

**LAKE GROVE WATER DISTRICT  
RESOLUTION NO. 2018- 01**

**A RESOLUTION ADOPTING AND AMENDING LAKE GROVE WATER DISTRICT  
WATER SYSTEM STANDARDS**

WHEREAS, on or about October 19, 2015, the Board of Commissioners of the Lake Grove Water District ("District") adopted Rules and Regulations that provided for usage of the District's water system and included Water System Standards; and

WHEREAS, the Board of Commissioners finds it necessary to amend those Water System Standards;

NOW, THEREFORE, IT IS RESOLVED BY THE BOARD OF COMMISSIONERS OF THE LAKE GROVE WATER DISTRICT THAT:

Section 1: The Water System Standards attached hereto as Exhibit 1 and incorporated by reference are hereby approved and adopted and supersede all previous Water System Standards as of the effective date in Section 2 below. With the exception of the Water System Standards, nothing in this Resolution should be interpreted to amend, modify, or otherwise alter the District's Rules and Regulations.

Section 2: The effective date for these Water System Standards, attached hereto as Exhibit 1, is January 15, 2018.

Section 3: This Resolution was adopted by at least the affirmative vote of a majority of the members of the District Board at its regular meeting on January 15, 2018 and was signed by the presiding officer and attested to by the ~~secretary~~ <sup>Commissioner</sup> ~~secretary~~ <sup>Commissioner</sup>. The ~~Secretary~~ <sup>Commissioner</sup> of the District is instructed to cause this Resolution to be filed in the Records of the District.

INTRODUCED AND ADOPTED this 15th day of January, 2018, effective as of the date specified in Section 2 above.

LAKE GROVE WATER DISTRICT,

BY \_\_\_\_\_

Attest

BY \_\_\_\_\_

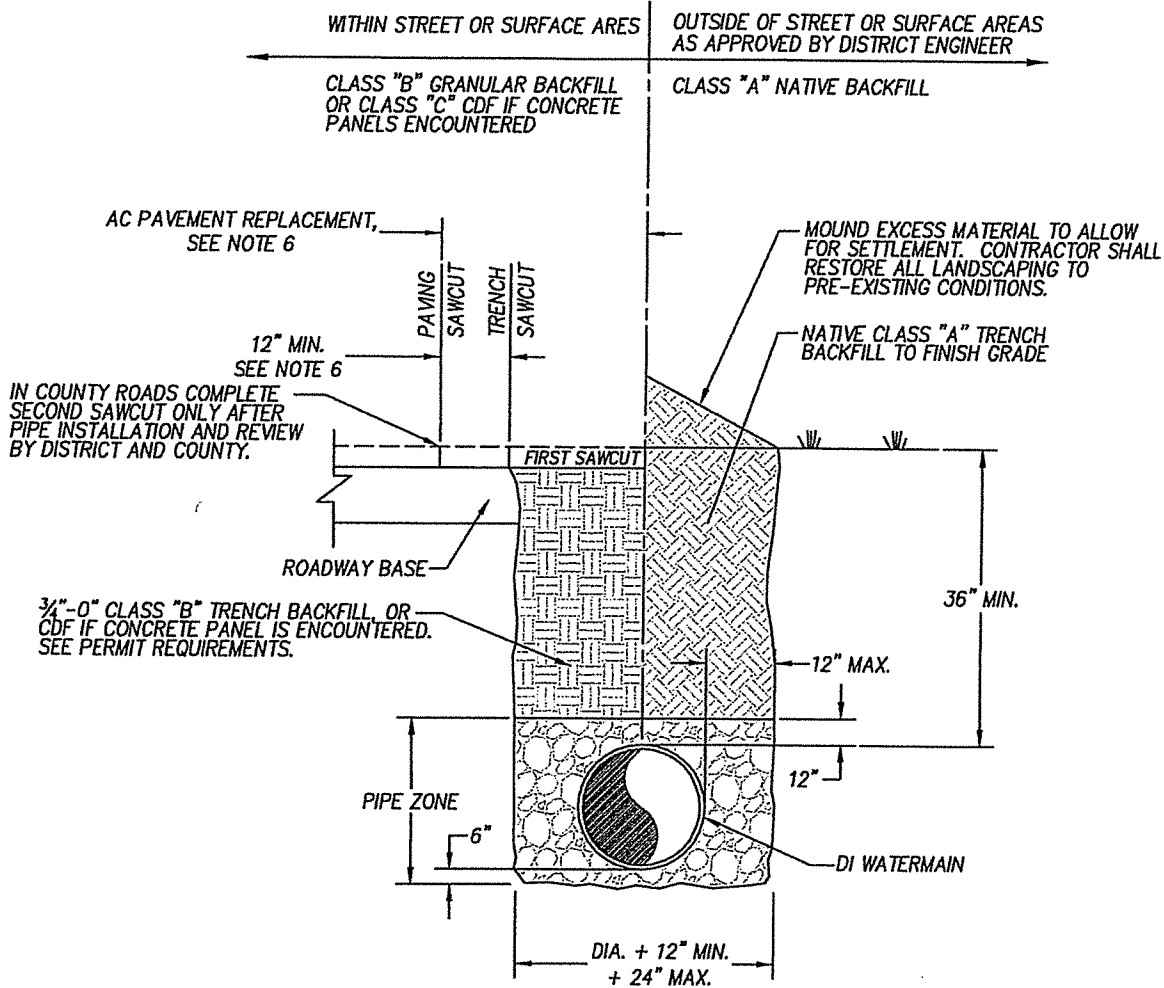
# LAKE GROVE WATER DISTRICT STANDARD DRAWING INDEX

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**LAKE GROVE WATER DISTRICT  
WATER SYSTEM STANDARDS**

NOVEMBER, 2017

**STANDARD DRAWINGS**



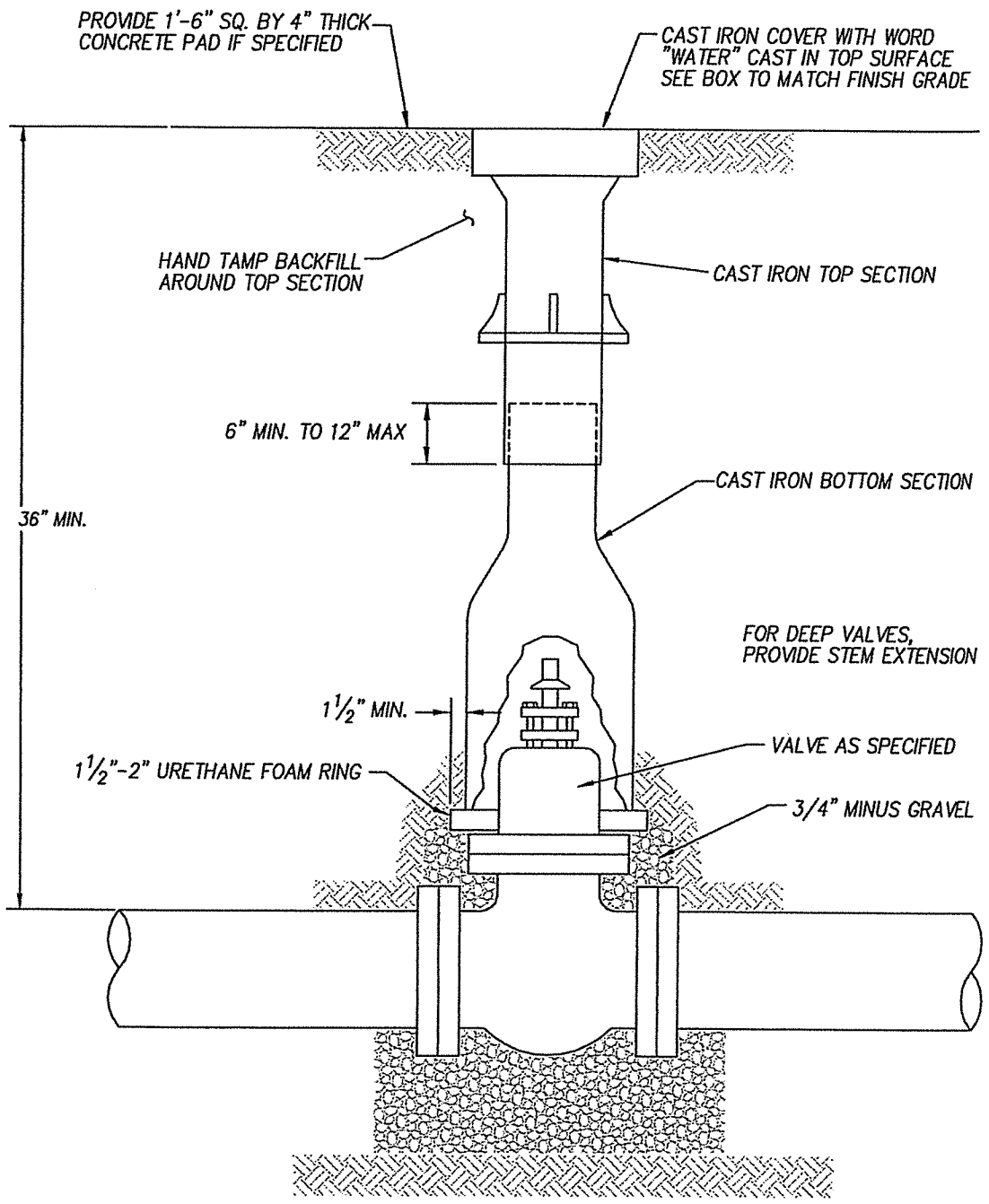
**NOTES:**

1. PIPE ZONE MATERIAL SHALL BE ¾"-0" CRUSHED ROCK GRANULAR BACKFILL COMPACTED TO 95% OF AASHTO T99.
2. CLASS "A" NATIVE BACKFILL MAY ONLY BE USED OUTSIDE OF PAVED AREAS AND REQUIRES DISTRICT APPROVAL. BACKFILL SHALL BE COMPACTED TO 90% OF AASHTO T-99 IN LIFTS NOT EXCEEDING 18" (LOOSE MEASURE).
3. CLASS "B" ¾"-0" CRUSHED ROCK GRANULAR BACKFILL SHALL BE USED WITHIN PAVED AREAS. BACKFILL SHALL BE COMPACTED TO 95% OF AASHTO T-99.
4. BACKFILL SHALL BE PLACED AND COMPACTED IN A MAXIMUM OF 24-INCH LIFTS. COMPACTION TESTING REQUIRED AT A FREQUENCY OF 1 TEST EVERY 100 FEET OF TRENCH.
5. COMPLETE SURFACE AND PAVEMENT RESTORATION IN ACCORDANCE WITH THE PROVISIONS OF THE ROAD OPENING PERMIT FROM CLACKAMAS COUNTY OR CITY OF LAKE OSWEGO.
6. SAWCUT WIDTH AND AC PAVEMENT REPLACEMENT SHALL BE PER APPLICABLE JURISDICTIONAL REQUIREMENTS. SAWCUT CLEAN EDGE FOR AC PAVEMENT REPLACEMENT. SAND SEAL JOINT.
7. PROVIDE CLASS "E" CDF BACKFILL FOR ALL TRENCH CROSSINGS LOCATED IN VEHICLE TRAVEL LANES OF ARTERIAL AND COLLECTOR STREETS, OR WHERE CONCRETE PANELS ARE ENCOUNTERED. IF THESE SPECIFICATIONS CONFLICT WITH THE SPECIFICATIONS OF ANOTHER APPLICABLE JURISDICTION, THE MORE STRINGENT SPECIFICATIONS SHALL GOVERN.

**LAKE GROVE WATER DISTRICT  
WATER SYSTEM STANDARDS**  
NOVEMBER, 2017

**TYPICAL PIPE  
TRENCH DETAIL**

**LG  
1**



**LAKE GROVE WATER DISTRICT  
WATER SYSTEM STANDARDS**

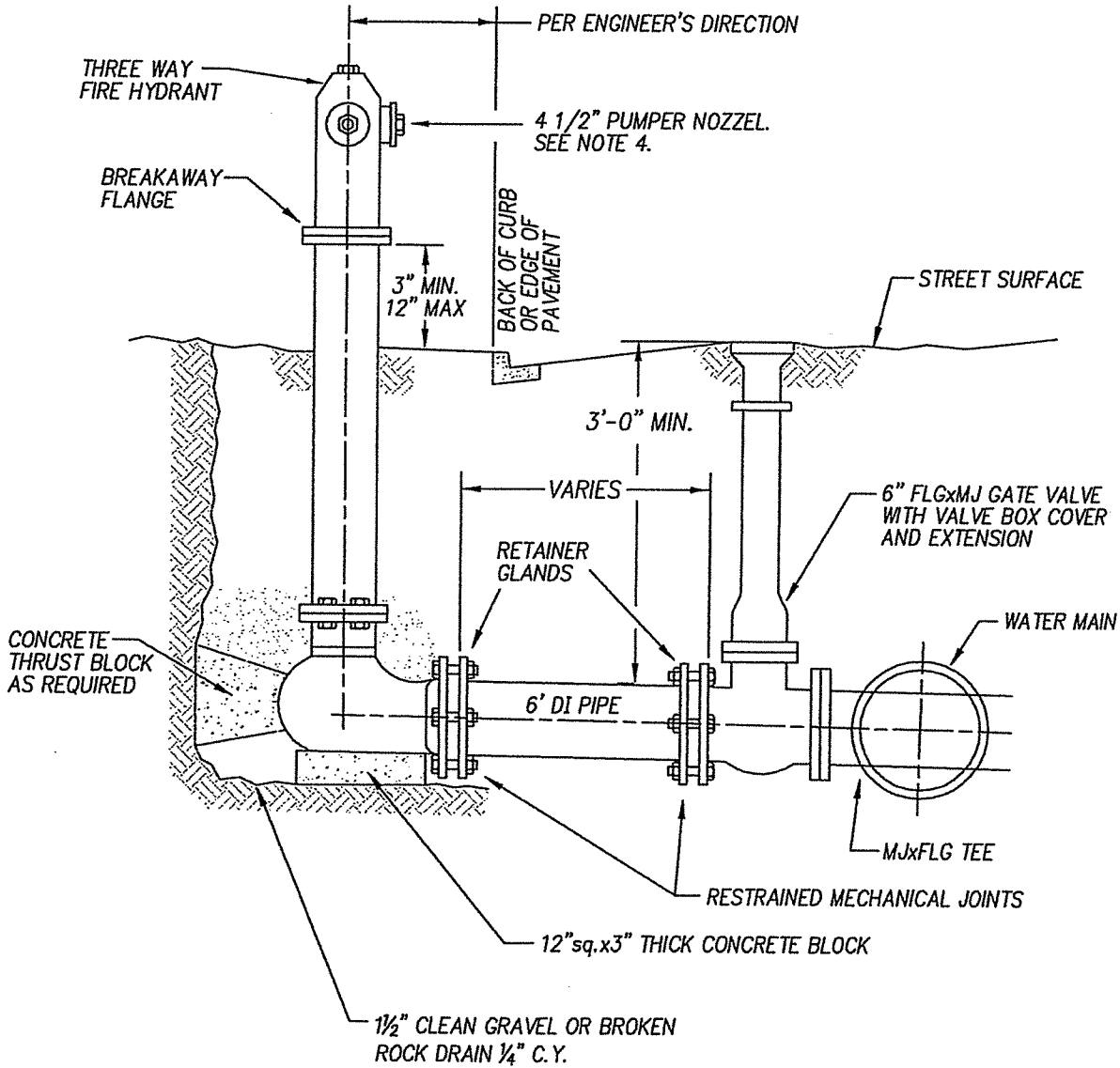
NOVEMBER, 2017

**VALVE BOX SETTING**

**LG  
2**

**NOTES:**

1. ALL OPERATOR & NOZZLE NUTS SHALL BE 1½" AND PENTAGONAL.
2. OPERATOR NOT TO OPEN COUNTER-CLOCKWISE.
3. PROVIDE RESTRAIN BETWEEN ISOLATION VALVE AND HYDRANT BASE SHOE WITH APPROVED JOINT RESTRAINT.
4. PROVIDE A 5" "QUICK DISCONNECT" STORZ ADAPTER ON 4½" PUMPER NOZZEL.

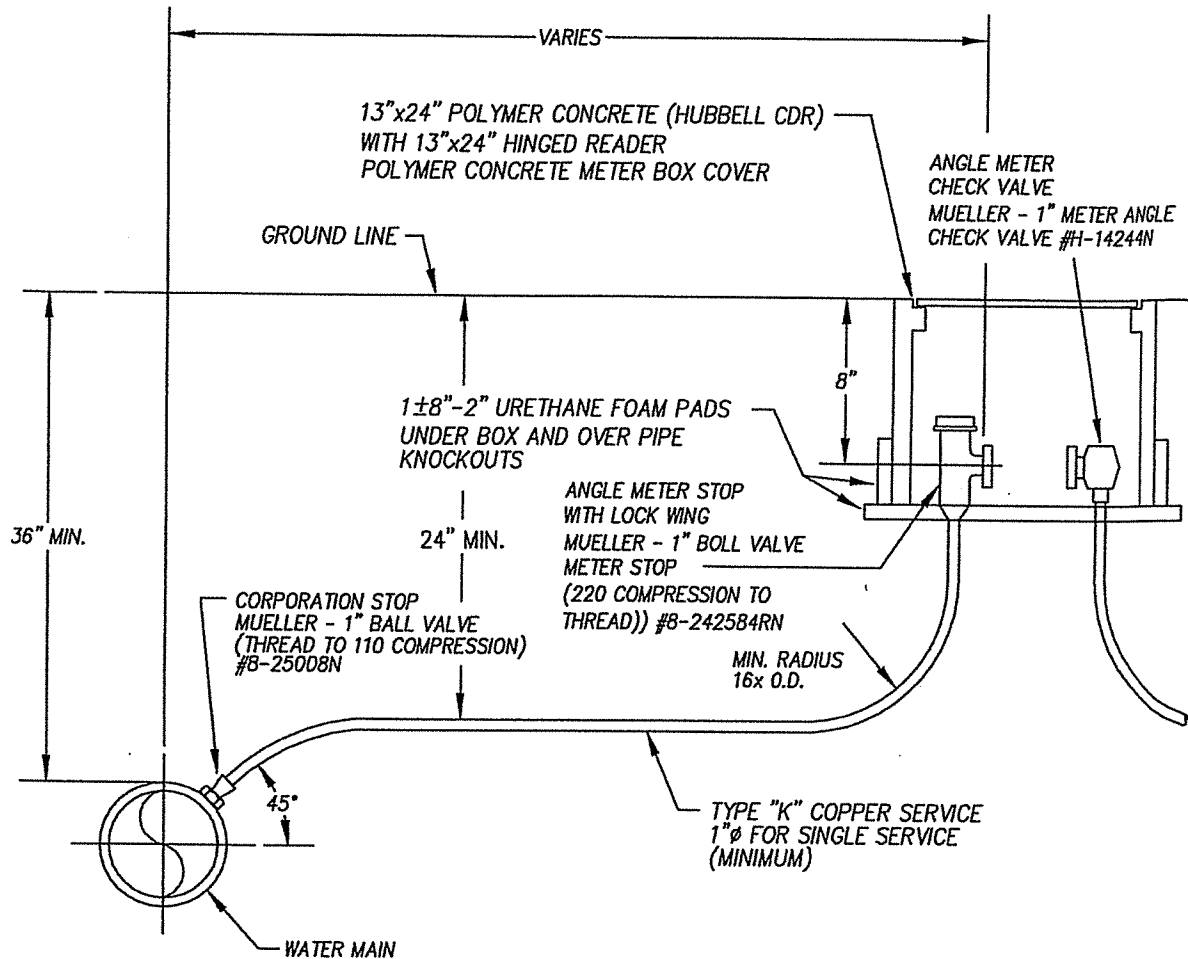


**LAKE GROVE WATER DISTRICT  
WATER SYSTEM STANDARDS**

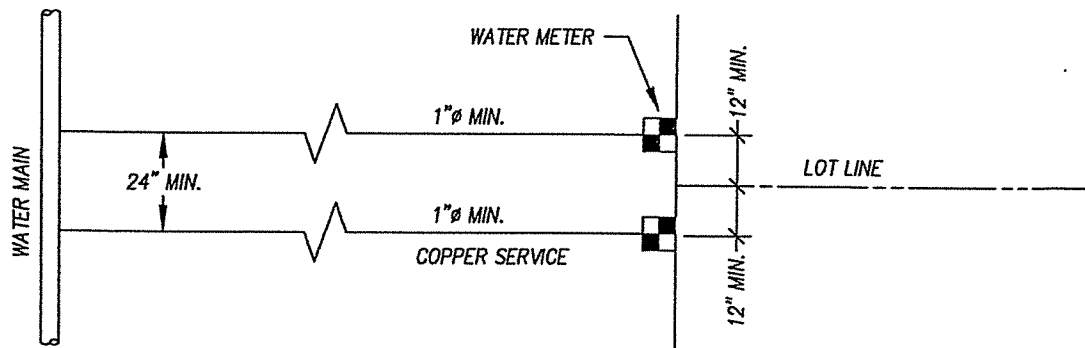
**JANUARY, 2004**

**FIRE HYDRANT**

**LG  
3**



NOTE:  
DIRECT TAP MAY BE MADE TO ALL SIZES OF DUCTILE IRON MAIN FOR  
1" SERVICES. ALL OTHER SERVICE CONNECTIONS SHALL BE MADE  
USING A SERVICE SADDLE AT THE MAIN. TRAFFIC RATED METER BOX  
AND COVER REQUIRED IN AREAS SUBJECT TO VEHICLE TRAFFIC.

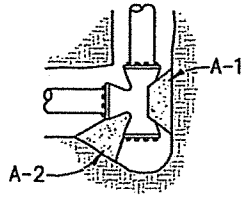


**LAKE GROVE WATER DISTRICT  
WATER SYSTEM STANDARDS**

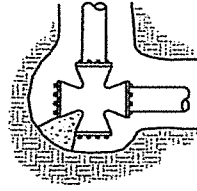
JANUARY, 2017

**1"Ø MINIMUM  
SERVICE CONNECTION**

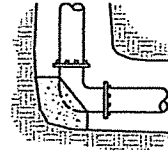
**LG  
4**



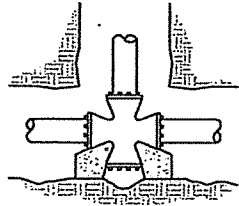
**TEEPLUGGED ON RUN**



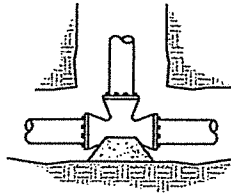
**PLUGGED CROSS**



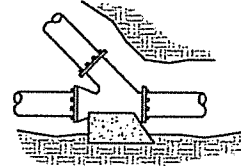
**BEND**



**PLUGGED CROSS**



**TEE**



**WYE**

**NOTES:**

1. CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.
3. THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLANS EG. 15 INDICATEDS 15 SQ. FT. BEARING AREA REQUIRED.
4. IFF NOT SHOWN ON PLANS REQUIRED BEARING AREAS AT FITTING SHALL BE AS INDICATED BELOW, ADJUSTED IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES) SLATED IN THE SPECIAL SPECIFICATIONS.
5. BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL.

BEARING AREA OF THRUST BLOCKS IN SQUARE FEET							
FITTING SIZE	TEE, WYE, PLUG OR CAP	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22-1/2° BEND	11-1/4° BEND
			A-1	A-2			
4	1.8	2.6	3.6	2.5	1.4	0.7	0.4
6	3.7	5.3	7.4	5.2	2.9	4.5	0.7
8	6.4	9.1	12.8	9.1	4.9	2.5	1.3
10	9.7	13.7	19.4	13.7	7.4	3.8	1.9
12	13.7	19.4	27.4	19.4	10.5	5.3	2.7
14	18.4	26.0	36.8	26.0	14.1	7.2	3.6
16	23.8	33.6	47.6	33.7	18.2	9.3	4.7
18	29.9	42.2	59.8	42.3	22.9	11.7	5.9
20	36.6	51.8	73.2	51.8	28.0	14.3	7.2
24	52.3	73.9	104.6	74.0	40.0	20.4	10.2

NOTE: ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 200 P.S.I. AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:

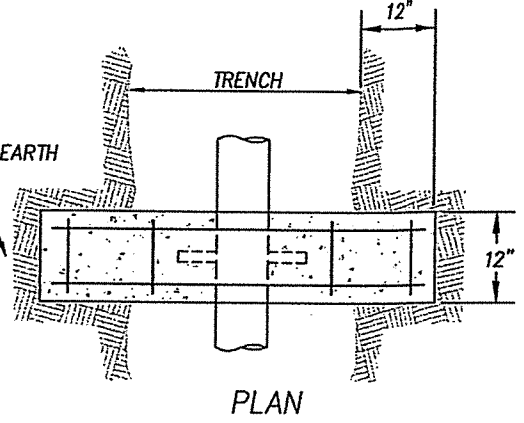
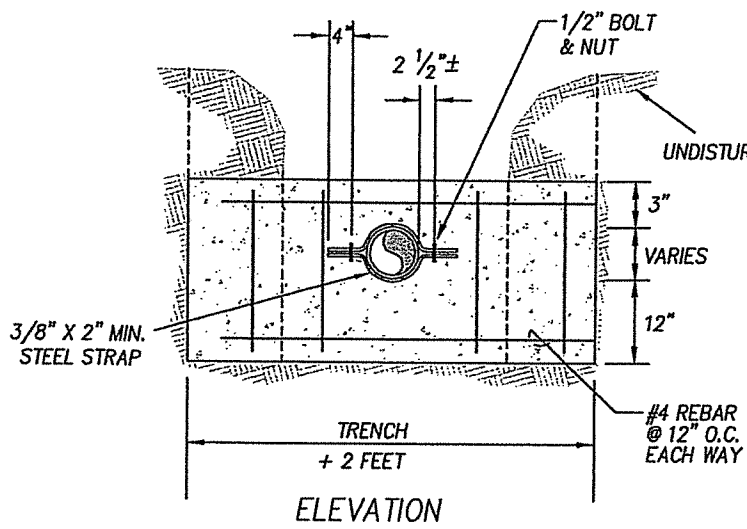
$$\text{BEARING AREA} = ( \text{TEST PRESSURE} / 200 ) \times ( 2000 / \text{SOIL BEARING STRESS} ) \times ( \text{TABLE VALUE} )$$

**LAKE GROVE WATER DISTRICT  
WATER SYSTEM STANDARDS**

**DECEMBER, 1986**

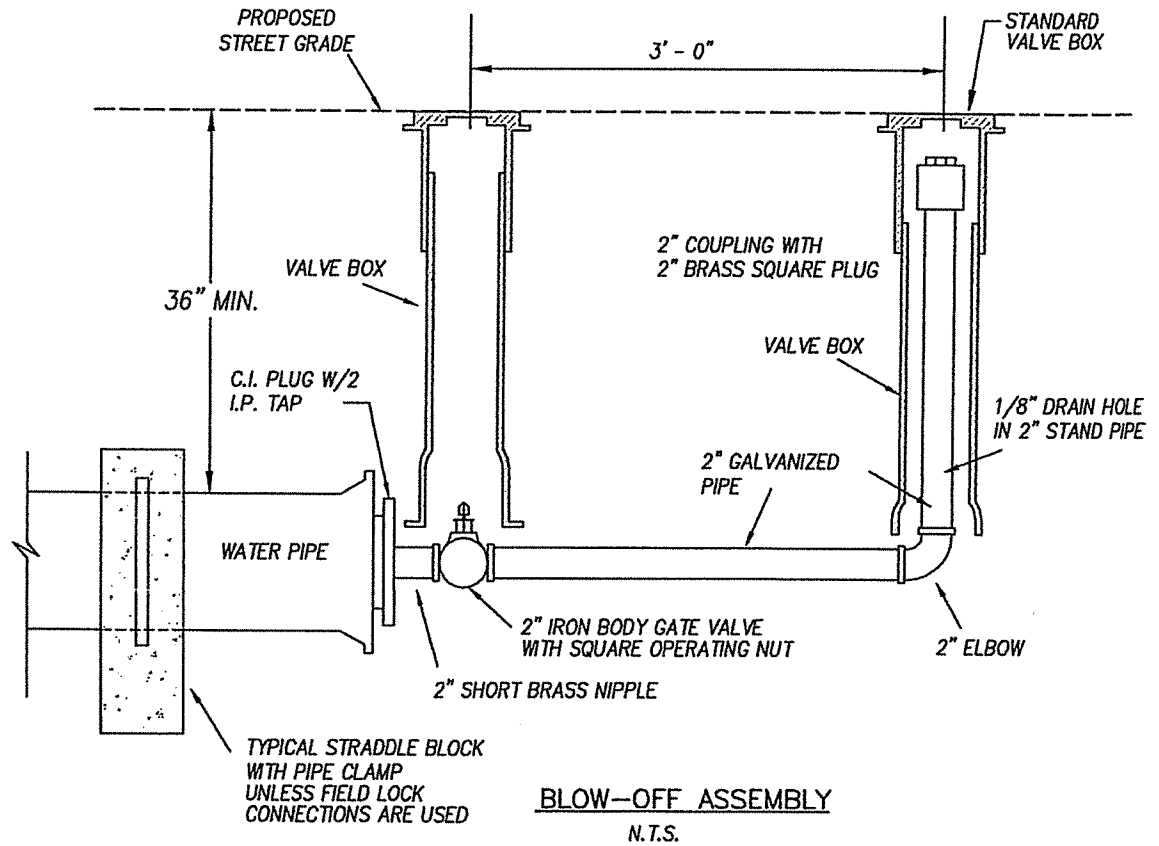
**THRUST BLOCKING**

**LG  
5**



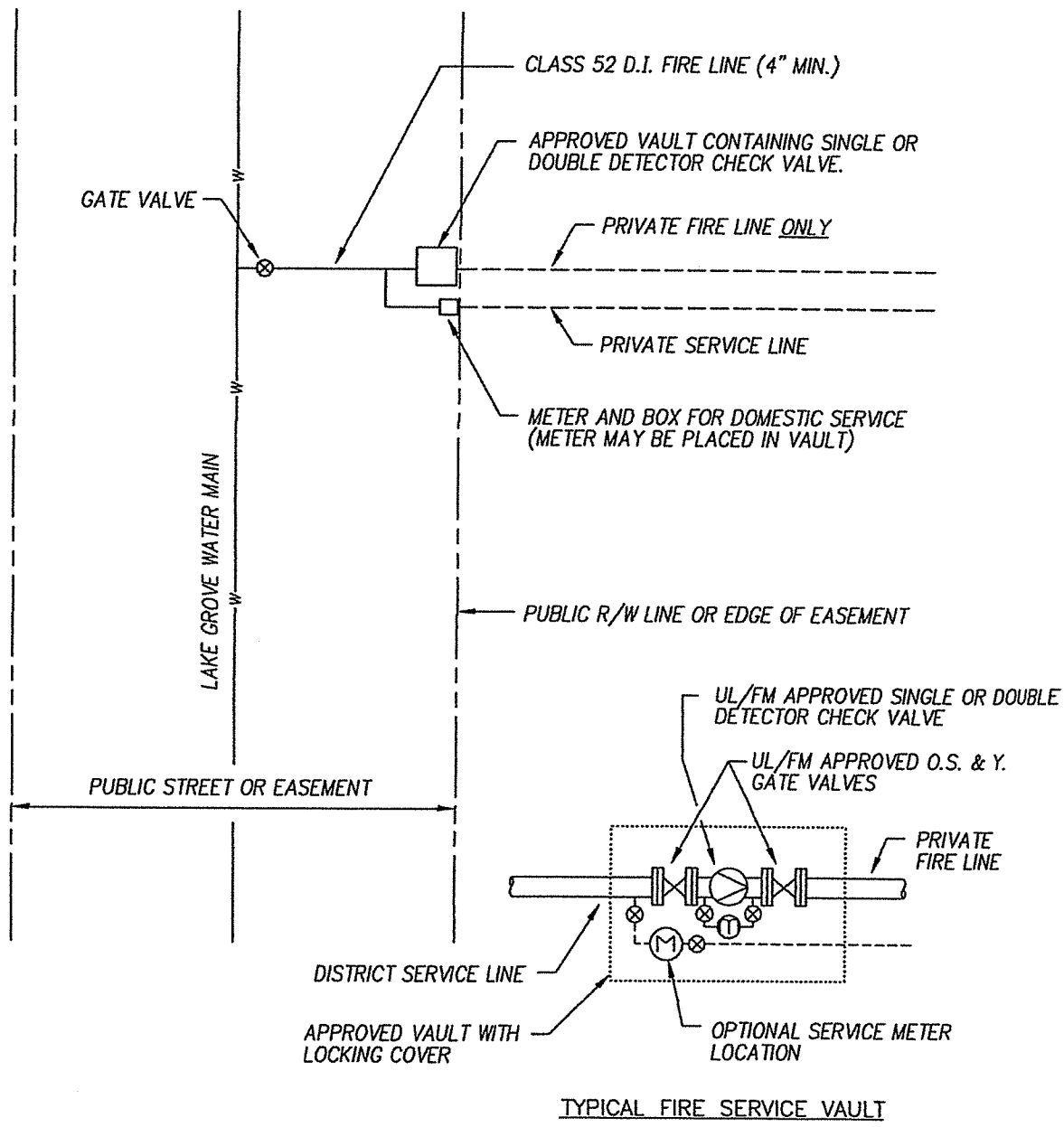
**NOTE:**  
ALL POURED IN PLACE CONCRETE SHALL CONFORM TO REQUIREMENTS OF ASTM-C-478, HAVE A 28 DAY STRENGTH OF 3,000 P.S.I. AND 2" TO 4" SLUMP.

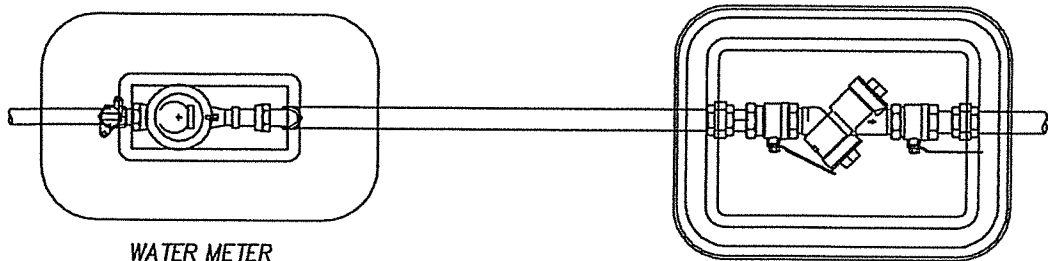
**CONCRETE ANCHOR BLOCK**  
N.T.S.



**BLOW-OFF ASSEMBLY**  
N.T.S.

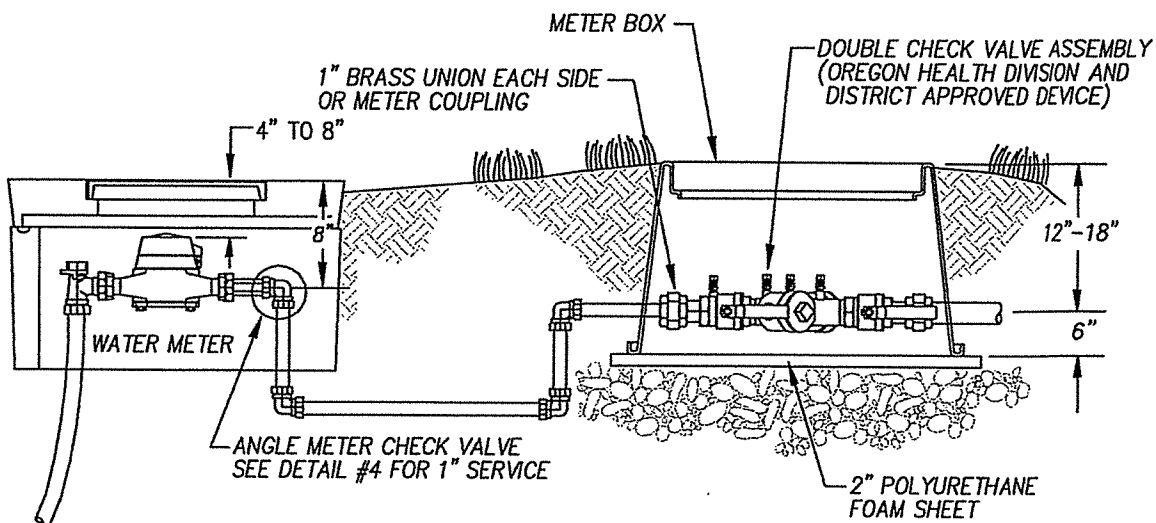






WATER METER  
1" SERVICE  
SEE DETAIL #4

PLAN



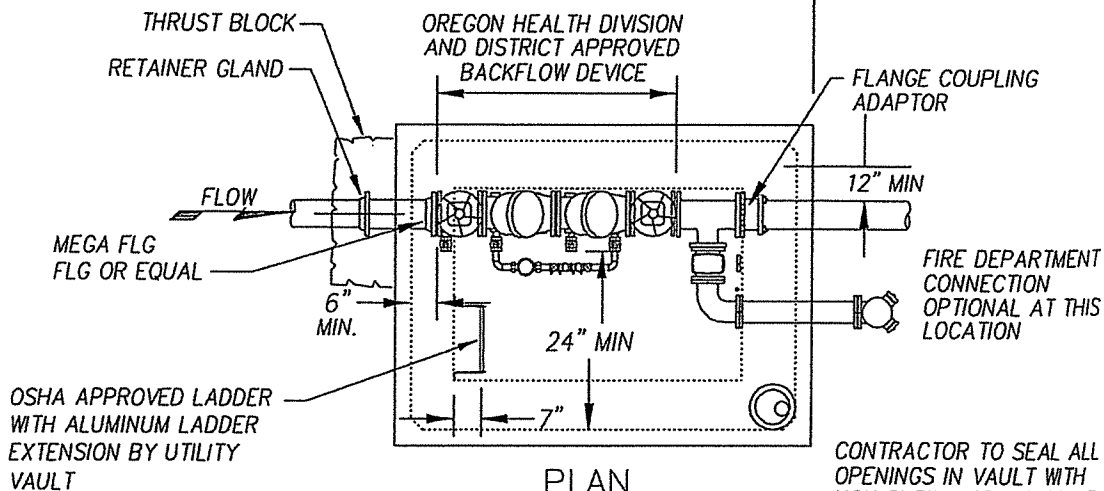
ELEVATION

BOX SPECIFICATIONS	
DEVICE SIZE	BOX TYPE
3/4" - 1"	BROOKS #4 SERIES OR EQUAL
1 1/2" - 2"	CARSON 1730D P15L OR EQUAL

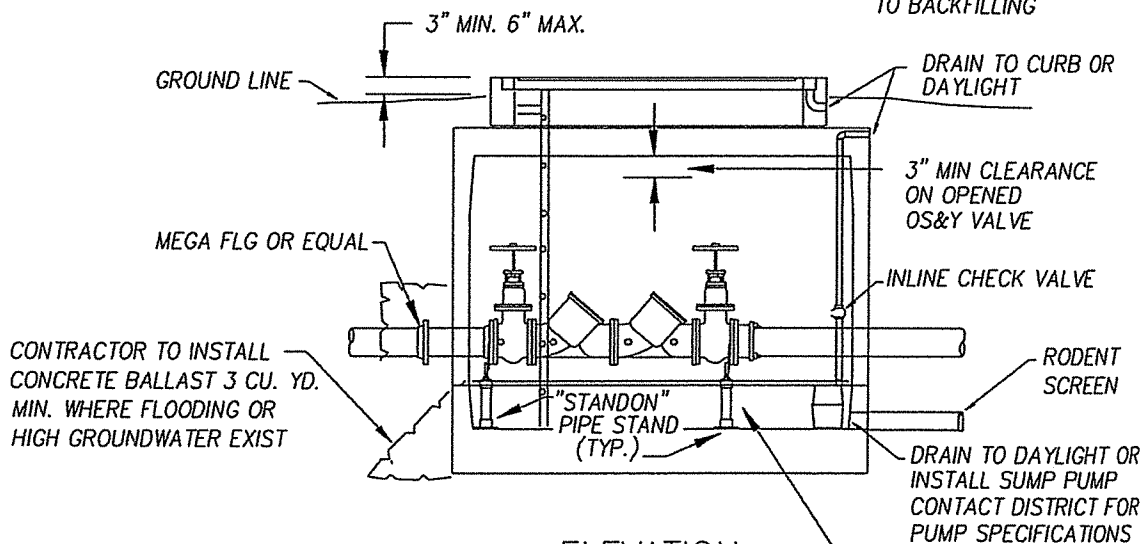
NOTES:

1. DOUBLE CHECK TO BE LOCATED DIRECTLY BEHIND WATER METER.
2. BRASS, STAINLESS, OR PLASTIC PLUGS TO BE INSTALLED IN TEST COCKS IF BELOW GROUND INSTALLATION.
3. DISTANCE FROM BOTTOM OF DEVICE TO FINISH GRADE, FREEZE PROTECTION, AND CLEARENCE FOR TESTING AND REPAIR ARE THE MAJOR CONSIDERATIONS FOR INSTALLATION.
4. THE BACKFLOW LAYOUT IS CONCEPTUAL AND CAN BE MODIFIED AS NEEDED BY THE OWNER.

LAKE GROVE DEPT. STANDARDS PLUMBING CODE



PLAN

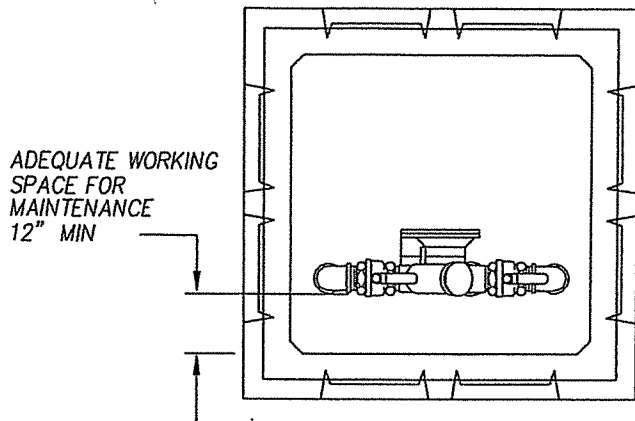


ELEVATION

FIRE DOUBLE CHECK VALVE ASSEMBLY

SIZE	UTILITY VAULT OR *EQUAL		BILCO DOOR OR *EQUAL
	WITH F.D.C.	WITHOUT F.D.C.	
4	676-WA	577-WA	J-5AL
6	687-WA	676-WA	J-5AL
8	5106-LA	687-WA	JD-3AL
10	5106-LA	2106-LA	JD-3AL

\* DISTRICT APPROVED EQUAL



**VAULT SPECIFICATIONS**

SIZE	MFG.
3/4" - 1"	UTILITY VAULT 3030-LA (OR EQUAL)
1 1/2" - 2"	UTILITY VAULT 3642-PUT (OR EQUAL)

REDUCED PRESSURE BACKFLOW  
PREVENTER FEBCO MODEL 825Y  
OR EQUAL

PLAN

SLOPE EARTH AWAY FROM  
VAULT IN BERM AREA

12' MIN  
ABOVE FINISH  
GRADE

CONCRETE PAD

ELEVATION

ADEQUATE DRAIN TO DAYLIGHT

CURB

FINISH GRADE

INSTALLATION SHOWN IS ONLY A SUGGESTION.

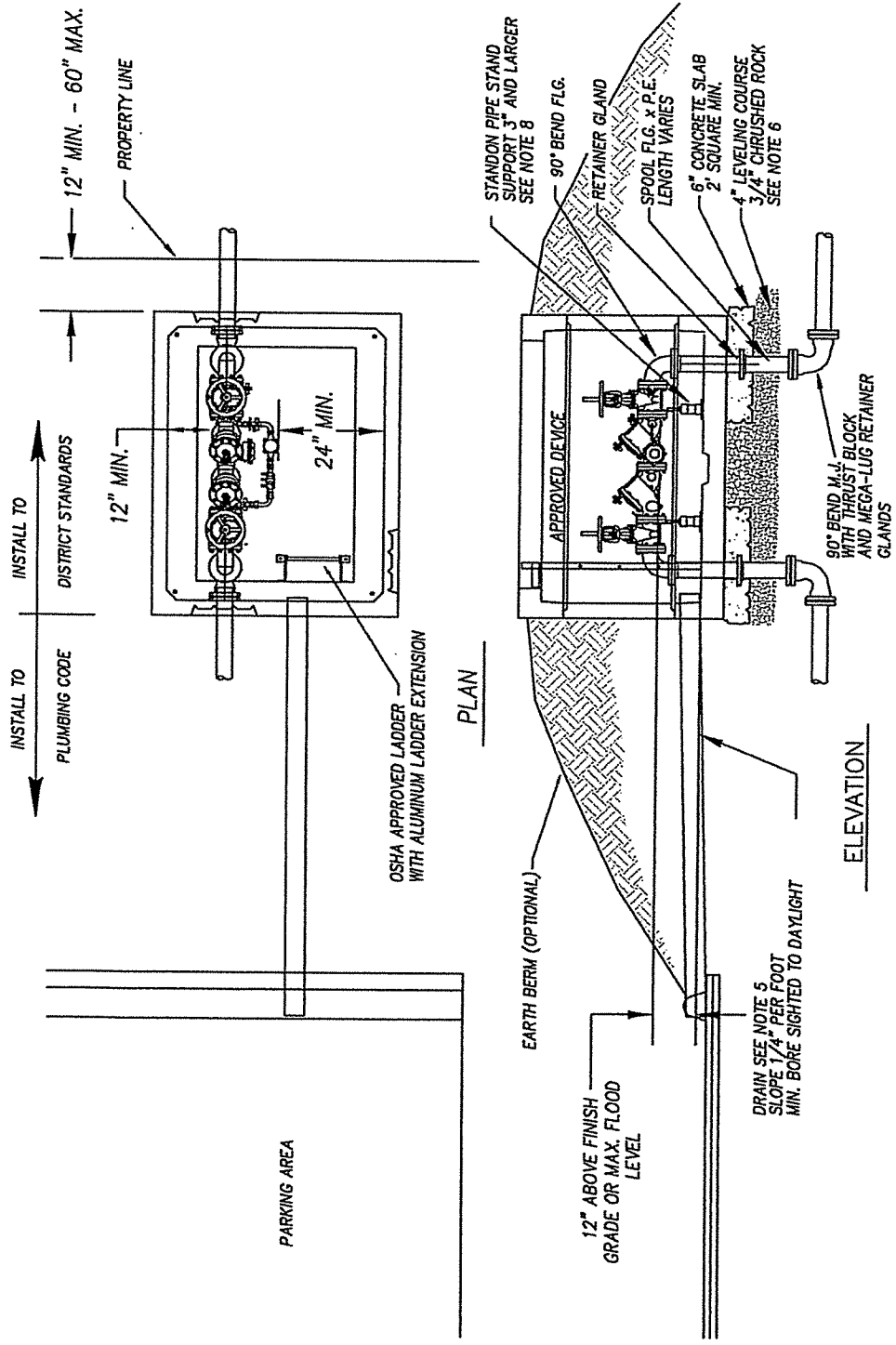
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2. BRASS, STAINLESS, OR PLASTIC PLUGS TO BE INSTALLED IN TEST COCKS IF BELOW GROUND INSTALLATION.
3. DISTANCE FROM BOTTOM OF DEVICE TO FINISH GRADE, FREEZE PROTECTION, AND CLEARANCE FOR TESTING AND REPAIR ARE THE MAJOR CONSIDERATIONS FOR INSTALLATION.

**LAKE GROVE WATER DISTRICT  
WATER SYSTEM STANDARDS**

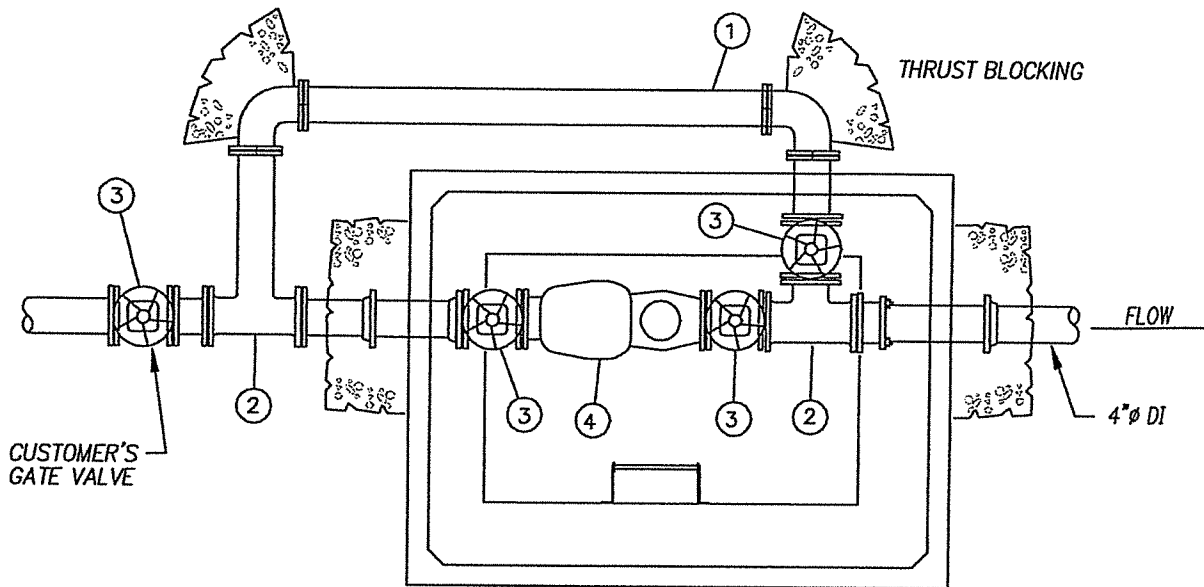
NOVEMBER, 1998

**REDUCED PRESSURE  
BACKFLOW ASSEMBLY**

**LG  
10**



- NOTES:
1. REDUCED PRESSURE BACKFLOW ASSEMBLY SHALL BE INSTALLED IN A LOCATION APPROVED BY THE DISTRICT
  2. REDUCED PRESSURE BACKFLOW ASSEMBLY SHALL BE INSTALLED HORIZONTAL AND PLUMB.
  3. ALL CLEARANCES APPLY TO OUTSIDE, IN-BUILDING, AND VAULT INSTALLATIONS.
  4. TO BE INSULATED AND/OR HAVE A HEAT SOURCE TO KEEP ENCLOSURE AT 40°F (NFPA 13-4-5.4.1.1).
  5. ENCLOSURE SHALL INCLUDE A BORE SIGHTED DRAIN TO DAYLIGHT CAPABLE OF DRAINING A FULL RELIEF VALVE DISCHARGE SEE DETAIL 557.
  6. 4" 3/4"-Ø COMPACTED GRAVEL LEVELING COURSE
  7. A BILCO DOOR OR OTHER APPROVED ACCESS SHALL BE PROVIDED.
  8. ALL ASSEMBLIES 2 1/2" AND LARGER SHALL BE FLANGED
  9. ALL STRUCTURES TO COMPLY WITH LOCAL BUILDING CODES
  10. OPENINGS IN BOTTOM OF VAULT TO BE PRE-FORMED KNOCKOUTS
  11. DETECTOR METER TO READ IN CUBIC FEET



UTILITY VAULT 675-WA-730 WITH SYRACUSE CHD-11AL OR BILCO JD-3AL DOOR AND A LADDER MEETING OSHA REQUIREMENTS. EXTERIOR TO BE SEALED WITH CRYSTAL SEAL OR APPROVED EQUAL. PROVIDE DRAINAGE VIA GRAVITY OR PUMP.

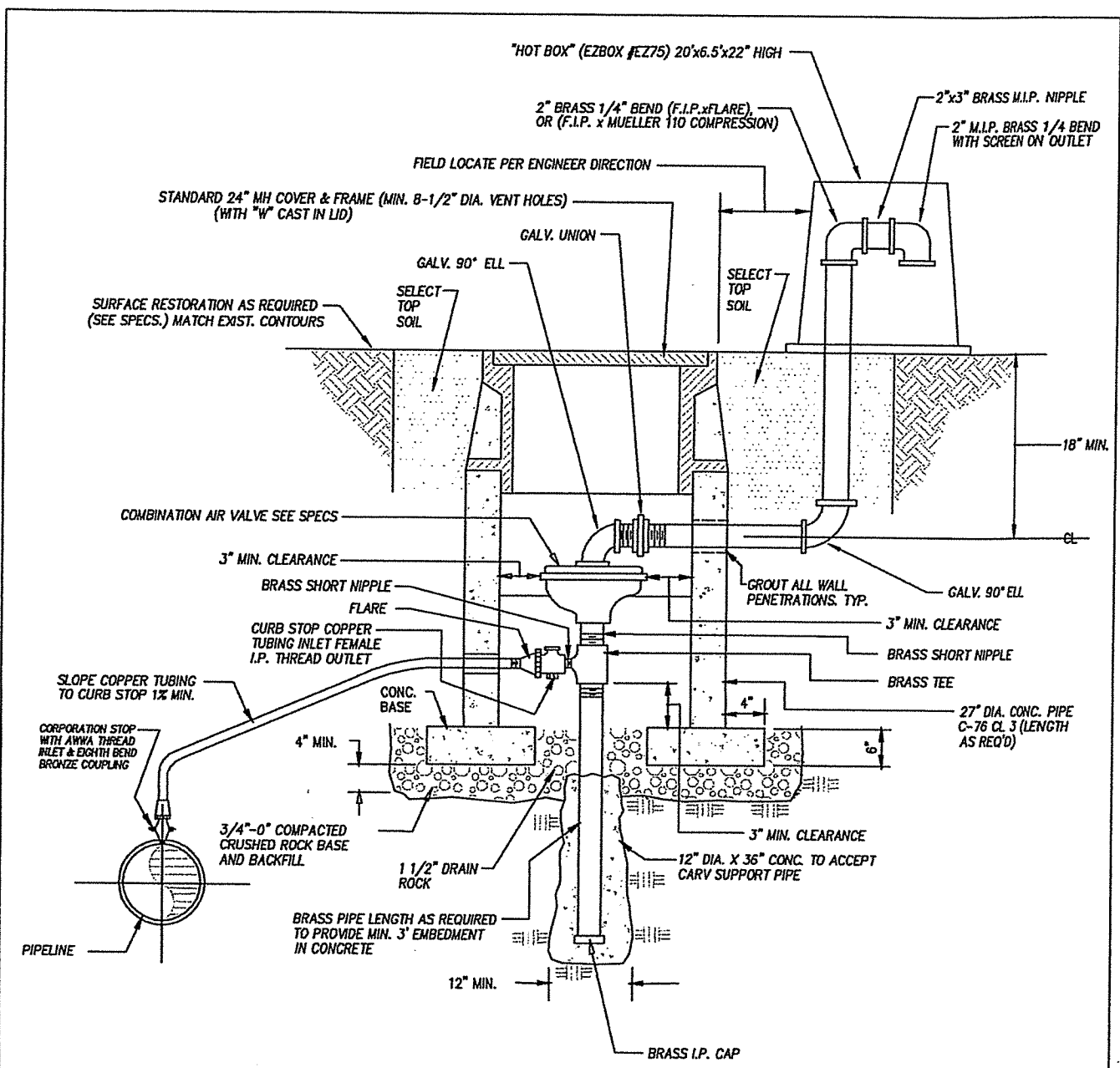
- ① 4" DUCTILE IRON BYPASS
- ② 4"x4" TEE
- ③ 4" GATE VALVE
- ④ 4" SENSOR SINGLE REGISTER COMPOUND METER

**LAKE GROVE WATER DISTRICT  
WATER SYSTEM STANDARDS**

SEPTEMBER, 2002

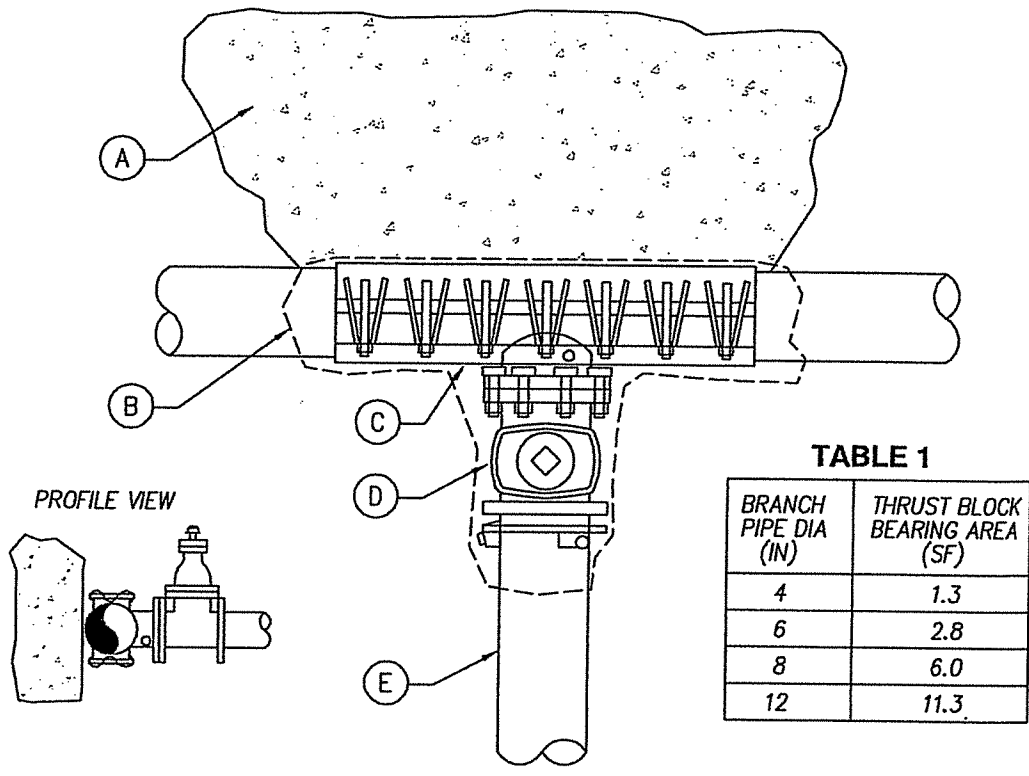
**4" SERVICE**

**LG  
12**



**NOTES:**

1. CORP. STOP, COPPER TUBING, CURB STOP, BRASS PIPING, GALV. PIPING & FITTINGS TO EQUAL SIZE OF AIR VALVE INLET/OUTLET.
2. CORP. STOP AND CURB STOP SHALL BE FLARED FITTINGS.
3. ENSURE ACCESS TO CURB STOP.



**TABLE 1**

BRANCH PIPE DIA (IN)	THRUST BLOCK BEARING AREA (SF)
4	1.3
6	2.8
8	6.0
12	11.3

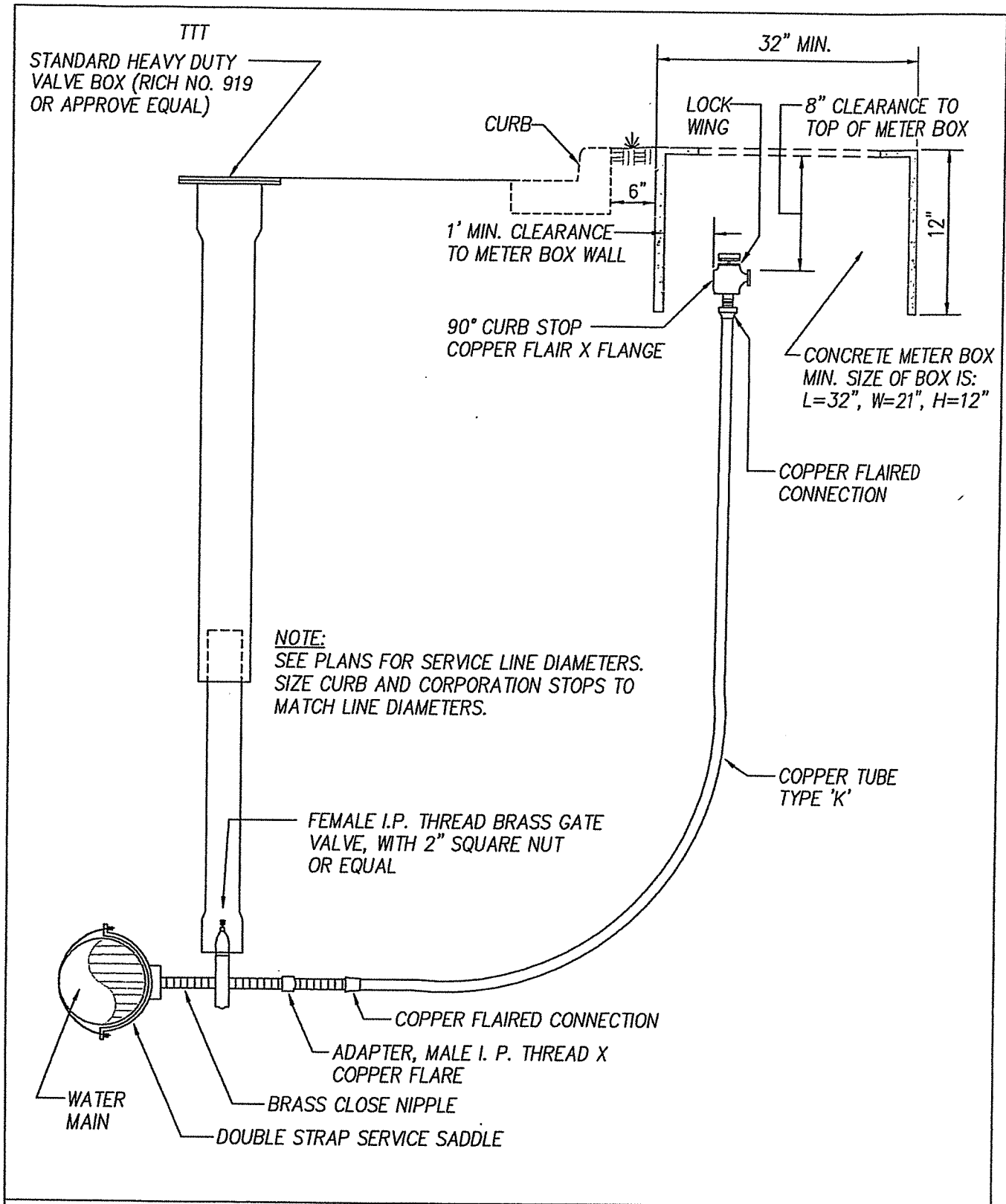
**KEYNOTES:**

- A. CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH. THRUST BLOCK SIZE SHALL BE PER TABLE 1 AND SHALL NOT BE LESS THAN ONE FOOT IN ANY DIMENSION. CONCRETE SHALL BE CLASS 3500 (6.5 SACK MIN.)
- B. WRAP TAPPING SADDLE AND VALVE WITH 3 LAYERS OF 8 MIL. POLYETHYLENE PRIOR TO POURING THRUST BLOCK AND BACKFILLING. EXTEND POLYETHYLENE 6" MINIMUM BEYOND SADDLE AND VALVE AND SECURE TO PIPE WITH POLYETHYLENE TAPE.
- C. STAINLESS STEEL TAPPING SADDLE WITH GASKET AND FLANGED CONNECTION.
- D. LINE-SIZE GATE VALVE (FLGxMJ).
- E. ALL JOINTS SHALL BE FIELD LOCKED.

**GENERAL NOTES:**

- 1. BEFORE INSTALLING TAPPING SADDLE, CONTRACTOR SHALL THOROUGHLY CLEAN PIPE TO REMOVE ALL DIRT, ROCKS, AND OTHER FOREIGN MATERIAL FROM PIPE WHERE SADDLE WILL BE INSTALLED.
- 2. SADDLE BOLTS SHALL BE TORQUED TO MANUFACTURER'S SPECIFICATIONS.
- 3. CONTRACTOR SHALL ENSURE THAT GASKET IS PROPERLY ALIGNED AND FREE OF FOREIGN MATERIAL PRIOR TO TIGHTENING SADDLE.
- 4. SADDLE LOCATION AND INSTALLATION SHALL BE APPROVED BY DISTRICT INSPECTOR PRIOR TO TAPPING.
- 5. CONTRACTOR SHALL AIR TEST SADDLE TO 40 PSI PRIOR TO TAPPING.
- 6. CONTRACTOR SHALL FLUSH AND PRESSURE TEST VALVE PRIOR TO BACKFILLING.





**LAKE GROVE WATER DISTRICT  
WATER SYSTEM STANDARDS**

SEPTEMBER, 2013

**1-1/2" TO 2" WATER SERVICE**

**LG  
15**

**NOTES:**

1. CONNECTIONS TO EXISTING SHALL BE PERFORMED UNDER THE DIRECT SUPERVISION OF THE DISTRICT. VALVES SHALL BE OPERATED BY DISTRICT ONLY, CONTRACTOR SHALL NOT OPERATE VALVE.
2. 11 MIL PLASTIC OR CONSTRUCTION FABRIC SHALL BE WRAPPED AROUND PIPE AND FITTINGS BEFORE THRUST BLOCK AND CONTROL DENSITY BACKFILL ARE POURED.
3. SUPPORT VALVE AND TEE CONTINUOUSLY THROUGH INSTALLATION.

