

Standard Details



CLACKAMAS COUNTY, OREGON

MAY 2021

CLACKAMAS RIVER WATER STANDARD DETAILS

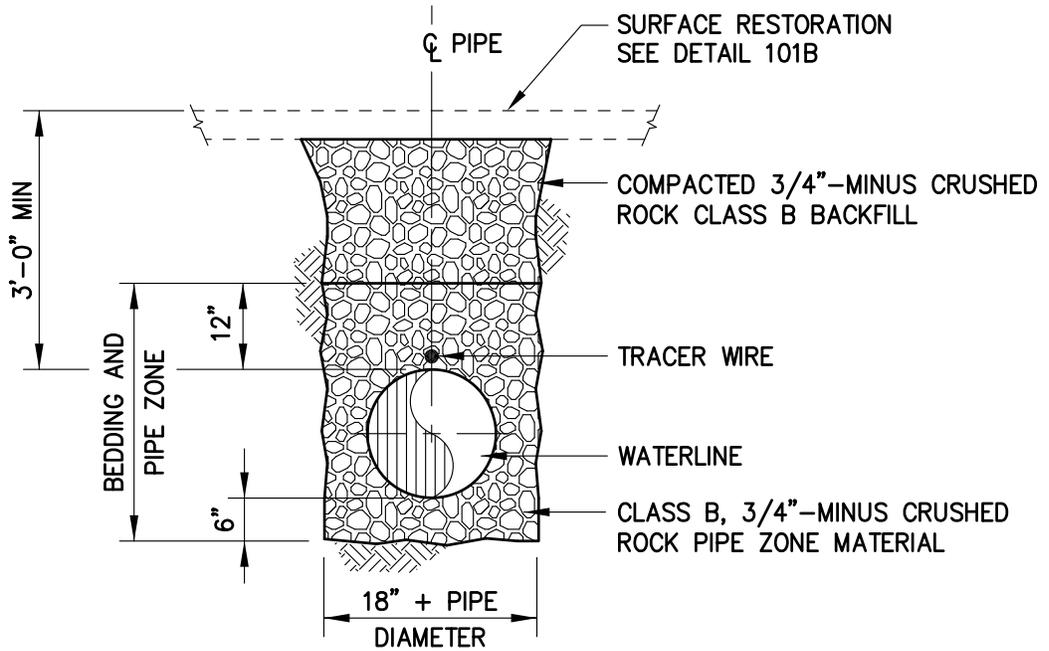
STANDARD DETAILS:

<u>No.</u>	<u>TITLE</u>
100	TABLE OF CONTENTS
101A	TYPICAL TRENCH
101B	TYPICAL SURFACE RESTORATION
102	THRUST BLOCK
103	COLLAR BLOCK
104A	TYPICAL VALVE AND ACCESSORIES
104B	VALVE BOX REPLACEMENT
105	WET TAP ASSEMBLY
106A	BLOW-OFF ASSEMBLY - TYPE I
106B	BLOW-OFF ASSEMBLY - TYPE II
107A	1" AIR / VACUUM VALVE ASSEMBLY
107B	2" AIR / VACUUM VALVE ASSEMBLY
108A	3/4" OR 1" SERVICE ASSEMBLY - NEW
108B	3/4" OR 1" SERVICE ASSEMBLY - RETROFIT
108C	3/4" OR 1" SERVICE ASSEMBLY - SERVICE RECONNECTION
109	1-1/2" OR 2" SERVICE ASSEMBLY - NEW
110A	FIRE HYDRANT ASSEMBLY - TYPE 1 AND 2
110B	FIRE HYDRANT ASSEMBLY - TYPE 3
110C	FIRE HYDRANT ASSEMBLY - CLEAR ZONE
111	TYPICAL FIRE SERVICE VAULT
112	BACKFLOW ASSEMBLIES
113	WATERLINE CROSSING OF DRY UTILITIES
114A	TYPICAL WATER QUALITY SAMPLE STATION ASSEMBLY
114B	WATER QUALITY SAMPLE STATION ASSEMBLY WITH PRV
115	TYPICAL TRACER WIRE
150A	TYPICAL 3-INCH METER ASSEMBLY
150B	TYPICAL 3-INCH METER ASSEMBLY NOTES

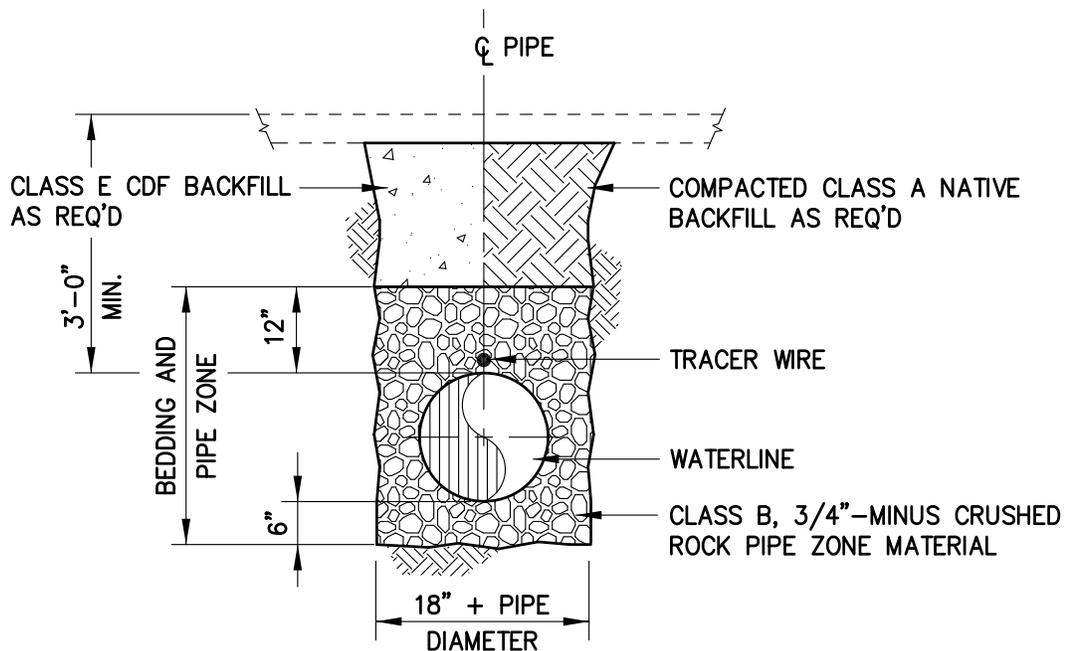
SPECIAL DETAILS:

<u>No.</u>	<u>TITLE</u>
201	DI/OD STL PIPE CONNECTION
202	CASED WATERLINE
203	WATERLINE ABANDONMENT - TRACER WIRE
204	WATERLINE ABANDONMENT - CAP AND FILL
205	CCP FLANGE ASSEMBLY

	NO	REVISION	CRW STANDARD DETAILS		
			TABLE OF CONTENTS		
			SCALE: N.T.S.	DATE: MAY 2021	100
			DRAWING: CRW.STD.DTL100.dwg		



TYPICAL TRENCH DETAIL



ALTERNATE TRENCH DETAIL
(AS DIRECTED BY DISTRICT)

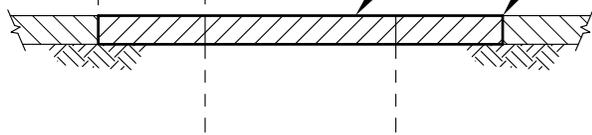
NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 02225.
2. ALL CRUSHED ROCK AND NATIVE BACKFILL SHALL BE COMPACTED TO 95% MAXIMUM RELATIVE DENSITY, UNLESS OTHERWISE SPECIFIED.
3. PROVIDE PROPER SHORING AS REQUIRED. COMPLY WITH OREGON OSHA REGULATIONS.

	NO	REVISION	TYPICAL TRENCH	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL101A.dwg	
				101A

INITIAL SAWCUT
FOR TRENCHING

12"
MIN.
TYP.

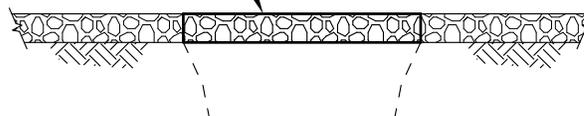


TYPICAL ASPHALT SURFACE
RESTORATION. MATCH EXISTING
DEPTH OR AS DIRECTED.

FINAL SAW CUT, TYP.

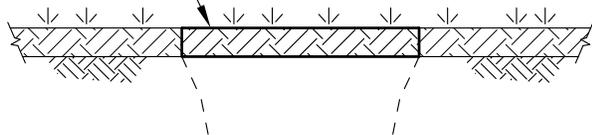
**ASPHALT
SURFACE RESTORATION WITH T-CUT**

COMPACTED CLASS B
3/4"-MINUS CRUSHED ROCK



**GRAVEL
SURFACE RESTORATION**

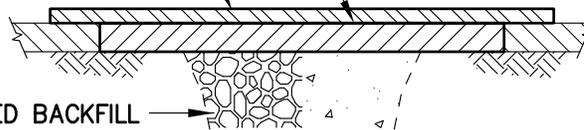
COMPACTED CLASS A NATIVE
BACKFILL WITH FINAL 6" LIFT
TOPSOIL, RESEED AS REQUIRED



**NATIVE
SURFACE RESTORATION**

STEEL PLATE PINNED AND COLD
PATCHED TO ROAD JURISDICTION'S
STANDARDS OR PERMIT REQUIREMENTS

TEMP. OR PERMANENT
AC AS REQUIRED



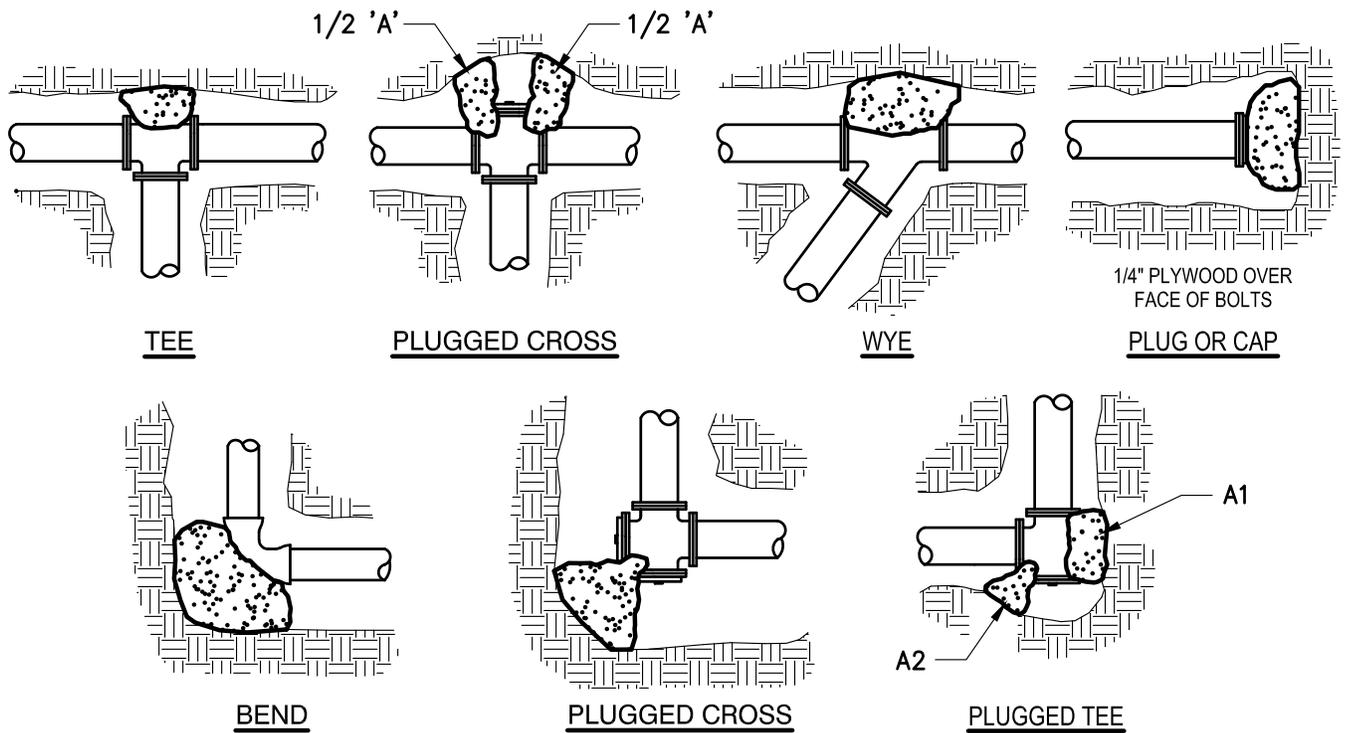
COMPACTED BACKFILL
AS SPECIFIED

**TEMPORARY
SURFACE RESTORATION**

NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 02225.
2. COMPLY WITH ROAD JURISDICTION PERMIT REQUIREMENTS AND AS DIRECTED.

 Clackamas River Water	NO	REVISION	TYPICAL SURFACE RESTORATION	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL101B.dwg	
			101B	



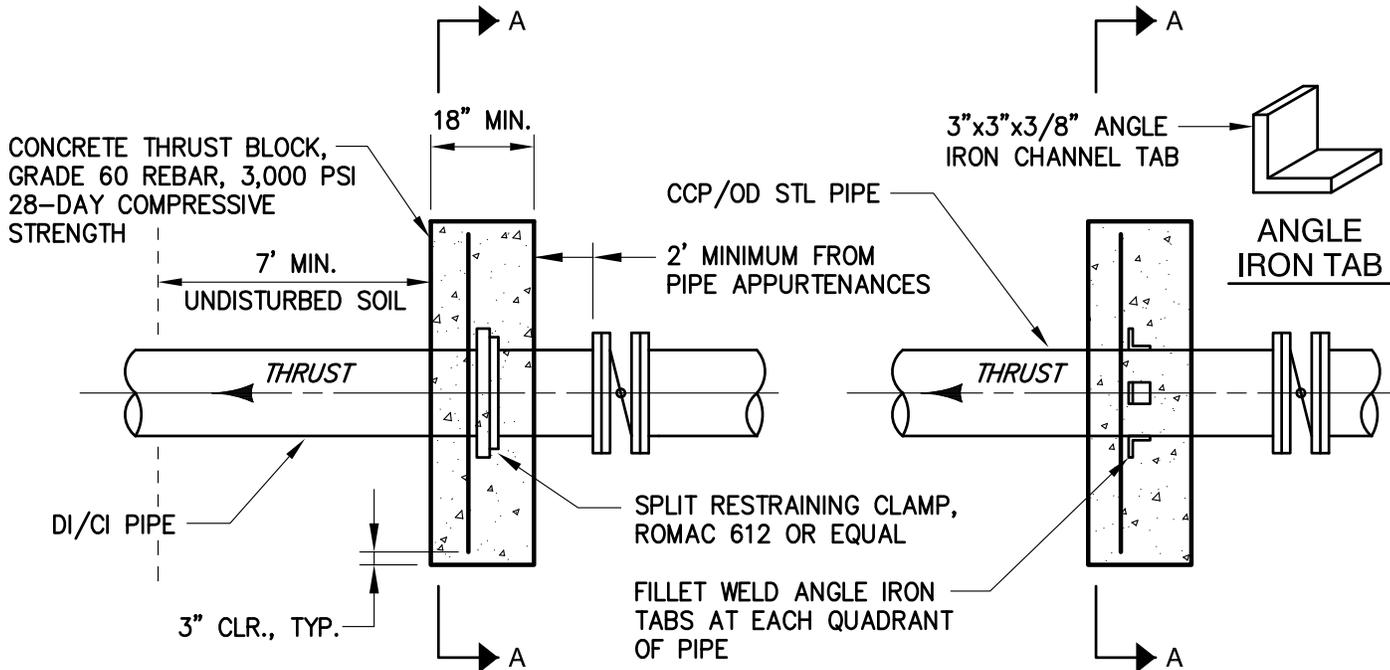
BEARING AREA, 'A', OF THRUST BLOCKS IN SQUARE FEET *							
FITTING SIZE	TEE, WYE, PLUG OR CAP	90° BEND, PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22½° BEND	11¼° BEND
	A	A	A1	A2	A	A	A
4	1.4	1.9	2.7	1.9	1.0	—	—
6	2.8	4.0	5.6	4.0	2.1	1.1	—
8	4.8	6.8	9.6	6.8	3.7	1.9	0.9
10	7.3	10.3	14.5	10.3	5.6	2.8	1.4
12	10.3	14.5	20.4	14.5	7.9	4.0	2.0
14	13.8	19.5	27.5	19.5	10.6	5.4	2.7
16	17.8	25.2	35.5	25.2	13.6	7.0	3.5
18	22.4	31.7	44.7	31.7	17.1	8.7	4.4
20	27.5	38.9	54.8	38.9	21.0	10.7	5.4
24	39.2	55.5	78.3	55.5	30.0	15.3	7.7

* ABOVE BEARING AREAS BASED UPON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:
 BEARING AREA = (TEST PRESSURE/150) X (2,000/SOIL BEARING STRESS) X (TABLE VALUE).

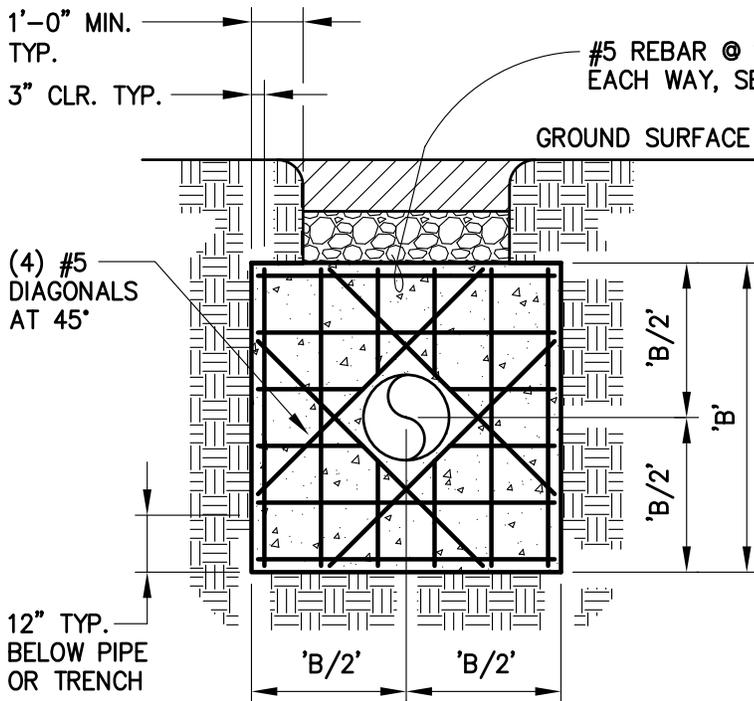
NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15100. CONCRETE THRUST BLOCKS USED WITH APPROVAL ONLY.
2. CONCRETE THRUST BLOCK SHALL BE POURED AGAINST UNDISTURBED EARTH.
3. KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES. INSTALL 4 MIL VISQUEEN MATERIAL BETWEEN PIPE AND/OR FITTINGS BEFORE POURING BLOCKING.
4. CONCRETE SHALL BE 3,000 PSI MINIMUM 28 DAY COMPRESSIVE STRENGTH.
5. BEARING AREAS WHERE EXISTING PIPE WILL BE ABANDONED IN PLACE SHALL INCLUDE 1/2" STEEL PLATE AT THE BASE OF THE THRUST BLOCK. THE MINIMUM BEARING AREA OF THE STEEL PLATE END LINES SHALL HAVE THRUST RESTRAINT PROVIDED BY A COLLAR BLOCK PER STANDARD DETAIL OR BY INTERNAL OR EXTERNAL JOINT RESTRAINT SYSTEMS.
6. ALLOW CONCRETE TO CURE 5 DAYS MINIMUM PRIOR TO FILLING/TESTING WATERLINE.

	NO	REVISION	THRUST BLOCK		
			SCALE: N.T.S.	DATE: MAY 2021	102
			DRAWING: CRW.STD.DTL102.dwg		



SEE DI/CI PIPE PLAN FOR ADD'L INFO.



SECTION A-A

PIPE SIZE (IN)	COLLAR THRUST BLOCKS DIMENSION B (FT)	NO. OF #5 DOWELS, NO. OF HORIZ=NO. OF VERT
4,6,8	3.8	4
10	4.3	4
12	4.7	6
16	5.6	6
18	6	6

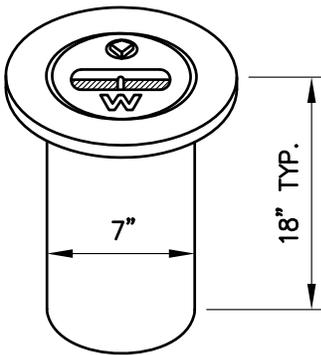
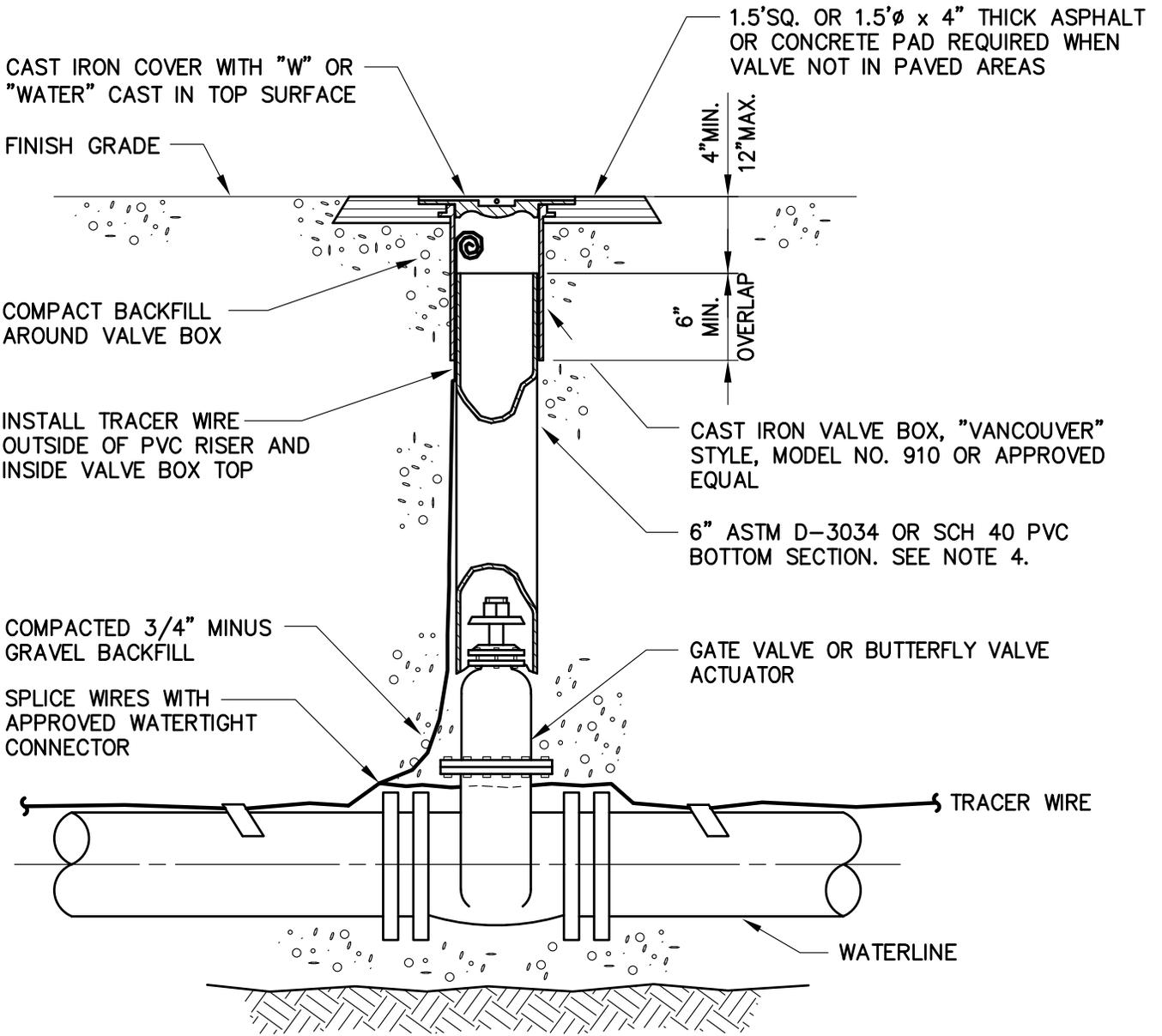
* ABOVE BLOCK DIMENSIONS BASED UPON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION: BLOCK DIMENSION = (TEST PRESSURE/150) X (2,000/SOIL BEARING STRESS) X (TABLE VALUE).

NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15100.
2. CONCRETE THRUST BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH OR 95% COMPACTED GRANULAR BACKFILL ON SIDES AND BOTTOM.
3. FOR COLLAR THRUST BLOCK INSTALLATION UPSTREAM OF VALVE, RESTRAIN ALL JOINTS BETWEEN VALVE AND COLLAR BLOCK, INCLUDING VALVE.
4. ALLOW CONCRETE TO CURE 5 DAYS MINIMUM PRIOR TO FILLING/TESTING WATERLINE.



NO	REVISION	COLLAR BLOCK	
		SCALE: N.T.S.	DATE: MAY 2021
		DRAWING: CRW.STD.DTL103.dwg	
			103



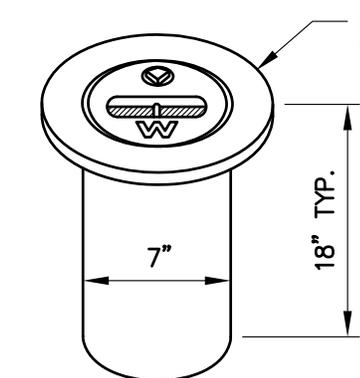
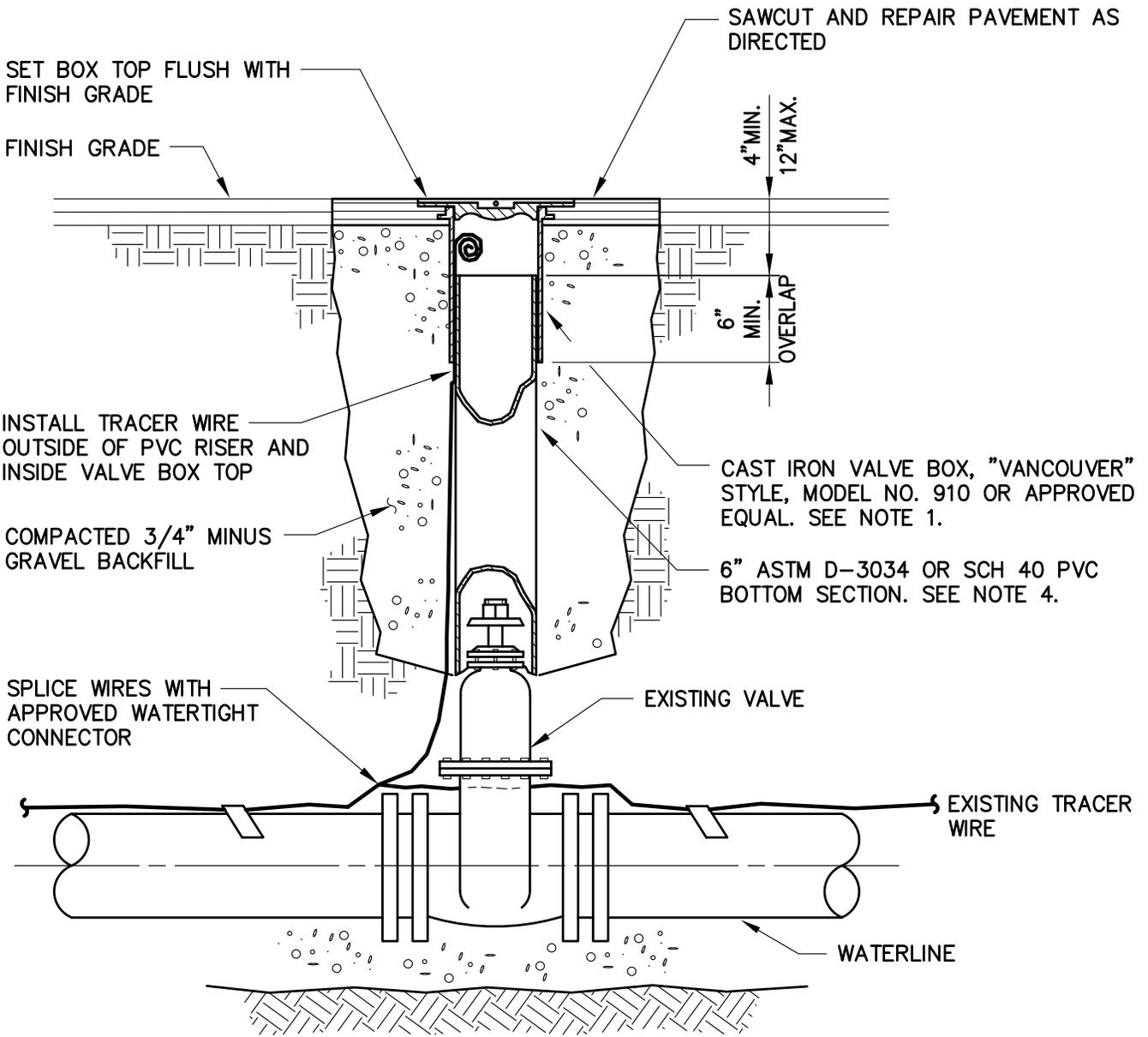
"VANCOUVER" STYLE VALVE BOX

NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15200.
2. VALVE BOXES SHALL BE CENTERED DIRECTLY OVER THE VALVE NUT IN A VERTICAL POSITION.
3. VALVE BOX TOP SHALL BE ADJUSTED TO FINISH GRADE.
4. PVC LOWER SHALL BE A CONTINUOUS PIECE – NO BELLS OR COUPLERS.
5. FOR VALVES 6-FEET OR DEEPER, PROVIDE STEEL EXTENSION STEM TO RAISE OPERATING NUT TO WITHIN 3'-4' BELOW GRADE.



NO	REVISION	TYPICAL VALVE AND ACCESSORIES	
		SCALE: N.T.S.	DATE: MAY 2021
		DRAWING: CRW.STD.DTL104A.dwg	
			104A

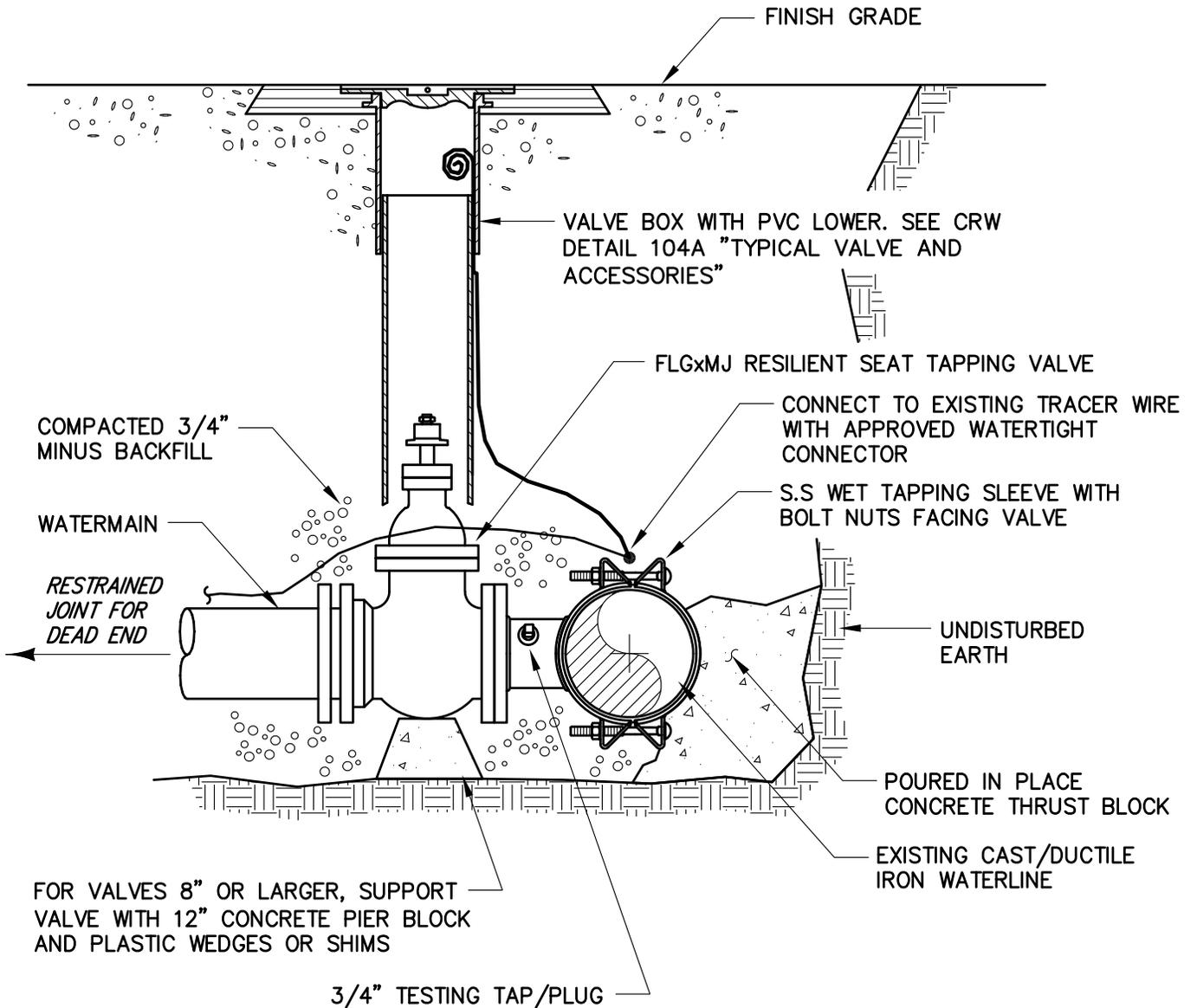


"VANCOUVER" STYLE VALVE BOX

NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15200.
2. VALVE BOXES SHALL BE CENTERED DIRECTLY OVER THE VALVE NUT IN A VERTICAL POSITION.
3. VALVE BOX TOP SHALL BE ADJUSTED TO FINISH GRADE.
4. PVC LOWER SHALL BE A CONTINUOUS PIECE – NO BELLS OR COUPLERS.

	NO	REVISION	VALVE BOX REPLACEMENT	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL104B.dwg	
			104B	



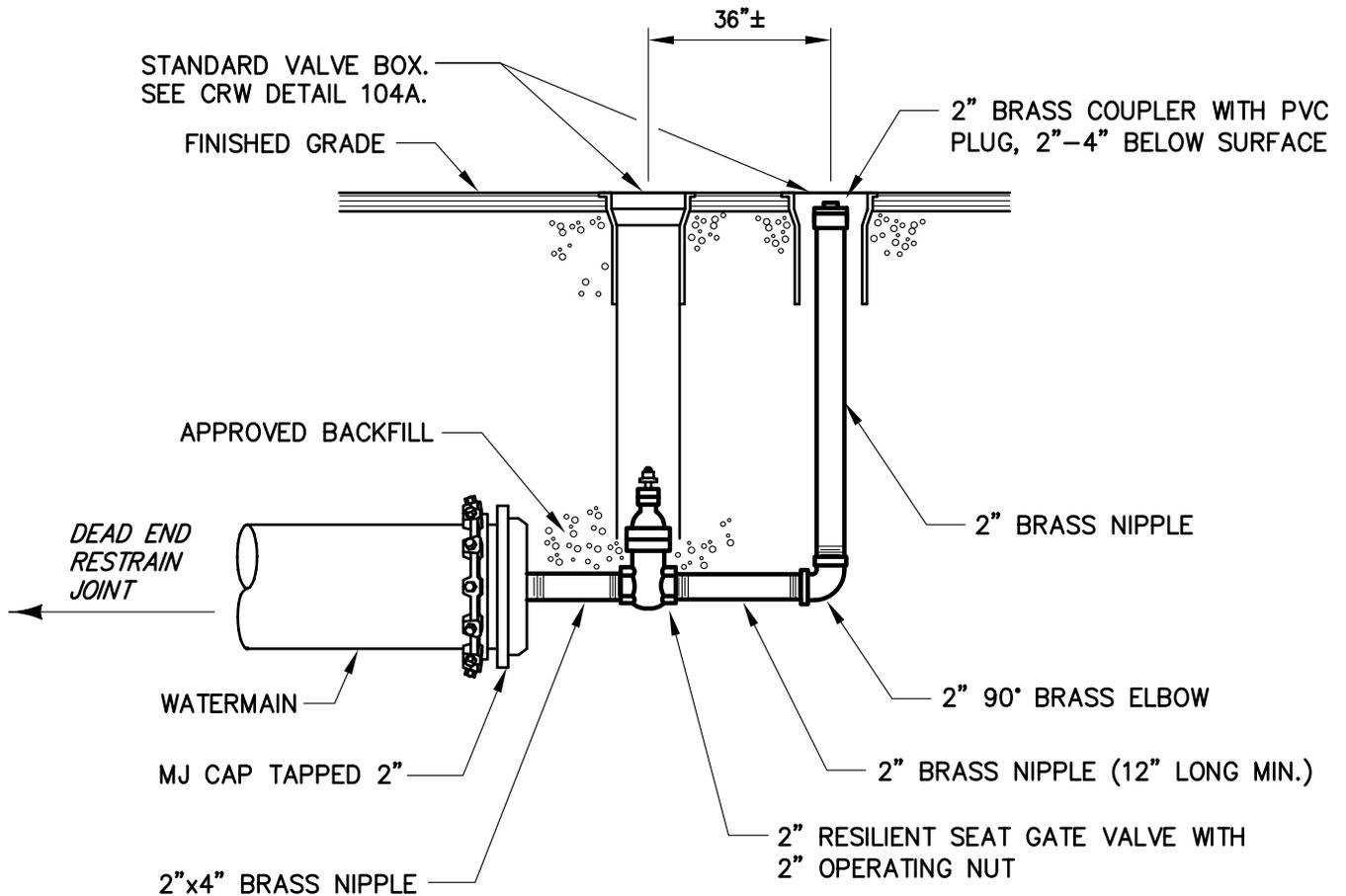
FOR VALVES 8" OR LARGER, SUPPORT VALVE WITH 12" CONCRETE PIER BLOCK AND PLASTIC WEDGES OR SHIMS

NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15100.
2. EXISTING WATERLINE SURFACE SHALL BE CLEANED PRIOR TO ATTACHING SLEEVE.
3. PRESSURE TEST AND TAP SHALL BE MADE IN THE PRESENCE OF AN AUTHORIZED DISTRICT REPRESENTATIVE.
4. TAP SHALL BE MADE NO CLOSER THAN 18" FROM THE NEAREST JOINT OR TAP.
5. WET TAPPING SLEEVE SHALL BE WRAPPED IN (4-6 MIL) VISQUEEN.
6. ALL NUTS, BOLTS, AND WASHERS SHALL BE STAINLESS STEEL ON SADDLE (USE ANTI-GALL COATING ON ALL THREADS).
7. SLEEVE AND VALVE SHALL BE AS LEVEL AS POSSIBLE.
8. TAPPING SLEEVE SHALL BE PER CRW SPECIFICATION FOR EXISTING PIPE MATERIAL AND PRESSURE.



NO	REVISION	WET TAP ASSEMBLY	
		SCALE: N.T.S.	DATE: MAY 2021
		DRAWING: CRW.STD.DTL105.dwg	
			105



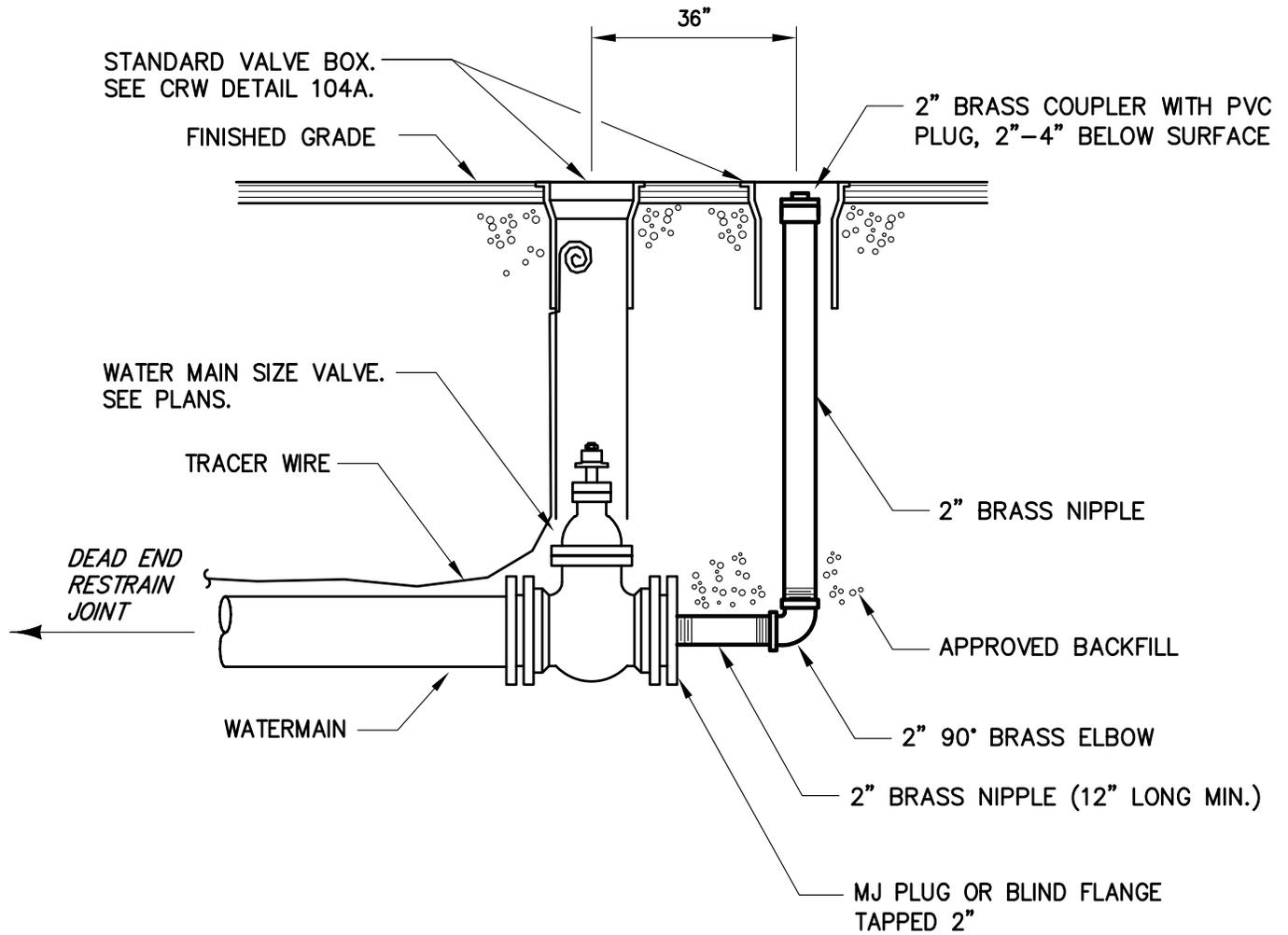
NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15100.
2. BLOW-OFF SHALL NOT BE LOCATED IN GUTTER OR DITCH.
3. 2" FITTINGS AND PIPE SHALL BE BRASS WITH I.P. THREAD FOR PERMANENT ASSEMBLY.

TEMPORARY BLOWOFF NOTES:

1. VALVE BOXES NOT REQUIRED WITH OPEN TRENCH SITUATIONS.
2. 2" PIPING MATERIAL MAY BE GALVANIZED PIPE.
3. OPEN TRENCHES SHALL BE PROTECTED PER CONSTRUCTION PERMIT (COUNTY ROAD OPENING PERMIT OR OTHER AS APPLICABLE).
4. REMOVE ALL BLOW-OFF RELATED MATERIALS FOR FINAL TIE-INS.

	NO	REVISION	BLOW-OFF ASSEMBLY	
			TYPE I	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL106A.dwg	
				106A



NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15100.
2. BLOW-OFF SHALL NOT BE LOCATED IN GUTTER OR DITCH.
3. 2" FITTINGS AND NIPPLES SHALL BE BRASS WITH I.P. THREAD FOR PERMANENT ASSEMBLY.

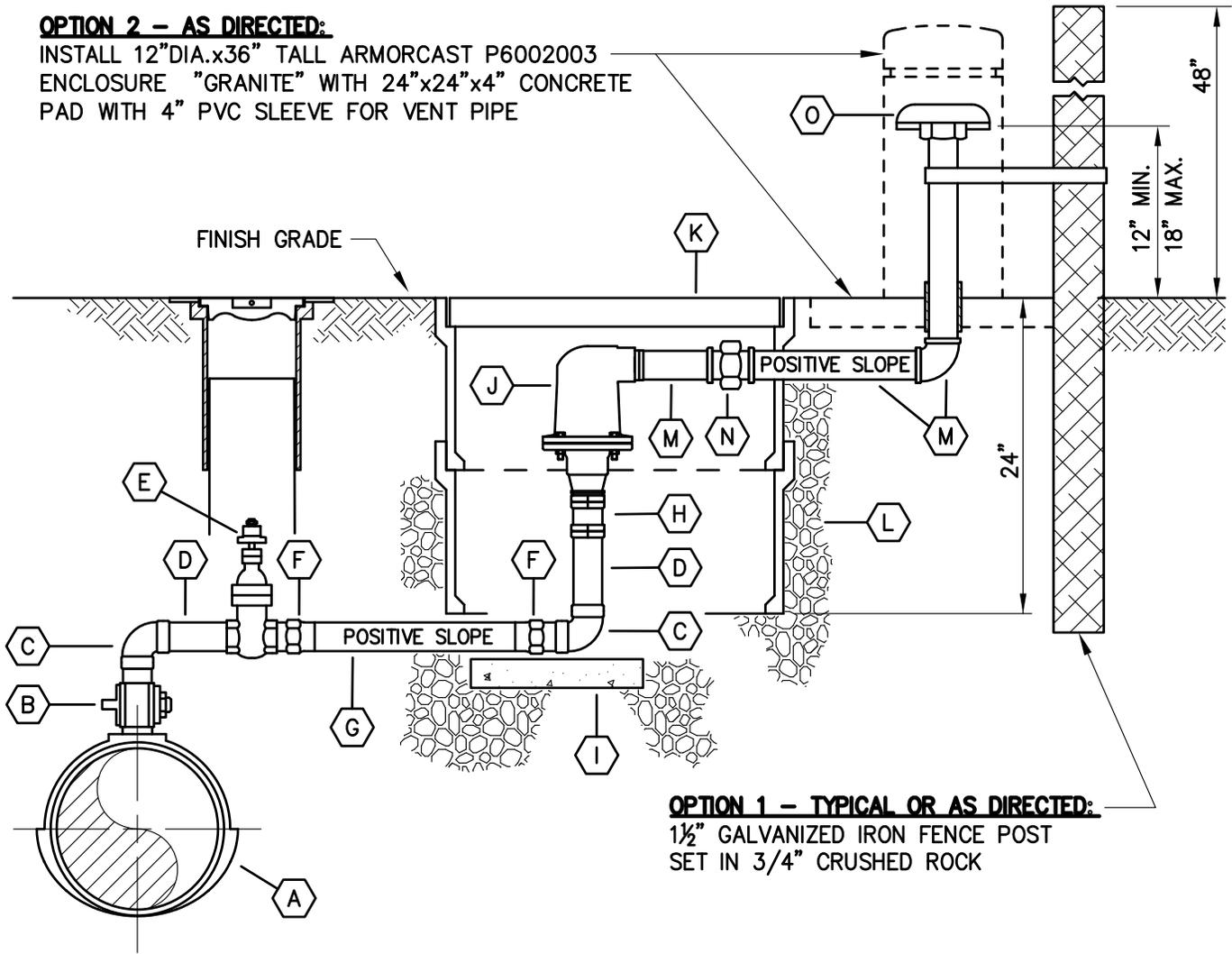
TEMPORARY BLOWOFF NOTES:

1. VALVE BOXES NOT REQUIRED WITH OPEN TRENCH SITUATIONS.
2. 2" PIPING MATERIAL MAY BE GALVANIZED PIPE.
3. OPEN TRENCHES SHALL BE PROTECTED PER CONSTRUCTION PERMIT (COUNTY ROAD OPENING PERMIT OR OTHER AS APPLICABLE).
4. REMOVE ALL BLOW-OFF RELATED MATERIALS FOR FINAL TIE-INS.

	NO	REVISION	BLOW-OFF ASSEMBLY	
			TYPE II	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL106B.dwg	
				106B

OPTION 2 – AS DIRECTED:

INSTALL 12”DIA.x36” TALL ARMORCAST P6002003 ENCLOSURE “GRANITE” WITH 24”x24”x4” CONCRETE PAD WITH 4” PVC SLEEVE FOR VENT PIPE



OPTION 1 – TYPICAL OR AS DIRECTED:

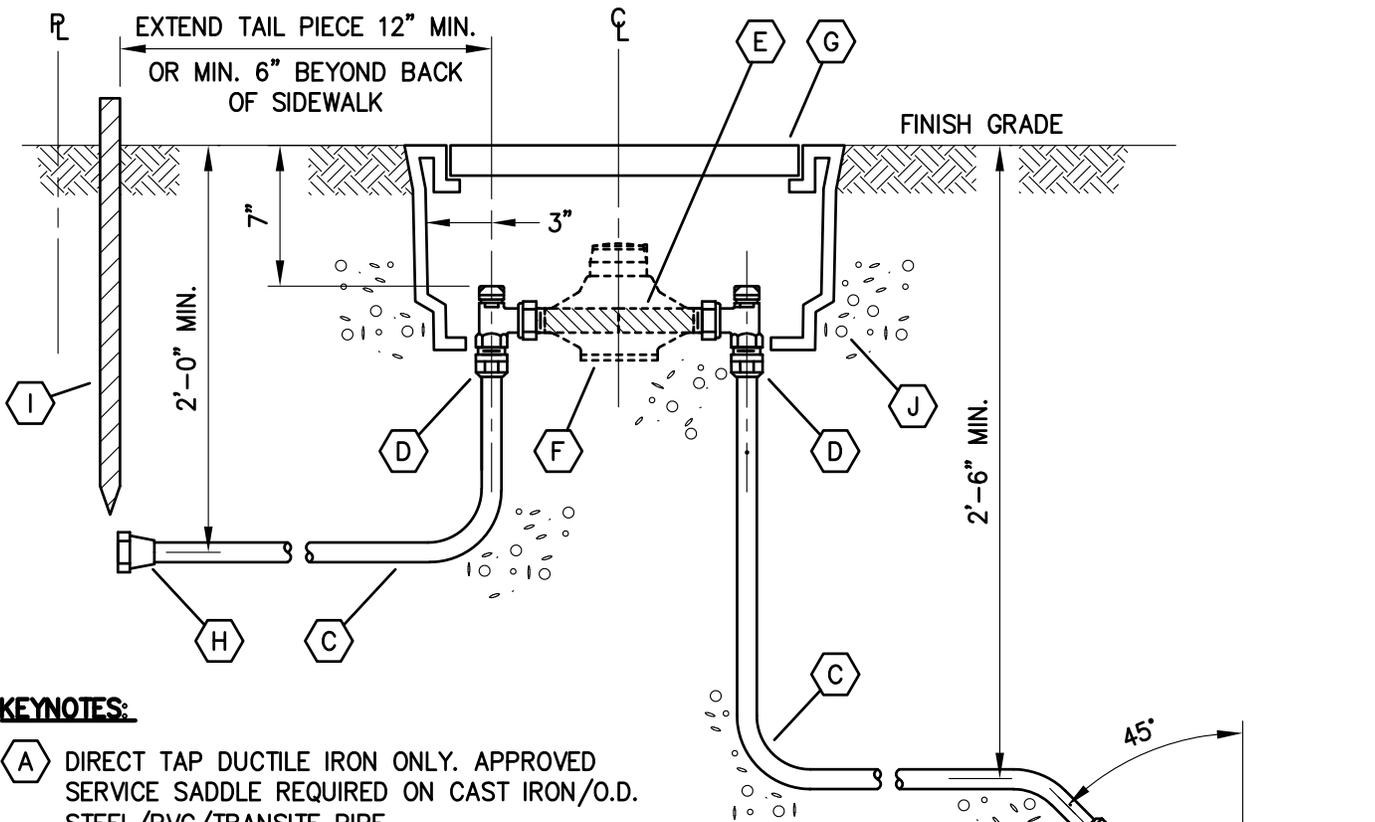
1½” GALVANIZED IRON FENCE POST SET IN ¾” CRUSHED ROCK

KEYNOTES:

- (A) APPROVED 2” SERVICE SADDLE REQUIRED FOR ALL PIPE MATERIALS. ALTERNATE: TEE WITH BLIND FLANGE TAPPED 2” (AS DIRECTED)
- (B) 2” CORPORATION STOP (FORD FB400-7-NL)
- (C) 2” BRASS 90° BEND
- (D) 2” BRASS PIPE NIPPLE
- (E) 2” RSGV W/BOX AND LID PER CRW STD DETAIL 104
- (F) 2” COMPRESSION CONNECTION (FORD C84-77-G-NL)
- (G) 2” TYPE K RIGID COPPER PIPE LENGTH AS REQ'D.
- (H) 2” BRASS COUPLING
- (I) 12”x12”x4” CONCRETE BLOCK
- (J) 2” AIR/VACUUM VALVE (A.R.I. MODEL D-040-C)
- (K) 2-OLDCASTLE POLYMER 2436 BOXES STACKED TOGETHER WITH DFWB40C-1-LID ONE PIECE LID. SET BOX OVER 12” DRAINROCK.
- (L) ¾”-MINUS COMPACTED BACKFILL
- (M) 1.5” GALV AIR VENT PIPING AND FITTINGS. PAINT EXPOSED PIPING BLUE. WRAP DIRECT BURY PORTIONS IN 10 MIL. PVC PIPE WRAP TAPE.
- (N) 1.5” GALV UNION FOR DISASSEMBLY
- (O) 1.5” TANK VENT CAP WITH BUG SCREEN. CLAMP TO POST WITH SS PIPE CLAMP WITH MAX. 1” SEPARATION.

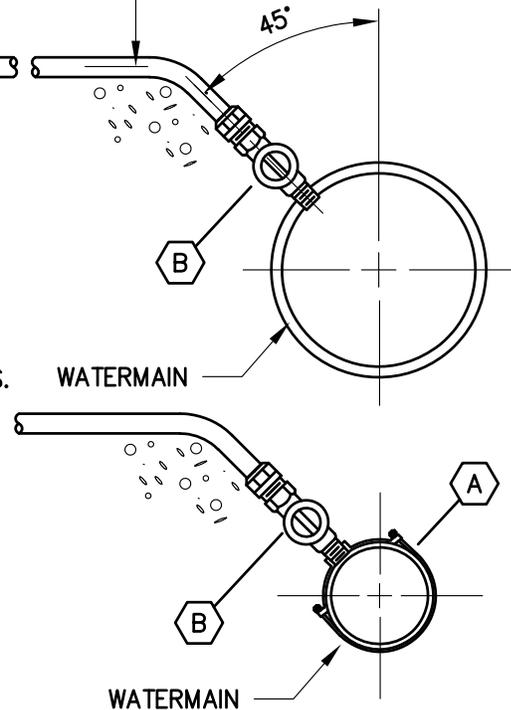
NOTE: REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15150 AND 15200.

	NO	REVISION	2" AIR / VACUUM VALVE ASSEMBLY	
			SCALE: N.T.S.	DATE: JANUARY 2023
			DRAWING: CRW.STD.DTL107B.dwg	
			107B	



KEYNOTES:

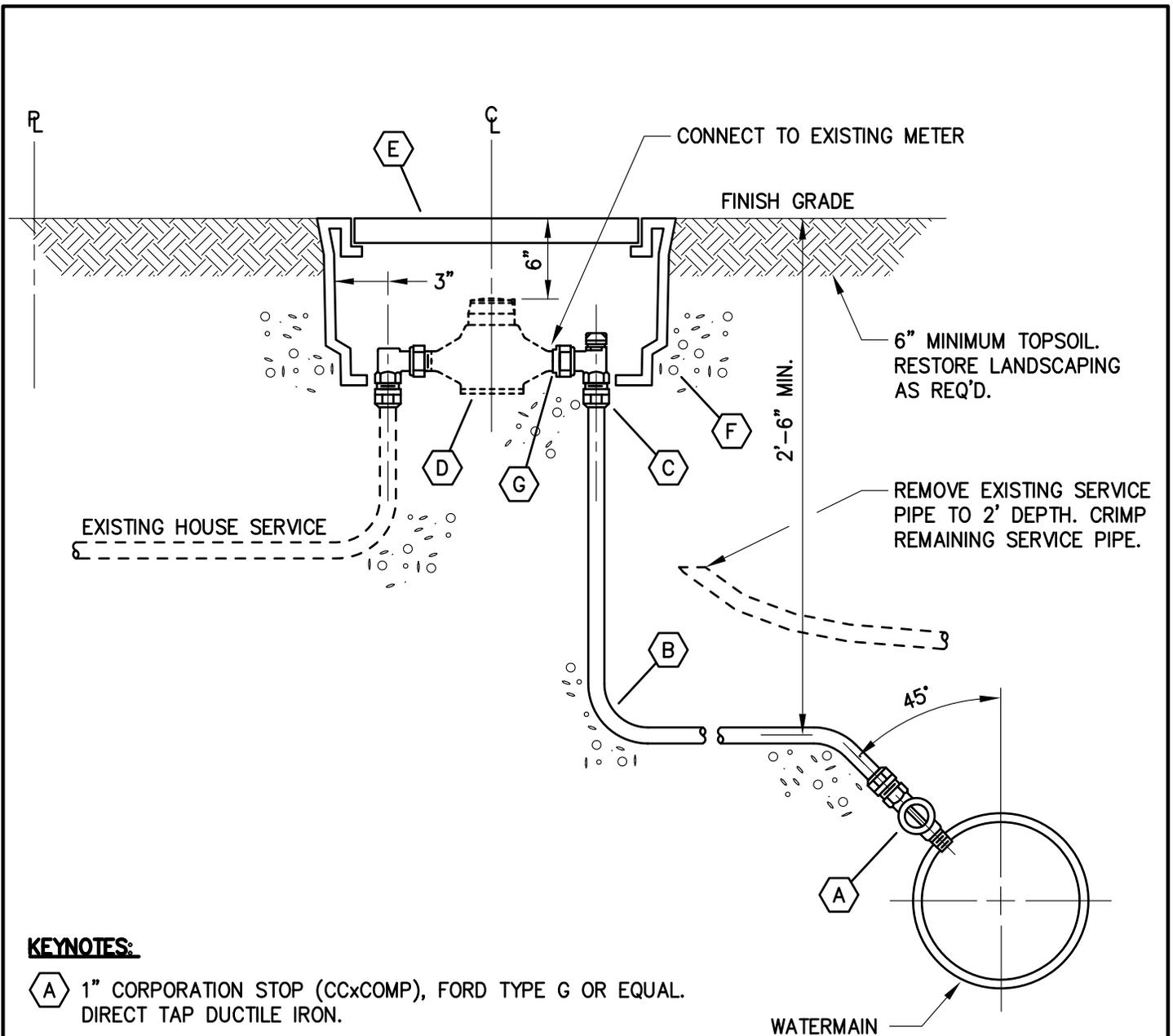
- A** DIRECT TAP DUCTILE IRON ONLY. APPROVED SERVICE SADDLE REQUIRED ON CAST IRON/O.D. STEEL/PVC/TRANSITE PIPE.
- B** 1" CORPORATION STOP (CCxCOMP), FORD TYPE G OR EQUAL
- C** 1" COPPER TUBING TYPE "K", SOFT SEAMLESS
- D** FORD OR EQUAL 1" ANGLE METER STOP (COMPxMETER SWIVEL NUT) WITH PADLOCK WING (LOCK INSTALLED BY CRW)
- E** METER SPACER – SUPPLIED BY CRW AND INSTALLED BY CONTRACTOR. CONTRACTOR TO SUPPLY AND INSTALL GASKETS.
- F** METER FURNISHED AND INSTALLED BY CRW
- G** METER BOX, ARMORCAST A6001946PCX12 OR EQUAL WITH CAST IRON READER LID. CENTER BOX OVER METER.
- H** 1" STRAIGHT JOINT COMP COUPLING (FIPxCU). PLUG WITH PVC IP PLUG. LEAK TEST ASSEMBLY AT SYSTEM PRESSURE.
- I** 2"x2" TEMPORARY MARKER STAKE, PAINTED BLUE
- J** CLASS B 3/4"-MINUS COMPACTED BACKFILL



NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15150.
2. ALL SERVICE MATERIALS SHALL COMPLY WITH "LEAD-FREE" REQUIREMENTS OF THE SPECIFICATIONS.
3. INSTALL SERVICE BRANCHES AT RIGHT ANGLES TO THE MAIN, EXCEPT IN CUL-DE-SACS.
4. 18" MINIMUM SEPARATION BETWEEN SERVICE TAPS.
5. UPSTREAM ANGLE BALL METER VALVE TO REMAIN LOCKED UNTIL CRW REMOVES SPACER PIPE AND ACTIVATES SERVICE. (LOCK INSTALLED BY CRW).
6. FINAL LOCATION OF SERVICE ASSEMBLY REQUIRES CRW APPROVAL.

	NO	REVISION	3/4" OR 1" SERVICE ASSEMBLY	
			NEW	
			SCALE: N.T.S.	DATE: JANUARY 2023
			DRAWING: CRW.STD.DTL108A.dwg	
				108A



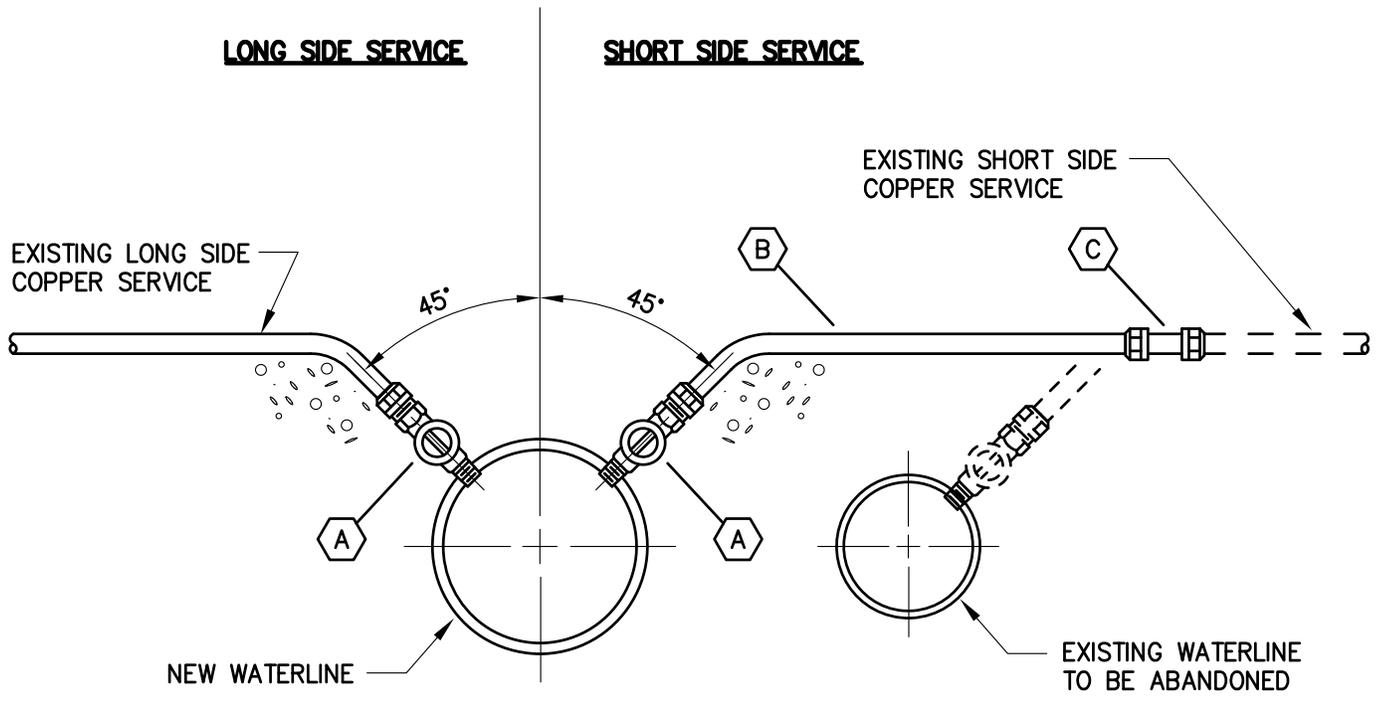
KEYNOTES:

- (A) 1" CORPORATION STOP (CCxCOMP), FORD TYPE G OR EQUAL. DIRECT TAP DUCTILE IRON.
- (B) 1" COPPER TUBING TYPE "K", SOFT SEAMLESS
- (C) 1" ANGLE METER STOP (COMPxMETER SWIVEL NUT) WITH PADLOCK, FORD TYPE G OR EQUAL
- (D) EXISTING METER TO REMAIN
- (E) REMOVE EXISTING METER BOX AND INSTALL NEW METER BOX ARMORCAST BOX A6001946PCX12 (13"x24"x12") WITH EBAA IRON LID MC1324-4R
- (F) 3/4"-MINUS COMPACTED BACKFILL
- (G) FORD A-24, 3/4"x1" METER REDUCER

NOTES:

1. SEE CLACKAMAS RIVER WATER STANDARD DETAIL 108A FOR ADDITIONAL INFORMATION.

	NO	REVISION	3/4" OR 1" SERVICE ASSEMBLY	
			RETROFIT	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL108B.dwg	
				108B



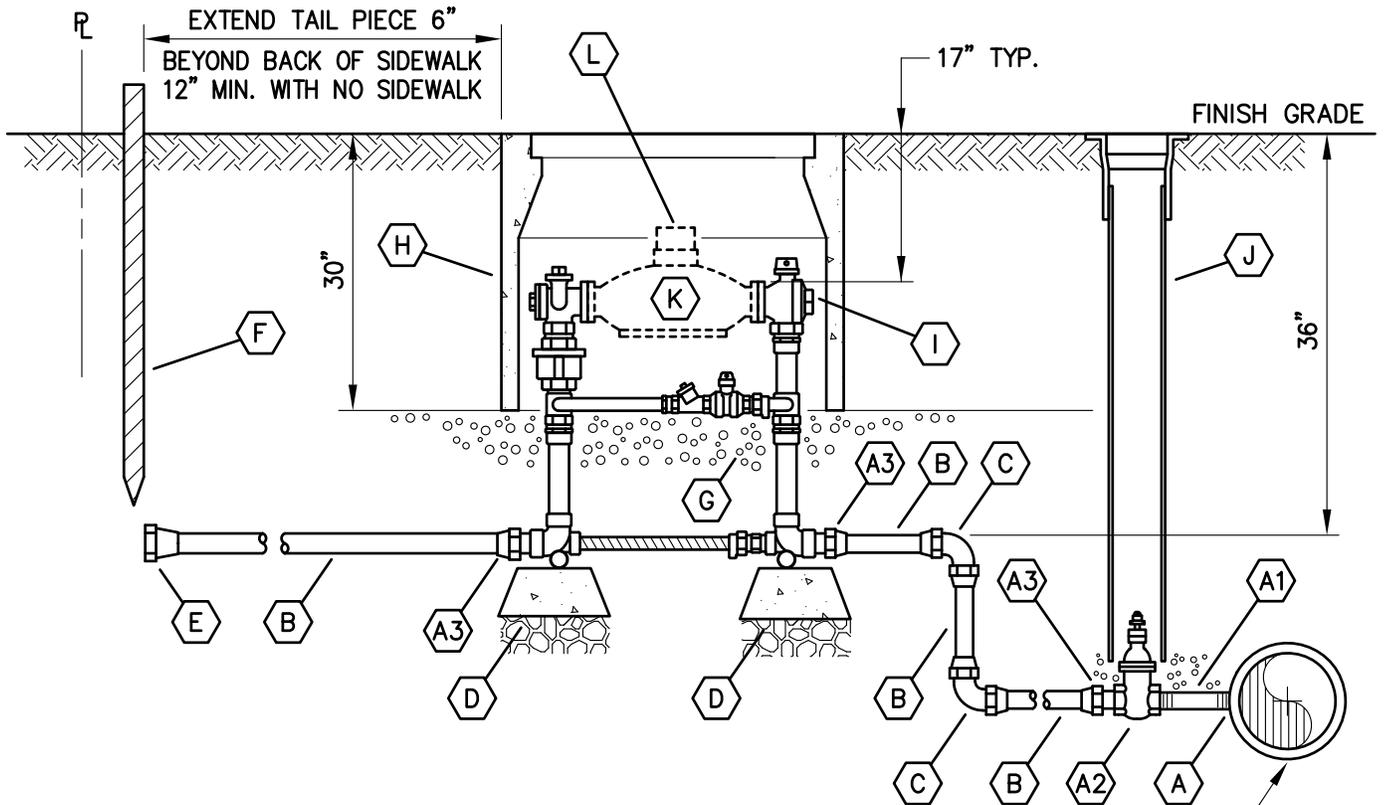
KEYNOTES:

- A** CORPORATION STOP (CCxCOMP), FORD TYPE G OR EQUAL. DIRECT TAP DUCTILE IRON. MATCH EXISTING SERVICE SIZE.
- B** COPPER TUBING TYPE "K", SOFT SEAMLESS – MATCH EXISTING COPPER SIZE.
- C** COMPRESSION COUPLING, FORD TYPE G OR EQUAL.

NOTES:

1. SEE CLACKAMAS RIVER WATER STANDARD DETAIL 108A FOR ADDITIONAL INFORMATION.
2. CONNECT EXISTING SERVICES TO NEW WATERLINE PRIOR TO ABANDONMENT OF EXISTING WATERLINE.
3. RECONNECTION OF EXISTING SERVICES BY DISTRICT APPROVAL ONLY.

	NO	REVISION	3/4" OR 1" SERVICE ASSEMBLY	
			SERVICE RECONNECTION	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL108C.dwg	
				108C



KEYNOTES:

- (A) SERVICE CONNECTION:
 1. EXISTING MAINS: WET TAP WITH APPROVED SADDLE.
 2. NEW MAINS: USE APPROVED CAST TEE.
- (A1) 2" I.P.T BRASS NIPPLE (2"-4" LENGTH)
- (A2) 2" I.P.T.xI.P.T. GATE VALVE WITH VALVE BOX AND LID
- (A3) 2" M.I.P.T.xC.U. RESTRAINED COUPLER
- (B) 2" TYPE K RIGID COPPER TUBING, TYPICAL
- (C) 2" 90° CUxCU FORD TYPE G COMPRESSION COUPLING OR APPROVED EQUAL
- (D) CONCRETE PIER BLOCKS FOR SETTER SUPPORT
- (E) 2" STRAIGHT JOINT COMPRESSION COUPLING (FIPxCU). PLUG WITH PVC IP PLUG. LEAK TEST ASSEMBLY AT SYSTEM PRESSURE.
- (F) 2"x2" TEMPORARY MARKER STAKE, PAINTED BLUE

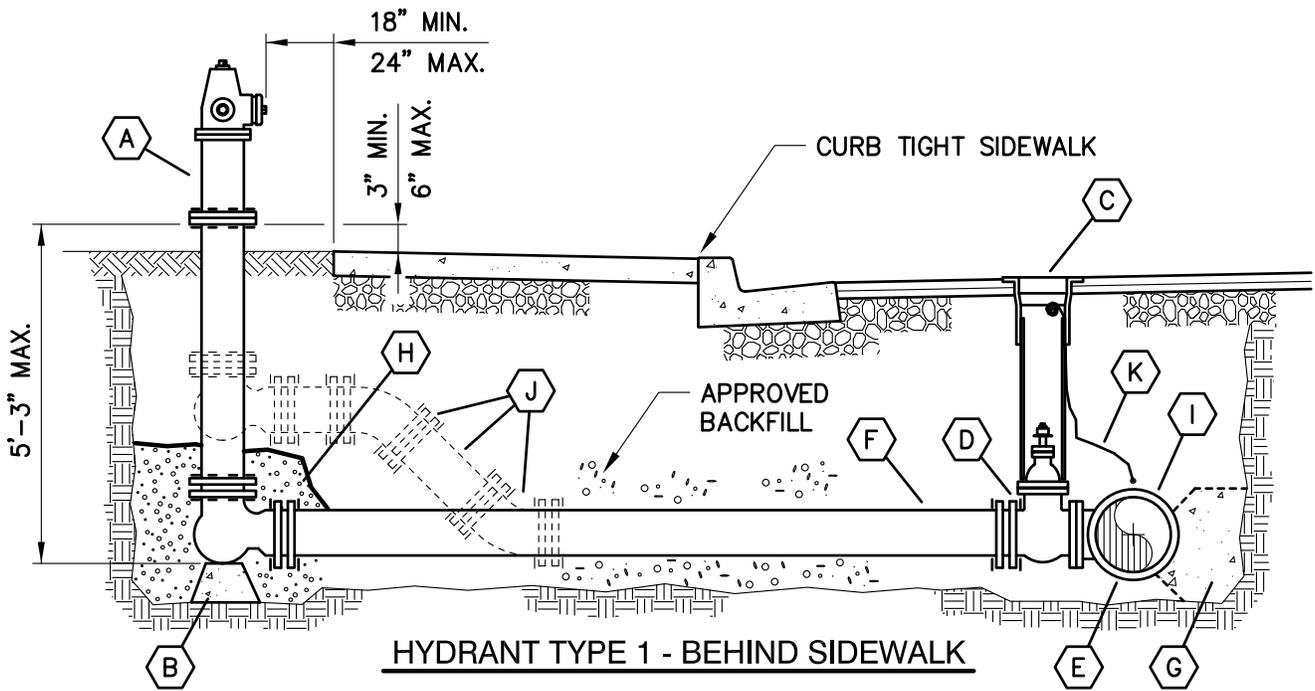
KEYNOTES: (CONTINUED)

- (G) PROVIDE 3/4"-MINUS COMPACTED GRAVEL BACKFILL TO BOTTOM OF BYPASS TO SET METER BOX TO FINISH GRADE
 - (H) OLDCASTLE 2436-30 METER BOX WITH DFW B40C-4EPA-LID OR OLDCASTLE STEEL COVER AS APPROVED
 - (I) 2" METER SETTER (FORD 70 SERIES COPPERSETTER MODEL #VBH77-95035-003-NL) OR EQUAL
 - (J) VALVE BOX ASSEMBLY PER CRW STANDARD DETAIL 104
- CRW-FURNISHED METER ASSEMBLY INCLUDES:**
- (K) 1-1/2" OR 2" METER AS SPECIFIED
 - (L) RADIO READ METER REGISTER

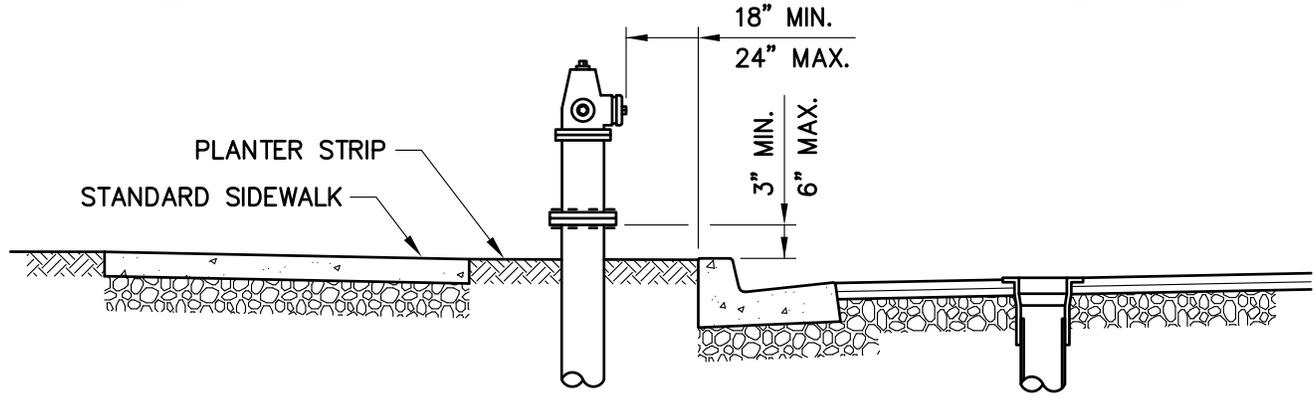
NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15150.
2. ALL SERVICE MATERIALS SHALL COMPLY WITH "LEAD-FREE" REQUIREMENTS OF THE SPECIFICATIONS.
3. PROVIDE PROPER SHORING FOR EXCAVATIONS AS REQUIRED. COMPLY WITH OREGON OSHA REGULATIONS.

	NO	REVISION	1-1/2" OR 2" SERVICE ASSEMBLY	
			NEW	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL109.dwg	
				109



HYDRANT TYPE 1 - BEHIND SIDEWALK



HYDRANT TYPE 2 - IN PLANTER STRIP

(MAIN CONNECTION AND VALVE AS ABOVE)

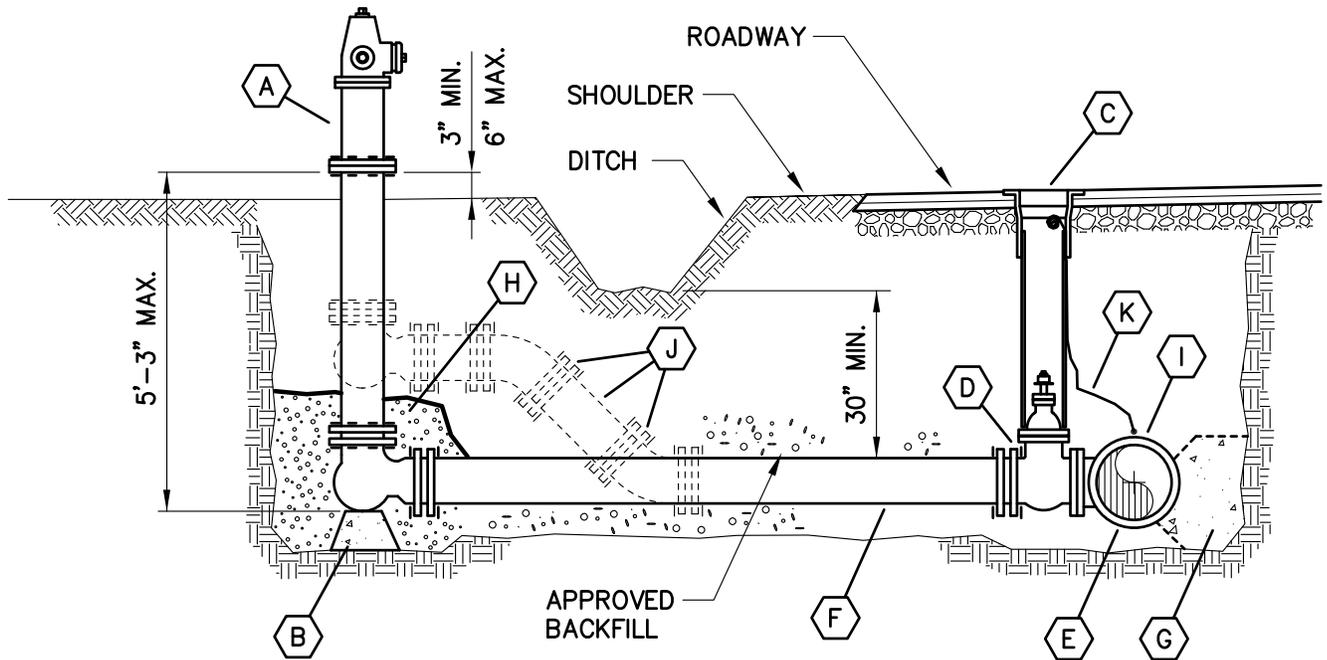
KEYNOTES:

- (A) THREE WAY FIRE HYDRANT WITH (2) 2½" HOSE NOZZLES AND (1) 4½" PUMP NOZZLE
- (B) STANDARD CONCRETE PIER BLOCK, 8" THICK x 16" SQUARE BASE
- (C) SEE CRW DETAIL 104, "GATE VALVE AND ACCESSORIES"
- (D) 6" FLGxMJ GATE VALVE.
- (E) NEW MJxFLG TEE. USE 18' OF RESTRAINED PIPING EACH WAY.
- (F) 6" D.I. RESTRAINED SPOOL
- (G) THRUST BLOCK REQUIRED AT WET TAP. SEE CRW DETAIL 105, "WET TAP ASSEMBLY".
- (H) 1½" MIN. CLEAN DRAIN ROCK 6" ABOVE WEEP HOLES. COVER WITH GEOFABRIC.
- (I) FOR WET TAP OF EXISTING MAIN, USE APPROVED S.S. TAP SADDLE – SEE CRW DETAIL 105, "WET TAP ASSEMBLY"
- (J) 6" RESTRAINED MJ BENDS AND SPOOL AS REQUIRED TO ADJUST GRADE
- (K) TRACER WIRE

NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15200.
2. INSTALL MJ BENDS AS REQUIRED TO ADJUST GRADE TO COMPLY WITH MAXIMUM FIRE HYDRANT BURY REQUIREMENTS.

	NO	REVISION	FIRE HYDRANT ASSEMBLY		
			TYPE 1 AND 2		
			SCALE: N.T.S.	DATE: MAY 2021	110A
			DRAWING: CRW.STD.DTL.110A.dwg		



STANDARD HYDRANT - TYPE 3

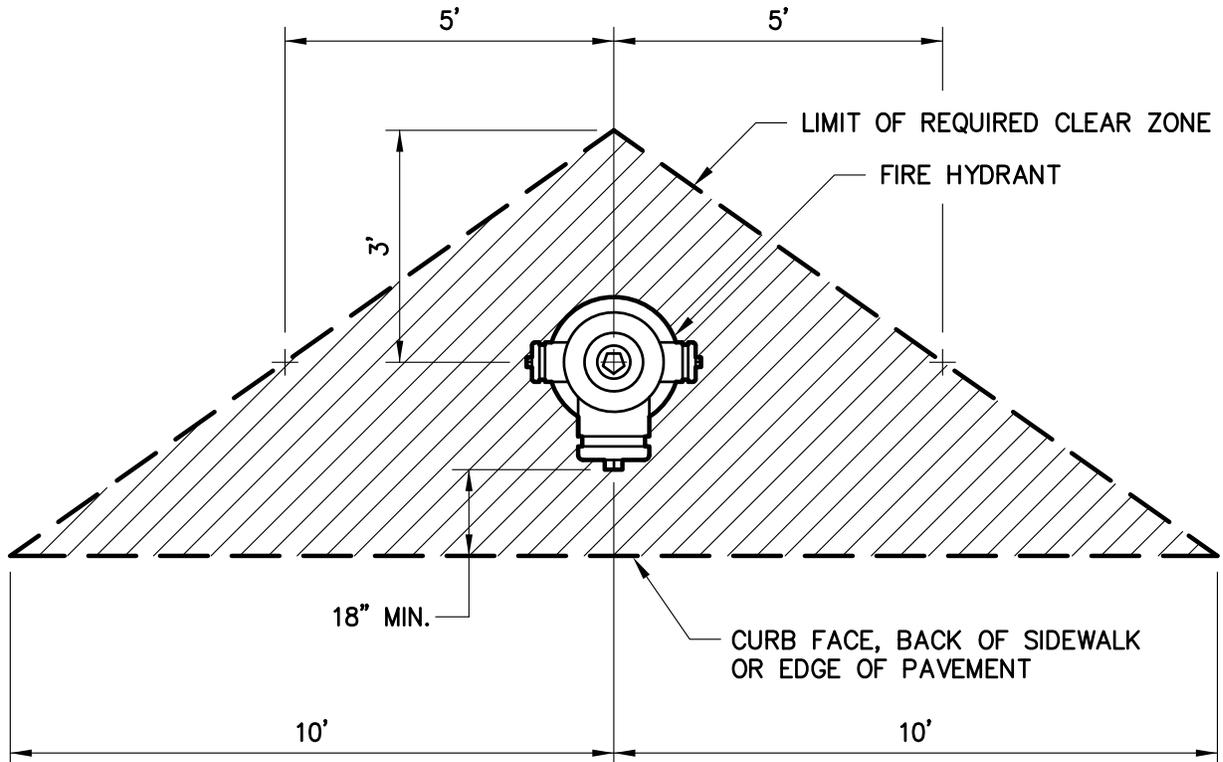
KEYNOTES:

- (A) THREE WAY FIRE HYDRANT WITH (2) 2½" HOSE NOZZLES AND (1) 4½" PUMP NOZZLE.
- (B) STANDARD CONCRETE PIER BLOCK, 8" THICK x 16" SQUARE BASE.
- (C) SEE CRW DETAIL 104, "GATE VALVE AND ACCESSORIES"
- (D) 6" FLGxMJ GATE VALVE.
- (E) NEW MJxFLG TEE. USE 18' OF RESTRAINED PIPING EACH WAY.
- (F) 6" D.I. RESTRAINED SPOOL.
- (G) THRUST BLOCK REQUIRED AT HOT TAP. SEE CRW DETAIL 105, "WET TAP ASSEMBLY".
- (H) 1½" MIN. CLEAN DRAIN ROCK 6" ABOVE WEEP HOLES. COVER WITH GEOFABRIC.
- (I) FOR WET TAP OF EXISTING MAIN, USE APPROVED S.S. TAP SADDLE – SEE CRW DETAIL 105, "WET TAP ASSEMBLY"
- (J) 6" RESTRAINED MJ BENDS AND SPOOL AS REQUIRED TO ADJUST GRADE
- (K) TRACER WIRE

NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15200.
2. INSTALL MJ BENDS AS REQUIRED TO ADJUST GRADE TO COMPLY WITH MAXIMUM FIRE HYDRANT BURY REQUIREMENTS.

	NO	REVISION	FIRE HYDRANT ASSEMBLY	
			TYPE 3	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL.110B.dwg	
				110B

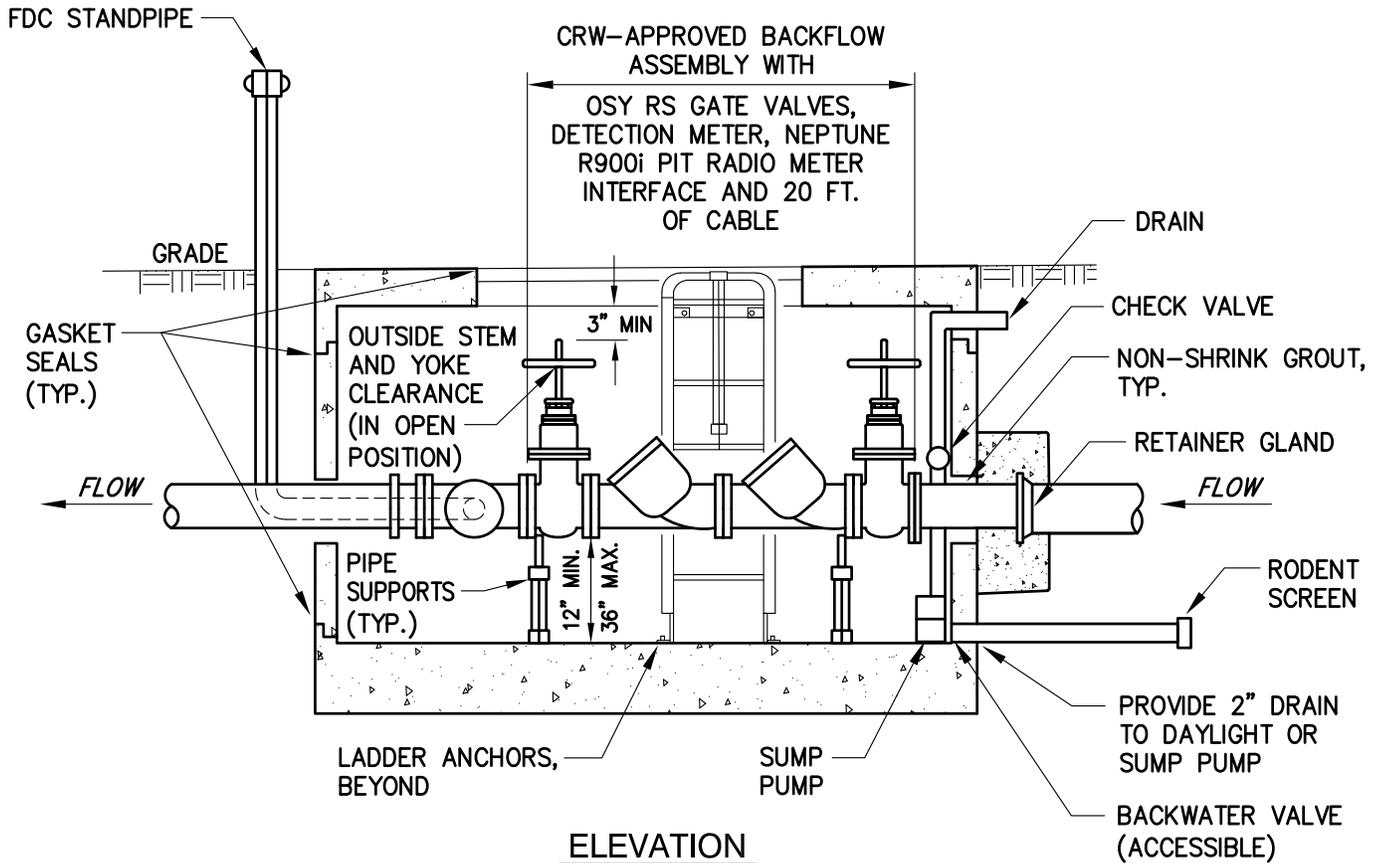
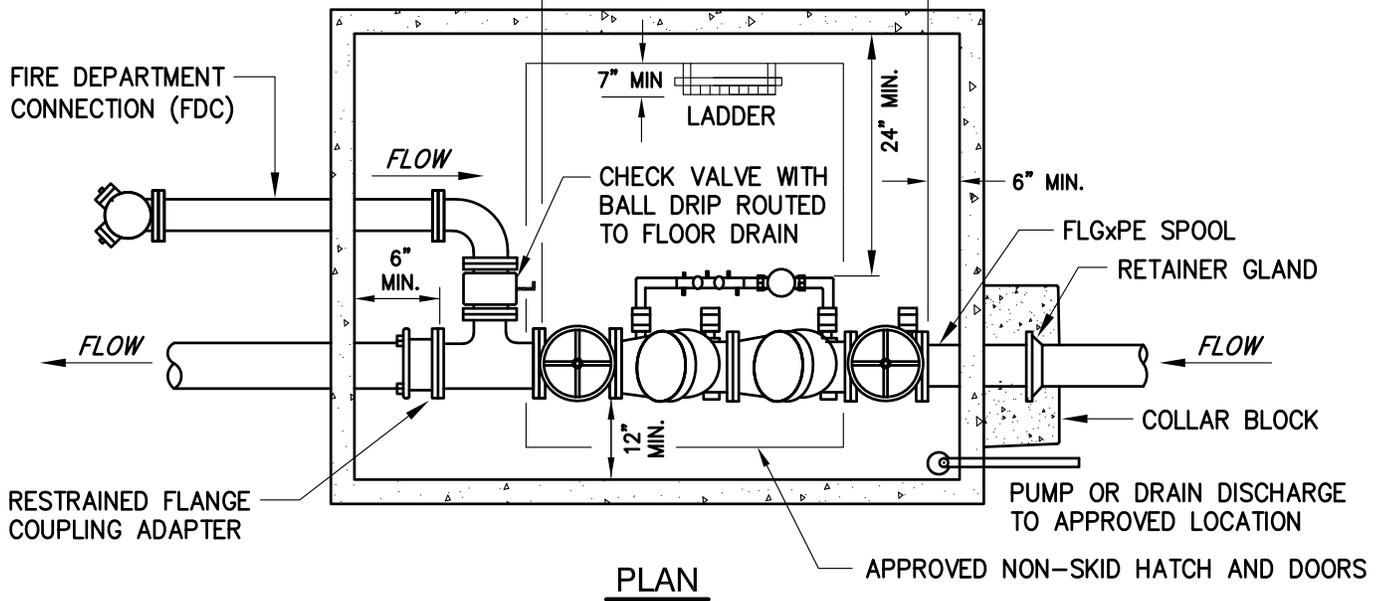


NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15200.
2. THE CLEAR ZONE PROHIBITS THE FOLLOWING:
 - VEHICLE PARKING
 - FENCES
 - TREES
 - LARGE BUSHES
 - RETAINING WALLS
 - ANYTHING ELSE THAT MAY INTERFERE WITH OPERATION OF THE FIRE HYDRANT
3. THE CLEAR ZONE ALLOWS THE FOLLOWING:
 - LAWN GRASS
 - MULCH
 - BARK DUST
 - GROUND COVER
 - LOW PLANTINGS

HOWEVER, THE PROPERTY OWNERS SHOULD BE AWARE THE GROUND COVER COULD BE DAMAGED WHEN THE HYDRANT IS USED OR MAINTAINED.

 Clackamas River Water	NO	REVISION	FIRE HYDRANT ASSEMBLY	
			CLEAR ZONE	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL.110C.dwg	
				110C

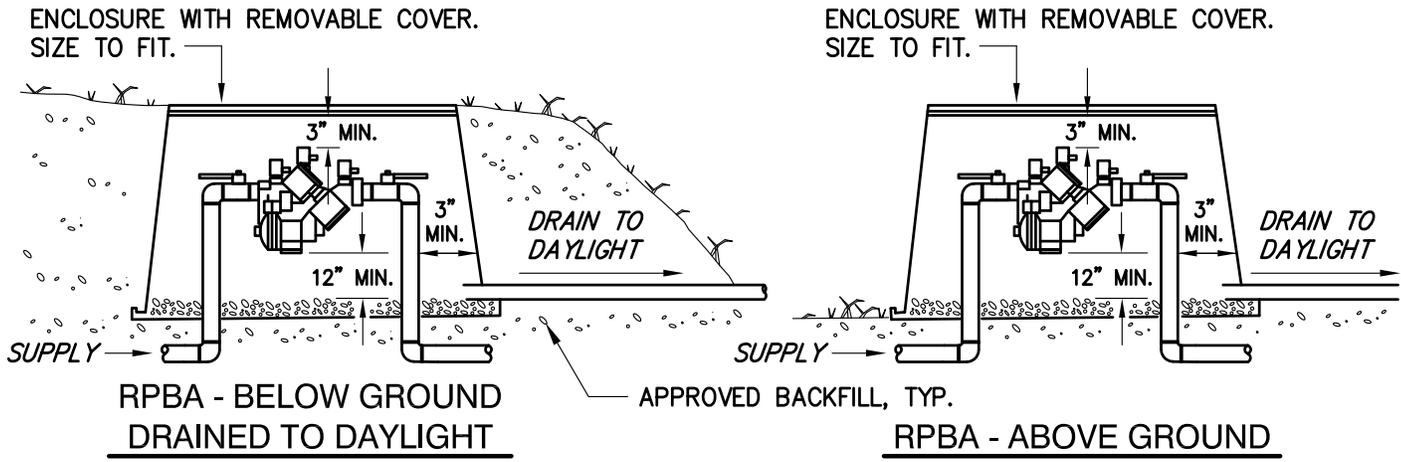


NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15200.
2. ALL FIRE SERVICE PIPING, INCLUDING THE FDC, DOWNSTREAM OF THE BACKFLOW ASSEMBLY IS GOVERNED BY LOCAL FIRE DISTRICT STANDARDS.
3. DETAIL FOR GENERAL LAYOUT AND CLEARANCE REQUIREMENTS.

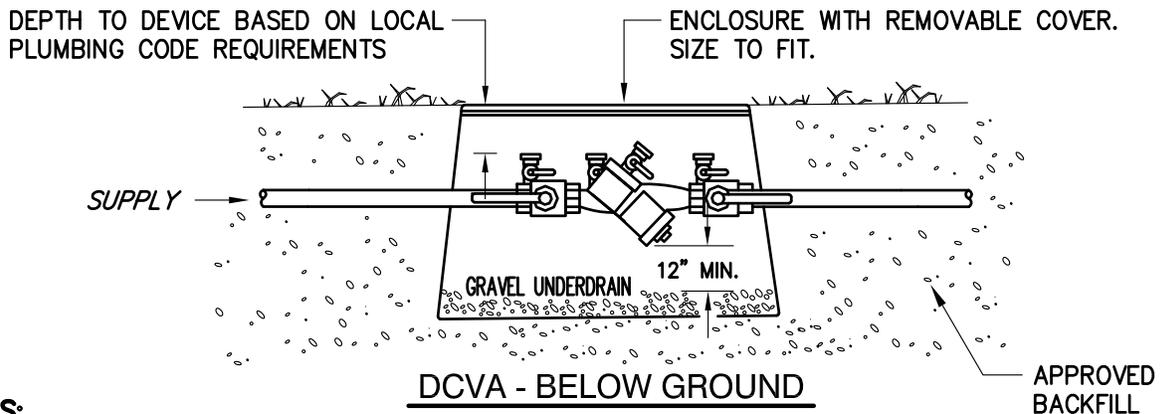


NO		REVISION	TYPICAL FIRE SERVICE VAULT	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL111.dwg	
				111



NOTES:

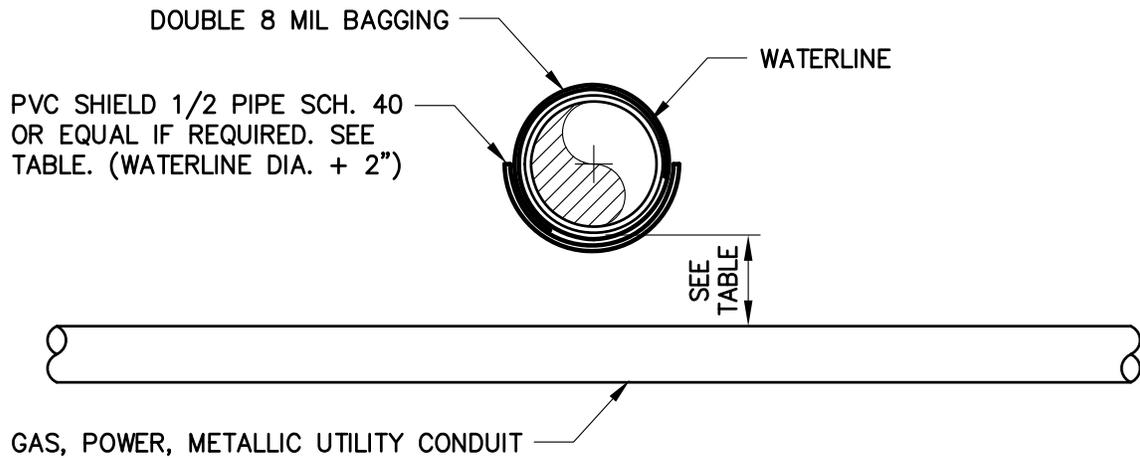
1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15200.
2. BOTTOM AND SIDE CLEARANCES APPLY WHEN ASSEMBLIES ARE INSTALLED INSIDE VAULT. ACCESS DOORS MAY BE PROVIDED ON SIDE OF ABOVE GROUND VAULT.
3. RPBA_s SHALL ALWAYS BE INSTALLED HORIZONTALLY. VERTICAL INSTALLATIONS SHALL ONLY BE BY DISTRICT APPROVAL AND AS ALLOWED BY MANUFACTURER RECOMMENDATIONS.
4. RPBA_s SHALL ALWAYS BE INSTALLED ABOVE THE 100-YEAR FLOOD LEVEL UNLESS OTHERWISE APPROVED BY CRW.
5. RELIEF VALVES SHALL NEVER BE EXTENDED OR PLUGGED.
6. PROTECTION FROM FREEZING SHOULD BE PROVIDED.
7. A PROVISION FOR AN AIR GAPPED DRAIN SHALL BE PROVIDED.
8. RPBA_s SHALL NOT BE INSTALLED IN AN ENCLOSED VAULT OR BOX UNLESS A PROPERLY SIZED BORE SIGHTED DRAIN TO DAYLIGHT IS PROVIDED AND WATERTIGHT BRASS OR PLASTIC PLUGS ARE INSTALLED ON ALL TEST PORTS.
9. MINIMUM CLEARANCE FOR ASSEMBLIES 2 INCHES OR SMALLER MAY BE REDUCED PROVIDED THAT THEY ARE ACCESSIBLE FOR TESTING AND REPAIRING AND APPROVED BY THE DISTRICT. THE MINIMUM 12" UNDER THE RELIEF VALVE MUST BE MAINTAINED.
10. MAXIMUM HEIGHT FOR ABOVE GROUND INSTALLATION SHALL NOT EXCEED 5 FEET UNLESS THERE IS A PERMANENTLY INSTALLED PLATFORM MEETING OSHA STANDARDS TO FACILITATE SERVICING THE ASSEMBLY.
11. ALL DEVICES AND RELATED PIPING MUST BE INSTALLED IN ACCORDANCE WITH LOCAL PLUMBING CODE.



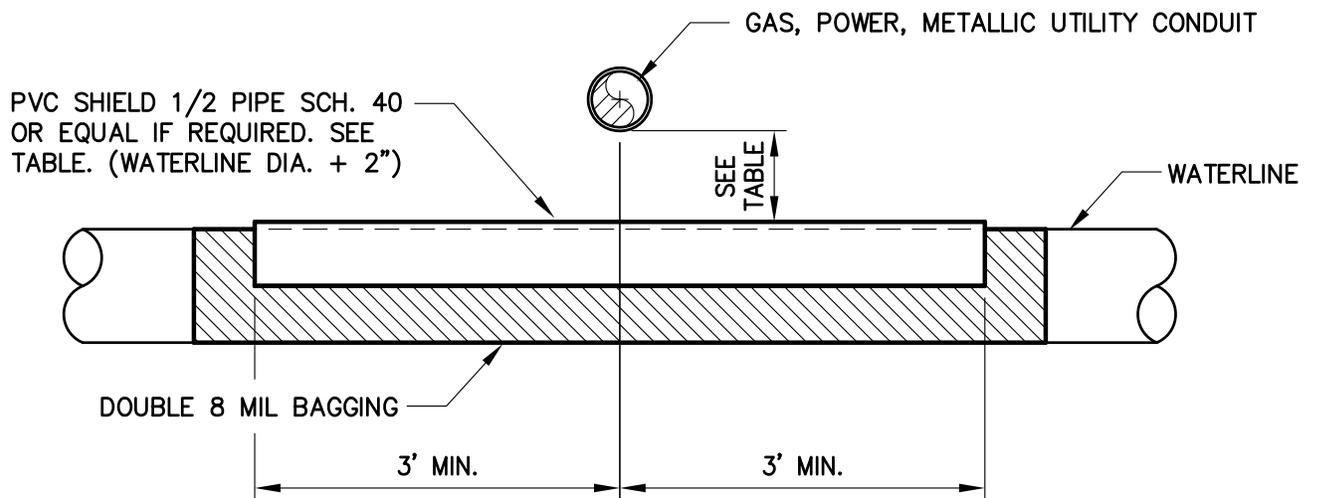
NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15200.
2. ADEQUATE CLEARANCE MUST BE PROVIDED FOR TESTING AND MAINTENANCE.
3. DCVA_s MAY BE INSTALLED BELOW GRADE IN A VAULT PROVIDED WATER-TIGHT BRASS PLUGS ARE INSTALLED IN THE TEST COCKS, BUT THE ASSEMBLY SHALL NOT BE SUBJECTED TO CONTINUOUS IMMERSION.
4. INSTALL DEVICE WITH TEST COCKS IN APPROPRIATE ORIENTATION PER MANUFACTURER'S REQUIREMENTS. (IF ALLOWED, TEST COCKS MAY BE IN HORIZONTAL POSITION IF ADEQUATE CLEARANCE FOR TESTING IS PROVIDED.)
5. PROTECTION FROM FREEZING SHOULD BE PROVIDED.
6. ALL DEVICES AND RELATED PIPING MUST BE INSTALLED IN ACCORDANCE WITH LOCAL PLUMBING CODE.

	NO	REVISION	BACKFLOW ASSEMBLIES	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL112.dwg	
			112	



WATERLINE ABOVE UTILITY



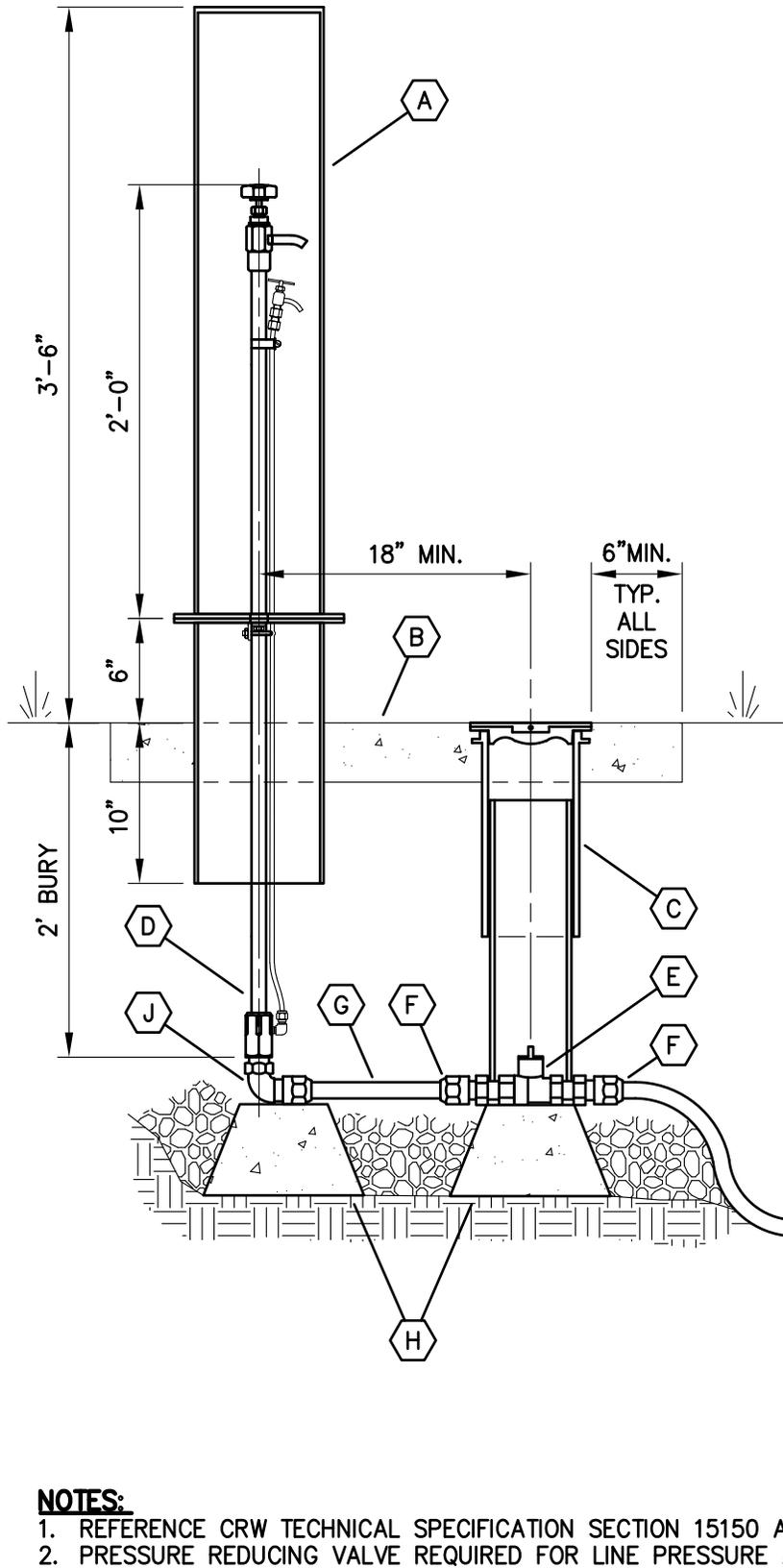
WATERLINE BELOW UTILITY

SEPARATION	DOUBLE BAGGING	PVC SHIELD
3"-12"	X	X
GREATER THAN 12"	X	

NOTES:

1. THE DISTRICT MAY ELECT TO HAVE WATERLINE BAGGED PER AWWA C105.
2. FOR WATER CROSSINGS OF SANITARY SEWER, REFER TO SPECIFICATIONS AND DETAILS OF OAR 333-061-0050.
3. NOT REQUIRED FOR STORM DRAINS, SANITARY SEWERS AND NON-METALLIC UTILITY CONDUIT.

	NO	REVISION	WATERLINE CROSSING OF		
			DRY UTILITIES		
			SCALE: N.T.S.	DATE: MAY 2021	113
			DRAWING: CRW.STD.DTL113.dwg		



KEYNOTES:

- (A) KUPFERLE FOUNDRY CO. MAINGUARD NO. 66 SAMPLE STATION. ALL ALUMINUM LOCKABLE ENCLOSURE. MAINTAIN 24" CLEAR SPACE ON ALL SIDES.
- (B) PROVIDE 4" THICK CONCRETE PAD CENTERED AROUND VALVE BOX AND SAMPLING STATION IF OUTSIDE OF PAVED AREAS. PAD SHALL EXTEND A MINIMUM OF 6" BEYOND ALL SIDES OF VALVE BOX AND SAMPLING STATION.
- (C) VALVE BOX ASSEMBLY PER DETAIL 104. VALVE BOX ASSEMBLY SHALL BE CENTERED AND PLUMB WITH AXIS OF CURBSTOP NUT. VALVE BOX ASSEMBLY SHALL NOT REST ON CURBSTOP ASSEMBLY, AND SHALL BE "DOGHOUSED" TO REST ON PIER BLOCK.
- (D) SAMPLE STATION TUBING.
- (E) BALL VALVE CURBSTOP, FORD 3/4" B11-333-G-NL, FIPxFIP.
- (F) 3/4" FORD C84-33-G-NL MIPxCTS COUPLING
- (G) 3/4" DOMESTIC COPPER SOFT K-TYPE.
- (H) 8"x8" CONCRETE PIER BLOCK ON UNDISTURBED NATIVE SOIL.
- (I) 3/4" FORD TYPE G (CCxCOMP) CORPORATION STOP.
- (J) 3/4" FORD L84-33-G-NL MIPxCTS ELL COUPLING

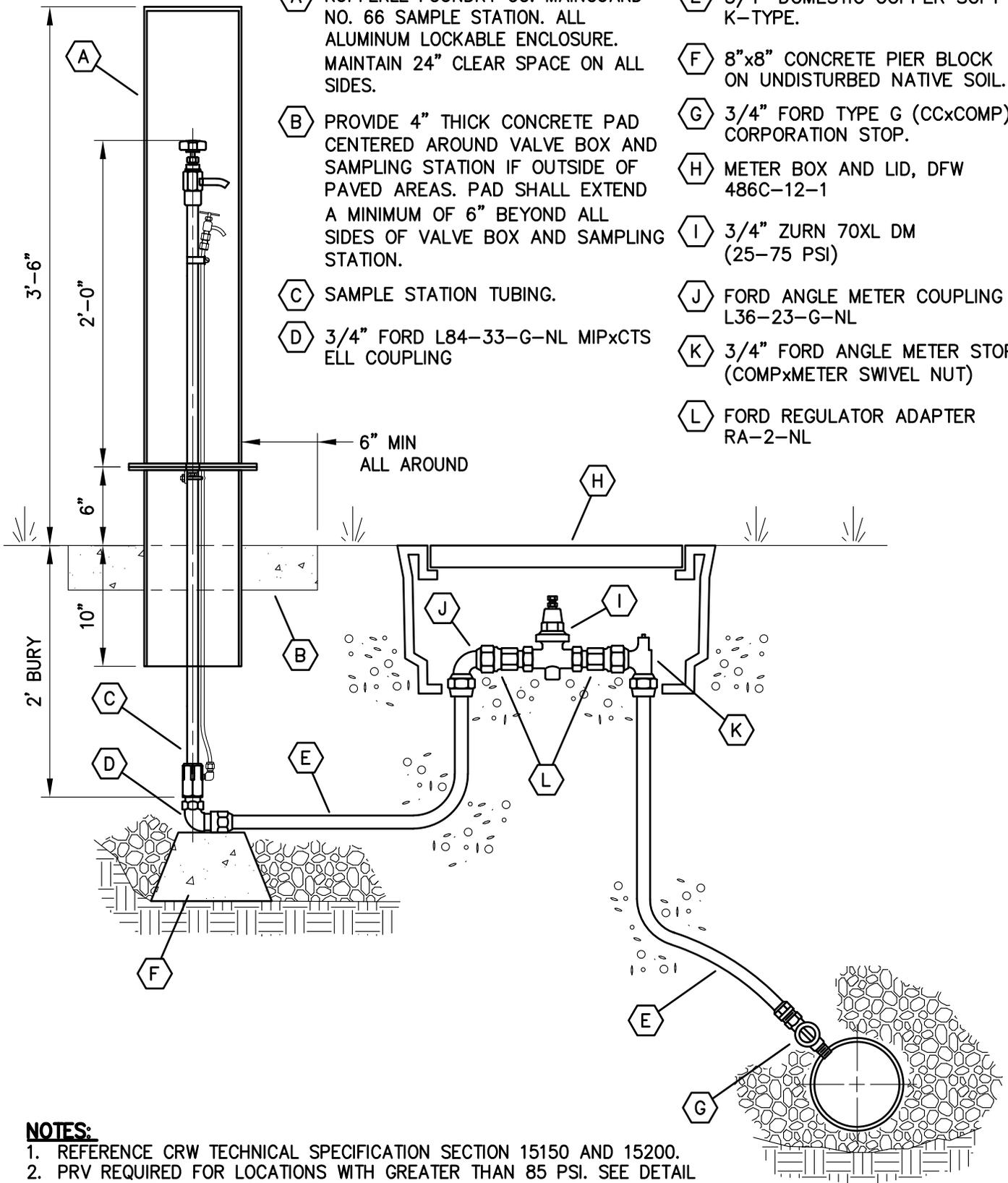
NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15150 AND 15200.
2. PRESSURE REDUCING VALVE REQUIRED FOR LINE PRESSURE ABOVE 85 PSI. SEE DETAIL 114B.

 Clackamas River Water	NO	REVISION	TYPICAL WATER QUALITY	
			SAMPLE STATION ASSEMBLY	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL114A.dwg	
			114A	

KEYNOTES:

- A** KUPFERLE FOUNDRY CO. MAINGUARD NO. 66 SAMPLE STATION. ALL ALUMINUM LOCKABLE ENCLOSURE. MAINTAIN 24" CLEAR SPACE ON ALL SIDES.
- B** PROVIDE 4" THICK CONCRETE PAD CENTERED AROUND VALVE BOX AND SAMPLING STATION IF OUTSIDE OF PAVED AREAS. PAD SHALL EXTEND A MINIMUM OF 6" BEYOND ALL SIDES OF VALVE BOX AND SAMPLING STATION.
- C** SAMPLE STATION TUBING.
- D** 3/4" FORD L84-33-G-NL MIPxCTS ELL COUPLING
- E** 3/4" DOMESTIC COPPER SOFT K-TYPE.
- F** 8"x8" CONCRETE PIER BLOCK ON UNDISTURBED NATIVE SOIL.
- G** 3/4" FORD TYPE G (CCxCOMP) CORPORATION STOP.
- H** METER BOX AND LID, DFW 486C-12-1
- I** 3/4" ZURN 70XL DM (25-75 PSI)
- J** FORD ANGLE METER COUPLING L36-23-G-NL
- K** 3/4" FORD ANGLE METER STOP (COMPxMETER SWIVEL NUT)
- L** FORD REGULATOR ADAPTER RA-2-NL



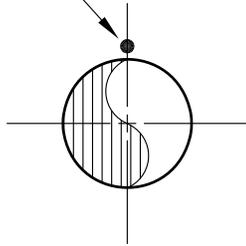
NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15150 AND 15200.
2. PRV REQUIRED FOR LOCATIONS WITH GREATER THAN 85 PSI. SEE DETAIL 114A FOR TYPICAL INSTALLATION.



NO	REVISION	TYPICAL WATER QUALITY	
		SAMPLE STATION ASSEMBLY WITH PRV	
		SCALE: N.T.S.	DATE: MAY 2021
		DRAWING: CRW.STD.DTL114B.dwg	
			114B

PLACE TRACER WIRE AT TOP CENTER OF NEW PIPELINE



NOTES:

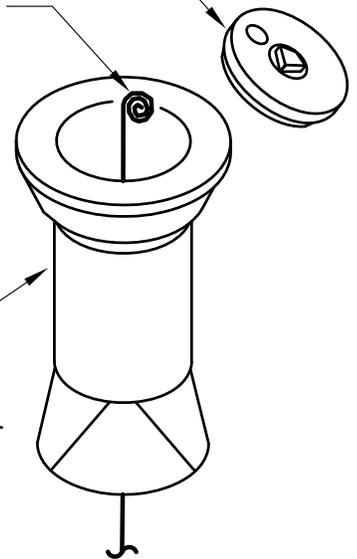
1. TRACER WIRE SHALL BE 12 AWG SOLID COPPER WIRE WITH BLUE HMWPE OR PVC INSULATION.
2. INTERSECTIONS AND SPLICES SHALL PROVIDE ELECTRICAL CONTINUITY AND SHALL BE WATER TIGHT, SILICONE FILLED CONNECTORS.
3. REFERENCE CRW SPECIFICATION SECTION 15100.

TRACER WIRE LOCATION

BLUE CAST IRON LID

CONNECT TRACER WIRE TO TERMINAL PER MANUFACTURER'S RECOMMENDATIONS

"SNAKE-PIT" CONCRETE/DRIVEWAY TRACER WIRE TERMINAL OR APPROVED EQUAL



NOTES:

1. TRACER WIRE TERMINAL STATIONS SHALL BE SUITABLE FOR TRAFFIC LOADS WITH CAST IRON TOP AND SINGLE TERMINAL.
2. REFERENCE CRW SPECIFICATION SECTION 15100.
3. INSTALL 1.5'SQx4" THK CONCRETE OR HMAC PAD AROUND BOX.

TRACER WIRE TERMINAL STATION

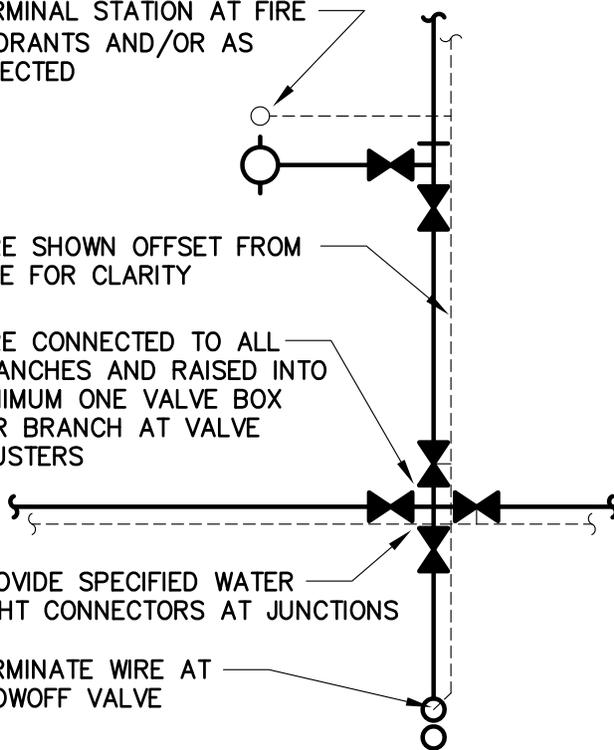
TERMINAL STATION AT FIRE HYDRANTS AND/OR AS DIRECTED

WIRE SHOWN OFFSET FROM PIPE FOR CLARITY

WIRE CONNECTED TO ALL BRANCHES AND RAISED INTO MINIMUM ONE VALVE BOX PER BRANCH AT VALVE CLUSTERS

PROVIDE SPECIFIED WATER TIGHT CONNECTORS AT JUNCTIONS

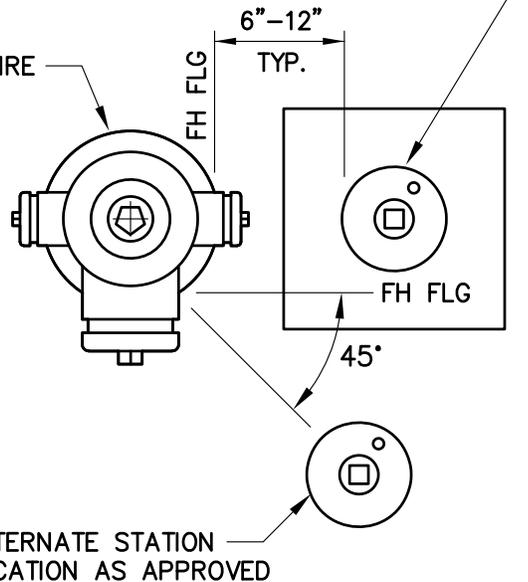
TERMINATE WIRE AT BLOWOFF VALVE



TRACER WIRE LAYOUT

TYPICAL STATION LOCATION

TYPICAL FIRE HYDRANT



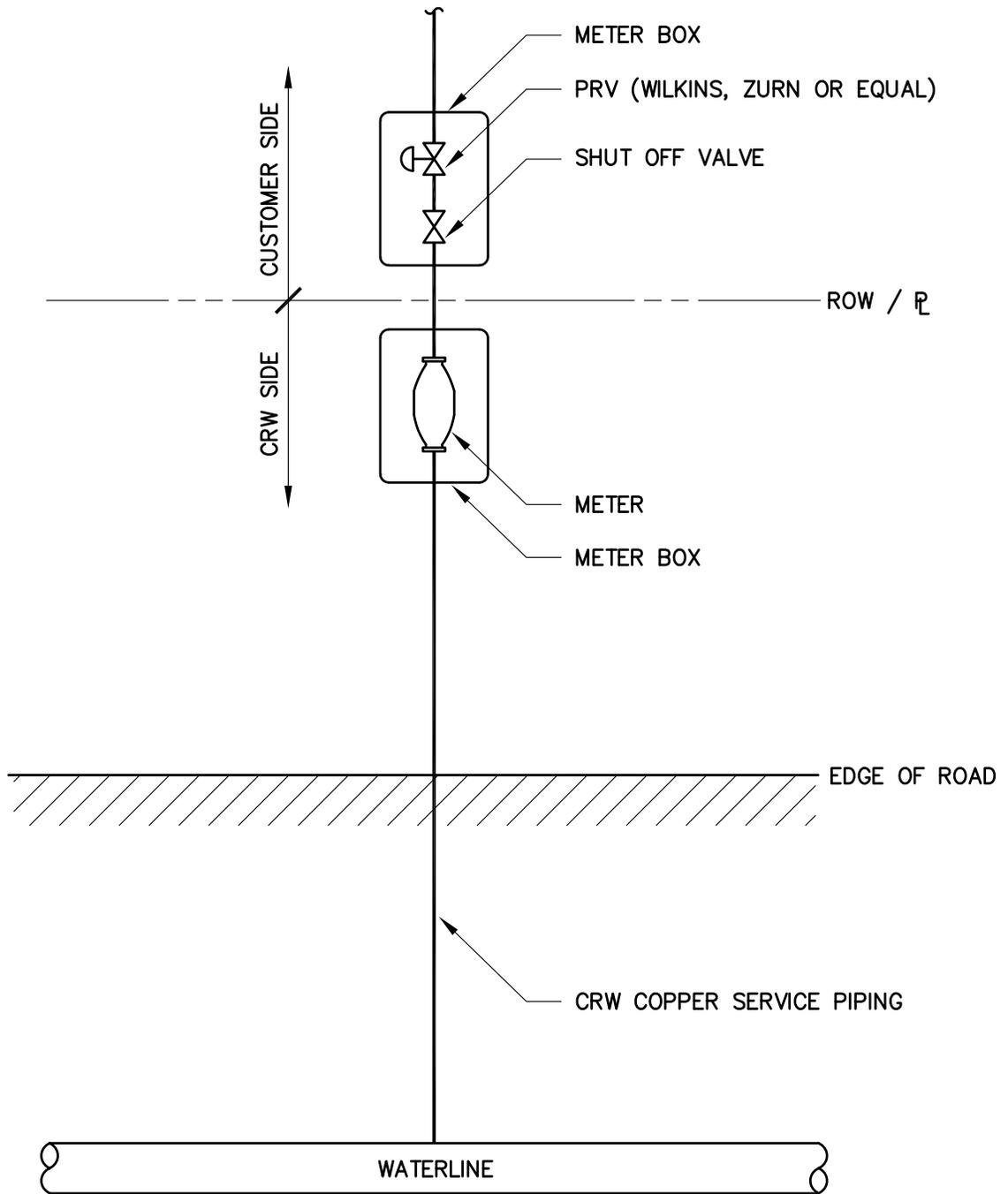
NOTES:

1. TRACER WIRE TERMINAL STATIONS ARE TYPICALLY LOCATED AT FIRE HYDRANTS. LOCATE THE STATION AS SHOWN OR AS DIRECTED.
2. REFERENCE CRW SPECIFICATION SECTION 15100.

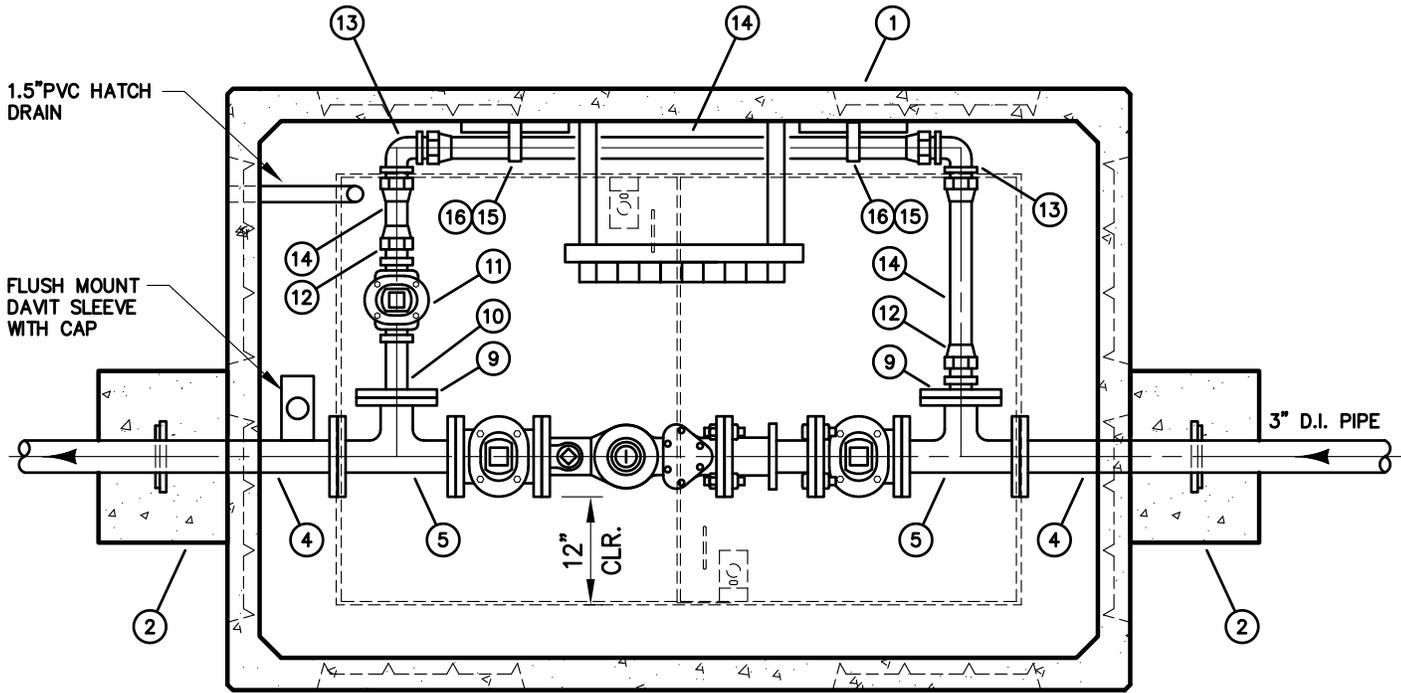
TRACER WIRE TERMINAL STATION LOCATION



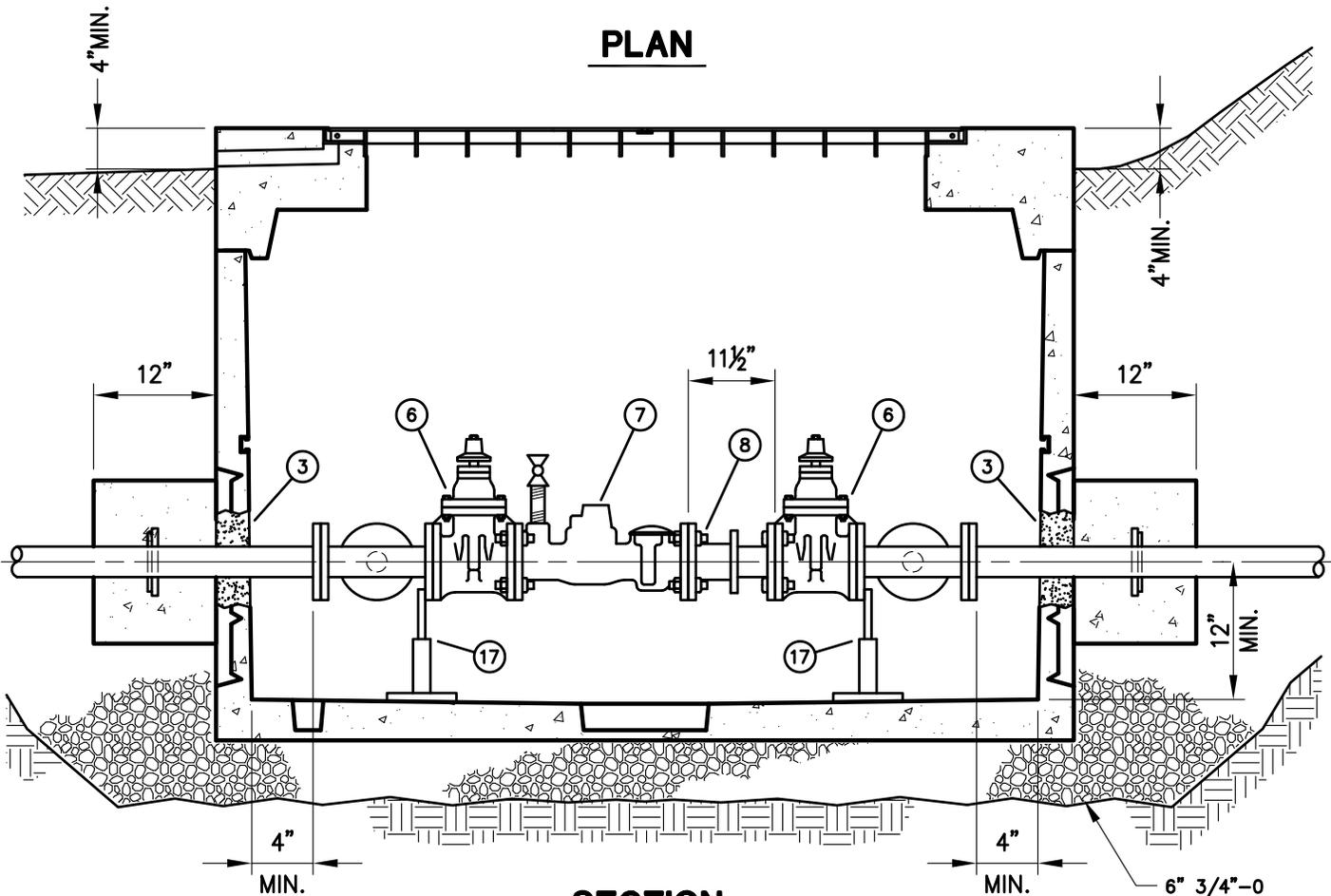
NO	REVISION	TYPICAL TRACER WIRE	
		SCALE: N.T.S.	DATE: MAY 2021
DRAWING: CRW.STD.DTL115.dwg			



NO	REVISION	PRESSURE REGULATING VALVE	
		RECOMMENDED INSTALLATION LOCATION	
		SCALE: N.T.S.	DATE: MAY 2021
		DRAWING: CRW.STD.DTL116.dwg	
			116



PLAN



SECTION

NOTE:

1. SEE DETAIL 105B FOR NOTES.



NO	REVISION

TYPICAL 3-INCH METER ASSEMBLY		
SCALE: N.T.S.	DATE: MAY 2021	150A
DRAWING: CRW.STD.DTL150.dwg		

CONSTRUCTION NOTES:

- ① VAULT: 577-LA WITH TOP INCLUDING:
 - 1.1. EJ CLN2 H30481501 ALUMINUM DOUBLE DOORS
 - 1.2. PEDESTRIAN RATED WITH SAFETY SURFACE
 - 1.3. DOORS SHALL HAVE SLAM LOCK
 - 1.4. RECESSED PADLOCK CLIP
 - 1.5. PENTAHEAD PLUG AND 2 POST KEYS
 - 1.6. SAFETY CHAINS
 - 1.7. DRAIN CHANNEL WITH PVC DRAIN TO VAULT EXTERIOR
 - 1.8. CAST IN PLACE CAPITAL SAFETY DBI-SALA FLUSH FLOOR MOUNT SLEEVE, STAINLESS STEEL CONSTRUCTION PART #8512828. PROVIDE HEAVY DUTY SLEEVE CAP; 3M DBI-SALA PART NO. 8510827
 - 1.9. VAULT WALL MOUNT LADDER WITH ALUMINUM PULL-UP LADDER EXTENSION, OSHA SPEC.
- ② 18"x18"x12" CONCRETE BLOCK WITH 3" ROMAC 612 RETAINER GLAND
- ③ NON-SHRINK GROUT, TYP.
- ④ 3"x8' FLGXPE SPOOL (FIELD CUT TO LENGTH)
- ⑤ 3" FLGXFLG TEE
- ⑥ 3" RSGV (NO BOX) WITH 2" OPERATING NUT
- ⑦ 3" METER, FLGXFLG SENSUS OMNI C2 WITH R900 RADIO READ MIU. MIU TO BE INSTALLED BY CRW.
- ⑧ 3" ROMAC STYLE DJ405 DISMANTLING JOINT, FUSION EPOXY COATED
- ⑨ 3" BLIND FLANGE, TAPPED 2"
- ⑩ 2"x4" BRASS NIPPLE
- ⑪ 2" RSGV, THREADED BOTH SIDES (NO BOX)
- ⑫ 2" BRASS THREADxCOMPRESSION COUPLING
- ⑬ 2" BRASS 90 BEND, COMPRESSIONxCOMPRESSION
- ⑭ 2" COPPER PIPE
- ⑮ 12" LONG, UNISTRUT P4000, GALV.
- ⑯ UNIVERSAL PIPE CLAMP FOR 2" PIPE, UNISTRUT
- ⑰ STAND-ON NO. S-92, PIPE SUPPORTS

GENERAL NOTES:

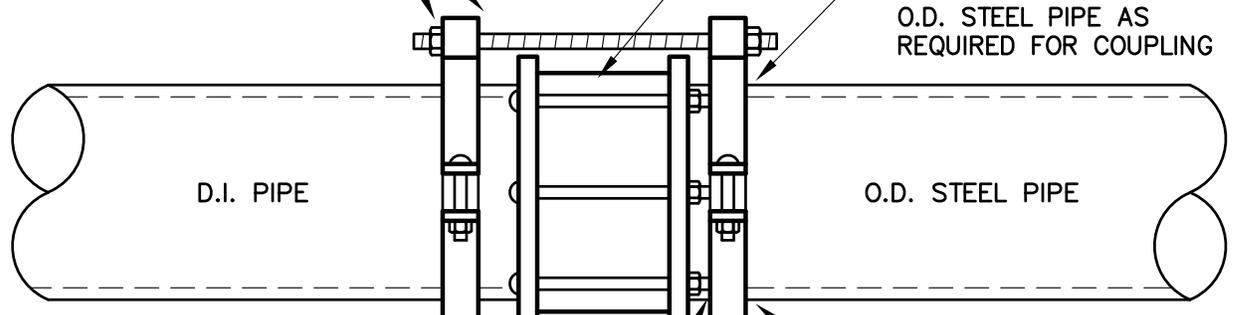
- 1. ALL PIPE AND FITTINGS SHALL BE MECHANICALLY RESTRAINED.
- 2. PROVIDE TEMPORARY THRUST RESTRAINT ON ANY UNRESTRAINED CONNECTION FITTINGS THAT WILL SEE SYSTEM PRESSURE BEFORE CONCRETE THRUST BLOCKS CURE.

 Clackamas River Water	NO	REVISION	TYPICAL 3-INCH METER ASSEMBLY		150B
			NOTES		
			SCALE: N.T.S.	DATE: JANUARY 2023	
			DRAWING: CRW.STD.DTL150.dwg		

NUT AND INSULATING WASHER ON EACH SIDE WITH MYLAR SLEEVES, TYP.

INSULATING COUPLER D.I. TO O.D.

REMOVE COATING FROM O.D. STEEL PIPE AS REQUIRED FOR COUPLING



ROMAC 611 RESTRAINING SYSTEM OR EQUAL

COVER ALL EXPOSED STEEL PIPE WITH ANTI-CORROSION WAX TAPE PER SPECIFICATIONS

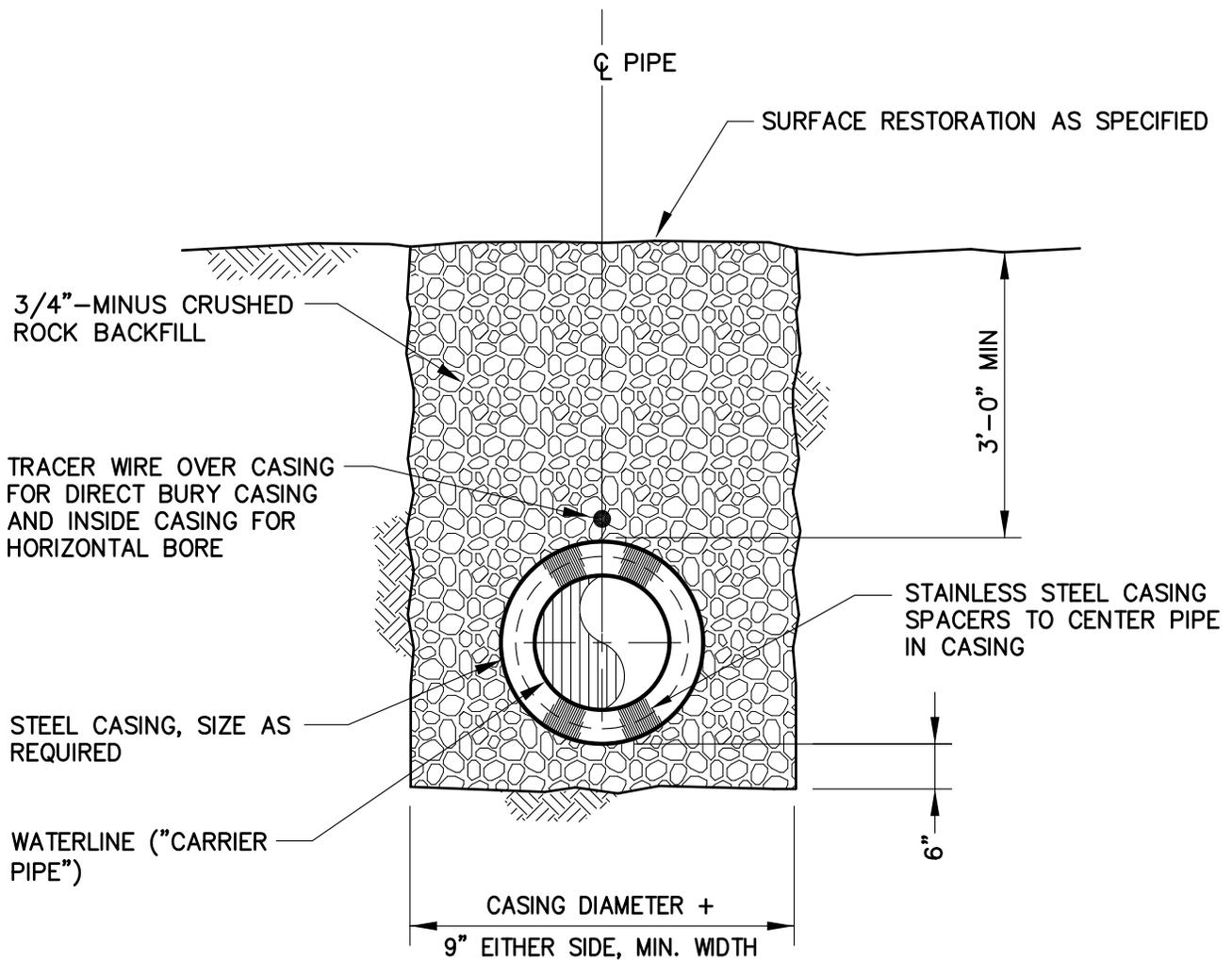
3/4" ALL-THREAD TYP.

INSTALL RESTRAINING SYSTEM TO CAPTURE COUPLING AND PREVENT MOVEMENT

NOTES:

1. REFERENCE CRW TECHNICAL SPECIFICATION SECTION 15100.

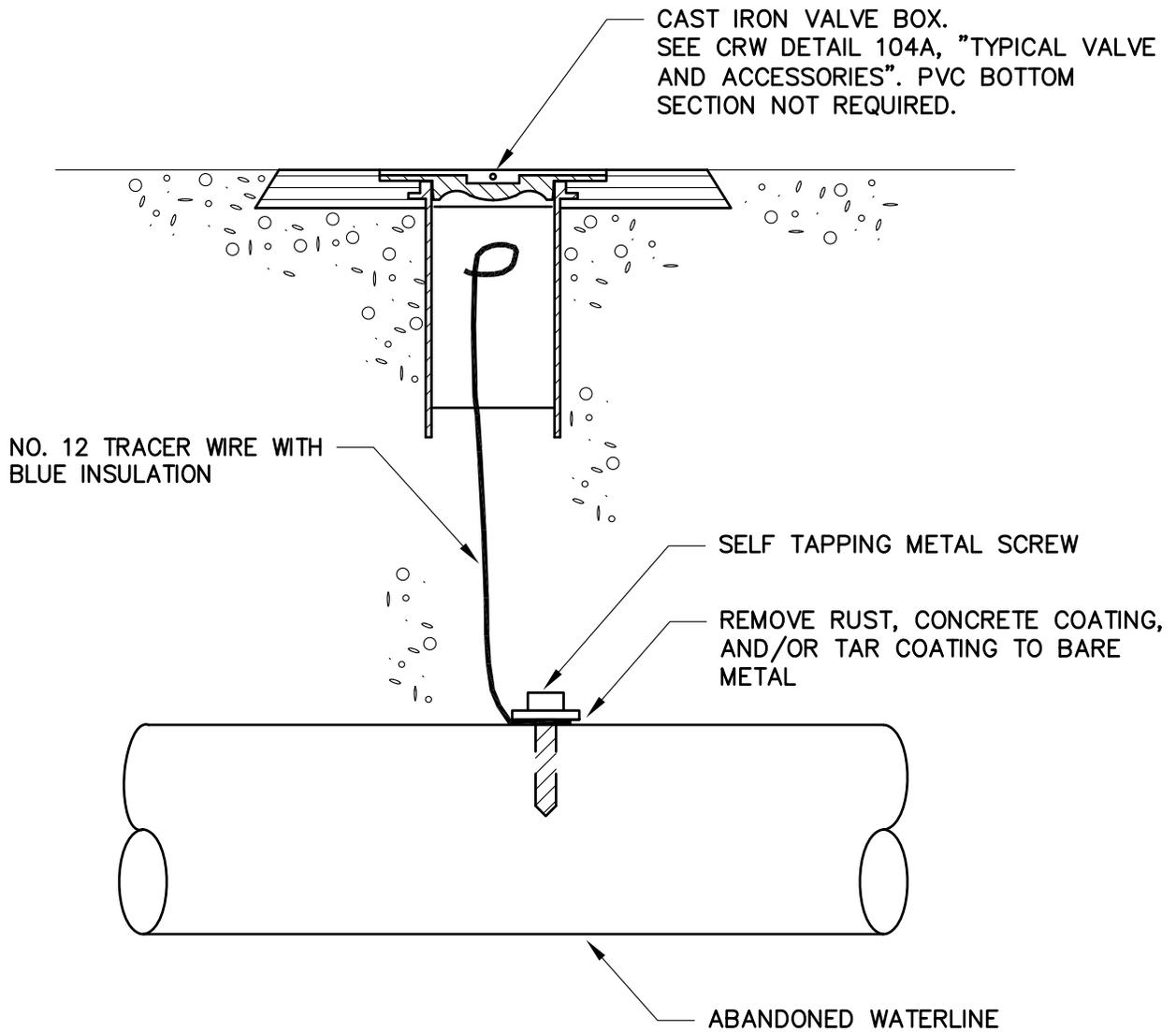
 <p>Clackamas River Water</p>	NO	REVISION	DI/OD STL PIPE CONNECTION	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL201.dwg	
			201	



NOTES:

1. STEEL CASING SHALL BE ASSEMBLED WITH CONTINUOUS SEAM-WELDING BY A WELDER CERTIFIED IN ACCORDANCE WITH SECTION 15100-3.02.
2. SPACE CASING SPACERS PER MANUFACTURERS RECOMMENDATION LENGTHWISE ALONG THE PIPE (MINIMUM 3 PER LENGTH OF PIPE.)
3. CONTRACTOR SHALL INSTALL CONCRETE GROUT AND RUBBER END SEALS AT BOTH ENDS OF THE CASING PER MANUFACTURER'S RECOMMENDATION.
4. DIRECT BURY CASING SHOWN, HORIZONTAL BORE SIMILAR.
5. REFERENCE CRW SPECIFICATION SECTION 15100.

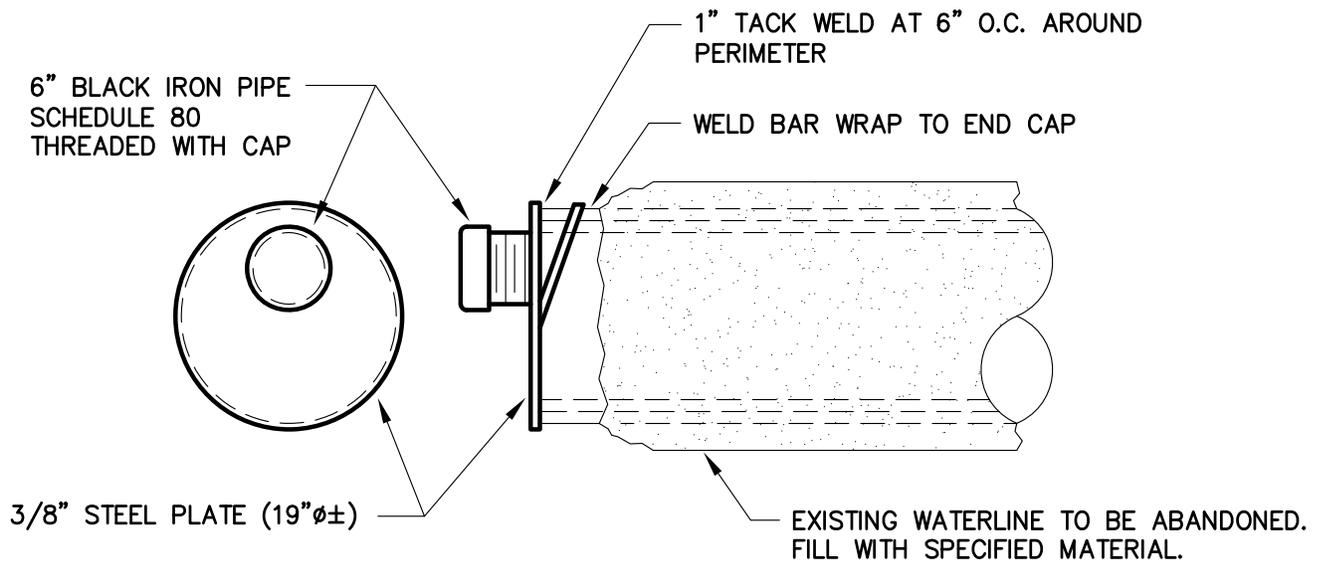
	NO	REVISION	CASED WATERLINE	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL202.dwg	
			202	



NOTES:

1. DRILL HOLE IN ABANDONED PIPE.
2. STRIP END OF NO. 12 TRACER WIRE.
3. USE HEX HEADED WASHER TYPE SELF-TAPPING SCREW TO SECURE LOOPED END OF WIRE TO PIPE.
4. SPRAY BARE WIRE, SCREW AND PIPE WITH 3M RUBBERIZED UNDERCOATING.
5. RUN WIRE TO TOP OF VALVE BOX.
6. INSTALL IN VALVE BOX FOR LOCATE.
7. INSTALL ONLY AS APPROVED AND DIRECTED BY CRW.

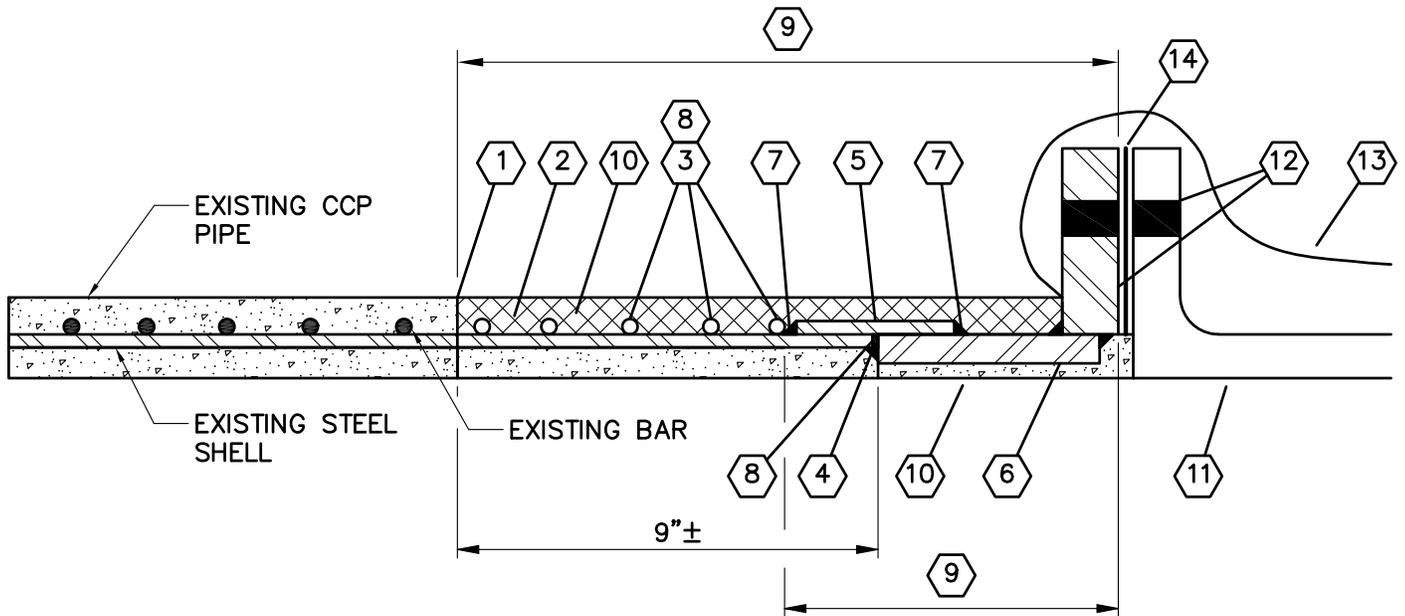
	NO	REVISION	WATERLINE ABANDONMENT	
			TRACER WIRE	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL203.dwg	
				203



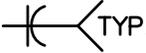
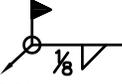
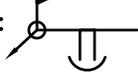
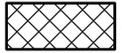
NOTES:

1. INSTALL 15'-0" MINIMUM CLEAR FROM FITTINGS AND BENDS.
2. INSTALL AS APPROVED AND DIRECTED.

 Clackamas River Water	NO	REVISION	WATERLINE ABANDONMENT		
			CAP AND FILL		
			SCALE: N.T.S.	DATE: MAY 2021	204
			DRAWING: CRW.STD.DTL204.dwg		



KEYNOTES:

- ① 1/2" DEEP NEAT SAWCUT OF MORTAR. DO NOT CUT OR NICK SPIRAL WIRE.
- ② REMOVE O.S. CONCRETE COVER OF STEEL CYLINDER AS REQUIRED. DO NOT CUT OR NICK SPIRAL WIRE.
- ③ ANCHOR WELD ALL DISTURBED WRAPS OF SPIRAL WIRE, THUS:  TYP.
- ④ NEAT PLASMA CUT OR NEAT MECHANICAL CUT STEEL CYLINDER. GRIND SMOOTH.
- ⑤ INSTALL ROLLED 3/8" X 6" X 31/8" I.D. CONTINUOUS STEEL BUTT STRAP.
- ⑥ INSTALL ROLLED 1/2" X 9" SHELL SECTION WITH 125# CUSTOM BOLT FLANGE WITH STANDARD AWWA BOLTS.
- ⑦ FIELD WELD STEEL CYLINDER TO FLANGE SHELL WITH , TYP.
- ⑧ FIELD WELD SPIRAL WIRE END TO BUTT STRAP AND BOX WELD STEEL CYLINDER TO 1/2" FLANGE SHELL INSIDE, THUS: 
- ⑨ COAT INSIDE AND OUTSIDE METAL SURFACES WITH TNEMEC EPOXOLINE FC22 PAINT, TYP.
- ⑩ REPLACE MORTAR COATING AND LINING THUS: . MATCH EXISTING MORTAR THICKNESS.
- ⑪ C153 FLANGE X MJ ADAPTER.
- ⑫ INSTALL ISOLATION KIT WITH FLANGE BOLTING.
- ⑬ PROTECTIVE POLYETHYLENE ENCASEMENT FOR DUCTILE IRON PIPE PER PROJECT REQUIREMENTS.
- ⑭ FULL FACE 1/8" INSULATING GASKET.
- ⑮ PROVIDE SHOP DRAWINGS AS DIRECTED.

	NO	REVISION	CCP FLANGE ASSEMBLY	
			SCALE: N.T.S.	DATE: MAY 2021
			DRAWING: CRW.STD.DTL205.dwg	
			205	