

## STANDARDS, CONDITIONS & SPECIFICATIONS

### PRIVATE RESIDENTIAL IRRIGATION DISTRIBUTION SYSTEMS

#### I. GENERAL:

The items herein contained are the Standards, Conditions, and Specifications of Lake Chelan Reclamation District. These are minimums only and may be increased or altered to fit particular situations.

#### II. DEFINITIONS:

***District*** - Lake Chelan Reclamation District, a quasi-municipal corporation organized and operating pursuant to Title 87, Laws of the State of Washington.

***Developer(s)*** - The landowner, land developer, or agent responsible for installation of the water distribution system.

***Water Main*** - A pipe designed to convey water to more than two users.

***Water User*** - Any person, firm, or corporation having a water right within the District; this also includes the holders of title or evidence of title to land to which water service is furnished.

***Water Service Line*** - The pipe, valves, and necessary accessories designed to convey water from the water main to each lot.

***Water Distribution System*** - The collection of water mains and water service lines required to provide water service to each customer in a development.

#### III. SPECIFICATIONS:

A. SYSTEM CAPACITY: Allocation of system capacity is 6.9 gpm (3.0 acre-feet per year) per irrigable acre. The system shall be sized to deliver 150% of the total allotment to any group of consecutive service risers or at a rate of 20 gpm per single service riser with negligible headloss along the lateral.

#### B. PIPELINE CONSTRUCTION:

1. All pipe shall be polyvinyl chloride (PVC) Schedule 40 or better.
2. Pipe three inches (3") and smaller shall be solvent welded.
3. Pipe four inches (4") and larger shall be ring gasketed joints with MJ Fittings
4. Fittings: PVC pipe fittings
5. Fittings three inches (3") and smaller shall be solvent welded. Solvent weld fittings must be Schedule 40 or better and meet or exceed the pressure rating of the pipe. Threaded PVC fittings shall be Schedule 80.

6. Fittings larger than three inches (3") shall be cast iron. Cast iron fittings must meet current AWWA requirements.
7. Gate Valves: Valves three inches (3") and smaller shall be gate valves. The operator will be a RSGV.
8. Valve Boxes: Valve boxes shall be installed on all buried valves. Valve boxes shall be cast iron, two-piece slip type standard design with a base corresponding to the total size of the valve. The box shall be protected with coal tar or other approved coatings, applied by the manufacturer. Valve boxes shall be Rich Series 940 or equal.
9. Thrust Blocking: Thrust blocks are required at tees, bends and dead ends, except tees leading to single service risers. Concrete thrust blocks are to be poured against undisturbed earth. Thrust blocks shall have a bearing area sized to resist design pressures with a minimum of 1.0 square feet.
10. Identifying Tape: Identifying tape shall be installed twenty-four inches (24") below finished grade over all irrigation pipelines. Pipe locator ribbon shall be two inches (2") wide, plastic coated aluminum and shall be clearly marked, "CAUTION BURIED WATER LINE" continuously along the length of the ribbon with minimum 1- ½ inch letters. The ribbon shall be blue in color.

C. PIPE INSTALLATION:

All PVC pipe shall be assembled and installed in accordance with the pipe manufacturer's recommendations. Thrust blocks shall be placed at locations described in Section B.9 of this document and shown in the standard details. Thrust blocks shall be placed such that accessibility to the pipe and the fittings is not impaired.

PIPE INSTALLED OUTSIDE OF A STREET RIGHT OF WAY

1. It shall have a minimum of thirty inches (30") of cover. Utilities encountered in the pipe zone shall be crossed below.
2. Pipe base and zone shall include the full width of the trench from four inches (4") below the bottom of the pipe to six inches (6") above the top of the pipe. Backfill material may be excavated native material containing no rock, organic matter, or materials larger than ½ inches. Where the volume or quality of native excavated materials is inadequate, sand will be used for pipe base and pipe zone backfill. The

backfill material shall be placed in two lifts and compacted sufficiently to preclude future settlement.

3. Trench Backfill Above Pipe Zone: Native material not larger than six inches (6") may be used.

PIPE INSTALLED WITHIN A STREET RIGHT-OF-WAY:

1. All pipe shall have a minimum of thirty inches (30") of cover. The state or county may require a greater depth in some instances. Utilities encountered in the pipe zone shall be crossed below.
2. Pipe base and pipe zone shall include the full width of the trench from four inches (4") below the bottom of the pipe to six inches (6") above the top of the pipe. Pipe base and pipe zone shall be backfilled with a clean, round, granular sand or gravel of which 100% will pass the U.S. Standard 3/4-inch opening. The bedding shall be free of humus, organic matter, frozen material or debris. Bedding shall be placed in lifts, not to exceed six inches (6"), except for the initial lift, which shall be four inches (4"). All bedding shall be compacted to 95% of maximum density in accordance with a modified Proctor standard by means of mechanical compaction. A minimum three-inch (3") sand cushion shall be installed between the irrigation pipe and any existing pipes or conduits encountered.
3. Backfill above the pipe zone and road surfacing shall be done according to the requirements of the agency in whose right-of-way the pipe is being installed.
4. All work within public road right-of-ways shall meet these specifications, those of the agency having jurisdiction over the road right-of-way, and current APWA specifications. The plans will be reviewed by the Chelan County Engineer prior to approval of the Water Plan by the District.

D. SERVICE RISERS TO EACH LOT:

1. Pipe shall be schedule 40 or better.
2. Threaded, galvanized, malleable iron fittings shall be used with all steel pipe.
3. Service valves 2" or smaller can be a ball valve.
4. Service Boxes for service risers located in front yards shall be a Carson series "Standard" or equal. Service boxes shall be constructed of reinforced fiberglass. All service boxes shall be installed flush with the finished ground surface.

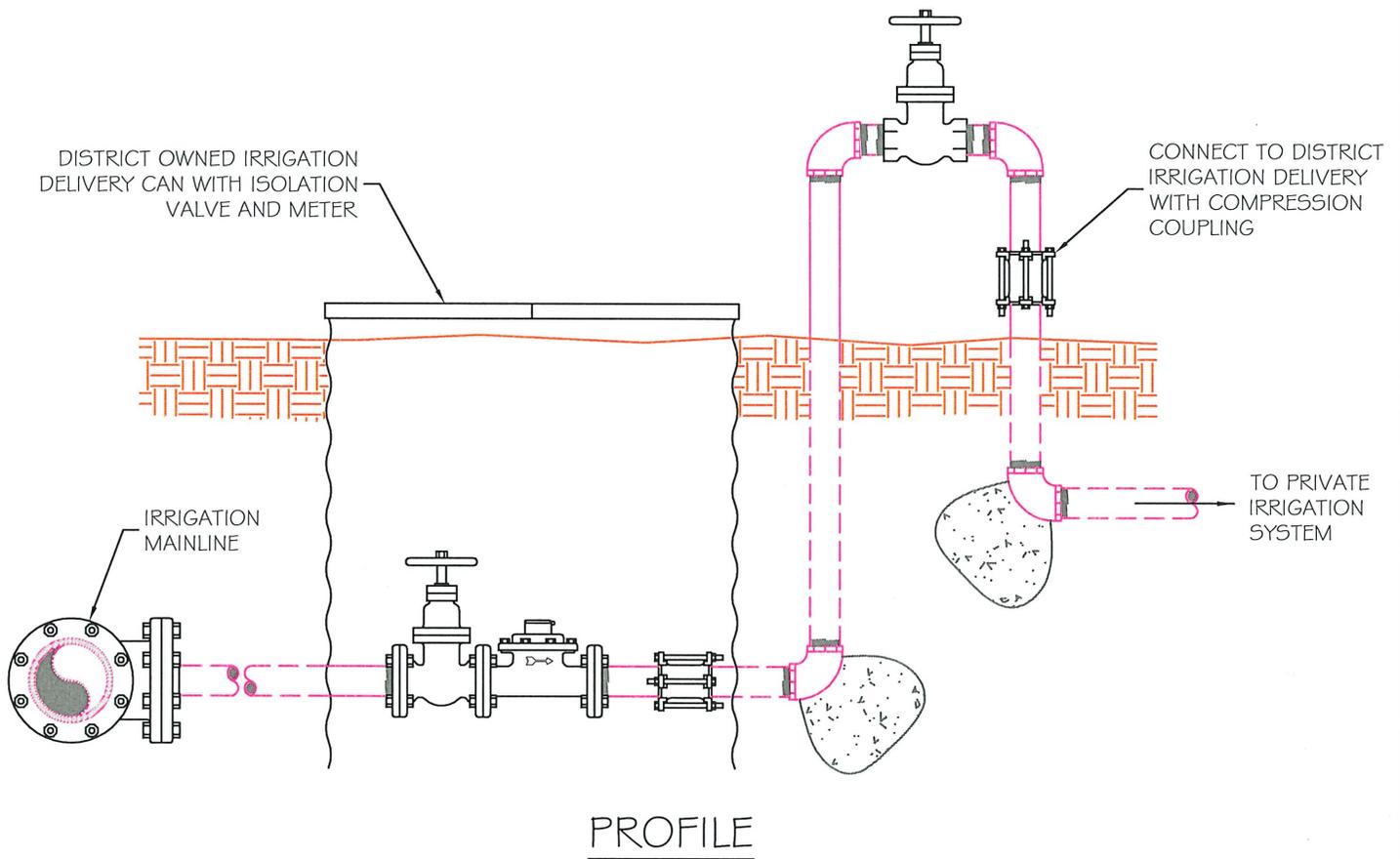
5. The construction of the service risers are to be in conformance with the Standard Details. Service risers located along property lines adjacent to public roads shall be Type B, all others shall be Type A. Lateral pipelines extending to the service riser shall be two inch (2") pipe.

#### E. BLOW-OFFS OR DRAINS FOR WINTERIZATION

1. A blow-off or drain valve will be installed on all pipelines serving more than two (2) service risers.

#### IV. ADDITIONAL REQUIREMENTS:

1. Piping shall be designed from the Lake Chelan Reclamation District's designated delivery point for the area.
2. Isolation valves shall be installed on all laterals and turnouts. The number and location of valves shall be arranged to minimize service disruptions.
3. As-constructed reproducible drawings detailing pipe, service riser and isolation valve locations and pipe depths to be provided to the Lake Chelan Reclamation District via both hard copy and electronic PDF copies.



NOTES:  
 COMPRESSION COUPLING IS NOT A THRUST PROTECTION DEVICE  
 - PROVIDE THRUST BLOCKING FOR PRIVATE SYSTEM

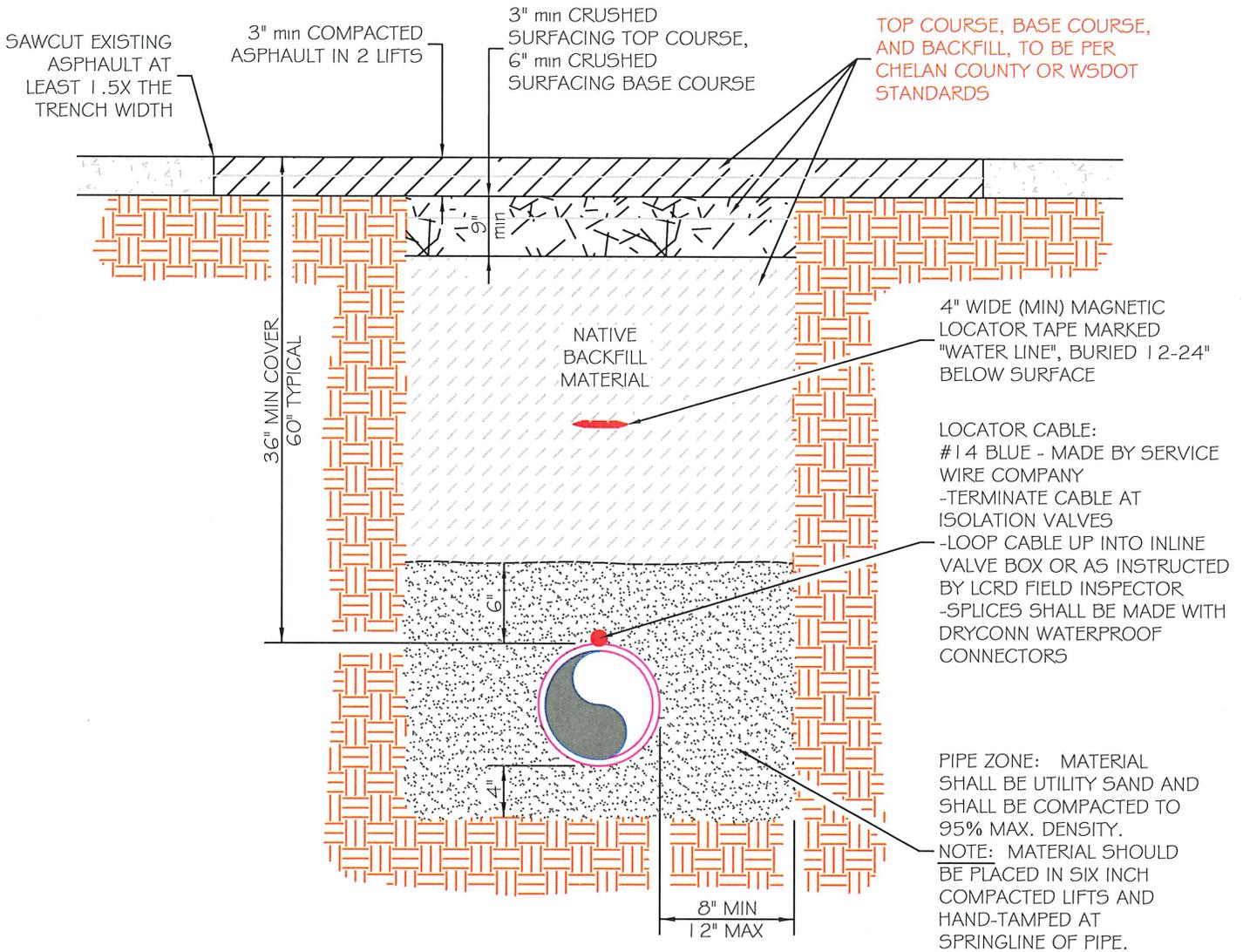
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TITLE	
IRRIGATION CAN CONNECTION	
STANDARD IRRIGATION DETAIL	
SHEET	DWG SCALE
1 OF SET	NO SCALE



CALL 48 HOURS  
BEFORE YOU DIG:

Northwest Utility Notification Center  
1-800-553-4344



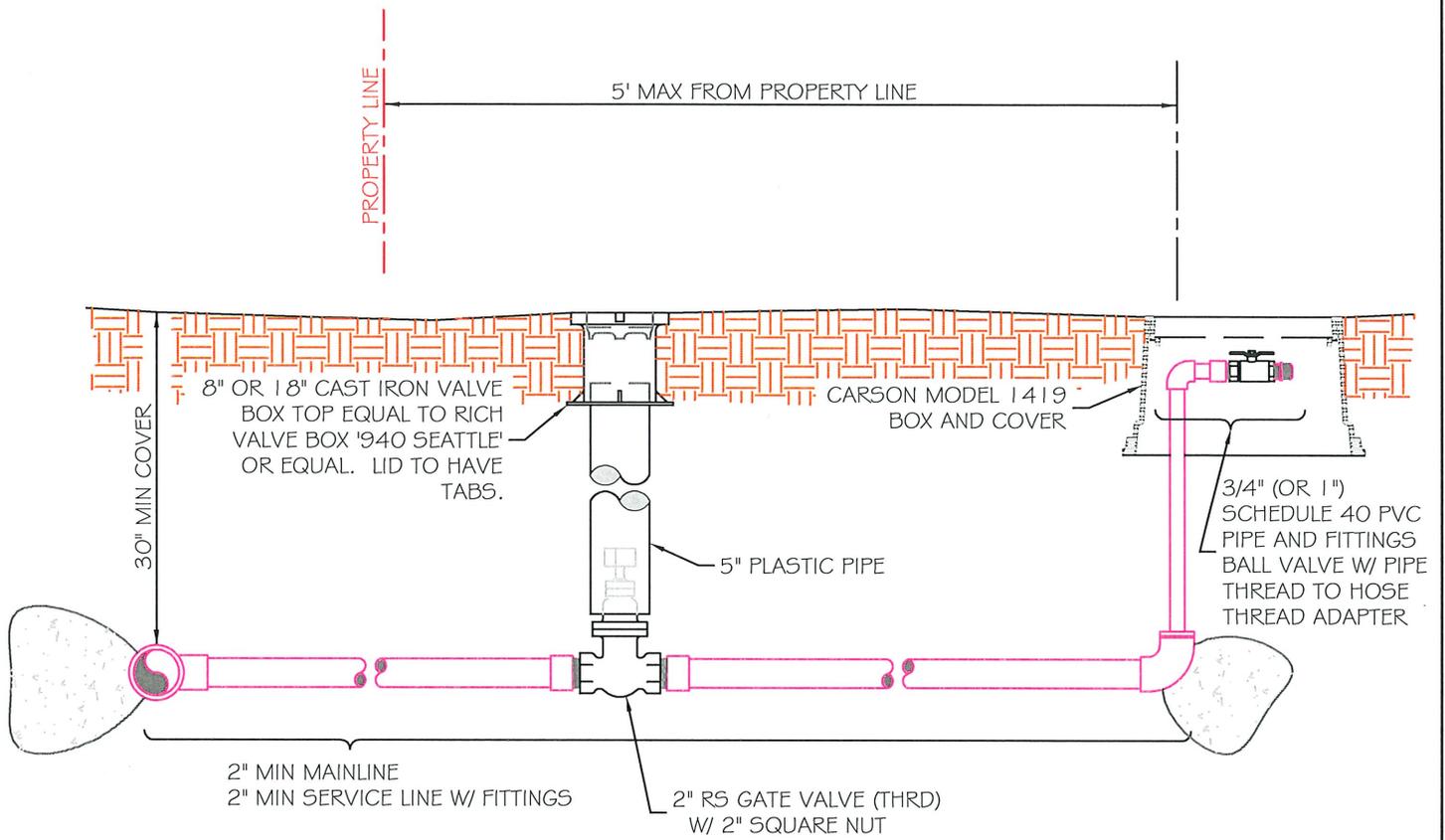
PROFILE

NOTES:  
MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

BACKFILL, SURFACE RESTORATION, AND MINIMUM PIPE DEPTH SHALL CONFORM TO THE REQUIREMENTS OF THE AGENCY HAVING JURISDICTION OVER THE ROAD RIGHT-OF-WAY.

TITLE	
TYPICAL TRENCH SECTION	
STANDARD IRRIGATION DETAIL	
SHEET	DWG SCALE
2 OF SET	NO SCALE





PROFILE

NOTES:

TYPE B SERVICE RISERS ARE TO BE USED WHEN THE SERVICE IS LOCATED IN THE FRONT YARD.

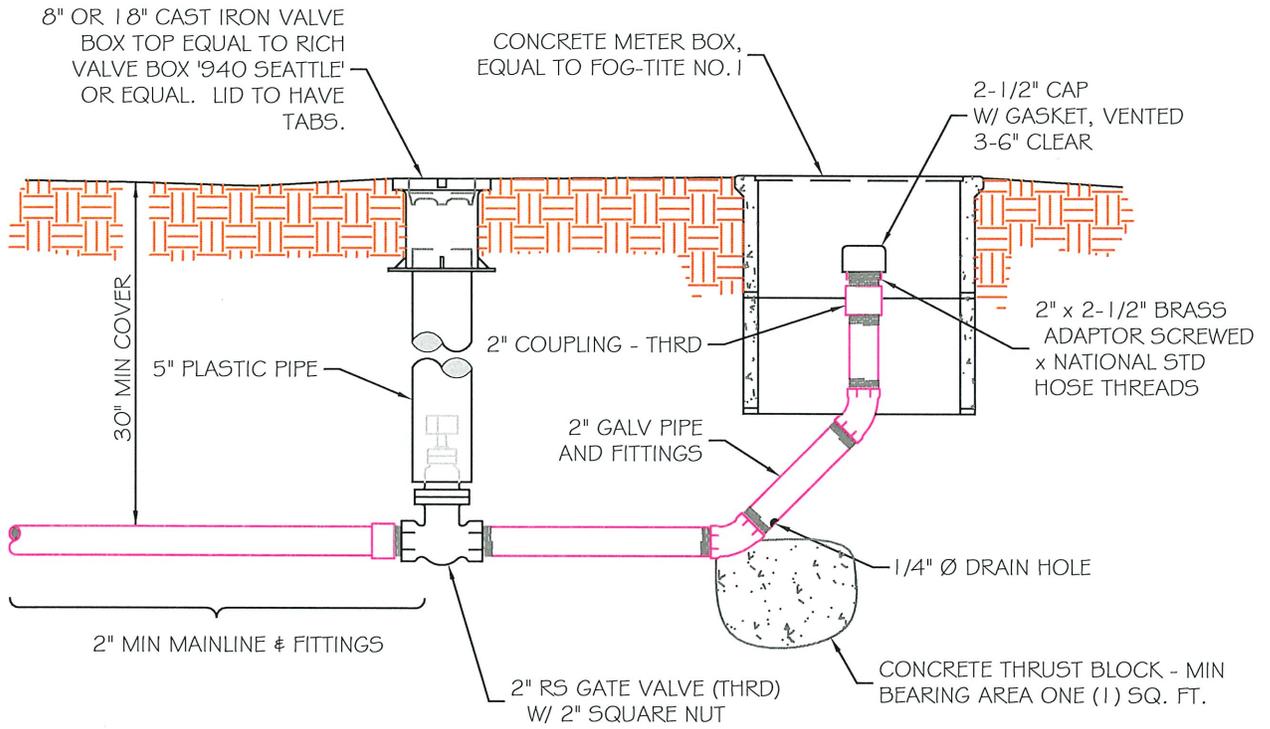
USE SCHEDULE 40 PVC FOR 2" PIPE. CLASS 200 PVC MAY BE SUBSTITUTED FOR PIPE 3" OR LARGER.

CONCRETE METER BOXES EQUAL TO FOG-TITE NO. 1 CAN BE USED IN TRAFFIC AREAS IN PLACE OF CARSON MODEL 1419, USE FOG-TITE LID.

MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

TITLE	
TYPE B SERVICE RISER	
STANDARD IRRIGATION DETAIL	
SHEET	DWG SCALE
3 OF SET	NO SCALE





PROFILE

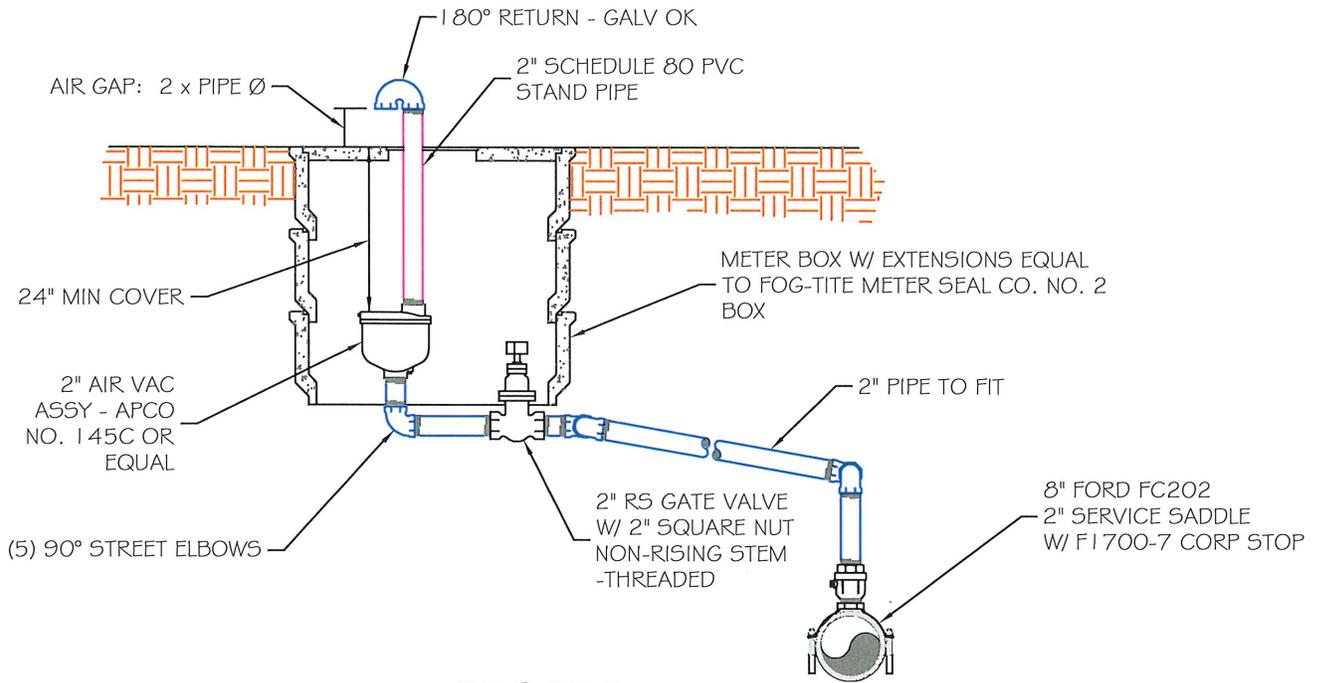
NOTES:  
 MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

PLASTIC METER BOXES CAN BE USED IN NON-TRAFFIC AREAS IN PLACE OF FOG-TITE I-D, USE CARSON MODEL 1419.

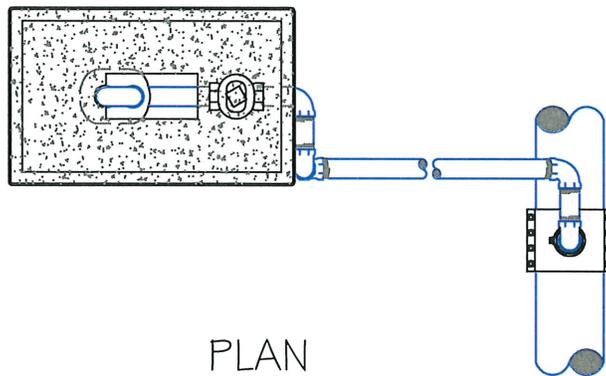
TITLE	
(2") BLOW-OFF ASSEMBLY	
STANDARD IRRIGATION DETAIL	
SHEET	DWG SCALE
4 OF SET	NO SCALE



NOTE:  
 AIR & VACUUM VALVE ASSEMBLY MUST BE INSTALLED AT HIGHEST POINT OF LINE. IF HIGH POINT FALLS IN A LOCATION WHERE ASSEMBLY CANNOT BE INSTALLED, PROVIDE ADDITIONAL DEPTH OF LINE TO CREATE HIGH POINT AT A LOCATION WHERE ASSEMBLY CAN BE INSTALLED.



PROFILE



PLAN

NOTES:  
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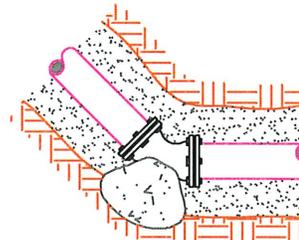
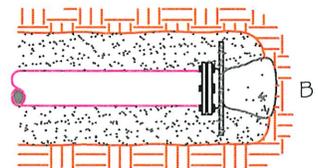
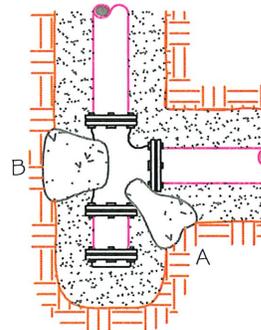
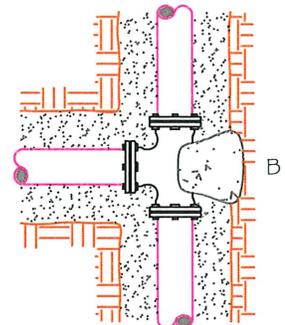
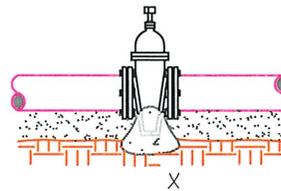
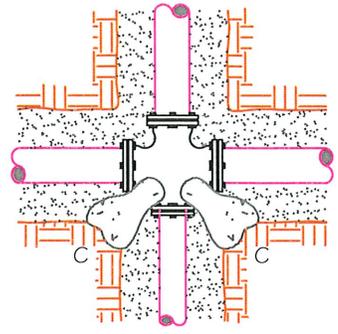
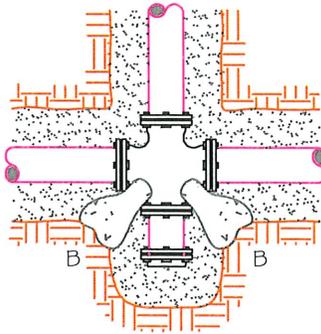
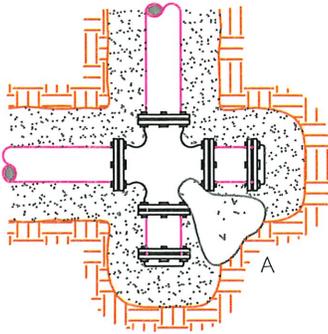
ALTERNATE OF A TAPPED CAST IRON COUPLING MAY BE INSTALLED IN THE MAIN.

VACUUM VALVE ASSEMBLY LOCATED IN STREET REQUIRES SPECIAL VAULT.

ALL 2" PIPE AND FITTINGS TO BE GALVANIZED IRON UNLESS OTHERWISE SHOWN.

TITLE	
(2") AIR VACUUM VALVE ASSEMBLY	
STANDARD IRRIGATION DETAIL	
SHEET	DWG SCALE
5 OF SET	NO SCALE





THRUST BLOCK TABLE  
MIN. BEARING AREA AGAINST UNDISTURBED SOIL  
(FT<sup>2</sup>)

PIPE SIZE	A	B	C	D	E	X
4"	3	1	1	1	1	NONE
6"	4	4	2	1	1	NONE
8"	7	6	4	2	1	4
10"	11	10	6	3	2	6
12"	16	14	9	5	3	9
14"	22	19	12	6	3	12
16"	29	25	16	8	4	16
18"	36	31	20	10	5	20
20"	45	39	24	13	6	24
22"	54	47	29	15	8	29
24"	64	56	35	18	9	35
28"	87	76	48	24	12	48
30"	101	87	55	28	14	55
36"	145	125	78	40	20	78
42"	197	171	107	55	27	107
48"	257	223	140	71	36	140

NOTES:  
BEARING AREA OF CONCRETE THRUST-BLOCK BASED ON 200 PSI PRESSURE AND SAFE SOIL BEARING LOAD OF 2,000 POUNDS PER SQUARE FOOT.

AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES AND SOIL CONDITIONS.

CONCRETE BLOCKING SHALL BE CAST IN PLACE AND HAVE A MINIMUM OF 1/4 SQUARE FOOT BEARING AGAINST THE FITTING.

BLOCK SHALL BEAR AGAINST FITTINGS ONLY AND SHALL BE CLEAR OF JOINTS TO PERMIT TAKING UP OR DISMANTLING OF JOINT.

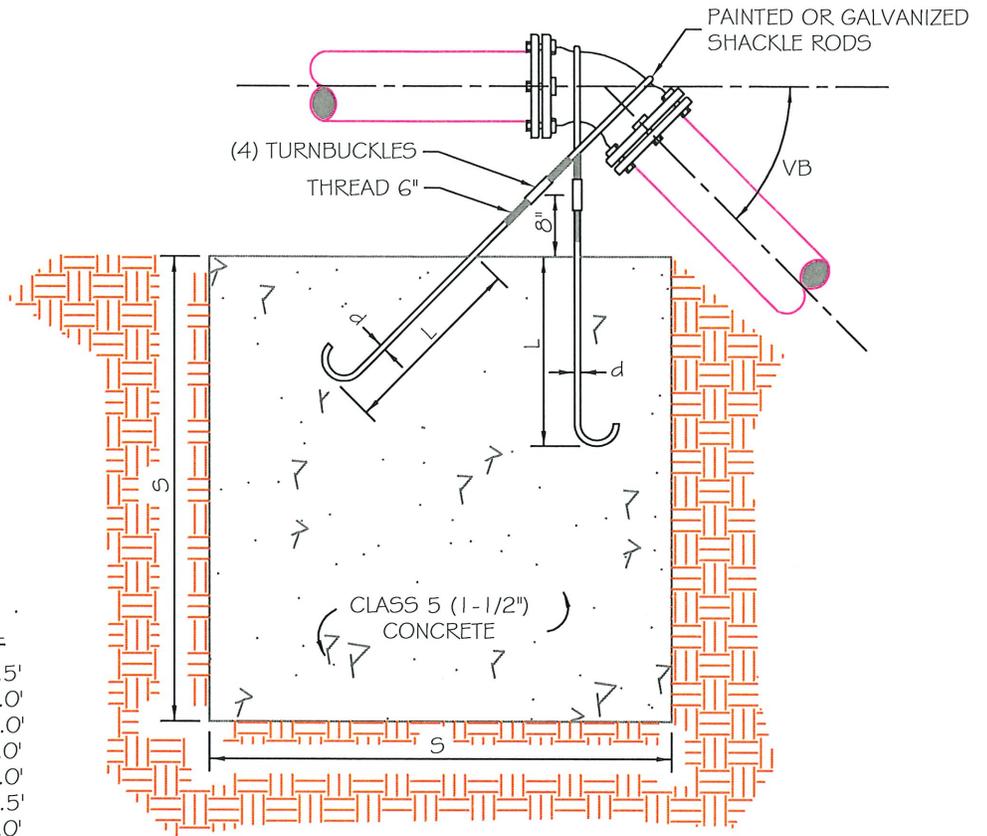
CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATION PRESSURE UNDER ALL CONDITIONS OF SERVICE.

MATERIAL SUBSTITUTIONS OR DETERMINATION OF EQUAL ARE AT THE SOLE DISCRETION OF LAKE CHELAN RECLAMATION DISTRICT.

A FOR 90° BEND  
C FOR 45° BEND  
D FOR 22-1/2° BEND  
E FOR 11-1/4° BEND

TITLE	
CONCRETE BLOCKING	
STANDARD IRRIGATION DETAIL	
SHEET	DWG SCALE
6 OF SET	NO SCALE

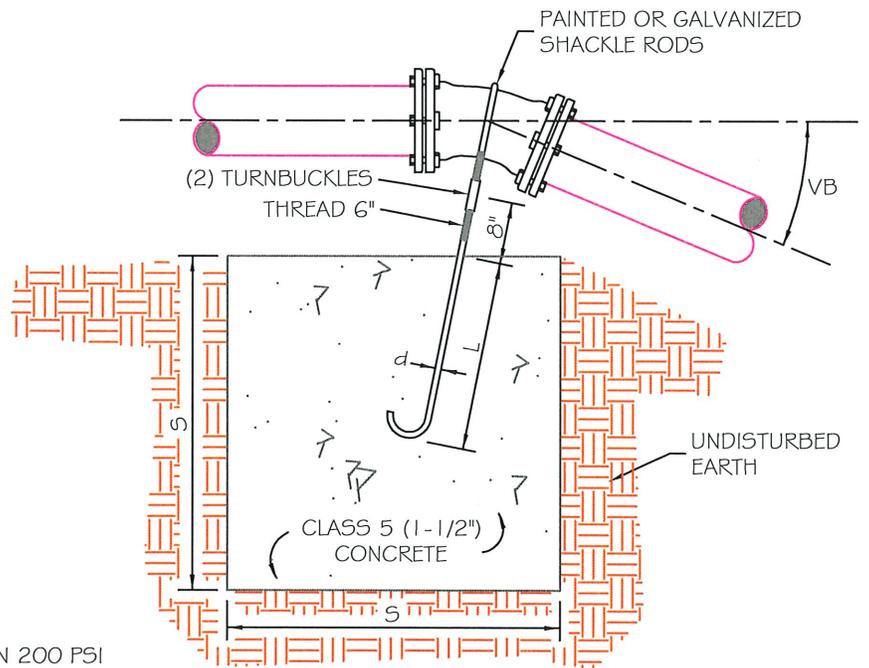




**TYPE B BLOCKING - FOR  
45° BENDS**

VERTICAL BLOCKING  
FOR 11-1/4°, 22-1/2°, 45° BENDS

PIPE SIZE	VB	CU FT	S	d	L
4"	11-1/4°	8	2.0'	3/4"	1.5'
	22-1/2°	11	2.2'	3/4"	2.0'
6"	45°	30	3.1'	3/4"	2.0'
	11-1/4°	11	2.2'	3/4"	2.0'
8"	22-1/2°	25	2.9'	3/4"	2.0'
	45°	68	4.1'	3/4"	2.5'
12"	11-1/4°	16	2.5'	3/4"	2.0'
	22-1/2°	47	3.6'	3/4"	2.0'
16"	45°	123	5.0'	3/4"	2.0'
	11-1/4°	32	3.2'	3/4"	3.0'
20"	22-1/2°	88	4.5'	7/8"	3.0'
	45°	232	6.1'	3/4"	2.5'
24"	11-1/4°	70	4.1'	7/8"	3.0'
	22-1/2°	184	5.7'	1-1/8"	4.0'
28"	45°	478	7.8'	1-1/8"	4.0'
	11-1/4°	91	4.5'	7/8"	3.0'
32"	22-1/2°	225	6.1'	1-1/4"	4.0'
	45°	560	8.2'	1-1/4"	4.0'
36"	11-1/4°	128	5.0'	1"	3.5'
	22-1/2°	320	6.8'	1-3/8"	5.5'
40"	45°	820	9.4'	1-3/8"	4.5'



**TYPE A BLOCKING - FOR  
11-1/4°, 22-1/2° BENDS**

**NOTES:**  
BEARING AREA OF CONCRETE THRUST-BLOCK BASED ON 200 PSI MAINLINE PRESSURE AND SAFE SOIL BEARING LOAD OF 2,500 POUNDS PER SQUARE FOOT.

AREAS MUST BE ADJUSTED FOR OTHER PIPE SIZES, PRESSURES AND SOIL CONDITIONS.

CONTRACTOR SHALL INSTALL BLOCKING ADEQUATE TO WITHSTAND FULL TEST PRESSURE AS WELL AS TO CONTINUOUSLY WITHSTAND OPERATION PRESSURE UNDER ALL CONDITIONS OF SERVICE.

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TITLE	
CONCRETE BLOCKING FOR VERTICAL BENDS	
STANDARD IRRIGATION DETAIL	
SHEET	DWG SCALE
7 OF SET	NO SCALE

