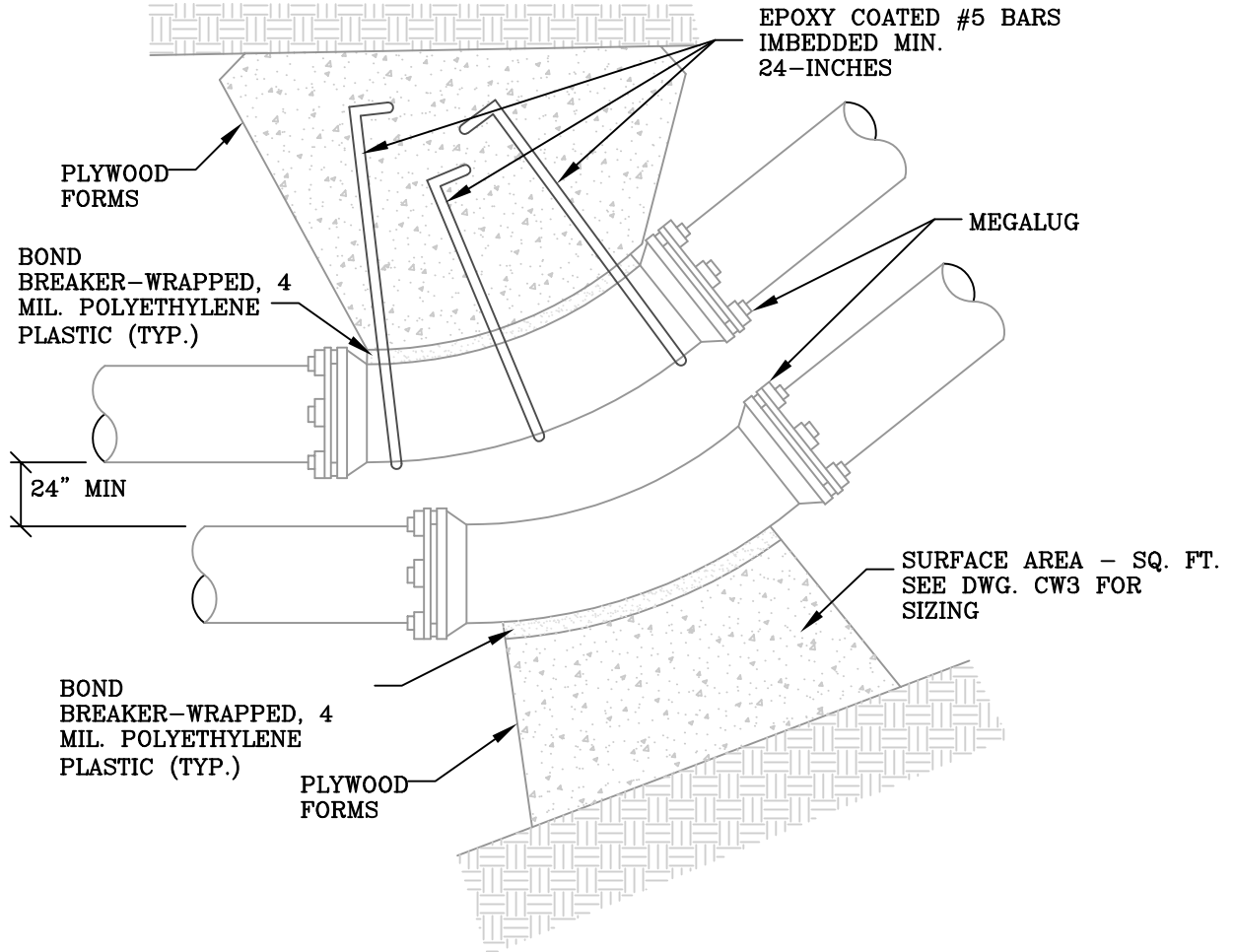
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**W27**

MINIMUM CUBIC YARDS OF CONCRETE

PIPE SIZE	BENDS			
	11-1/4'	22-1/2'	45'	90'
4"	0.2	0.4	1.3	N/A
6"	0.2	0.5	1.8	N/A
8"	0.2	0.5	1.8	N/A
10"	0.2	0.8	2.7	N/A
12"	0.3	1.0	3.8	N/A

N/A = NOT ALLOWED

NOTE:  
PIPE LARGER THAN 12" TO BE DESIGNED BY ENGINEER. FORMS SHALL BE 3/8" PLYWOOD OR DISTRICT APPROVED EQUIVALENT.



Top View

Horizontal Parallel Bends

GENERAL NOTES:

1. USE MEGALUG JOINT RESTRAINT DEVICES OR SIMILAR UPON PRIOR DISTRICT APPROVAL - POLY-WRAPPED PIPE TO SERVE AS BOND BREAKER (NOT TO INTERFERE WITH RESTRAINED JOINTS). ALL SURFACES OF THE RESTRAINED JOINTS SHALL BE ACCESSIBLE AND FREE FROM INTERFERENCE DUE TO THRUST BLOCK CONSTRUCTION.
2. MINIMUM AREA REQUIRED WILL BE THAT OF AN 8-INCH MAIN.
3. ALL THRUST BLOCKS SHALL BE FORMED. THE MINIMUM THICKNESS FORM MATERIAL SHALL BE 3/8" PLYWOOD OR DISTRICT APPROVED EQUIVALENT.
4. BEARING AREA BASED ON SOIL BEARING PRESSURE OF 2000 LB/SF.
5. EMBED THREE (3) NO. 5 EPOXY-COATED REBAR 18" INTO CONCRETE W/ ENDS BENT 90 DEGREES AS SHOWN.

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Parallel Bends w/  
Thrust Blocks

DATE:  
7-24-24  
DRWG NO.:  
W28