

WATER SYSTEM STANDARD SPECIFICATIONS

Detail Number

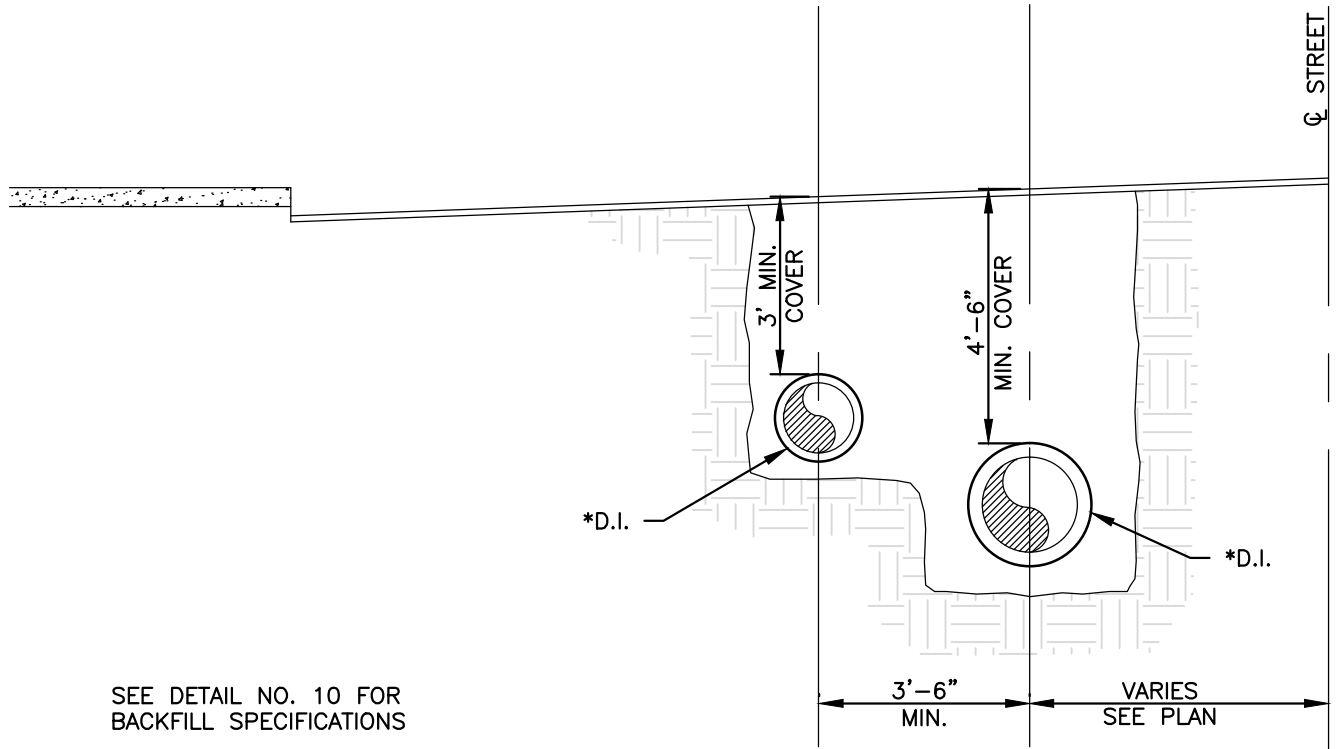
1. Typical trench cross section with two parallel water lines
2. Installation of valves and hydrants in ditches
3. Fire hydrant assembly
4. Guard and marker post
5. 2" Blow off
6. Concrete Blocking
7. Parallel construction
8. Standard 1" Water Service
9. Air and vacuum release assembly
10. Trench cross section for D.I. pipe
11. Replacement of existing service
12. Hill holder
13. Pipe anchors
14. Service connections in planter box
15. Double check valve assembly 4" and larger
16. Water and sewer main casing detail
17. Sump pump detail
18. 1-1/2" and larger meters
19. Pressure reducing station

Part Two – Materials

W-1 > W-5

Part Three – Construction

W-6 > W-14



SEE DETAIL NO. 10 FOR
BACKFILL SPECIFICATIONS

* SIZE AS NOTED

SECTION B-B

**TYPICAL TRENCH CROSS SECTION
WITH TWO PARALLEL WATER LINES**

SCALE 1"=5'

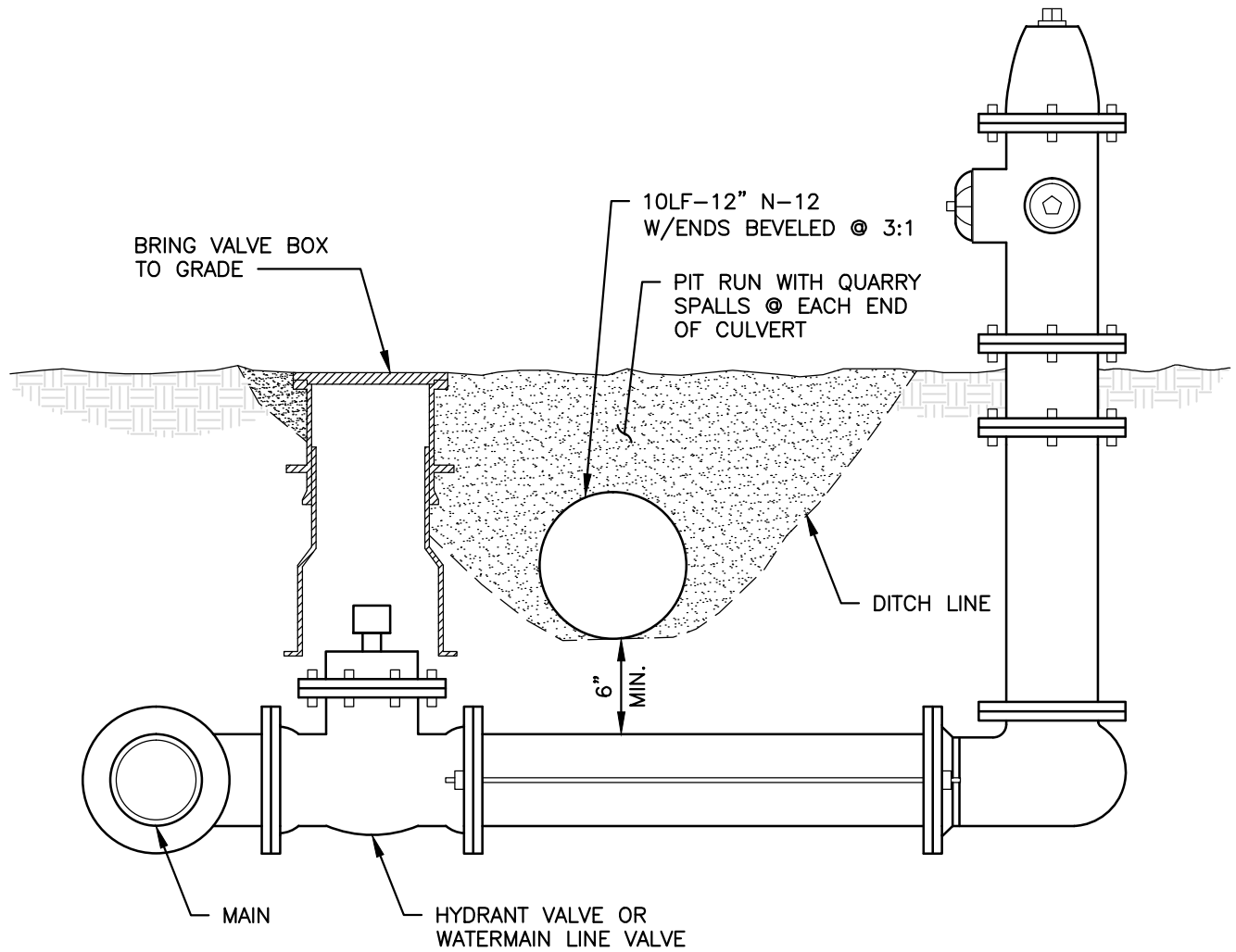


**Coal Creek
Utility District**

**TYPICAL TRENCH CROSS
SECTION WITH TWO
PARALLEL WATER LINES**

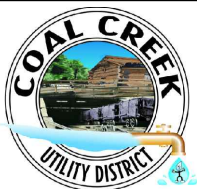
**WATER STD.
PLAN NO. 1**

**REVISION DATE
2-2017**



**INSTALLATION OF VALVES
& HYDRANTS IN DITCHES**

SCALE NTS

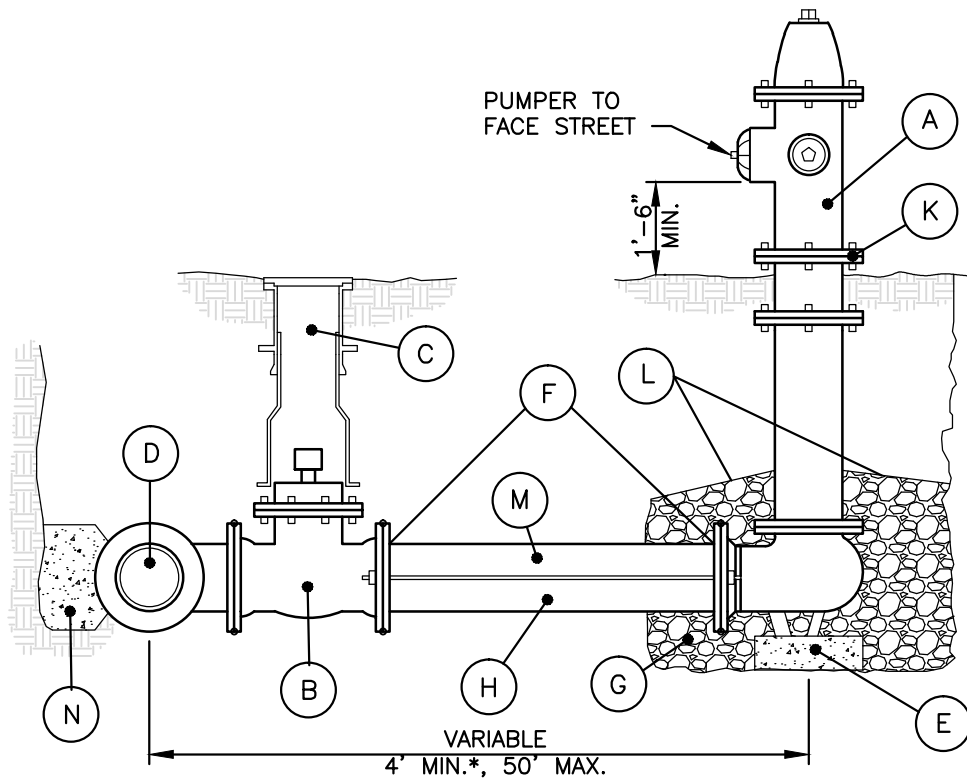


**Coal Creek
Utility District**

**INSTALLATION OF VALVES
AND HYDRANTS IN DITCHES**

**WATER STD.
PLAN NO. 2**

**REVISION DATE
2-2017**



* CONSULT ENGINEER IF LESS THAN 4 FEET

ITEM	QUANTITY	ITEM DESCRIPTION	
A	1	FIRE HYDRANT:	1-4" PUMPER-SEATTLE STANDARD THREAD 2-2½" HOSE NOZZLES-NATIONAL STD. THREAD MECHANICAL JOINT SHOE
B	1	AUXILIARY GATE VALVE:	6" - AWWA C509 RESILIENT SEAT, MJ x FL
C	1	VALVE BOX:	CAST IRON SLIDE EXTENSION & BASE LID TO HAVE DROP-IN HANDLE.
D	1	TEE:	6" FLANGED OUTLET
E	1	CONCRETE BRICK:	8" x 16" x 4"
F	2	RESTRAINED JOINT GLAND:	MEGA-LUG OR EQUAL
G	¼ CY	1½" WASHED ROCK	
H	VAR.	6" DUCTILE IRON PIPE:	CEMENT LINED, CLASS 52
J		DELETED	
K	1	HYDRANT EXTENSION, WHERE REQUIRED	
L	1	6 MIL PLASTIC SHEETING OVER WASHED ROCK.	
M	VAR.	FIELD LOCK GASKETS AT PIPE BELL'S	
N	1	CONCRETE BLOCKING	

1. HYDRANTS SHALL BE PAINTED WITH TWO COATS OF SEYMOUR/KRYLON PAINT EQUIPMENT NO. K00481 (YELLOW).
2. ALL HYDRANTS SHALL BE BREAK-AWAY TYPE, PER KING COUNTY STANDARDS
3. PUMPER CAP SHALL BE LOCATED ONE FOOT MINIMUM BEHIND SIDEWALK.
4. HYDRANT TO BE LOCATED FIVE FEET BEHIND CURB IF NO SIDEWALK IS PRESENT.

FIRE HYDRANT ASSEMBLY

SCALE NTS

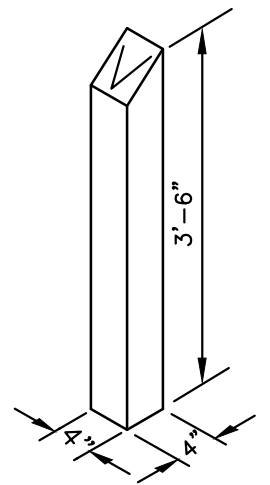


**Coal Creek
Utility District**

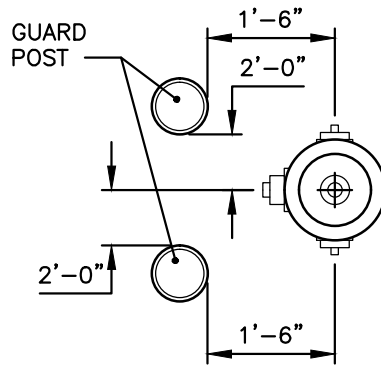
FIRE HYDRANT ASSEMBLY

**WATER STD.
PLAN NO. 3**

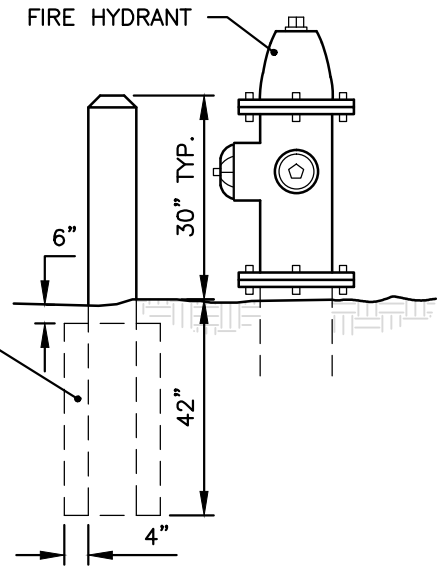
**REVISION DATE
1-2019**



VALVE MARKER POST



PLAN



ELEVATION

CONCRETE BACKFILL WHERE SPECIFIED. EARTH BACKFILL COMPACTED IN 6" LAYERS ELSEWHERE

3'-0" MIN. RADIUS OF LEVEL GROUND AROUND FIRE HYDRANT

FIRE HYDRANT GUARD POST

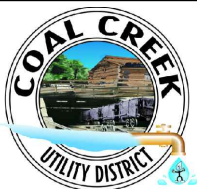
GUARD POST WILL NOT BE ALLOWED IN THE STREET CLEAR ZONE AS PER KING COUNTY REQUIREMENTS

NOTES:

1. GUARD POST SHALL BE 9" DIAMETER X 6' LONG PRECAST CONCRETE POSTS AS PER TECHNICAL SPECIFICATIONS. PAINT WITH TWO (2) COATS OF SEYMOUR/KRYLON PAINT EQUIPMENT YELLOW NO. K00481.
2. VALVE MARKER POST AS SPECIFIED. PAINT AS SPECIFIED FOR HYDRANT GUARD POST. PAINT DISTANCE FROM THE VALVE MARKER TO THE VALVE ON THE POST WITH BLACK ENAMEL PAINT, USING 2" HIGH NUMERALS.

GUARD AND MARKER POSTS

SCALE NTS

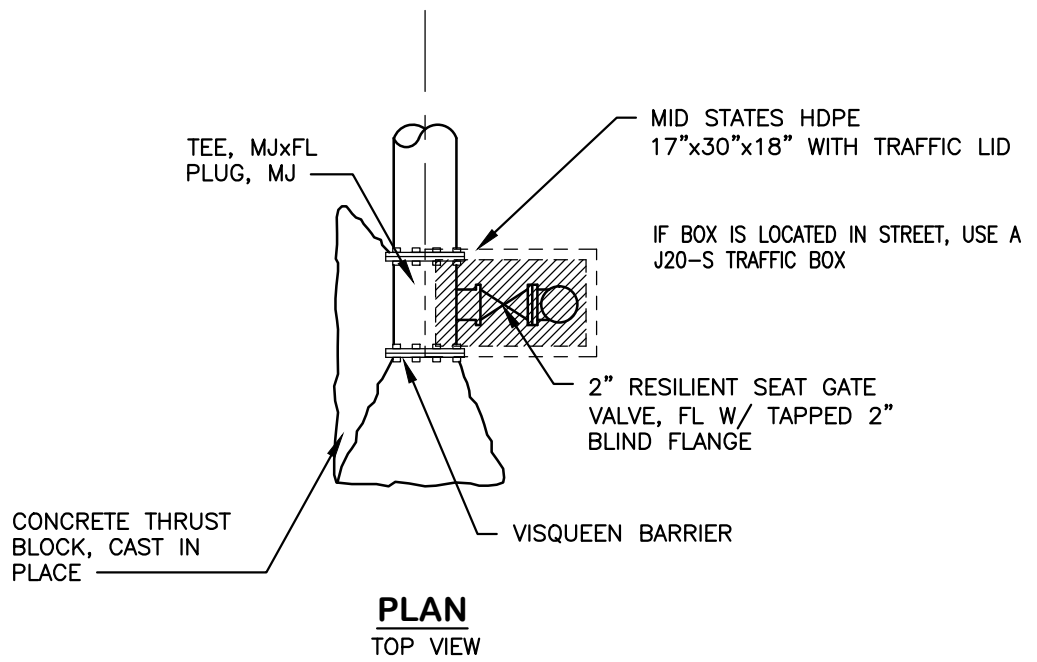


**Coal Creek
Utility District**

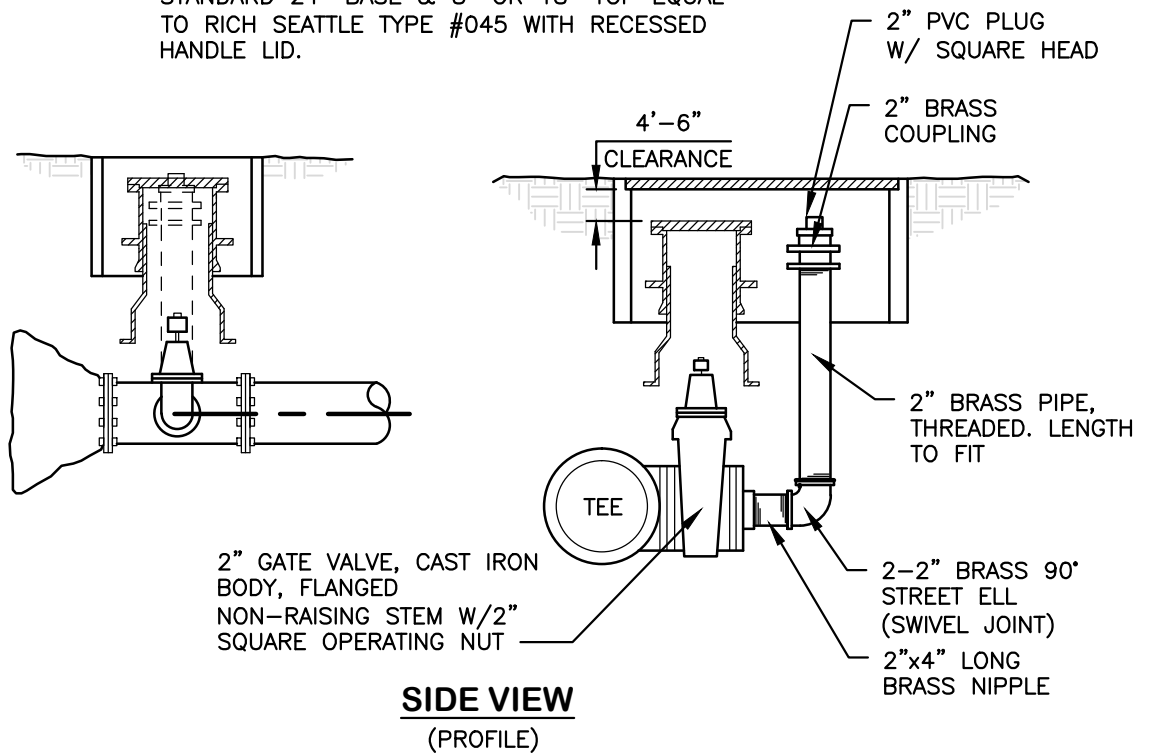
GUARD AND MARKER POSTS

**WATER STD.
PLAN NO. 4**

**REVISION DATE
2-2017**



TWO PIECE CAST IRON VALVE BOX W/
STANDARD 24" BASE & 8" OR 18" TOP EQUAL
TO RICH SEATTLE TYPE #045 WITH RECESSED
HANDLE LID.



2" BLOW OFF
SCALE NTS

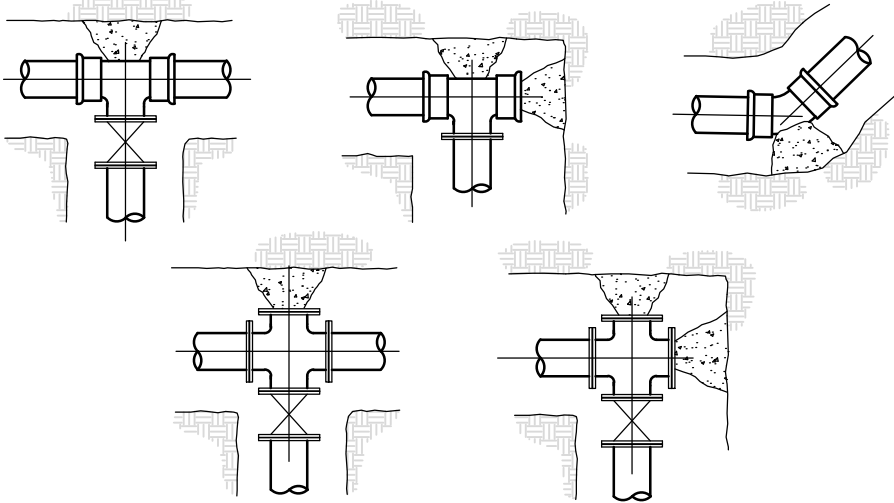


**Coal Creek
Utility District**

2 INCH BLOW OFF

**WATER STD.
PLAN NO. 5**

**REVISION DATE
2-2017**

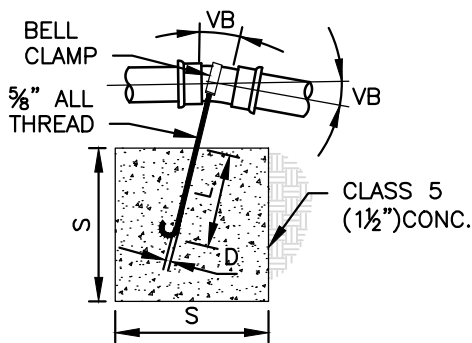


PIPE SIZE (DIA. IN.)	BEARING AREA OF BLOCK (SQ. FT.)				
	TEES & BENDS	90° BEND	45° BEND	22½° BEND	11¼° BEND
6"	3	4	2	1.5	0.8
8"	5	7	4	2	1
10"	8	11.2	6	3	1.6
12"	13.0	18.0	10	5	3
16"	20	28.5	16	8	4

NOTES:

1. ALL BLOCKING SHALL BE POURED AGAINST FIRM UNDISTURBED SOIL. BLOCKING IN ORGANIC SOILS OR FILL AREA TO BE DESIGNED BY ENGINEER.
2. BEARING AREA AT FITTINGS NOT GIVEN IN BEARING TABLE SHALL BE AS DIRECTED BY THE ENGINEER.
3. WHEN POURING AGAINST PLUGS AND BLIND FLANGES, SET STEEL METER BOX LID AGAINST FITTING TO KEEP CONCRETE OFF BOLTS.
4. LAYOUT TO BE APPROVED BY DISTRICT PRIOR TO CONCRETE POUR.
5. FOR BLOCKING SCHEME OTHER THAN SHOWN ABOVE, CONTACT DISTRICT ENGINEER FOR DETAIL.

HORIZONTAL BLOCKING



TYPE "A" BLOCKING FOR 11¼°/22½° VERTICAL BENDS

CONCRETE BLOCKING

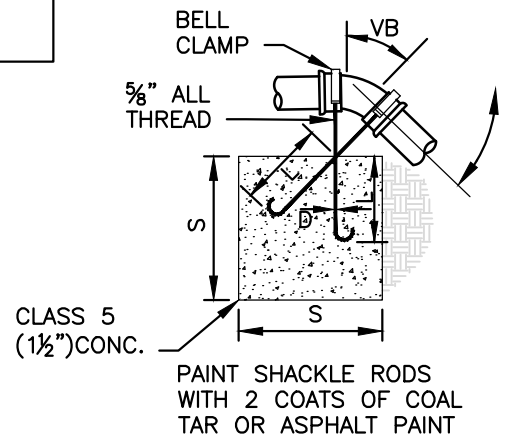
SCALE NTS

TYPE "A" BLOCKING FOR 11¼°/22½° VERTICAL BENDS						
PIPE SIZE NOM. (DIAMETER-INCHES)	TEST PRESSURE (PSI)	VERTICAL BEND (DEGREES)	CONC. BLOCKING (CU. FT.)	SIZE OF BLOCK (FEET)	DIAMETER OF SHACKLE RODS (INCHES)	
					DEPTH OF RODS IN CONCRETE (FEET)	
4"	250	11¼°	8	2.0	5/8"	1.5
		22½°	11	2.2		2.0
6"	250	11¼°	11	2.2	5/8"	2.0
		22½°	25	2.9		
8"	250	11¼°	16	2.5	5/8"	2.0
		22½°	47	3.6		
12"	250	11¼°	54	3.8	5/8"	2.0
		22½°	120	5.0	3/4"	2.5
16"	250	11¼°	96	4.5	7/8"	3.0
		22½°	215	6.0	1¼"	4.0

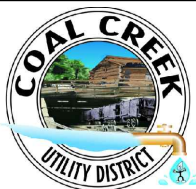
TYPE "B" BLOCKING FOR 45° VERTICAL BENDS

4"	250	45°	30	3.1	5/8"	2.0
6"			68	4.1		
8"			123	5.0		
12"	250		294	6.6	3/4"	3.0
16"	*		*	*	*	*

* TO BE DESIGNED BY ENGINEER



TYPE "B" BLOCKING FOR 45° VERTICAL BENDS



Coal Creek Utility District

CONCRETE BLOCKING

WATER STD. PLAN NO. 6

REVISION DATE 2-2017

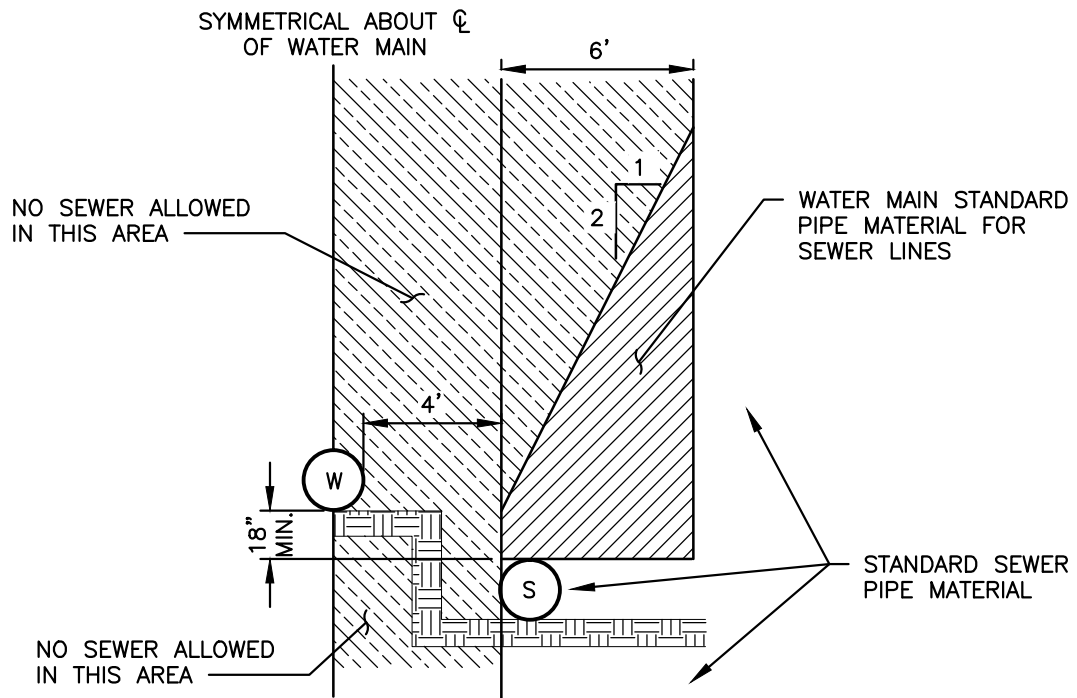


TABLE 1 WATER MAIN STANDARD PIPE MATERIAL			
	AWWA	(ASTM)	STANDARD
TYPE OF PIPE	PIPE	JOINT	FITTINGS
DUCTILE IRON	C 151 & C104	C 111	C 153

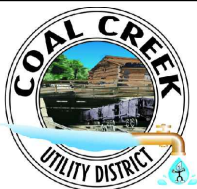
ALL WATER AND SEWER LINE SEPARATION SHALL MEET DOE STANDARDS.

FOR PERPENDICULAR CONSTRUCTION

FOR PERPENDICULAR SEWER LINE CROSSINGS, LAY SEWER BELOW WATER LINES AND PROVIDE 18 INCHES OF SEPARATION BETWEEN INVERTS OF WATER LINES AND CROWN OF SEWER PIPES. IF THIS IS NOT POSSIBLE, USE MATERIAL STANDARDS AS SET FORTH ABOVE FOR THE SEWER WITH MINIMUM 18 FEET LENGTH CENTERED OVER CROSSING TO MAXIMIZE JOINT SEPARATION.

FOR PARALLEL CONSTRUCTION

SCALE NTS

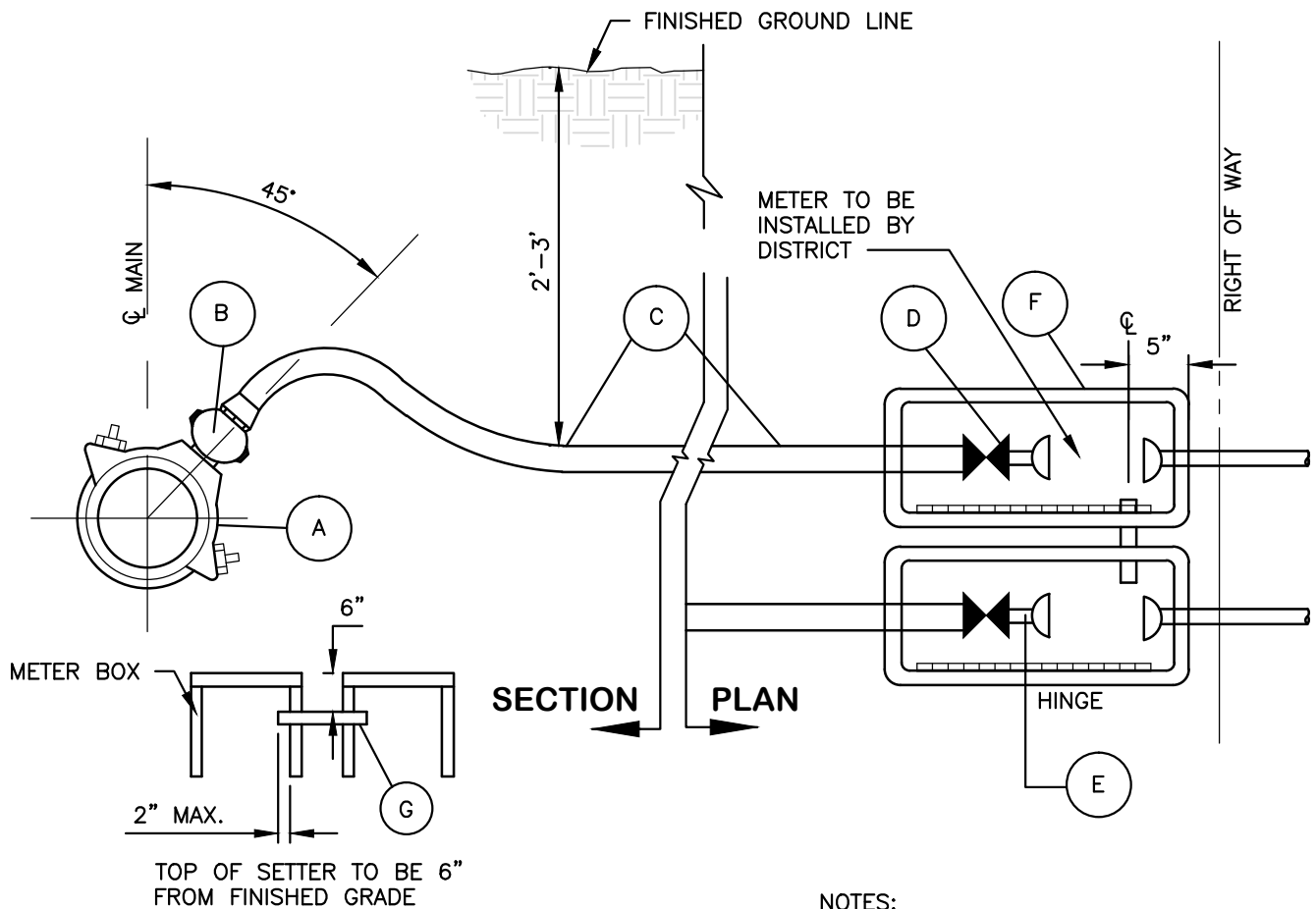


**Coal Creek
Utility District**

PARALLEL CONSTRUCTION

WATER STD.
PLAN NO. (7)

REVISION DATE
2-2017



TOP OF SETTER TO BE 6"
FROM FINISHED GRADE

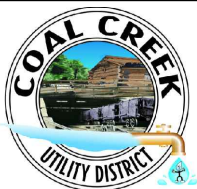
- A. SERVICE CLAMP, FORD MODEL FC 101 OR FC 202, OR EQUAL.
- B. CORPORATION STOP, FORD OR EQUAL. I.P. X G.T. COMPRESSION
- C. COPPER TUBING, ASTM B 88, TYPE K.
- D. CURB STOP, FORD OR APPROVED EQUAL. I.P. X G.T. COMPRESSION. CURB STOPS TO BE 18" DEEP MINIMUM TO 36" DEEP MAXIMUM.
- E. 1" COPPER SETTER WITH LOCKING STOP, C.T.S. INLET AND HORIZONTAL OUTLET, ANGLE CHECK VALVE OUTLET, 12" HIGH PER DISTRICT REQUIREMENTS. FORD NO. VBH 74-12W-11-44-NL, OR EQUAL.
- F. TRAFFIC AREAS: METER BOX SHALL BE MID STATES HDPE 13"x24"x18" WITH MID STATES 13"x24" DUCTILE IRON LID WITH READER. TRAFFIC LID REQUIRED WITH 2" M.X.U HOLE. NON-TRAFFIC AREAS: RAVEN METER BOX 13"x24"x18" WITH READER LID.
- G. 2" PVC SDR 21CONNECTING PIPE FOR RADIO READ CONDUIT (LENGTH AS REQUIRED) LOCATE 6" BELOW TOP OF BOX AND 5" FROM CUSTOMER END OF BOX. 2" ID, 2-3/8" OD, 2-1/2" HOLE TYPICAL

NOTES:

1. SINGLE SERVICE LINES ARE 1" DIAMETER.
2. EQUAL MATERIALS MUST BE APPROVED BY THE DISTRICT.
3. COPPER SETTER FOR SERVICES WITH MULTI-RESIDENTIAL EQUIVALENTS AND EQUIVALENTS AND ALL COMMERCIAL SERVICES SHALL HAVE A BY-PASS WITH A VALVE WITH PADLOCK WINGS. FORD NO. VBH77-12B-11-77-NL OR EQUAL.
4. NO METER BOXES IN SIDEWALKS OR DRIVEWAYS.
5. AFTER DISTRICT REQUIREMENTS HAVE BEEN MET, METER(S) WILL BE INSTALLED UPON COMPLETION OF THE STRUCTURE'S FOUNDATION AND ROOF.
6. BEDDING MATERIAL SHALL BE USED TO BACKFILL AROUND CORP. STOP AND SERVICE LINE.

STANDARD 1" WATER SERVICE

SCALE NTS



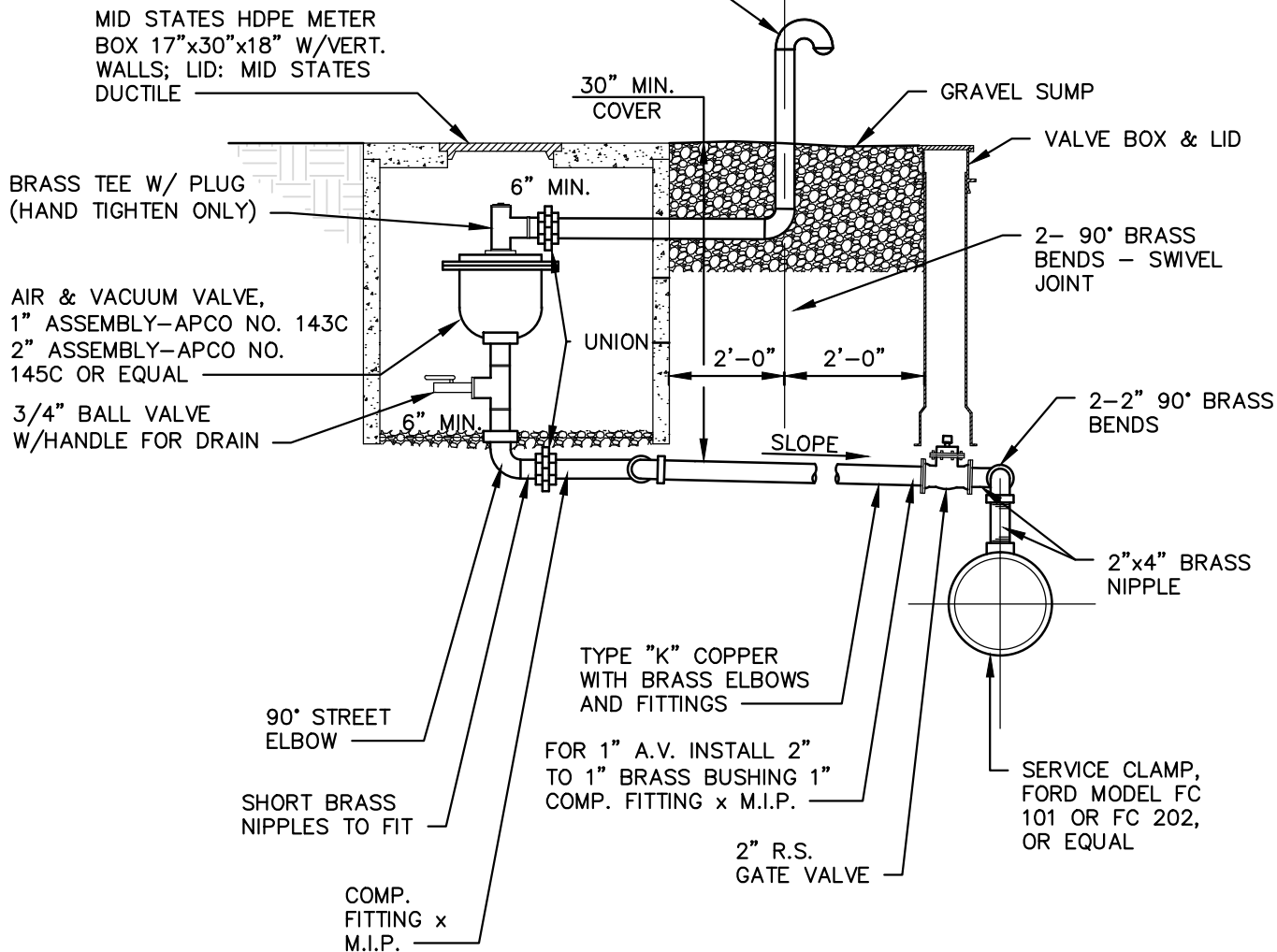
**Coal Creek
Utility District**

**STANDARD 1 INCH WATER
SERVICE**

**WATER STD.
PLAN NO. 8**

**REVISION DATE
2-2017**

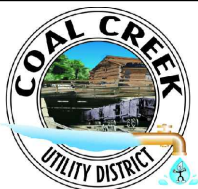
INSTALL 180° RETURN ELBOW WITH BEE HIVE ABOVE COVER. MIN. 18" ABOVE GRADE. IF IN A HIGH TRAFFIC AREA, INSTALL A PROTECTIVE DEVICE (MARKER POST, BOLLARD ETC.)



NOTE:
 FOR 8" DUCTILE IRON PIPE A 1" AIR/VAC ASSEMBLY IS TO BE INSTALLED. FOR 12" AND LARGER DUCTILE IRON PIPE A 2" AIR/VAC ASSEMBLY IS TO BE INSTALLED.

AIR AND VACUUM RELEASE ASSEMBLY

SCALE NTS

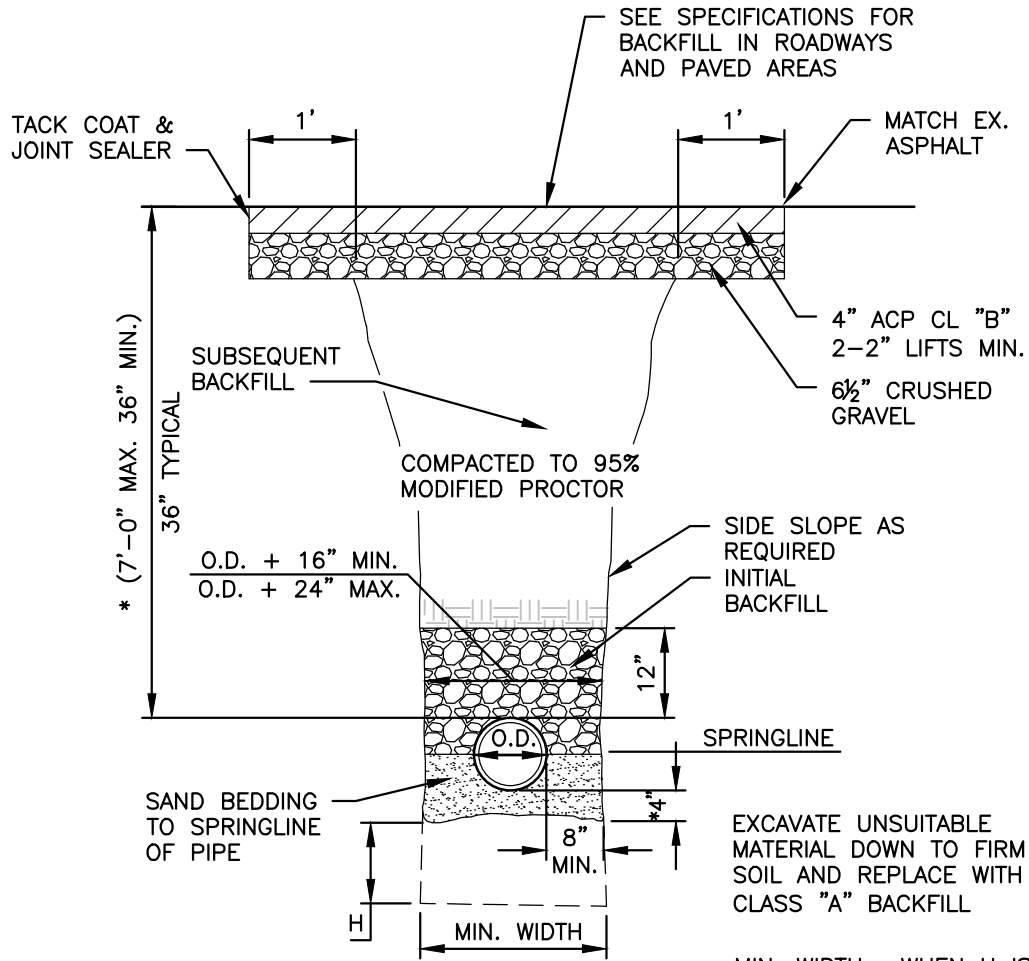


**Coal Creek
 Utility District**

**AIR AND VACUUM RELEASE
 ASSEMBLY**

**WATER STD.
 PLAN NO. 9**

**REVISION DATE
 2-2017**



*NOTE:
 DEPTHS MAY INCREASE AS REQUIRED.
 ADDITIONAL FITTINGS MAY BE REQUIRED
 TO ADJUST GRADE TO AVOID CONFLICTS.

**TRENCH CROSS SECTION
 FOR D.I. PIPE**
 SCALE NTS

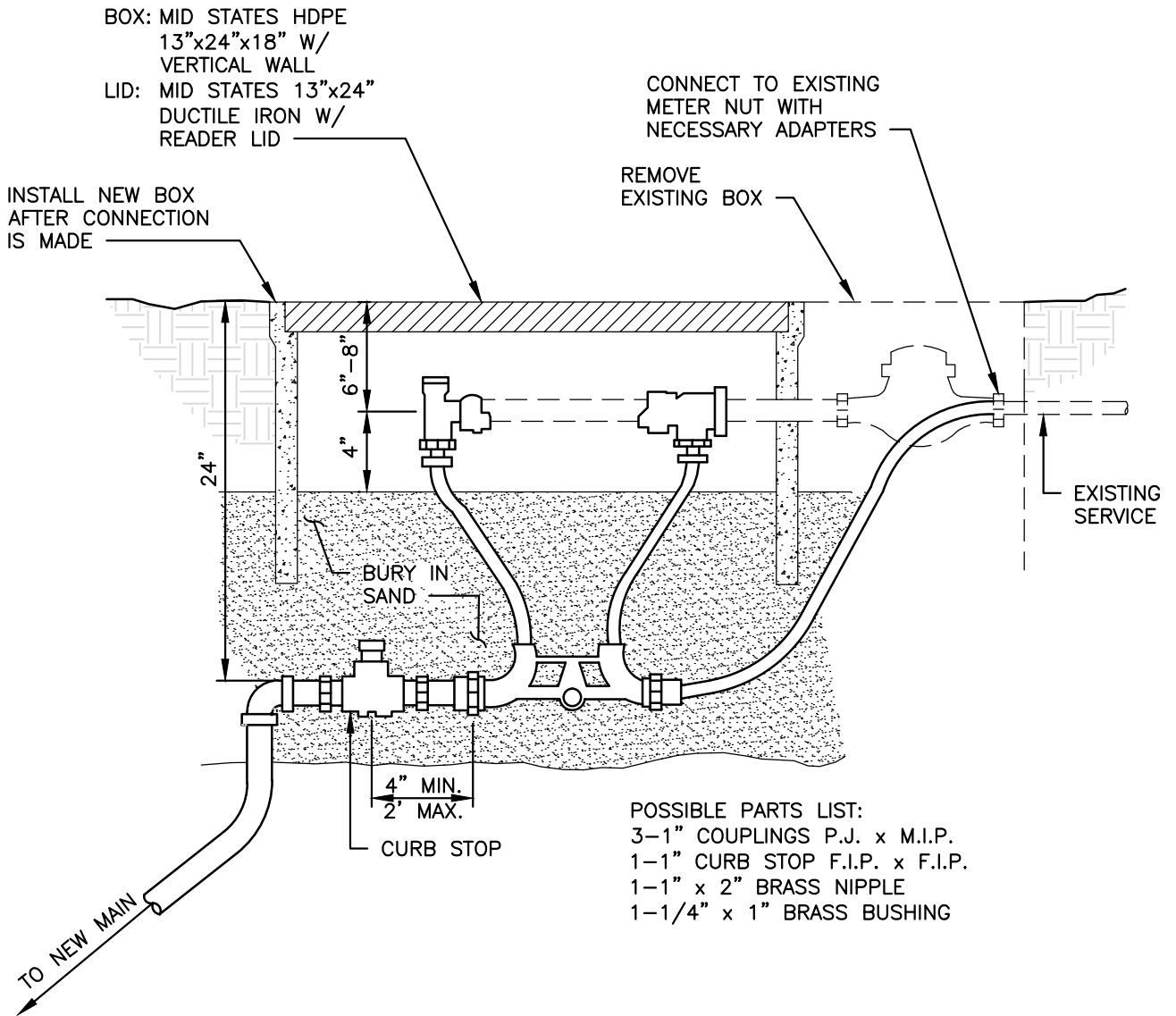


**Coal Creek
 Utility District**

**TRENCH CROSS SECTION FOR
 DI PIPE**

WATER STD.
 PLAN NO. 10

REVISION DATE
 2-2017



NOTES:

1. TYPICAL 1" WATER SERVICE REPLACEMENT. NEW SETTER TO BE OFFSET SUFFICIENTLY FROM OLD SERVICE TO PERMIT CONNECTION
2. MATERIAL USED IN REPAIR OF AN EXISTING SERVICE SHALL BE APPROVED BY THE DISTRICT ON A CASE BY CASE BASIS
3. CONTRACTOR TO TRANSFER METER OR INSTALL NEW METER AS FURNISHED BY THE DISTRICT

**REPLACEMENT OF
EXISTING SERVICE**

SCALE NTS

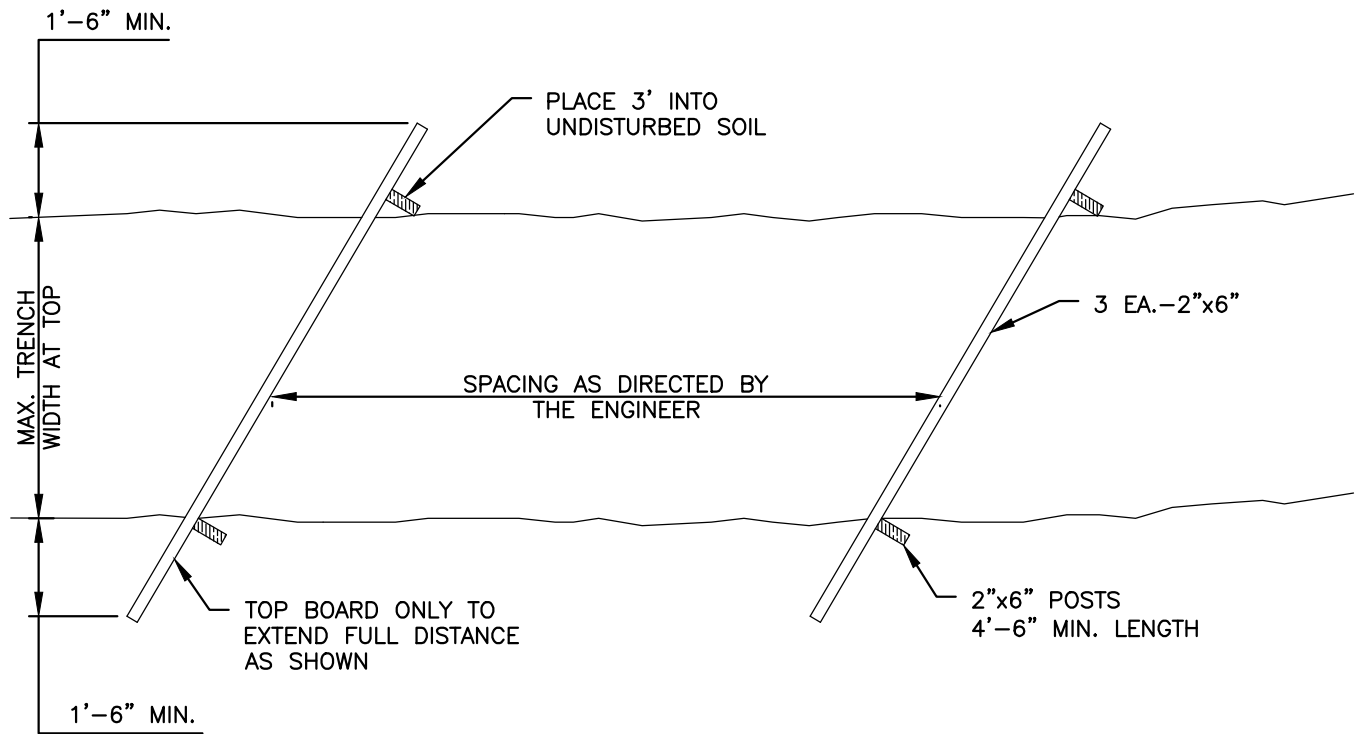


**Coal Creek
Utility District**

**REPLACEMENT OF EXISTING
SERVICE**

**WATER STD.
PLAN NO. 11**

**REVISION DATE
2-2017**



NOTES:

1. TIMBER BAFFLES TO BE INSTALLED WHERE DIRECTED BY THE ENGINEER OR DISTRICT INSPECTOR.
2. ALL BACKFILL SHALL BE SEEDDED.

HILL HOLDER

SCALE NTS

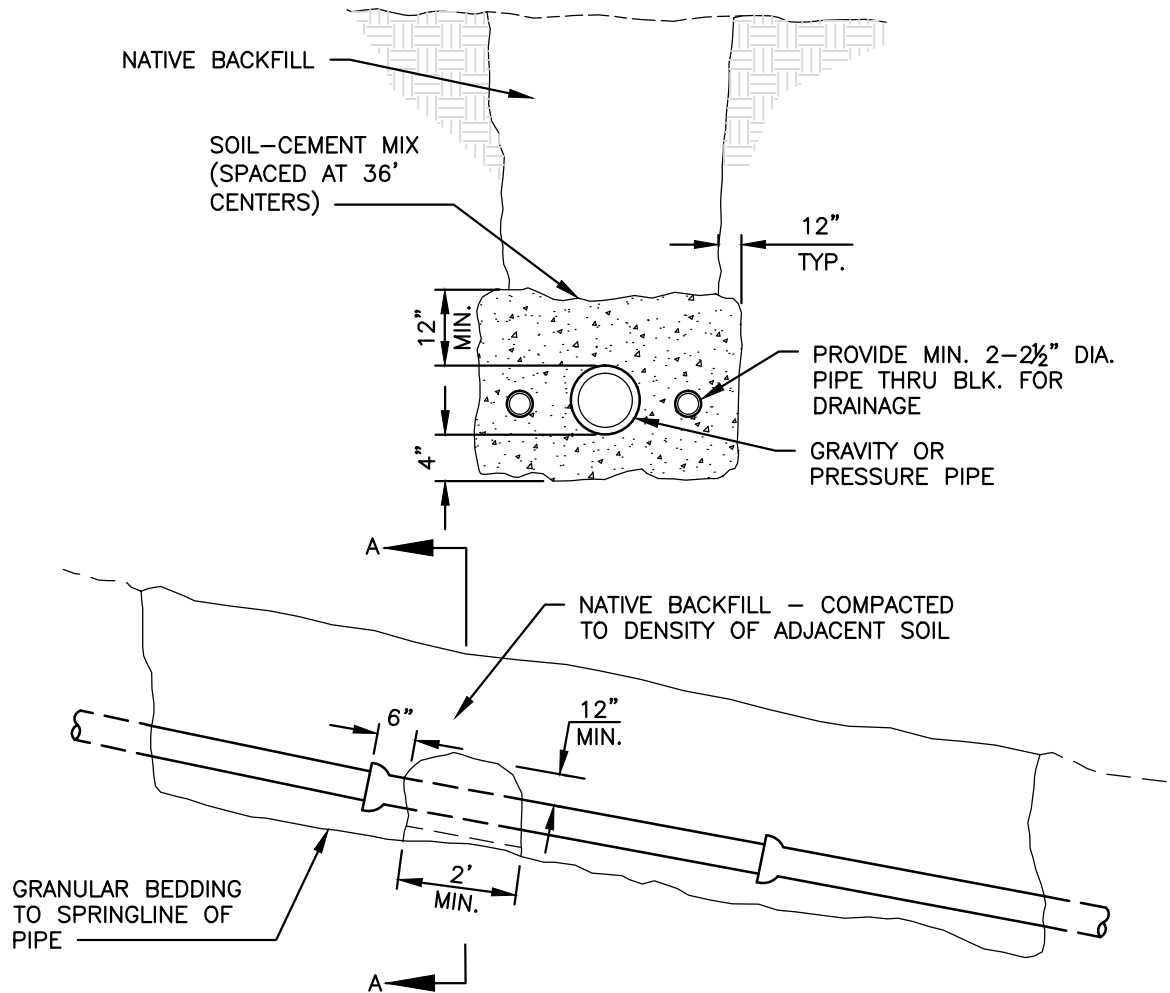


**Coal Creek
Utility District**

HILL HOLDER

**WATER STD.
PLAN NO. 12**

**REVISION DATE
2-2017**

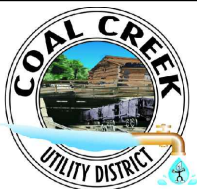


SOIL CEMENT BLOCKS PLACED OVER AND AROUND PIPE. TAMPED INTO PLACE BEFORE PLACING BACKFILL. USE 10 PERCENT CEMENT WITH 90 PERCENT NATIVE SOIL AND WATER TO SUIT TO FORM A DRY MIX THAT WILL HOLD ITS SHAPE WHEN MOLDED INTO A BALL. OMIT SOIL CEMENT BLOCKS ON SLOPES LESS THAN 15 PERCENT.

NOTE:
"FIELD LOK" GASKETS MAY BE USED IN LIEU OF PIPE ANCHORS.

PIPE ANCHOR

SCALE NTS

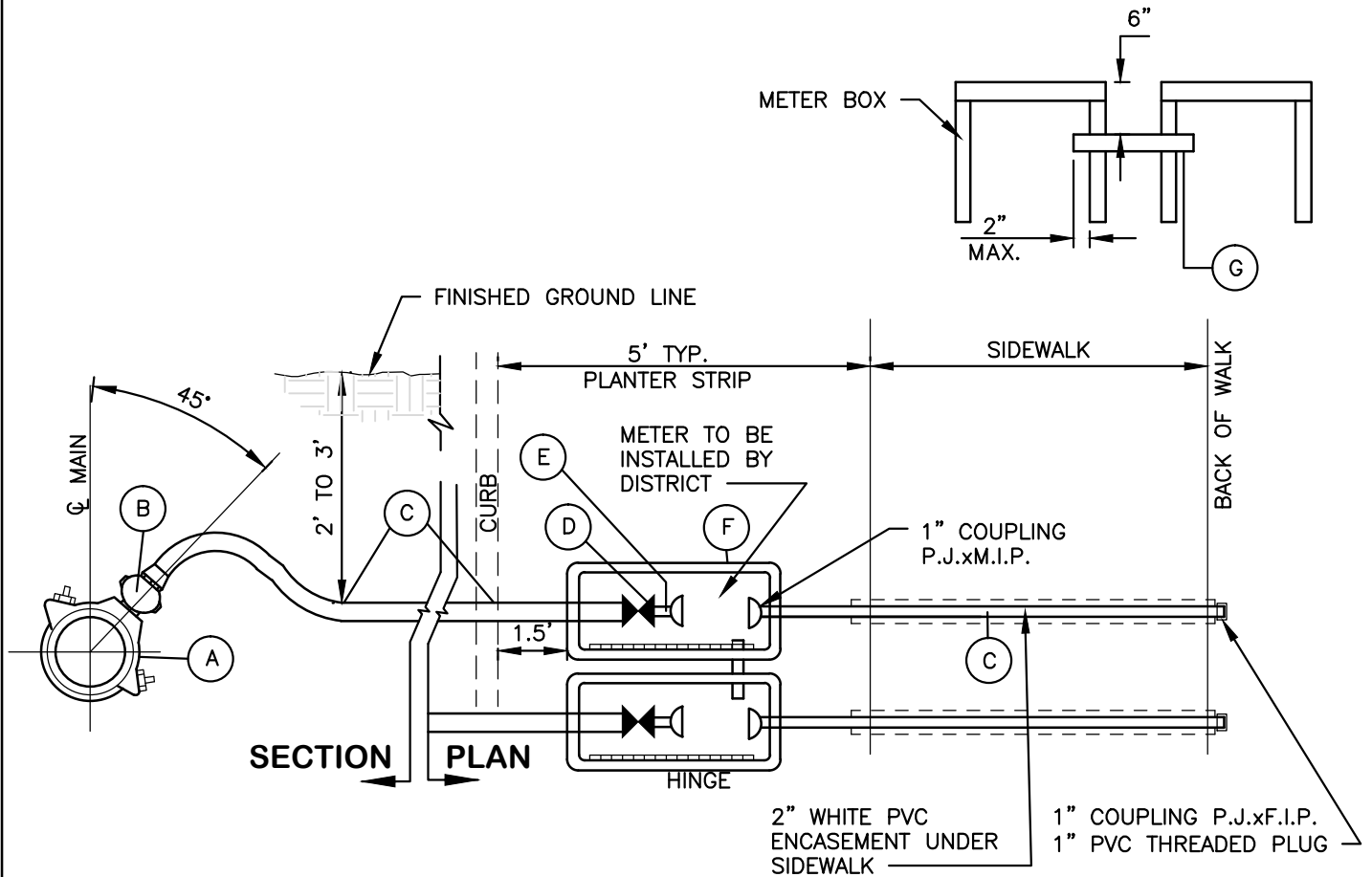


**Coal Creek
Utility District**

PIPE ANCHORS

**WATER STD.
PLAN NO. 13**

REVISION DATE
2-2017

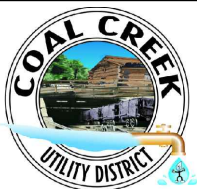


TOP OF SETTER TO BE 6" FROM FINISHED GRADE

- A. SERVICE CLAMP, FORD MODEL FC 101 OR FC 202, OR EQUAL.
- B. CORPORATION STOP, FORD OR EQUAL. I.P. X G.T. COMPRESSION
- C. COPPER TUBING, ASTM B 88, TYPE K.
- D. CURB STOP, FORD OR APPROVED EQUAL. I.P. X G.T. COMPRESSION. CURB STOPS TO BE 18" DEEP MINIMUM TO 36" DEEP MAXIMUM.
- E. 1" COPPER SETTER WITH LOCKING STOP, C.T.S. INLET AND HORIZONTAL OUTLET, ANGLE CHECK VALVE OUTLET, 12" HIGH PER DISTRICT REQUIREMENTS. FORD NO. VH74-12W-11-44-NL, OR EQUAL.
- F. TRAFFIC AREAS: METER BOX SHALL BE MID STATES HDPE 13"x24"x18" WITH MID STATES 13"x24" DUCTILE IRON LID.
NON-TRAFFIC AREAS: RAVEN METER BOX 13"x24"x18" WITH READER LID.
- G. 2" PVC SDR 21CONNECTING PIPE FOR RADIO READ CONDUIT (LENGTH AS REQUIRED) LOCATE 6" BELOW TOP OF BOX AND 5" FROM CUSTOMER END OF BOX. 2" ID, 2-3/8" OD, 2-1/2" HOLE TYPICAL

SERVICE CONNECTIONS IN PLANTER STRIP

SCALE NTS

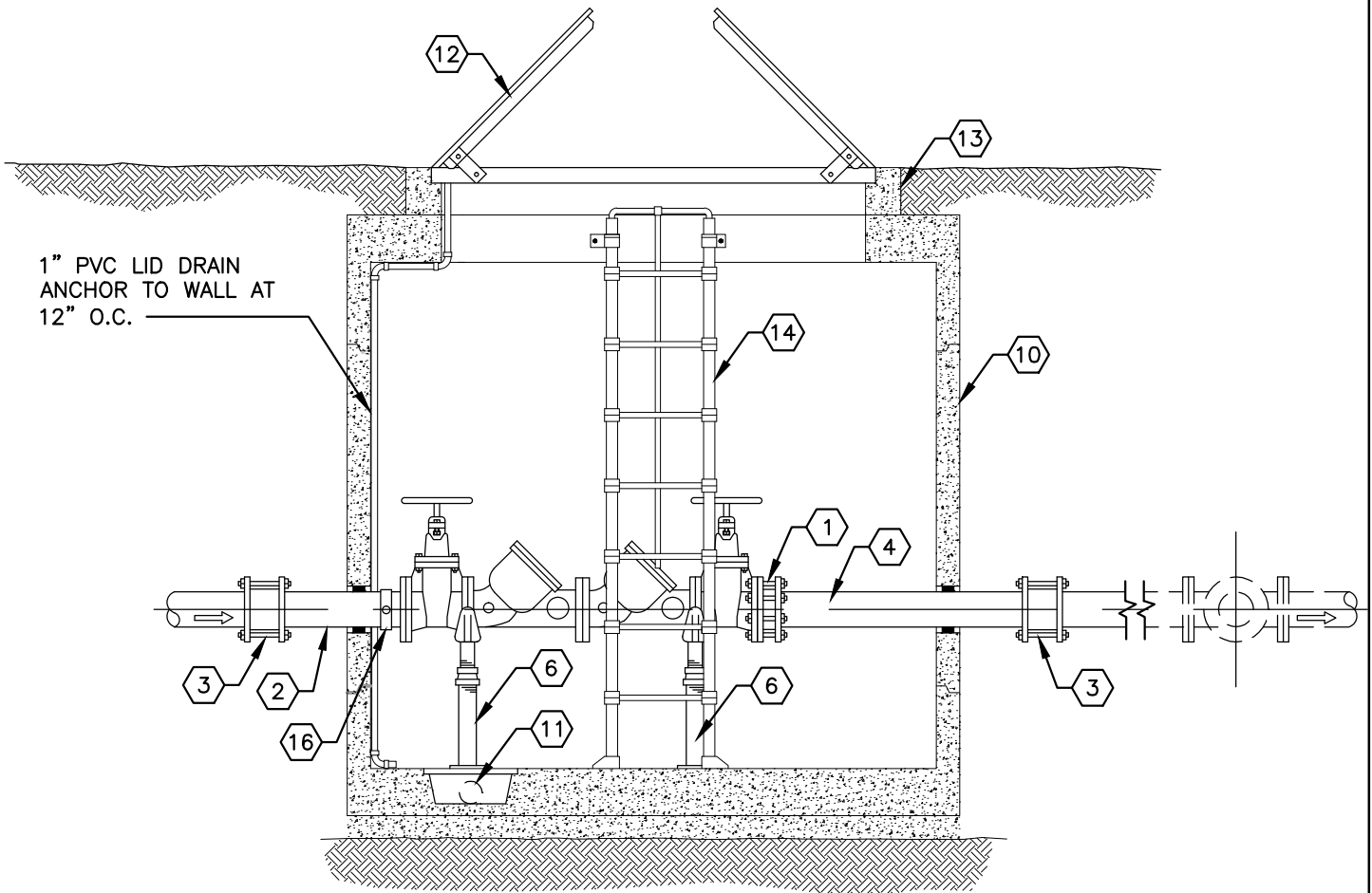


**Coal Creek
Utility District**

**SERVICE CONNECTIONS IN
PLANTER BOX**

**WATER STD.
PLAN NO. 14**

**REVISION DATE
2-2017**



1" PVC LID DRAIN
ANCHOR TO WALL AT
12" O.C.

ELEVATION

**DOUBLE DETECTOR
CHECK ASSEMBLY**

SCALE NTS



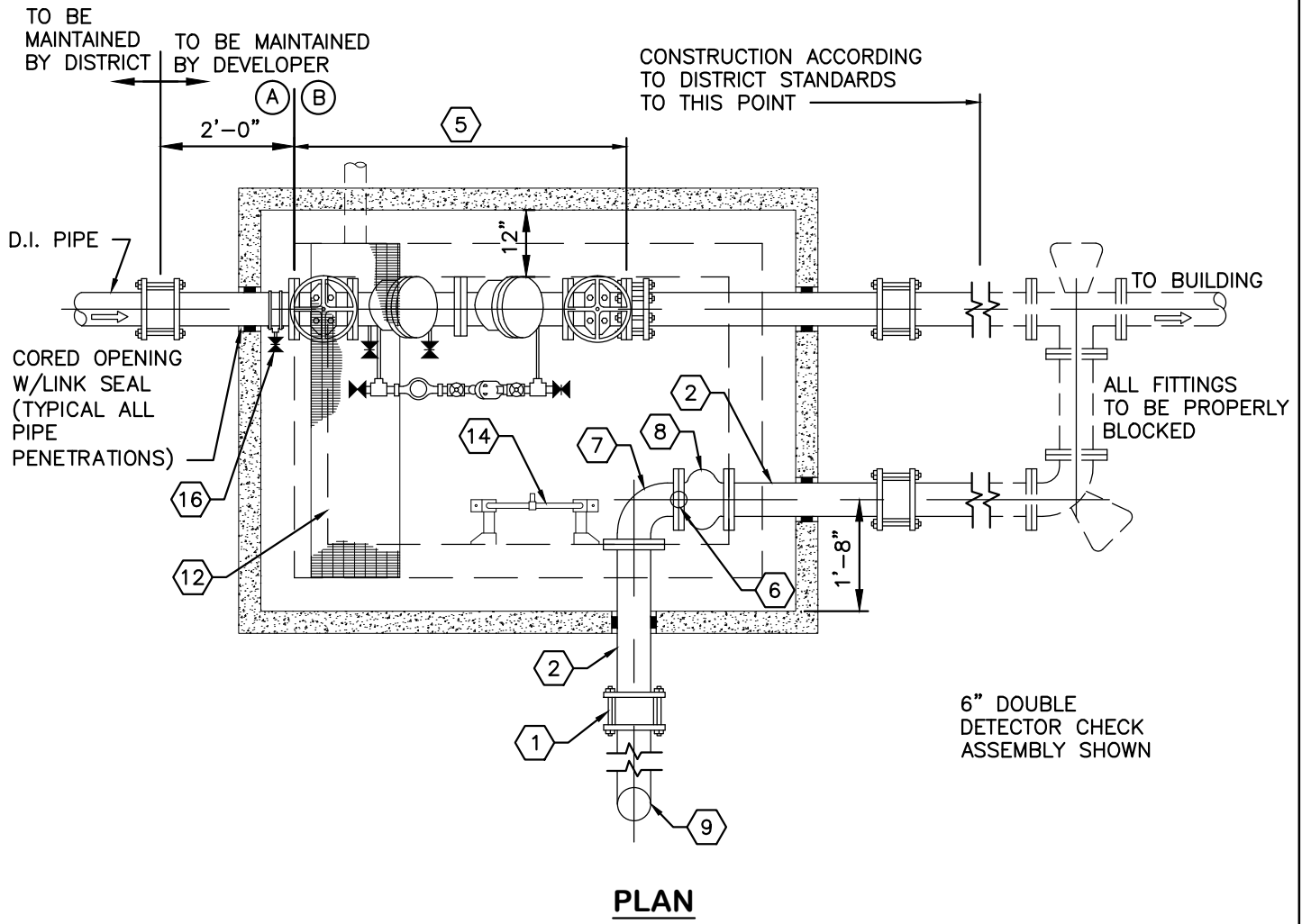
**Coal Creek
Utility District**

**DOUBLE CHECK VALVE
ASSEMBLY 4 INCH AND
LARGER**

15A

**WATER STD.
PLAN NO. 15**

REVISION DATE
2-2017

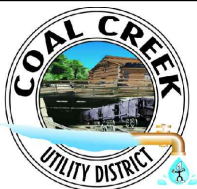


NOTE:

ALL D.I. OR C.I. PIPING SHALL BE PAINTED WITH ONE COAT PRIMER AND 2 COATS KRYLON OSHA BLUE # 481 (COLOR TO BE APPROVED BY THE DISTRICT). SUBMIT SUPPLIER CUTS ON ALL MATERIALS TO BE USED, FOR APPROVAL.

DOUBLE DETECTOR CHECK ASSEMBLY

SCALE NTS



**Coal Creek
Utility District**

**DOUBLE CHECK VALVE
ASSEMBLY 4 INCH AND
LARGER**

15B

**WATER STD.
PLAN NO. 15**

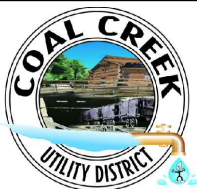
**REVISION DATE
2-2017**

ITEM	DESCRIPTION
1	FL COUPLING ADAPTER
2	FL X PE SPOOL
3	MJ COUPLING
4	PE SPOOL
5	U.L. APPROVED DOUBLE DETECTOR CHECK VALVE ASSEMBLY, FEBCO MODEL 806 DDC OR EQUAL
6	ADJUSTABLE PIPE SUPPORT, GRINNEL NO. 264 OR APPROVED EQUAL
7	FL 90° BEND
8	FL CHECK VALVE
9	FIRE DEPARTMENT CONNECTION – BASED ON FIRE MARSHAL REQUIREMENTS
10	PRE-CAST VAULT, SEE CALL OUT BELOW
11	4" PVC DRAIN PIPE TO STORM STRUCTURE
12	DIAMOND PLATE DOOR, LW PRODUCTS COMPANY HD-2C OR EQUAL FOR TRAFFIC AREAS, D-2C FOR NON-TRAFFIC AREAS
13	6" EXTENSION RING
14	POLYPROPYLENE VAULT LADDER W/EXTENSION, MANUFACTURED BY LANE INTERNATIONAL CORP., OR APPROVED EQUAL. ATTACH TO SIDE OF HATCH AND FLOOR.
15	DELETED
16	2" SADDLE W/ 2" BALL VALVE MIP x FIP PER DISTRICT STANDARDS

PIPE SIZE	UTILITY VAULT NO. (OR APPROVED EQUAL)
4" OR 6"	687-LA
8"	687-LA
10"	612-LA
NOTE: VAULTS TO BE SOLID WALL WITH NO KNOCKOUTS	

NOTES:

1. ALL VAULT PENETRATIONS SHALL BE CORED, WITH LINK-SEAL OR APPROVED EQUAL INSTALLED AROUND PIPE.
2. ALL PIPE AND FITTINGS TO BE DUCTILE OR CAST IRON.
3. ALL D.I. OR C.I. PIPING SHALL BE PAINTED WITH ONE COAT PRIMER AND 2 COATS KRYLON OSHA BLUE # 481 (COLOR TO BE APPROVED BY THE DISTRICT). SUBMIT SUPPLIER CUTS ON ALL MATERIALS TO BE USED, FOR APPROVAL.
4. IF SUMP PUMP IS REQUIRED, DEVELOPER SHALL SUPPLY POWER TO THE VAULT IN CONFORMANCE WITH ALL LOCAL AND STATE CODES.
5. ALL TEST COCKS SHALL BE PLUGGED.



**Coal Creek
Utility District**

**DOUBLE DETECTOR CHECK
VALVE ASSEMBLY 4 INCH
AND LARGER**

15C

**WATER STD.
PLAN NO. 15**

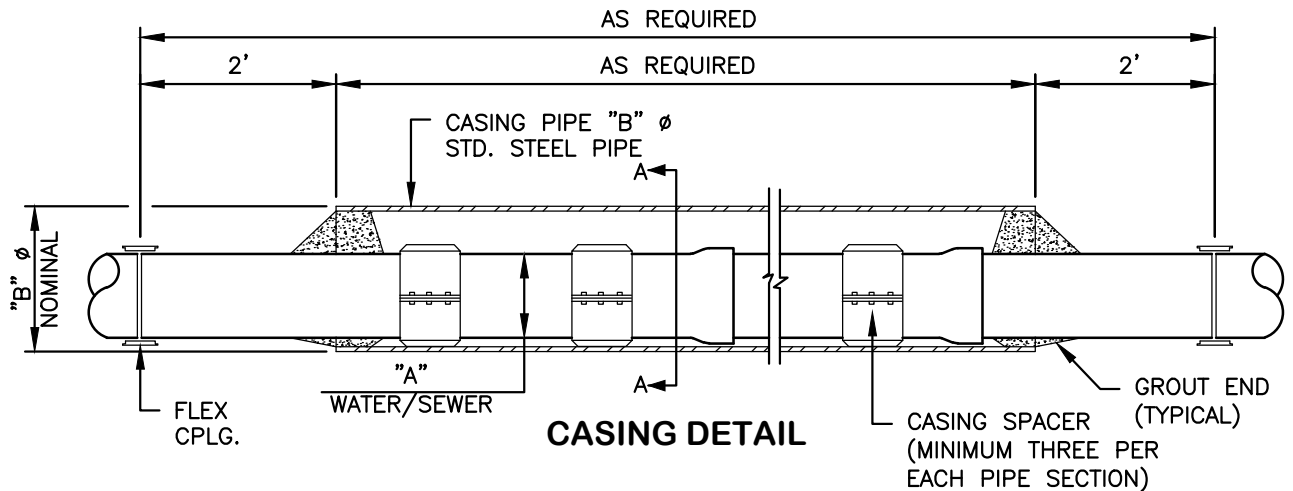
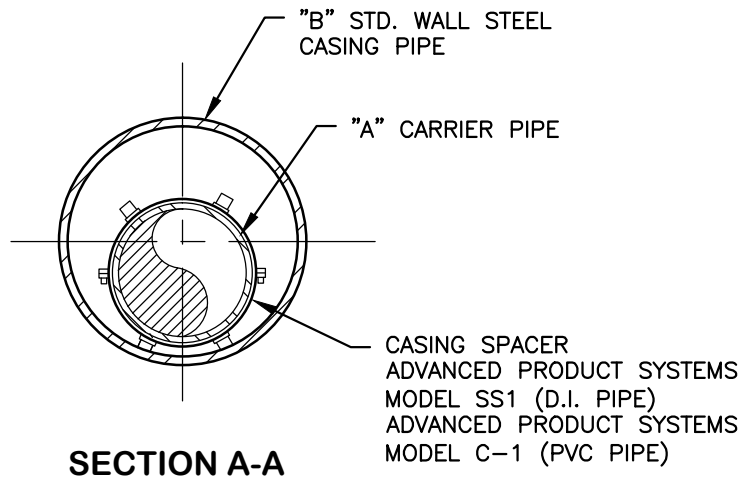
REVISION DATE
2-2017

"A" PIPE SIZES	"B" CASING SIZES	CASING WALL THICKNESS
6"	12"	.25"
8"	16"	.25"
10"	20"	.344"
12"	24"	.406"
14"	28"	.469"
16"	32"	.50"

"A" PIPE SIZES	"B" CASING SIZES	CASING WALL THICKNESS
6"	12"	.25"
8"	16"	.25"
10"	18"	.312"
12"	20"	.344"
15"	24"	.406"

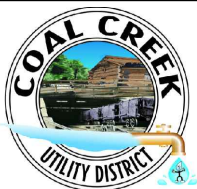
WATER PIPE SCHEDULE

SEWER PIPE SCHEDULE



WATER OR SEWER MAIN CASING DETAIL

SCALE NTS

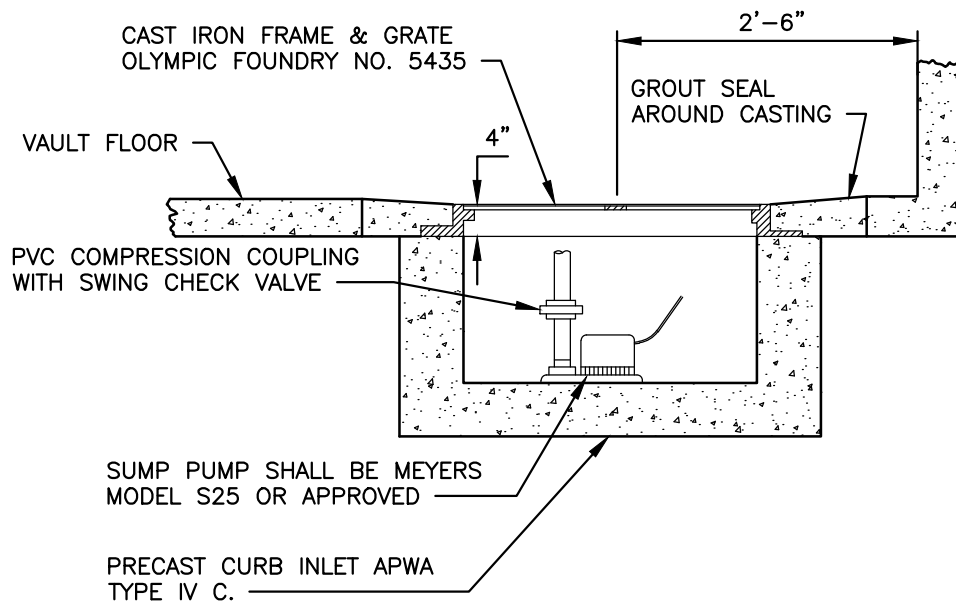


**Coal Creek
Utility District**

**WATER AND SEWER MAIN
CASING DETAIL**

**WATER STD.
PLAN NO. 16**

REVISION DATE
2-2017



NOTE:
 SUMP PUMP MAY BE SUBSTITUTED
 FOR DRAIN IF DRAIN LINE CANNOT
 BE CONNECTED TO STORM SYSTEM.
 (DETERMINATION TO BE MADE BY
 DISTRICT.)

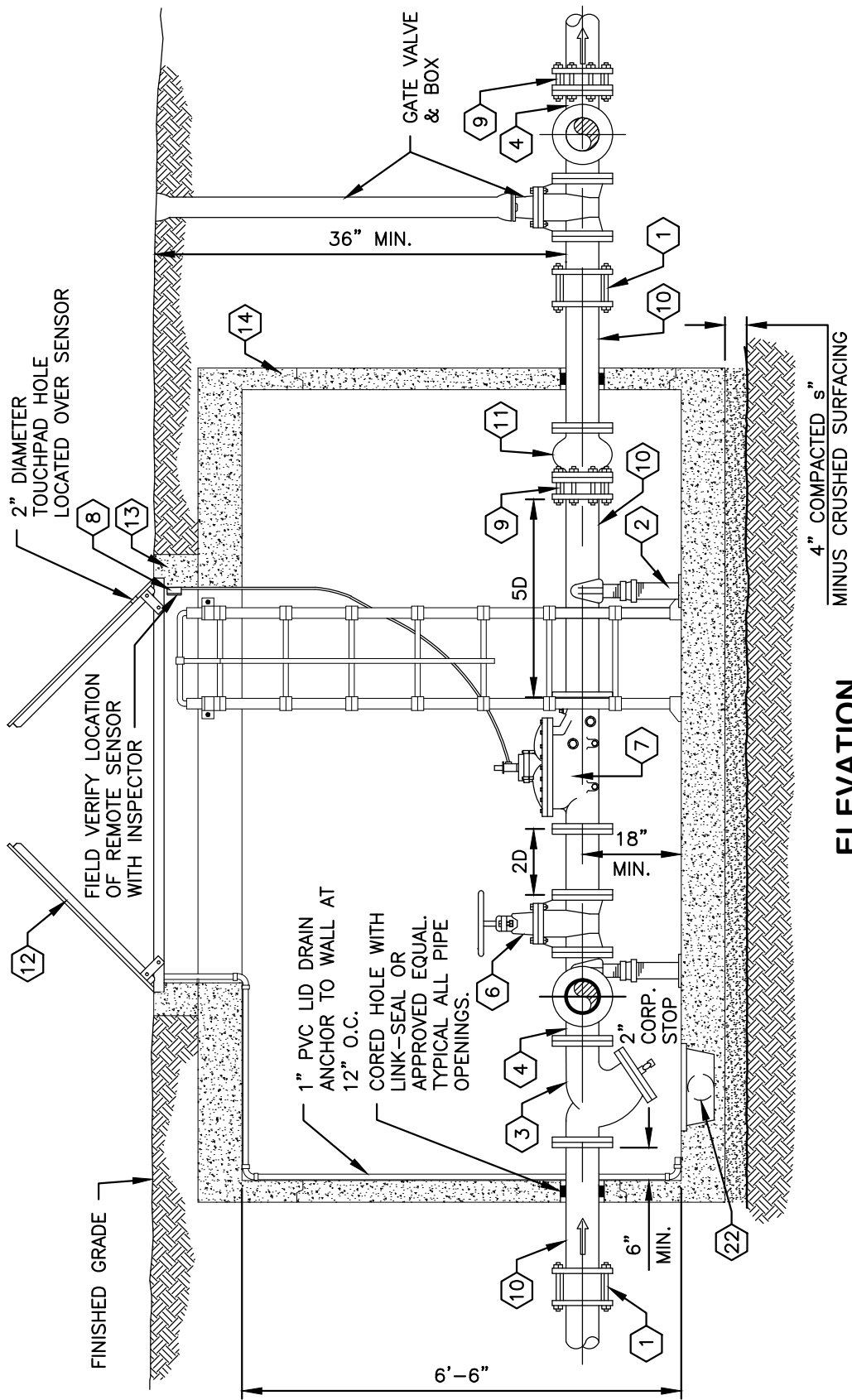
SUMP PUMP DETAIL
 SCALE NTS



**Coal Creek
 Utility District**

SUMP PUMP DETAIL

**WATER STD.
 PLAN NO. 17**
 REVISION DATE
 2-2017



ELEVATION
SCALE NTS



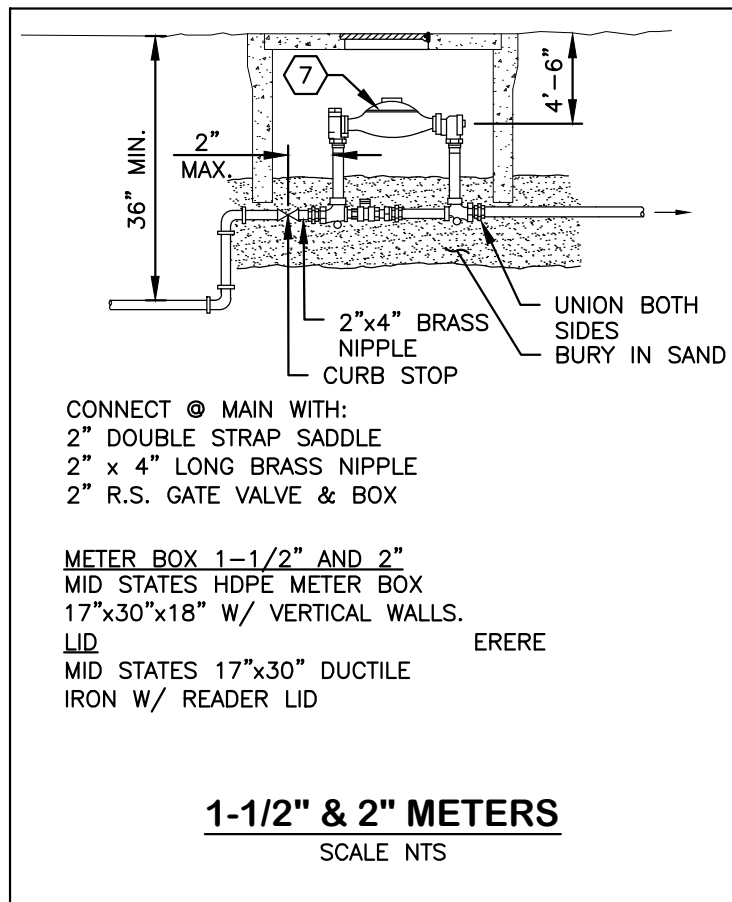
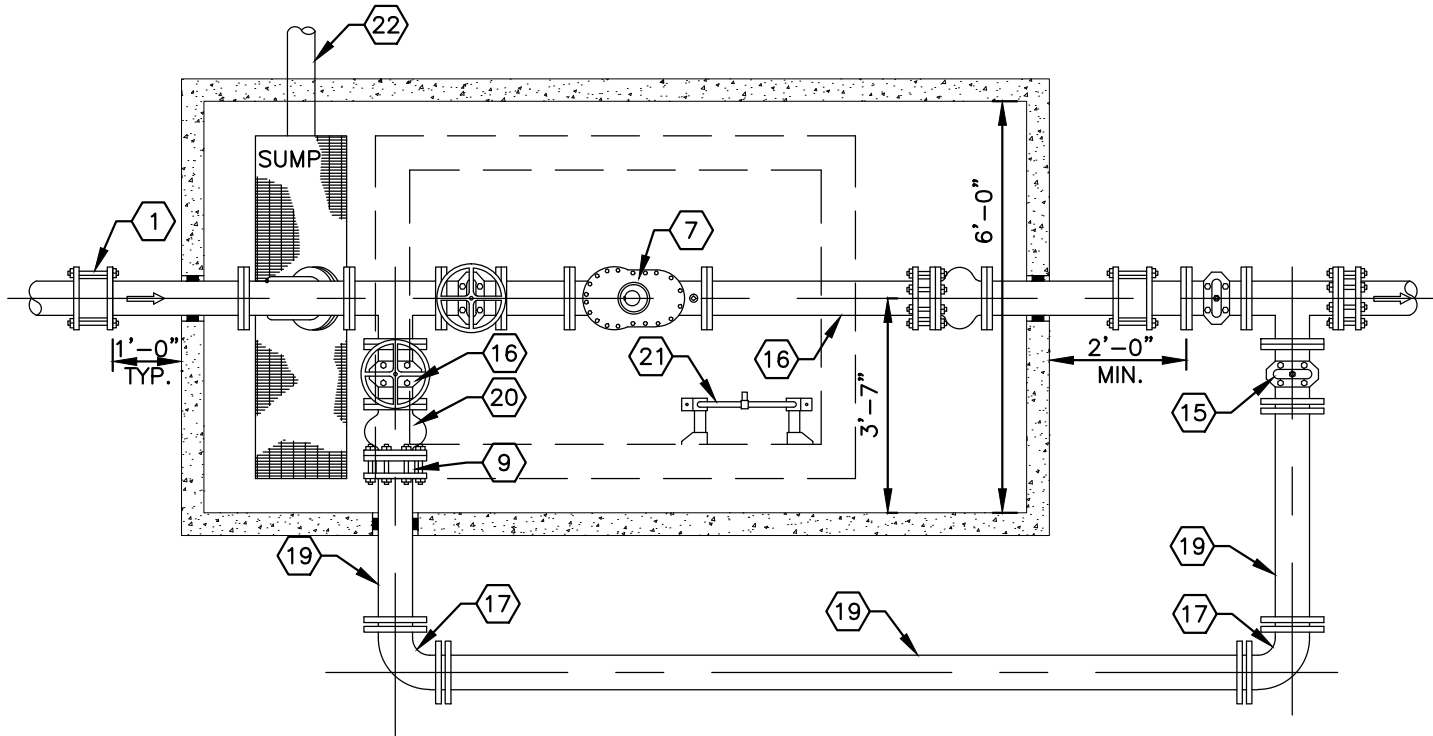
**Coal Creek
Utility District**

**1.5 INCH AND LARGER
METERS**

18A

**WATER STD.
PLAN NO. 18**

REVISION DATE
2-2017



**Coal Creek
 Utility District**

**1.5 INCH AND LARGER
 METERS**

18B

**WATER STD.
 PLAN NO. 18**

REVISION DATE
 2-2017

MATERIAL LIST FOR 3" AND LARGER ASSEMBLIES	
ITEM	DESCRIPTION
①	STRAIGHT COUPLING
②	ADJUSTABLE PIPE SUPPORTS. GRINNEL #264 OR APPROVED EQUAL
③	STRAINER, MUELLER, 751 "Y" TYPE OR APPROVED EQUAL, FL. BY FL.
④	TEE, FLANGE BY FLANGE
⑤	DELETED
⑥	R.S. GATE VALVE, FLANGE BY FLANGE W/HANDWHEEL
⑦	WATER METER, SENSUS OR APPROVED EQUAL
⑧	SELF GENERATING REMOTE READOUT, SENSUS OR APPROVED EQUAL
⑨	FLANGE COUPLING ADAPTER, ROMAC FCA501 OR APPROVED EQUAL
⑩	DUCTILE IRON PIPE, PLAIN END BY FLANGE
⑪	GLOBE STYLE CHECK VALVE W/D.I. BODY & RESILIENT SEAT. APCO SERIES 600 OR APPROVED EQUAL.
⑫	DIAMOND PLATE DOOR, LW PRODUCTS COMPANY HD-2C OR EQUAL FOR TRAFFIC AREAS, D-2C FOR NON-TRAFFIC AREAS
⑬	6" EXTENSION RING
⑭	PRECAST VAULT, UTILITY VAULT CO. (SEE BELOW FOR CALL OUTS)
⑮	R.S. GATE VALVE, FL x RJ W/VALVE BOX
⑯	CI BODY EPOXY COATED RESILIENT SEAT GATE VALVE, FL x FL
⑰	90° D.I. BEND, RJ x RJ
⑱	DELETED
⑲	D.I. PIPE LENGTH AS REQUIRED
⑳	D.I. INLINE CHECK VALVE
㉑	POLYPROPYLENE VAULT LADDER W/EXTENSION, MANUFACTURED BY LANE INTERNATIONAL CORP., OR APPROVED EQUAL. ATTACH TO SIDE OF HATCH AND FLOOR.
㉒	4" PVC DRAIN, CONNECT TO STORM SYSTEM



**Coal Creek
Utility District**

**MATERIAL LIST FOR 3 INCH
AND LARGER ASSEMBLIES**

18C

**WATER STD.
PLAN NO. ⑱**

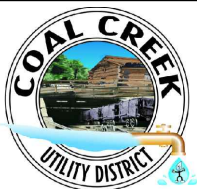
REVISION DATE
2-2017

METER VAULT REQUIREMENTS				
METER SIZE	MAINLINE	BY-PASS	METER VAULT (UTILITY VAULT)	METER TYPE (SENSUS)
1-1/2"	1-1/2" COPPER	ON SETTER	SEE DETAIL	SEALED REGISTER
2"	2" COPPER	ON SETTER	SEE DETAIL	SEALED REGISTER
3"	3" D.I.	4" D.I.	687-LA	COMPOUND W/GEN. REMOTE
4"	4" D.I.	4" D.I.	687-LA	COMPOUND W/GEN. REMOTE
6"	6" D.I.	6" D.I.	612-LA	DISTRICT DISCRETION

NOTE:

FOR 1-1/2" AND 2" METERS, USE CUSTOM SETTER WITH BY-PASS, FLANGED VALVE ON INLET AND ANGLE CHECK VALVE ON OUTLET. FORD COPPER SETTER OR EQUAL. FOR 1-1/2" USE VH76-12B-11-66-NL. FOR 2" USE VH77-12B-11-77-NL.

O.S.&Y. VALVES MAY BE SUBSTITUTED FOR N.R.S. VALVES FOR 3" METERS. IF O.S.&Y. VALVES ARE USED FOR 4" & 6" METERS, THE MAIN WILL HAVE TO BE LOWERED TO ALLOW FOR HEAD ROOM INSIDE THE VAULT.



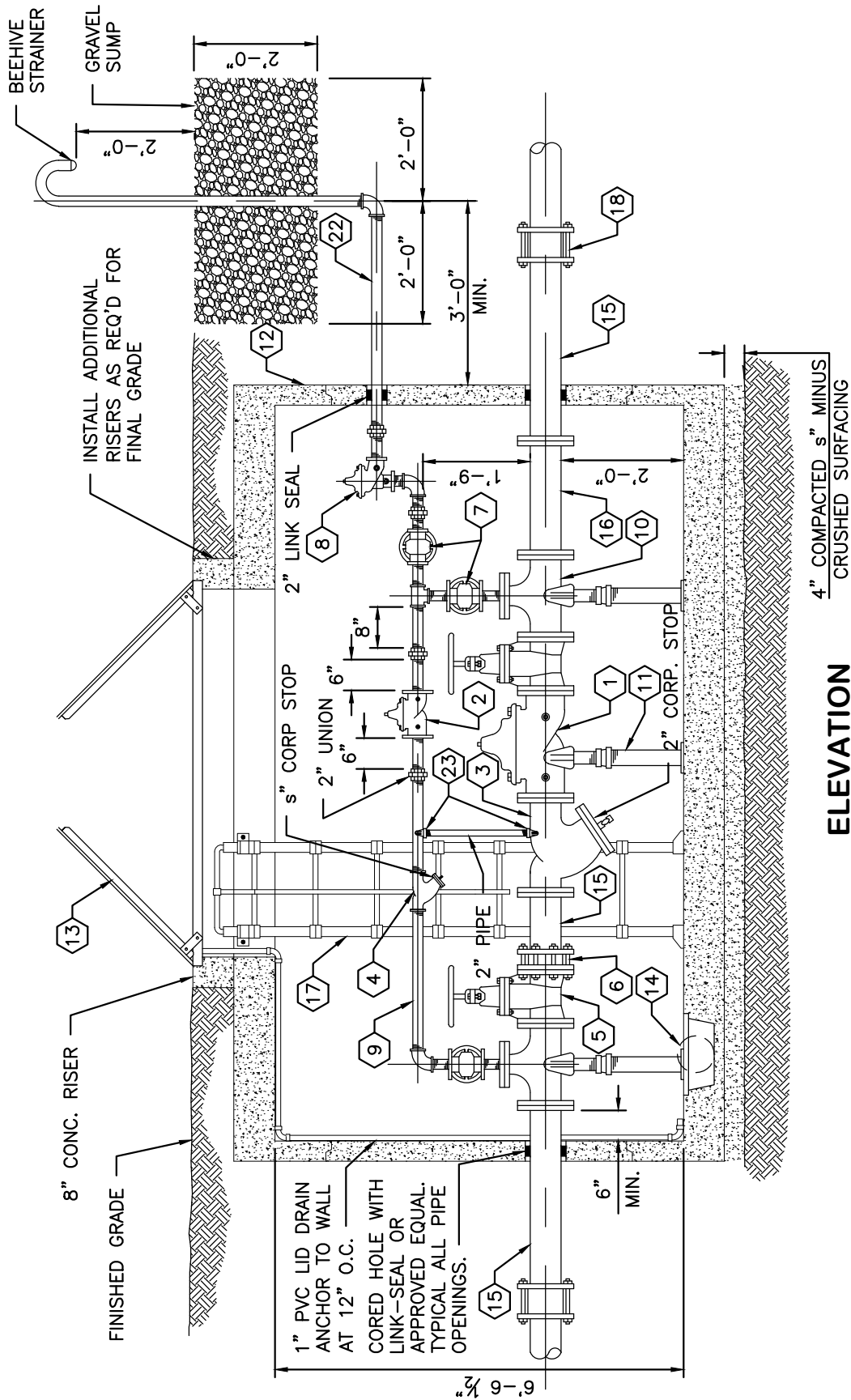
**Coal Creek
Utility District**

**METER VAULT
REQUIREMENTS**

18D

**WATER STD.
PLAN NO. 18**

REVISION DATE
2-2017



4" COMPACTED s" MINUS
CRUSHED SURFACING

ELEVATION
SCALE s"=1'



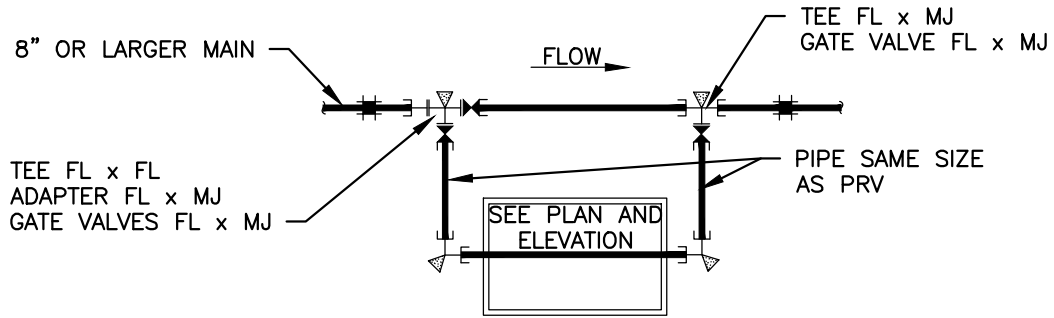
**Coal Creek
Utility District**

**PRESSURE REDUCING
STATION**

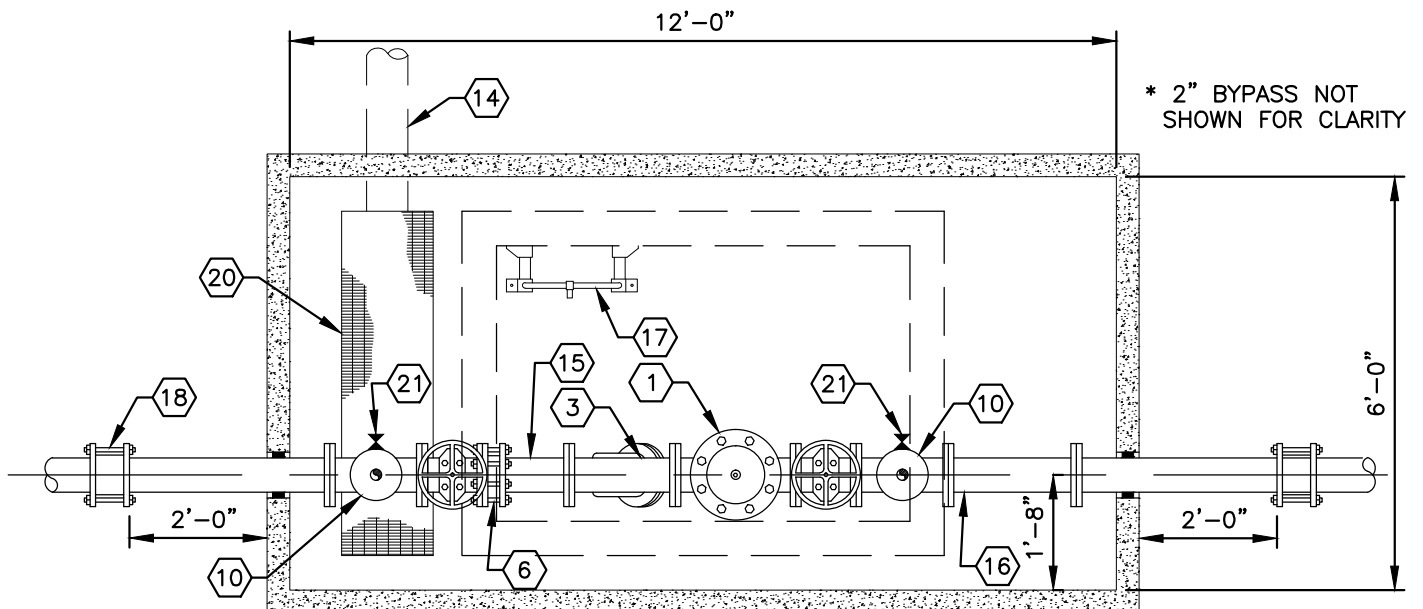
19A

WATER STD.
PLAN NO. 19

REVISION DATE
2-2017



**PRESSURE REDUCING STATION
TYPICAL INSTALLATION**



PRESSURE REDUCING STATION

SCALE NTS



**Coal Creek
Utility District**

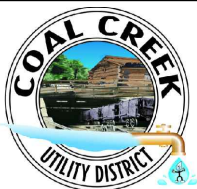
**PRESSURE REDUCING
STATION**

19B

**WATER STD.
PLAN NO. 19**

REVISION DATE
2-2017

ITEM	DESCRIPTION
1	6" PRV, CLA VAL NO. 92 G-01 BCS W/STAINLESS STEEL TRIM, EPOXY LINING AND VALVE POSITION INDICATOR
2	2" PRV, CLA VAL NO. 92 G-01 BCS THREADED W/STAINLESS STEEL TRIM, EPOXY LINING AND VALVE POSITION INDICATOR
3	6" STRAINER, MUELLER NO. 751 Y TYPE OR APPROVED EQUAL, FL x FL
4	2" STRAINER, MUELLER NO. 751 Y TYPE OR APPROVED EQUAL, SE x SE
5	6" R.S. GATE VALVE WITH HANDWHEEL & SLOTTED BOLT HOLES.
6	FLANGED COUPLING ADAPTER, SMITH-BLAIR NO. 912 OR APPROVED EQUAL W/ ANCHOR STUDS.
7	2" R.S. GATE VALVE W/HANDWHEEL
8	2" PRESSURE RELIEF VALVE, CLA VAL NO. 50-A01.
9	2" THREADED BRASS PIPE & FITTINGS (ALL BYPASS PIPING)
10	6" x 4" TEE, FL X FL, W/4" BLIND FLANGE TAPPED FOR 2".
11	ADJUSTABLE PIPE SUPPORT, GRINNEL NO. 264 OR APPROVED EQUAL.
12	6' x 12' END SUMP VAULT W/SOLID WALLS (NO KNOCKOUTS), UTILITY VAULT NO. 612-LA OR APPROVED EQUAL. ALL JOINTS TO BE GROUTED.
13	4' x 6' DOUBLE LEAF ALUMINUM HATCH, LW PRODUCTS CO. HD-2C FOR TRAFFIC AREAS, H-2C FOR NON-TRAFFIC AREAS.
14	6" D.I. DRAIN TO STORM STRUCTURE.
15	6" FL x PE SPOOL.
16	6" FL x FL SPOOL..
17	POLYPROPYLENE VAULT LADDER W/ EXTENSION, MANUFACTURED BY LANE INTERNATIONAL CORP., OR APPROVED EQUAL. ATTACH TO SIDE OF HATCH AND FLOOR.
18	LONG SLEEVE C.I. COUPLING, SMITH-BLAIR NO. 441 OR APPROVED EQUAL.
19	DELETED
20	FLOOR SUMP W/GALVANIZED GRATING.
21	1/2" BRASS BALL VALVE TAPPED INTO TEE & REDUCED FOR 1/4" CONNECTION (FOR GAUGES).
22	2" BRASS PRESSURE RELIEF DISCHARGE LINE W/180° RETURN ELBOW & BEEHIVE STRAINER 2' ABOVE GRADE. DRILL 1/8" HOLE IN PIPE DIRECTLY ABOVE RELIEF VALVE. COORDINATE DISCHARGE LOCATION W/DISTRICT.
23	PIPE SUPPORT SADDLES



**Coal Creek
Utility District**

**MATERIAL LIST FOR
PRESSURE REDUCING
STATION**

19C

**WATER STD.
PLAN NO. 19**

REVISION DATE
2-2017

PART TWO – MATERIALS

NOTE:

"Developer" in these specifications shall also signify "Contractor" for the purpose of District financed projects.

2-1 GENERAL

All materials and equipment shall be new and undamaged. Where possible, the same manufacturer of each item shall be used throughout the job.

2-2 MATERIAL LISTS AND SPECIFICATIONS

The Developer or his Contractor shall deliver to the Engineer a material list not less than ten (10) days before commencement of construction. The list shall contain the manufacturer and model number, if applicable, of the material and equipment to be installed as a part of the work so that the Engineer may determine whether such materials conform to the Plans and Specifications. Materials that are not included in the material list shall not be installed as a part of the work. The manufacturer's technical specifications for pipe, appurtenances and equipment to be incorporated into the work shall be submitted to the Engineer at least ten (10) days before commencement of construction with the materials listed.

2-3 GUARANTEE BY MANUFACTURER

If requested by the District or the Engineer, a written guarantee made by the manufacturer of any materials to be incorporated into the work shall be furnished, guaranteeing to the District that such materials shall conform to these Specifications and any specifications otherwise applying to the work.

2-4 DUCTILE IRON PIPE AND FITTINGS

- (a) Ductile iron pipe shall conform to AWWA Standard C-151. Pipe shall be thickness class 52 or as indicated on the Drawings. Pipe and fittings shall have cement mortar lining conforming to AWWA Standard C-104. Joints shall be mechanical joint or push-on joint and shall conform to AWWA Standard C-111.
- (b) Cast iron fittings shall conform to AWWA Standard C-110 or C-153. Mechanical or push-on joints shall conform to AWWA Standard C-111. Flanged joints shall conform to ASA Standard B-16.1, class 125. Flange gaskets shall be ring type, cloth insert rubber, 1/16-inch thick, equal to Rainbow or Durable Garlock.

2-5 COPPER PIPE AND FITTINGS

- (a) Copper pipe shall conform to ASTM B 88, type K, annealed.
- (b) Fittings shall be brass conforming to ASTM B 62 for compression style connections.

See Standard Details.

2-6 VALVES

- (a) Gate valves shall be resilient seated, non-rising stem, conforming to AWWA Standard C-515. Valves to have S.S. nuts and bolts. Valves shall be opened by turning counterclockwise. Joints shall be as indicated on the Plans.
- (b) Butterfly valves shall conform to AWWA Standard C-504 as supplemented herein. Valves shall be Class 150B with flanged, mechanical joint, or flanged x mechanical joint end connections. Valves in chambers shall be handwheel operated with integral position indicators. Buried valves shall have a stem extension with AWWA 2-inch operating nut and suitable valve box. Buried valves 14 inches or larger and other valves that may be designated "critical" shall be provided with a ground level position indicator and valve box adaptor. Rubber seats may be either body or disc-mounted. Valves using hardware to retain the seat shall positively secure all internal fasteners with lockwires or equivalent means.

Manual operators shall be certified to withstand an input torque of 450 foot-pounds in either extreme position of travel. This torque shall be absorbed by individually adjustable travel stop mechanisms using the operator housing to limit travel. All valve operating nuts shall be brought to within three (3) feet of the finished grade by the use of extensions.

2-7 FIRE HYDRANTS

Hydrants shall have a 5-1/4-inch main valve opening (MVO), 6-inch MJ connections, two 2-1/2-inch hose connections, ASA (National) standard thread and a 4-inch pumper connection with City of Seattle standard threads 4-875. They shall have 36 inches of ground cover unless otherwise required, and be flanged at the ground line. Hydrants shall be constructed such that the direction of the pumper connection may be rotated to face the roadway. Hydrant shackles and straps shall be as shown on the Standard Details. Hydrants shall be EJIW Watermaster 5CD250 W/Dust cap, Mueller, M & H, or Waterous Pacer model WB-67-250. See Standard Details.

2-8 VALVE BOXES

Valve boxes shall be cast iron, two-piece, suitable for installation required, equal to Rich Co. style 045 with drop-in handle or approved equal. Locking lids of approved design shall be used where designated on the plans.

2-9 CORPORATION STOP, SERVICE CLAMP, CURB STOP

See Service Connections in Standard Details.

2-10 TWO-INCH BLOW OFF

See Standard Details.

2-11 PRESSURE REDUCING STATION

See Construction Drawings and Detail Sheet.

2-12 AIR AND VACUUM RELEASE VALVES

See Standard Details.

2-13 DETECTOR CHECK VALVE

Detector check valves shall be U.L. approved, FEBCO Model 806 DDC or equal. See Standard Details.

2-14 HYDRANT GUARD POSTS

Guard posts shall be precast concrete nine inches (9") in diameter by six feet (6') long constructed with concrete having minimum strength of 3,500 psi. Reinforcing shall consist of a minimum of four (4) #3 deformed steel bars. See Standard Detail #4 for placement.

2-15 VALVE MARKER POSTS

Valve marker posts shall be equal to Fog-Tite Meter Seal Company product 4" x 4" - 42" long. See Standard Details.

2-16 CONCRETE BEDDING AND BLOCKING

Bedding and blocking concrete shall be Portland cement concrete containing four sacks of cement per cubic yard and a maximum aggregate size of 1-1/2 inches. Maximum slump shall be 3-1/2 inches.

2-17 BOLTS IN PIPING

Bolts shall be carbon steel, zinc or chromium plated, brass or stainless steel.

2-18 BEDDING MATERIALS

Bedding material shall be well-graded, clean, granular sand and shall meet the following requirements:

<u>U.S. Standard Sieve Size</u>	<u>% Passing By Weight</u>
Sand:	
3/8" square opening	100
1/4" square opening	90-100
#10 sieve	40-75
#40 sieve	15-40
#200 sieve	0-15

2-19 TRENCH FOUNDATION MATERIAL

Over-excavated material shall be replaced with trench foundation material conforming to one of the following gradations as specified:

U.S. Standard Sieve Size	Class "A"		Class "B"	
	Min.	Max.	Min.	Max.
2-1/2" square opening	98%	100%	95%	100%
2" square opening	92	100	75	100
1-1/2" square opening	72	87	30	60
1-1/4" square opening	58	75	0	15
3/4" square opening		27	47	0
1				
3/8" square opening		3	14	0
0				
No. 4 sieve	0	1	0	0

2-20 ASPHALTIC CONCRETE

Asphalt concrete pavement shall conform to the technical requirements for Class B Asphalt in the latest edition of the Washington State Department of Transportation Standard Specifications for Road, Bridge and Municipal Construction.

2-21 TOP COURSE AND KEYSTONE MATERIAL

For use in restoration of excavated areas, Top Course and Keystone material shall be manufactured from ledge or talus rock, be free from wood, roots, bark and other extraneous material and shall conform to the following requirements:

<u>U.S. Standard Sieve Size</u>	<u>% Passing By Weight</u>
5/8" square opening	100
1/4" square opening	55-75
U.S. No. 40 sieve	8-24
U.S. No. 200 sieve	10 MAX
Sand Equivalent	40 MIN.

2-22 BASE COURSE MATERIAL

Base course material shall conform to the following requirements:

<u>U.S. Standard Sieve Size</u>	<u>% Passing By Weight</u>
1-1/2" square opening	100
5/8" square opening	50-80
1/4" square opening	30-50
U.S. No. 40 sieve	3-18
U.S. No. 200 sieve	7.5 Max.
Sand Equivalent	40 Min.

2-23 IMPORTED BACKFILL MATERIAL

Imported backfill material shall be free from wood, bark, roots or other extraneous material and shall meet the following requirements:

<u>U.S. Standard Sieve Size</u>	<u>% Passing By Weight</u>
2-1/2" Square Opening	100
1/4" Sieve	25 Min.
No. 200	10 Max.
Sand Equivalent	35 Min.

PEA GRAVEL WILL NOT BE ALLOWED AS BACKFILL MATERIAL.

PART THREE – CONSTRUCTION

3-1 GENERAL

Except as otherwise noted herein, all work shall be accomplished as recommended in the latest revision of AWWA and APWA Specifications and according to the recommendations of the manufacturer of the material and equipment concerned. In roadway areas, all asphalt and concrete pavement shall be saw cut and vacuumed. When trenching operations cut through concrete pavement, the pavement shall be removed to a width of 18 inches greater than the top width of the trench. The concrete shall be saw cut on a straight line and shall be beveled so that the cut will be approximately 1 inch wider at the top than at the bottom. Asphalt paving shall be saw cut ahead of the backhoe to prevent excessive tearing up of the surfacing and to eliminate ragged edges.

3-2 ALIGNMENT

Pipe shall be laid to the specified grade and alignment as staked in the field. Alignment deviation shall not exceed 0.5 feet. Replacement of stakes lost or destroyed shall be made at the Developer's expense and in accordance with Contract Plans, including modifications called for by the District.

3-3 TRENCH

Trenches shall be excavated to the line and grade designated by the District. Except for unusual circumstances where approved by the District, the trench sides shall be excavated vertical and the trench shall be excavated to only such widths as are necessary for adequate working space. The maximum trench width at the top of the pipe shall normally be the outside diameter of the pipe barrel plus 16 inches. The trench shall be kept free from water until joining material has set. Surface water shall be diverted so as to not enter the trench. The Developer shall maintain sufficient pumping equipment on the job to insure that these provisions are carried out. Boulders, rocks, roots and other obstructions shall be entirely removed or cut out to the width of the trench and to a depth of 6 inches below water main grade. Where material is removed from below a water main grade, the trench shall be backfilled to grade with material satisfactory to the District and thoroughly compacted. Trenching operations shall not proceed until pipe laying is ready to commence and not more than 300 feet of trench shall be opened in advance of pipe laying operations without written approval of the District. All work on City right-of-way shall be backfilled in its entirety each day.

The depth of trenching for water mains shall be such as to give a minimum cover of 36 inches over the top of the pipe unless otherwise specified. Pipe cover shall be increased as required to provide minimum 6-inch clearance when crossing culverts or existing utilities, and due to localized breaks in grade. Where the profile of the pipeline and ground surface is shown on the Plans, the pipeline shall be laid to the elevation shown, regardless of depth. Excavation shall be to such depth that the minimum cover over the valve nuts shall be one foot. No valve shall be located in such a position as to be in any roadside ditch, drainage ditch or channel.

3-4 TRENCH FOUNDATION

If, in the judgment of the District, the native trench bottoms will provide a firm base for the subsequent placement of bedding, pipe and backfill, such native trench bottom may be used if the bottom is leveled and smoothed so that the entire length of pipe will rest on a well-compacted base. Trench bottoms shall be over-excavated as necessary to remove all unstable soil and eliminate "boiling" or "quick" conditions to such a depth as to provide a firm base. Over-excavated materials shall be replaced with trench foundation material as specified in Section 2-19. Foundation material shall be placed when ordered by the District.

3-5 TIMBERING AND SHEETING

The Developer shall provide and install timbering and sheeting as necessary to protect workers, the work, existing buildings, utilities and other properties, and shall meet all OSHA and WISHA requirements.

3-6 DUCTILE IRON

Pipe laying shall in general conform to AWWA Standard C-600 and the manufacturer's recommendations unless specifically contradicted by these Specifications. Special care shall be taken in handling pipe to avoid damaging ends, coatings and linings. Pipe shall be carried in slings and shall not be rolled or dragged.

The pipe shall be cleaned of all foreign material and examined for defects before lowering into the trench. Whenever the pipe laying is not in process, the last section of pipe shall be tightly capped or plugged. No pipe cutting will be allowed except by means of a cutter or other device approved by the District. The trench shall be overexcavated 4 inches and a sand bedding shall be placed and compacted under and around to the spring line of the pipe. After approval by the District, the backfilling shall then be completed in conformance with the section on backfilling of this Specification.

All pipe installed at slopes of 15% or greater shall incorporate "Field Lok" gaskets and/or mechanical restrained joint glands.

3-7 BEDDING MATERIAL PLACEMENT

All rigid pipe shall be placed in bedding material of the type specified in Section 2-18. The bedding shall be placed from a minimum of four (4) inches below the pipe barrel to the spring line of the pipe as shown on the Standard Details. Bedding material shall be worked and compacted by hand under, around and over the pipe to the depths required for the full width of the trench.

Bedding shall be placed in more than one lift. The first lift, to provide at least 4-inch thickness under any portion of the pipe, shall be placed before the pipe is installed and shall be spread smoothly so that the pipe is uniformly supported along the barrel. Subsequent lifts of not more than 6-inch thickness shall be placed as shown on the Standard Details and individually compacted to minimum 90 percent of maximum density.

3-8 BACKFILLING

No backfilling shall be performed until after the District has inspected the installation of the pipe and bedding and approved backfilling.

The initial backfill shall be hand placed select material spread evenly over the bedding material and compacted by hand up to an elevation of 12 inches above the top of the pipe. This shall be done in such a manner that subsequent backfilling will not disturb the pipe in any way. Subsequent lifts of not more than 12-inch thickness shall be placed as shown on the Standard Details and individually compacted to minimum 95 percent maximum density. Subsequent backfilling shall be performed by pushing material from the end of the trench along and directly over the pipe so that the material will be applied in the form of rolling slope, rather than by side filling. Backfilling from the sides of the trench will not be done until the District has determined that material has been carefully placed over the pipe to a sufficient depth.

In areas such as existing paving, or in areas to be paved or shoulder areas, where the District determines minor settlement would be detrimental and the native excavated material is not suitable for compaction as backfill, the trench shall be backfilled with imported backfill material as specified in Section 2-23.

3-9 COMPACTION OF BACKFILL

Compaction of backfill and backfill procedures in public rights-of-way shall, at the minimum, conform to the requirements of the governmental agency having jurisdiction thereof.

Backfilling shall be compacted to 95 percent of maximum theoretical density, from the pipe crown to the surface, in all areas where paving will be placed over the backfill and in shoulder areas and to 90 percent of maximum theoretical

density in all other areas. Measurement of compaction density shall be by the modified AASHTO method.

Compaction of backfill shall be achieved by power operated tampers, or roller vibration equipment. Water settling will not be accepted as a means of compaction. If excavated material cannot, in the judgment of the District, be compacted as specified, such excavated material shall be replaced with imported backfill material. No backfill shall be placed without immediate compaction according to these specifications.

The District will require that the services of an independent testing laboratory be employed to perform in-place density tests to ascertain whether the specified density can be or has been obtained, and the cost thereof shall be borne by the Developer.

Regardless of the approval of the District as to the manner of compaction or testing, the Developer shall repair any settlement of trenches and excavations that may occur within two years after compaction and formal acceptance of the work by the District.

3-10 POLYETHYLENE ENCASEMENT

Where the District determines that the pipe will be installed in corrosive soils, the Developer will protect the pipe with a polyethylene encasement as per ANSI/AWWA C105/A 21.5-82. No holes or repairs in the polyethylene encasement are allowed. Taping is required - poly wrap tape.

3-11 JACKED OR BORED CROSSING

All work shall be done in accordance with the requirements of the agency in control of the facility being bored or jacked. See highway crossings and railroad crossings (Section 3-12) for further details.

3-12 HIGHWAY CROSSINGS AND RAILROAD CROSSINGS

This item applies only to rigid surface pavements. The Developer may use any method that provides satisfactory results and is acceptable to the governmental agency having control of the road and to the District, provided that the Developer restores the roadway to its original condition. Normally, highway crossings require the placing of a steel casing by jacking or tunneling and laying the water mains within this casing. For steel casing specifications - see Plans. For District Standards for boring or tunneling see "Water or Sewer Casing Detail" on separate sheet.

3-13 FIRE HYDRANT INSTALLATION

Hydrant installation shall generally conform to AWWA Standard C-600 and the Standard Detail "Fire Hydrant Assembly". The concrete guard posts as shown on the Standard Detail Drawing shall be installed where required by the District. Shackle rods shall receive two coats of coal tar or asphalt prior to installation. Pumper nozzle shall face the road after installation is completed.

3-14 GATE VALVE INSTALLATION

Before installation, gate valves shall be cleaned of all foreign material as earlier specified for installation of pipe. Such blocking as the District may deem necessary shall be provided. The valve and valve box shall be set plumb with the valve box centered on the valve. The top of the valve box shall be set to the grade indicated by the District. If the valve nut is over 3 feet deep, operating nut extensions shall be used.

Valve markers shall be set where required by the District. The marker shall be set on a line through the valve at a right angle to the centerline of the road. The marker shall be generally set on the property line unless the District decides another location is safer or more conspicuous.

3-15 VALVE BOX INSTALLATION

Valve boxes shall be set flush in pavement. If placed in gravel areas, an asphalt pad 2 inches thick and three feet in diameter shall be placed around the box. No valve boxes shall be installed in the curb and gutter areas.

3-16 CONCRETE BLOCKING

Concrete blocking shall be cast from 1:3:6 mix with a slump of not more than six inches (6"). Concrete blocking shall be cast-in-place, (not mixed in trench) and have a minimum of 1/4 square foot bearing against the fitting and bearing area against undisturbed soil as shown in the Standard Details. Additional bearing area may be required by the District. Blocking shall bear against fittings only and shall be clear of joints to permit taking up or dismantling joints. All hydrants, bends, tees, and valves shall be blocked. The Developer shall install blocking that is adequate to withstand full test pressure as well as operating pressures under all conditions of service. Vertical blocking, when required, shall conform to that shown in the Standard Details.

3-17 AIR AND VACUUM RELEASE VALVE INSTALLATION

See Plans. Location of the air release valves as shown on the Plans is approximate. The installation shall be set at the high point of the line.

3-18 HYDROSTATIC PRESSURE TEST

The hydrostatic pressure test shall be performed after the water system to be tested is initially filled, but before bacteriological sampling is conducted. Filling of mains from existing facilities shall be through an approved Reduced Pressure Backflow Device (RPBD) or Double Check Valve Assembly (DCVA). Hydrostatic pressure tests shall be performed on all valved sections. The test shall be made at the low point of the section. Only District personnel shall operate valves. At no time shall the Developer's personnel operate valves during the testing procedures.

The Developer shall provide all necessary equipment, including temporary blowoff assemblies and provisions for temporary thrust restraint, and shall perform all work connected with the tests. The installation shall be tested at 250 psi. All mains, valves, hydrants, service fittings, and thrust blocks are to be tested at 250 psi. All service lines shall be tested from the main to the curb stop, in conjunction with the main at the pressure stated above. Containers used during testing must be clean of debris and disinfected. A 300 p.s.i. pressure gauge is to be used during testing.

For approval, the pressure shall not drop more than 5 psi in 15 minutes. Any defective joints, pipe or fittings shall be replaced at the Developer's expense and the test repeated until satisfactory. Maximum test length = 1000 Ft.

3-19 STERILIZATION AND FLUSHING OF WATER MAIN

Sterilization of water lines shall conform to AWWA Standard C-651. Chlorination shall be by chloride-bearing compound placed in each pipe length or capsules secured to the top of the barrel of each pipe length. Chlorine residual shall not be less than 50 parts per million. Sterilization shall include all pipe mains, all pipe runs to hydrants and all service lines to the curb stop. Contact period shall be for a minimum of 24 hours during which time all valves shall be opened and closed. After the contact period, all mains, services and pipe runs to hydrants shall be thoroughly flushed and dechlorinated.

A pressure test will be taken, then a water sample taken for testing and approval by the Washington State Department of Health. Flushing water drawn from pipe or hydrant shall pass through an approved RPBD or DCVA. No pressure testing is allowed during contact period.

The environment to which the chlorinated water is to be discharged shall be inspected and if there is any question that the chlorinated discharge will cause damage to the environment, a reducing agent shall be applied to the water to be wasted to neutralize the chlorine residual remaining in the water. Disposal may be made to any available sanitary sewer provided the rate of disposal does not overload the sewer and the disposal is approved by the sewer agency having jurisdiction. Where necessary, Federal, State and local regulatory agencies

should be contacted to determine special provisions for the disposal of heavily chlorinated water.

Water required for flushing and testing due to non-passing purity tests, and to main breaks caused by the Developer, shall be paid for by the Developer at the existing Water District rates.

3-20 REPLACING ROAD SURFACING

The Developer shall restore all roadway and driveway surfaces excavated or disturbed to a condition acceptable to the District and to the government agency having control of the road. Before replacing asphalt surfacing, the edges of the existing asphalt shall be trimmed as necessary to make a smooth joint. Where concrete must be broken out prior to trench excavation, the cut in the concrete shall be made by sawing square and straight with a concrete saw to a depth of not less than 1 inch.

3-21 SERVICE CONNECTION

- (a) Ductile Iron Pipe: Connections into ductile iron pipe shall be by single strap saddles for 1-inch or smaller services and shall be made with double strap saddles for 1-1/2-inch and larger. Connections larger than 1-1/2-inch shall be made as required by the District. All saddles shall be epoxy or nylon coated and have stainless steel straps.
- (b) Service saddles, corporation stops, tees, curb stops and reducers shall be as manufactured by Ford or equivalent.
- (c) Taps to be made using tapping machine.

3-22 CONNECTION TO EXISTING PIPE LINES

No connections shall be made to the existing system until all hydrostatic and purity tests have been satisfactorily completed for the new sections of pipe. The two systems shall be completely isolated up to this point.

Where cut-ins are to be made in existing pipes, the work shall be conducted at such a time and in such a manner as to minimize the interruption of service. Necessary pipe, fittings and gate valves shall be assembled at the site ready for installation prior to shutting off water in the existing main. Once the water has been cut off, the work shall be prosecuted vigorously and shall not be halted until the line is restored to service. All fittings required for the connection shall be thoroughly swabbed with chlorine solution prior to connection. Unless specifically provided for elsewhere in these Specifications, the Developer shall have the responsibility of giving at least 24 hours notice to the District of intention to disrupt service and shall give at least 24 hours notice to the affected water users.

Developer shall not operate any valves, including fire hydrant valves, in any part of the existing water system, except in the presence of the District. Developer shall notify the District 24 hours in advance of the need to operate valves.

3-23 WET TAPS

The material requirements for wet or "hot" taps of existing pipe lines shall be as follows:

TAPPING GATE VALVES

Valves shall be of the resilient-seated variety and shall meet or exceed the requirements of AWWA C509. Valves shall be coated internally and externally with fusion bonded epoxy coating meeting or exceeding AWWA C550. Double metal disc or solid metal wedge valve designs are not acceptable. All valves shall be new and of current manufacture, and shall display a current casting date.

For applications with working pressures exceeding 175 psi, a ductile iron valve rated for 250 psi or higher working pressure shall be used. The valve shall be U.S. Pipe "Metroseal 250" or approved equal. For applications with working pressures below 175 psi, valves of the following manufacture, or an approved equal, are acceptable. Clow, M & H, Mueller, U.S. Pipe.

TAPPING SLEEVES

All tapping sleeves shall be rated by their manufacturer for a working pressure of at least 200 psi. Acceptable sleeve types are as follows:

"Mechanical Joint" Style: May be of either ductile or grey iron construction, although ductile iron is preferred. Acceptable for both size-on-size and non size-on-size applications on cast iron, ductile, iron, and AC mains through 12" on 12" only. All mechanical joint sleeves shall be new and of current manufacture, shall display a current casting date and be manufactured by Clow, Dresser, Mueller, Tyler, U.S. Pipe or approved equal.

"Stainless Steel" Style: The District prefers all stainless construction in this style. However, stainless sleeves with ductile iron (but not carbon steel) flanges are also acceptable. These sleeves are acceptable for all applications on ductile iron, cast iron and AC mains through 12" on 12" only. Stainless sleeves shall be manufactured by JCM or Romac or be an approved equal.

The District may at their option make all connections to existing mains and make all crossings of existing roadways at the expense of the Developer.

3-24 BACKFLOW PREVENTION DEVICES

Where the possibility of contamination of the water supply exists, the District will require certain services be equipped with a backflow prevention device. The only acceptable device is that which operates on the reduced pressure principle as indicated in the latest edition of the DOH approved list. The determination as to the need, size and location of a backflow device shall be determined solely by the District.

3-25 TRAFFIC CONTROL

All traffic control shall be according to the Manual of Uniform Traffic Control Devices and/or the agency with local jurisdiction. During construction, traffic shall not be delayed for more than 5 minutes unless previously approved by the District and the agency of jurisdiction.

3-26 ASBESTOS CEMENT PIPE

All pipe work and procedures are to be followed as set forth in WAC-296-62-077 thru 296-62-0776, including appendix A thru J.

3-27 NEW WATER SERVICE LINES

All new water service lines shall be marked with a 2" x 4" board which is to be located at meter box and the top of which shall be painted white and extended 4 feet above the ground labeled "WATER" in 2" high blue stenciled letters.

3-28 STREAMGUARD CATCH BASIN INSERTS

All catch basins located along project shall have a streamguard sediment catch basin insert model 9226 as manufactured by Ultra-Drain Guard, model 3003 as manufactured by Foss Environmental, or approved equal, installed. Inserts are to be cleaned and replaced by Contractor per manufacturer's recommendations or by District direction.