

DISTRIBUTION CONSTRUCTION SPECIFICATIONS



THE ISLAND WATER ASSOCIATION, INC.

SANIBEL, FLORIDA

Revised January 6, 2010

1. All water mains shall be sterilized in accordance with the Lee County Health Department requirements. The Contractor is responsible for bacteriological testing and clearance from the Health Department.
2. All water mains shall be pressure tested in accordance with "IWA Pressure and Leakage Test," Specifications. The IWA representatives and the engineer of record shall observe a satisfactory pressure test.
3. All water mains shall have a minimum of 30 inches and a maximum of 36 inches cover from finished grade.
4. The Contractor must furnish IWA with certified "as built" drawings showing the location of all water mains, fittings, valves, services, etc.
5. Prior to the start of any construction the Contractor must schedule and attend a pre-construction meeting with the IWA representative and the engineer of record.
6. The Contractor must obtain permission from IWA prior to shutting down existing water mains or making connections to existing water mains. All connections to water mains and shutdowns of water mains shall be coordinated with and done under the supervision of the IWA representative.
7. The minimum notice for inspections, connections, main shut downs and testing is 24 hours. Many situations will require more than 24 hour notice time.
8. The installation of fire hydrants and fire hydrant locations must comply with the appropriate fire district regulations. There is a separate specification for the installation of fire hydrants.
9. All new service connections must be protected by an IWA approved backflow prevention device. There is a separate specification for the installation of backflow prevention devices.
10. The Contractor shall sterilize fittings to be installed on existing water mains with a 50-ppm chlorine solution. The sterilization must be done under the supervision of the IWA representative.
11. Separation of water and sewer mains shall be maintained as follows:

Shall conform to F.A.C 62-555.314 Location of Public Water System Mains.

- A. ~~Parallel Installation: Water Mains, including well water shall be installed with a horizontal, edge to edge distance of 10 feet from any existing or proposed gravity or force sewer mains. The distance shall be 5 feet, center line to center line, for reclaimed water lines.~~
- B. ~~Crossings: (This requirement refers to all sewer mains and laterals, force or gravity.)
1) Water mains shall cross above sewer mains. They shall be laid to provide a minimum vertical distance of 18 inches between them. The distance shall be measured edge to edge. Where this minimum separation cannot be maintained and the water main is above the sewer main, with the ENGINEER'S approval, the crossing shall be arranged so that the water main joints are no less than 10 feet between the crossing and the water main joint.~~

- 2). Where there is no alternative to sewer pipes being placed below water mains, then, with the ENGINEER'S approval, there shall be a minimum vertical distance of 18 inches between them; and the crossings shall be arranged so that the water main joints are no less than 10 feet between the crossing and the water main joint.
- 3). Alternatively, to 1) and 2) above, with the ENGINEER'S approval:
- The sewer main may be placed in a sleeve or encased in concrete for a distance of 10 feet between the crossing and the water main joint; *OR*
 - Both the sewer main and the water main shall be ductile iron for a distance of 10 feet between the crossing and the nearest pipe joint.
12. All new main extensions shall be protected by an approved backflow prevention device and an installed temporary water meter. The backflow prevention device (see the IWA Backflow Prevention Device Specifications) shall be installed by the contractor and tested by IWA. The temporary water meter shall be purchased from IWA and installed by the contractor. This temporary connection will be used for all testing, flushing and sterilizing; and shall not be removed until approval is granted by IWA. The contractor will be charged for all water used at the current IWA rates.
13. 1" 2" and 3" pipe shall be polyethylene tubing conforming to ASTM D2239, SDR9, 200 psi, CTSI. Fittings shall be pack joint (compression), brass manufactured by Mueller or McDonald. All 1" pipe shall be installed in a 2" PVC casing. All PVC pipe and tubing shall be colored blue.
14. 4" through 16" pipe, used for water mains, shall be pressure rated PVC conforming to the requirements of AWWA specification A-C900-SDR-18, push on joints and a minimum pressure rating of 235 psi. All PVC pipe and tubing shall be colored blue.
15. Where ductile iron pipe is specified it shall be Class 51, conforming to AWWA C151, mechanical joint or push-on type conforming to AWWA C110 and C111. All ductile iron pipe shall have a factory applied bituminous seal coat over a cement mortar lining conforming to AWWA C104.
16. AC pipe in the ground shall never be removed or otherwise disturbed, unless it becomes unavoidable/impractical. AC pipe shall never be crushed and buried in place. If AC pipe is disturbed or removed from the ground, it shall be handled properly (bagged) and disposed of in an approved landfill, if less than 260 linear feet of pipe is involved. If over 260 feet of AC pipe is damaged in any way, all aspects of state regulations (62257, F.A.C. and 40CFR61, subpart M) shall be followed.
17. All fittings shall be ductile iron, mechanical joint conforming to AWWA C151. All ductile iron fittings shall have a factory-applied bituminous seal coat over a cement mortar lining conforming to AWWA C104. All solid sleeves and any fittings where cement lining is unavailable such as end caps shall be coated with a 6 mil. to 8 mil. thick fusion bonded epoxy conforming to the requirements of ANSI/AWWA C550, C116/A21.16 and NSF 61 approval.
18. All follower glands shall be mechanical joint restraint type (meglug). Glands shall have twist-off nuts, properly used to ensure the actuating of the wedging action against the pipe. The contractor must obtain permission from the IWA representative for the use of thrust blocks.
19. Polyethylene Wrapping: Corrosion protection of all metal including ductile iron pipe,

fittings, valves, saddles etc. shall be provided by wrapping with polyethylene sheets with a minimum of 8-mil thickness. This wrapping shall completely cover the ductile iron pipe without holes and form a snug fit with a minimum one foot overlap at all points and seams. These joints and seams shall be securely tapped in place. Tape polyethylene wrap securely at all penetrations, fittings, valves and joints.

20. All gate valves, 2" through 16" shall be resilient seated, manufactured to meet or exceed the requirements of AWWA C509 or latest revision and in accordance with the following specifications:
 - A. All valves 3" through 12" shall be Mechanical Joint (MJ) by MJ with the exception of tapping valves, which shall be flat flange by MJ. All 2" valves shall be IPT by IPT, and all valves shall be manufactured by Mueller. There will be no exception as to manufacturer of the valves without written permission from IWA.
 - B. All valves shall have an unobstructed waterway equal to or greater than the full nominal diameter of the valve.
 - C. All valves 2" through 12" are to be non-rising stem with the stem made of case forged or rolled bronze as shown in AWWA C509. Two stem seals shall be provided and shall be of the O-ring type, with one above and one below the thrust collar.
 - D. The stem nut, made of bronze, shall be independent of the gate.
 - E. The valve body, bonnet and bonnet cover shall be of cast iron as established by ASTM A 126, Class B. All ferrous surfaces inside and outside shall have a fusion-bonded epoxy coating, 10 mils thick. (dealer valve option 9020)
 - F. All bonnet, body, stem clamp nut or bolt, and head bolts and nuts shall be of 316 stainless steel or better. These required stainless steel nuts and bolts shall be installed on the valve prior to delivery to project site and shall be inspected by IWA personnel prior to installation.
 - G. A 2" operating nut shall be provided and installed on the valve, for operating the valve.
 - H. The sealing mechanisms shall consist of a cast iron gate having a vulcanized synthetic rubber coating. The resilient sealing mechanism shall provide zero leakage with the full working pressure on either side of the gate and zero pressure on the opposite side.
 - I. All valves, 2" through 12", are to be tested in strict accordance with AWWA C509.
 - J. All valves, 14" and larger, shall be manufactured by U.S. Pipe. There will be no exception as to manufacturer of the valves without written permission from IWA.
21. All water mains shall be installed under the field supervision of an engineering firm approved by IWA. The engineering firm shall be responsible for the certification of the "as built" drawings referenced in Note 4.
22. Water mains will not be accepted by The Island Water Association, Inc. until all road construction, easements, restoration of all disturbed areas and utility installations are complete. All new water mains must be cleared for service, in writing, by the HRS Lee

County Public Health Unit before they can be connected to an existing system.

23. All pipe joints, fittings, sewer crossings, restraints and thrust blocks must be left exposed for inspection by IWA prior to backfill. If any joints, fittings, sewer crossings or thrust blocks are covered without IWA inspection, the representative may require them to be exposed for inspection. After hours work must be approved by I.W.A.
24. The Contractor shall do whatever is necessary to maintain a dry trench. The pipe shall not be laid in water.
25. All 4" and larger jack and bores will require a welded steel casing with a factory-applied bituminous seal coat. The inside diameter of the casing shall be 6" greater than the outside diameter of the pipe bell. The pipe shall be centered in the casing using stainless steel casing spacers. One spacer shall be placed not more than two feet from each end of the casing. Subsequent spacers shall be placed at 6' intervals within the casing. One spacer shall be placed on the spigot end of each segment at the line marking the limit of insertion into the bell. When the joint is complete, the spacer shall be in contact with the bell of the joint so that the spacer pushes the joint and relieves compression within the joint. The ends of the casing shall be sealed using rubber end seals with stainless steel bands. 2" and smaller jack and bores shall be installed in PVC or HDPE casings. Bell restraints shall be installed at each joint inside the casing. Welded steel lugs "pig ears" shall be installed at each end of the casing.
26. The following parts shall be used for service connections:

A. 1" Service Taps

Service saddles:

- AC mains 4"-12"
Romac "SS1" series- all stainless steel
- AC mains 14"
Romac"SS-2" series- all stainless steel
- PVC/ DI mains 2"-8"
Romac "304" series- all stainless steel
- PVC/ DI mains 10"-12"
Romac "306" series- all stainless steel
- PVC/ DI mains 14"-24"
Romac "305" series- all stainless steel

Corporation stops:

- Muller MIP X MIP, 1" Ball Crop. # 20013
- AY McDonald MIP x MIP, 1" Ball Corp #3131B

Curb stops 1" meter:

- Mueller #B24351 (1" meter x 1" FIPT) With locking wing
- AY McDonald #6101MW (1" meter x 1" FIPT) With Locking wing

Curb stops 5/8" meter:

- Mueller #B24351 (3/4" meter x 3/4" Ball valve x 3/4" FIPT) With locking wing
- AY McDonald #6101MW (3/4" meter x 3/4" Ball valve x 3/4" FIPT) With locking wing

Meter Box:

- See Table 3

B. 2" Service taps

Service saddles:

- AC mains 4"-14"
Romac"SS-2" series- all stainless steel
- PVC/ DI mains 2 1/2"-8":
Romac "304" series- all stainless steel
- PVC/ DI mains 10"-12":
Romac "306" series- all stainless steel
- PVC/ DI mains 14"-24"
Romac "305" series- all stainless steel

Gate valves:

- See note 20

Curb stops 1-1/2":

- Mueller #B24351 (1-1/2" elliptical meter flange x 1-1/2" IPT)
- AY McDonald #6101MW (1-1/2" elliptical meter flange x 1-1/2" IPT)

Curb stops 2":

- Mueller #B24351 (IPT x IPT) With locking wing
- AY McDonald (IPT x IPT) With locking wing

Meter box:

- See Table 3

C. 3" Service Taps/Connections:

Use 4" tapping sleeve and reduce to 3" just after the tapping valve for both "AC" and "PVC" mains. See Table 3 for meter box and Note 17 for gate valve.

D. 4" and LARGER Service Taps/Connections:

ROMAC "SST" Series Tapping Sleeve - All Stainless Steel

See Table 3 for meter box and Note 20 for gate valve.

27. Any question not covered by these specifications shall be referred to the IWA representative and shall be resolved to his satisfaction prior to proceeding.

28. All new water lines shall have a detectable marking tape buried 12" deep directly above the

water line. The detectable marking tape shall be aluminum foil, plastic encased, 5 mil thick, 6” wide, blue, with the words “Caution: Buried Water Line Below” permanently printed in large letters.

29. Abandonment of AC Pipe

AC pipe in the ground shall never be removed or otherwise disturbed, unless it becomes unavoidable/impractical. AC pipe shall never be crushed and buried in place. When AC pipe is cut the cutting blade and the pipe being cut must be continually flooded with water to prevent airborne dust. The technician who is doing the cutting must wear a protective dust mask. If AC pipe is disturbed or removed from the ground, it shall be handled properly (bagged) and disposed of in an approved landfill, if less than 260 linear feet of pipe is involved. If over 260 feet of AC pipe is damaged in any way, all aspects of state regulations (62257, F.A.C. and 40CFR61, subpart M) shall be followed.

30. Cathodic Protection

All the bolts on tapping saddles and repair clamps (“wraparounds”) shall be fitted with Mars Zinc Caps as manufactured by the Farwest Corrosion Control Company.

31. IWA Pressure & Leakage Test Specifications

The CONTRACTOR shall provide the necessary material, equipment and labor necessary to perform a pressure test and a leakage test on all water lines. All testing for defects and for leakage under pressure and disinfection, shall be performed in the presence of IWA unless otherwise instructed by the OWNER, and shall be subject to his approval before acceptance.

31a. Flushing

Prior to any testing the line must be thoroughly flushed at a rate of flow as shown in Table 1.

Pipes 4” and larger shall be cleaned by use of “flushing pigs”. The pigs shall be pushed the entire length of the new pipeline a minimum of 2 times. The pigs shall be reinserted and the process repeated until there is no visible matter and the water is completely clear. Pig launchers and any other apparatus used for the insertion of the pigs shall be completely removed once the flushing is complete.

Table 1
Rate of Flow For Flushing

Pipe Diameter (inches)	Rate of Flow (gallons per minute)
1	7
2	25
3	60
4	100
6	200
8	400
10	625
12	900
14	1200
16	1600

31b. Pressure Tests

1. After the pipe has been laid and flushed, it shall be subjected to a hydrostatic pressure test of 150 psi. The pressure test shall be made before the joints have been backfilled unless the backfill has been authorized by the ENGINEER. All saddles, hydrants, fittings, taps, etc. are to be completely installed prior to any testing.
2. Tests shall be made only after a minimum of 36 hours have elapsed after the last concrete thrust or reaction backing has been cast with high early strength concrete or at least 7 days after the last concrete thrust or reaction backing has been cast, using standard concrete.
3. The duration of the test shall be one hour unless otherwise directed by IWA.
4. Procedure: Each section of pipeline shall be slowly filled with water and the specified test pressure, measured at the point of lowest elevation, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the ENGINEER. The pump, pipe connection and all necessary apparatus shall be furnished by the contractor. The pressure gauge may be supplied by the OWNER if he desires.

During the filling of the pipe and before applying the specified test pressure, all air shall be expelled from the pipeline. During the test all exposed ends, fittings, valves, hydrants and couplings will be carefully examined. If found to be cracked or defective, they shall be removed and replaced by the CONTRACTOR with sound material without additional cost to IWA.

31c. Leakage Tests

Leakage tests shall be conducted after completion of the pressure test and shall consist of an examination of all exposed joints for leakage as well as overall leakage test of the completed pipeline.

The pressure to be maintained during the tests shall be 150 psi.

No test shall be made until at least 36 hours after the last concrete reaction or thrust block has been cast with high, early strength cement, or at least seven days after the last concrete thrust or reaction backing has been cast with standard cement. The duration on each leakage test shall be two hours.

Each section of pipeline shall be slowly filled with water and the specified test pressure shall be supplied by means of a pump connected to the pipe in a manner satisfactory to IWA. The pump, pipe connection, and all necessary apparatus shall be furnished by the CONTRACTOR.

Before starting the leakage tests, all air shall be expelled from the pipe.

All exposed pipes, fittings, valves, hydrants and joints shall be examined for leakage during the test. Any joint found where the accumulated leakage of that joint exceeds the rate of leakage specified in Table 2 will be rejected by IWA.

No pipe installation shall be accepted until leakage for the section of line tested is less than the rate of leakage specified in Table 2. In calculating leakage, the IWA will make allowance for added joints in the pipeline above those incidental to normal 20 foot lengths of pipe and for which Table 2 applies. Should any test in the section of pipeline disclose joint leakage

greater than that permitted, the CONTRACTOR shall at his own expense, locate and repair the defective joints until the leakage is within permitted allowance.

Table 2
Leakage Allowance
Test Pressure 150 psi

Pipe Diameter (inches)	Allowable leakage per 100 joints or couplings in gallons per hour
2	.33
4	.66
6	.99
8	1.32
10	1.66
12	1.99
14	2.36
16	2.65
20	3.31

32. Sterilization of Mains

Upon completion of the work or any usable portion thereof, and prior to placing the system or part thereof in operation, all mains, valves, etc. shall be thoroughly flushed and sterilized using a chlorine-gas and water mixture or a hypochlorite and water mixture applied in amounts sufficient to produce a dosage of 50 ppm.

The point of application of the sterilizing mixture shall be directed by IWA. Water from the existing system shall be controlled to flow slowly into the newly laid pipeline during the application of the chlorine. Treated water shall remain in the pipeline for not less than 24 hours. After the treated water has been retained for the required time, the chlorine residual at the pipe extremities should be at least 25 ppm.

Following sterilization, the treated water should be flushed from the pipe at its extremities.

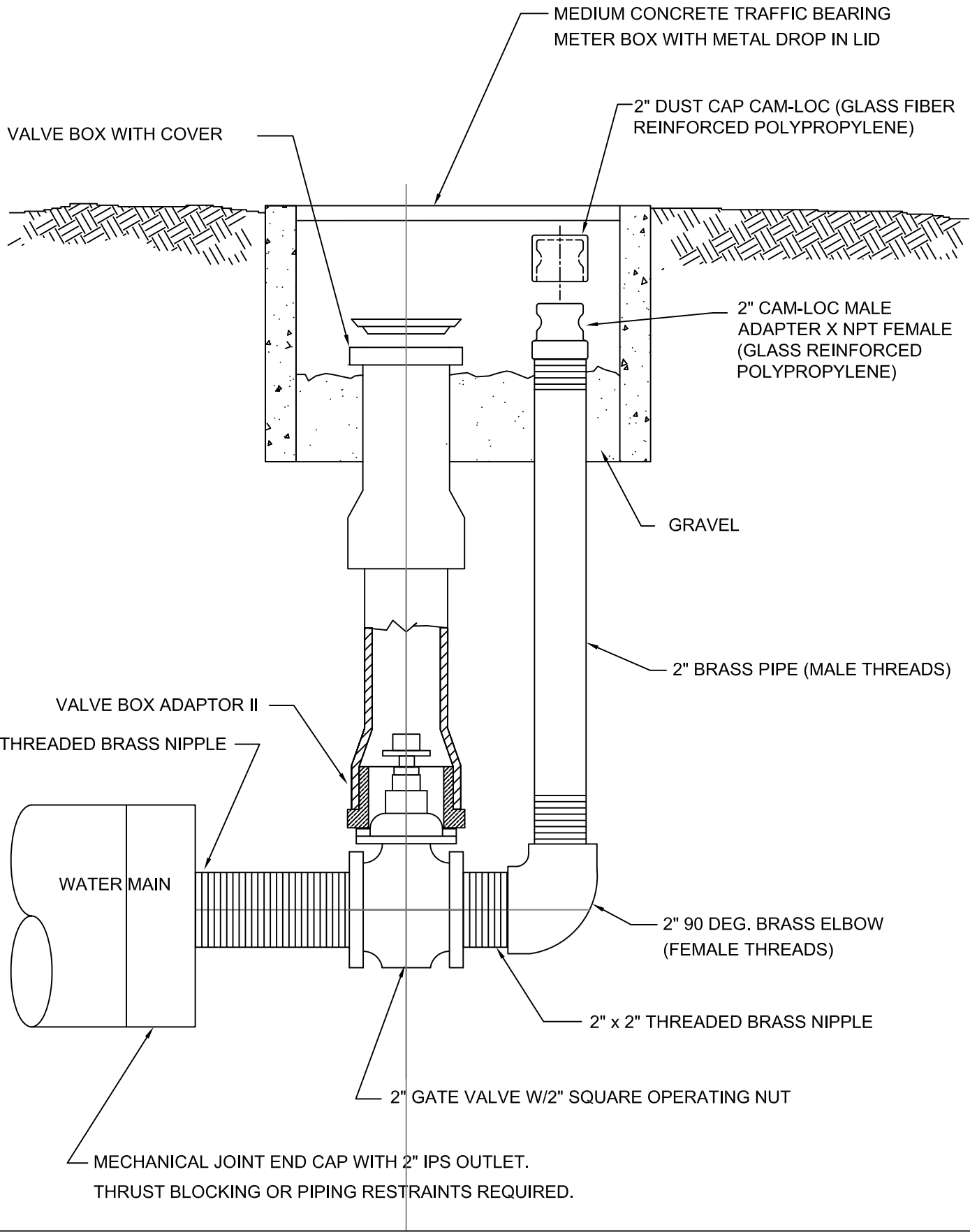
If necessary, repeat sterilization until the quality of water to be delivered through the system is satisfactory to IWA and the state Board of Health. Two (2) successive tests must be run to conform to the timetable of the local Health Department lab-testing schedule.

IWA representatives must be present when samples are to be collected.

Table 3

<u>METER SIZE</u>	<u>METER BOX PART #</u>	<u>VALVE & TAP SIZE</u>	<u>SERVICE LINE</u>	<u>CASING FOR JACK & BORE</u>
5/8"	CDR 1118	1"	1" Polyethylene	2"
1"	CDR 1118	1"	1" Polyethylene	2"
1 1/2"	CDR 1730	2"	2" Polyethylene	4"
2"	CDR 1730	2"	2" Polyethylene	4"
3"	CDR 1730	4"	4" C-900 *	8"
4"	CDR 1730	4"	4" C-900 *	8"

* With Restrained (Mega-Lug) Ductile Iron Fittings and Bell Restraints in Casing

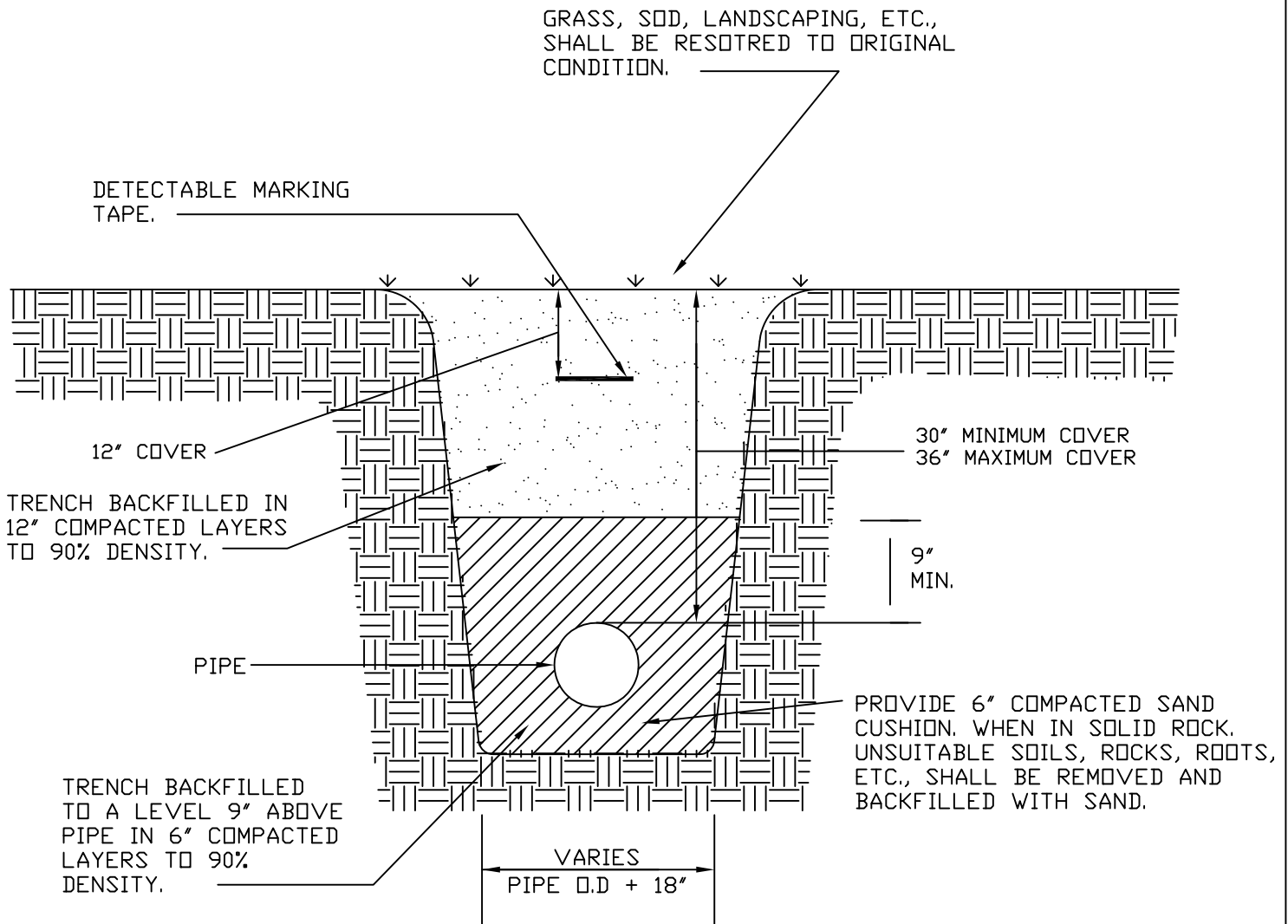


THE ISLAND WATER ASSOCIATION, INC.

3651 SANIBEL-CAPTIVA ROAD, SANIBEL FL 33957
 TELEPHONE: (941) 472-1502 - FAX: (941) 472-1505
 INTERNET: www.islandwater.com

**TYPICAL
 BLOWOFF**

DATE REVISED	REV
9-20-02	N/A
SCALE	
0" = 000'	
K-1	



NOTE:

SHEETING AND BRACES ARE REQUIRED WHERE SLOPES ARE NOT STABLE. TRENCHES MUST BE KEPT FREE OF WATER DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR ALL DEWATERING. TESTING BY AN APPROVED LABORATORY MAY BE REQUIRED TO CONFIRM PROPER COMPACTION. PAVEMENT RESTORATION MUST MEET APPLICABLE CITY AND COUNTY STANDARDS.

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**TYPICAL
 TRENCH
 DETAIL**

DATE	REVISED	REV
2-3-00		N/A
SCALE		
0"=000'		

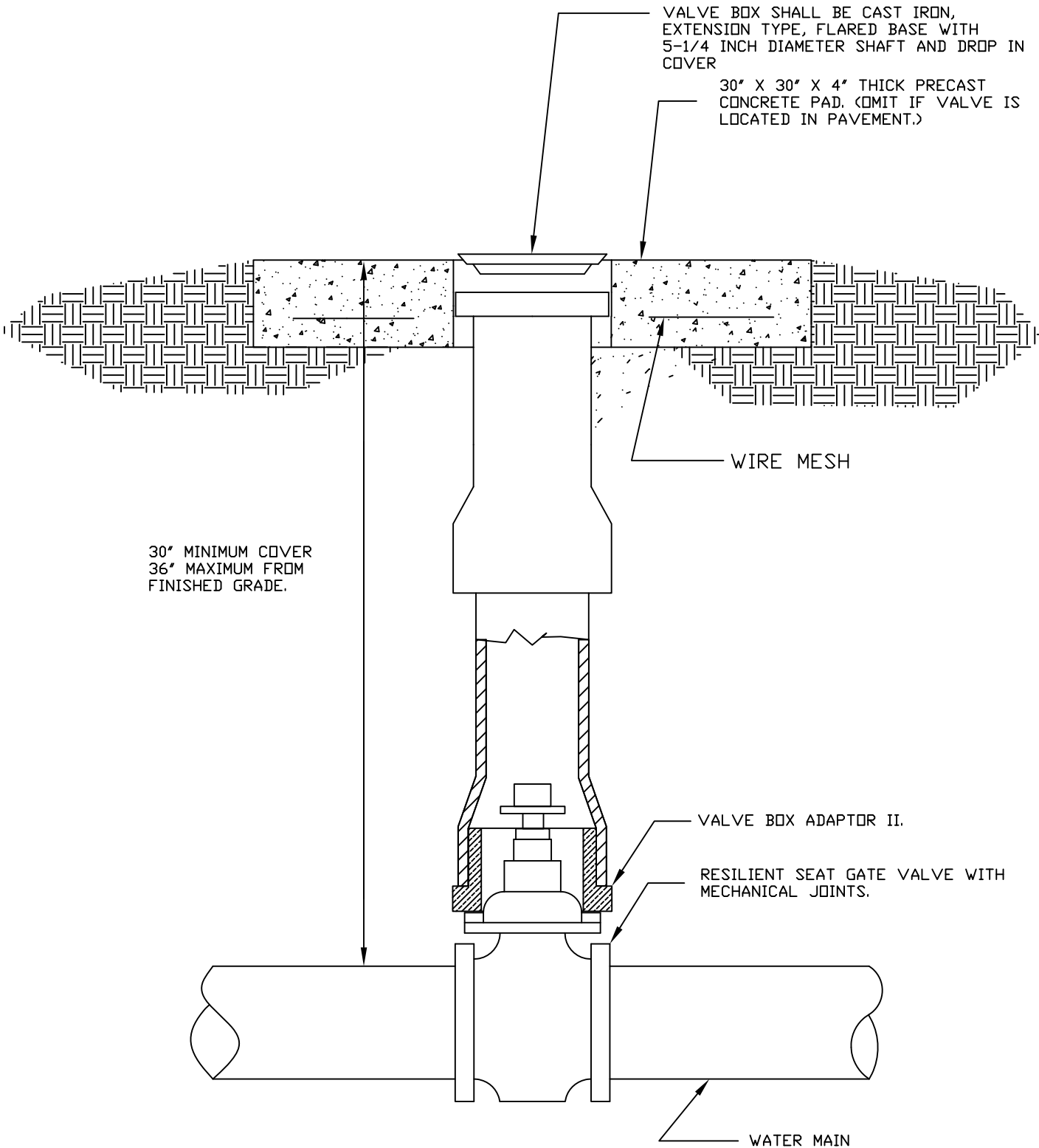
K-2

NOTE:

1. CONCRETE PAD MUST BE FLUSH WITH FINISHED GRADE.
2. SET VALVE BOX COVER 1" LOWER THAN PRECAST PAD.
3. VALVE BOX MUST NOT REST DIRECTLY ON THE WATER MAIN.
4. PVC PIPE SHALL NOT BE USED AS A SUBSTITUTE FOR THE VALVE BOX NOR SHALL PVC BE USED AS A VALVE BOX RISER.

VALVE BOX SHALL BE CAST IRON, EXTENSION TYPE, FLARED BASE WITH 5-1/4 INCH DIAMETER SHAFT AND DROP IN COVER

30" X 30" X 4" THICK PRECAST CONCRETE PAD. (OMIT IF VALVE IS LOCATED IN PAVEMENT.)



30" MINIMUM COVER
36" MAXIMUM FROM
FINISHED GRADE.

VALVE BOX ADAPTOR II.

RESILIENT SEAT GATE VALVE WITH
MECHANICAL JOINTS.

WATER MAIN

THE ISLAND WATER ASSOCIATION, INC.

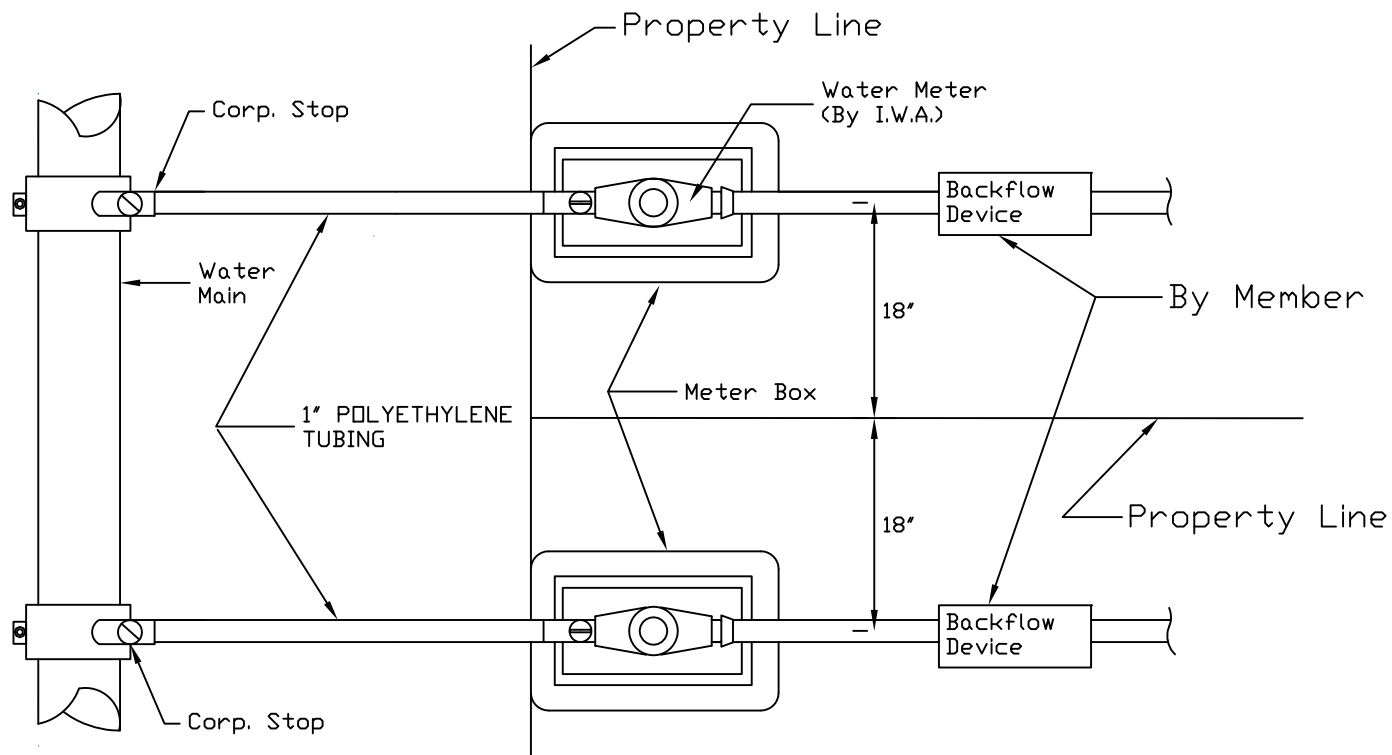
3651 SANIBEL-CAPTIVA ROAD, SANIBEL FL 33957
TELEPHONE: (941) 472-1502 - FAX: (941) 472-1505
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**TYPICAL VALVE
INSTALLATION**

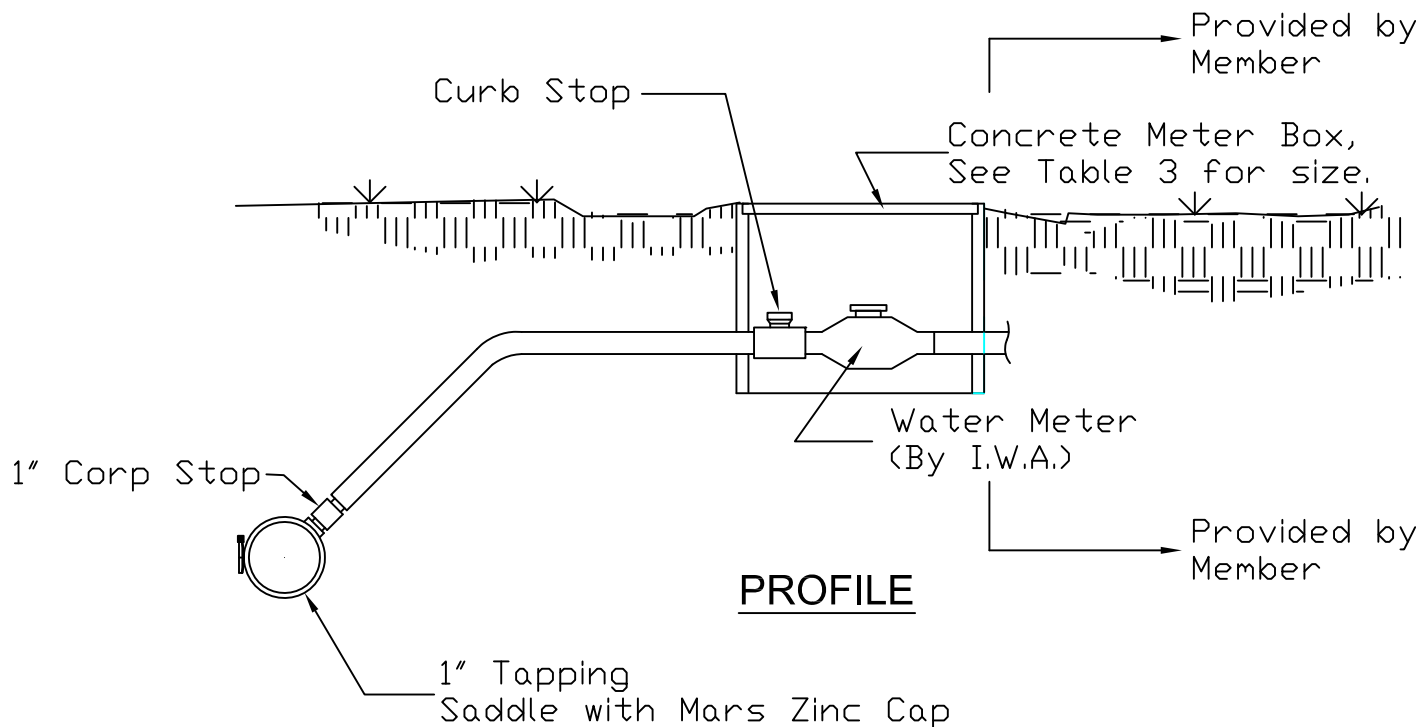
DATE	REVISED	REV
8-13-07		N/A

SCALE
0"=000'

K-3



PLAN

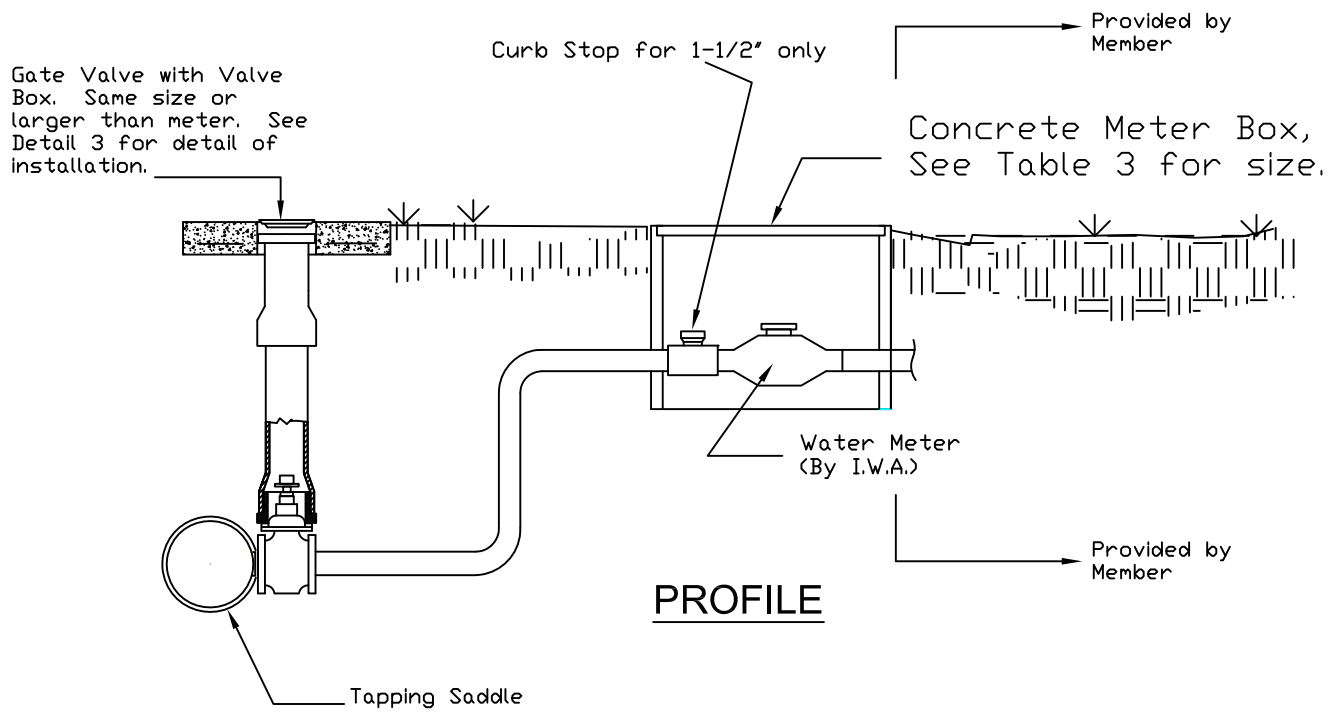
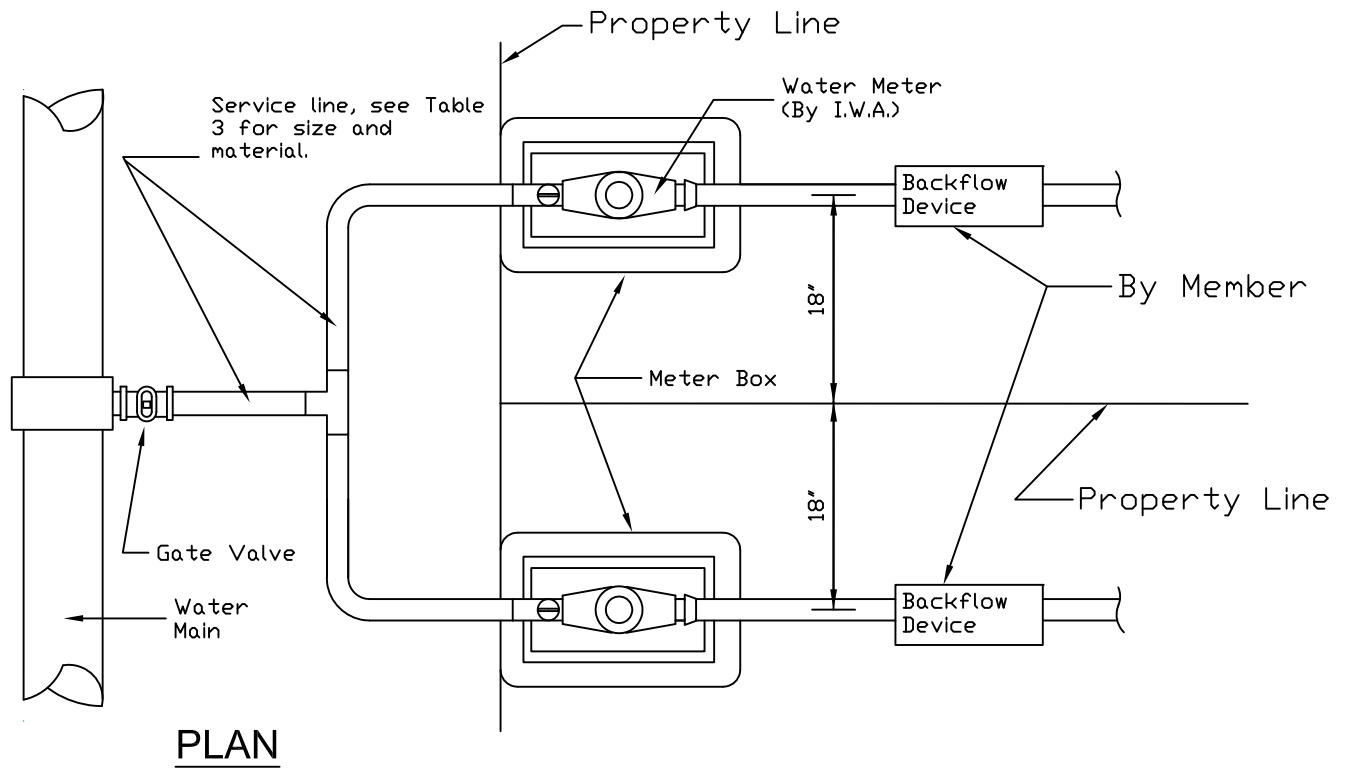


PROFILE

THE ISLAND WATER ASSOCIATION, INC.
 3651 SANIBEL-CAPTIVA ROAD, SANIBEL FL 33957
 TELEPHONE: (941) 472-1502 - FAX: (941) 472-1505
 INTERNET: www.islandwater.com

**5/8" & 1" TYPICAL SERVICE
 INSTALLATION**

DATE REVISED	REV
5-31-07	N/A
SCALE	
0" = 000'	
K-4	

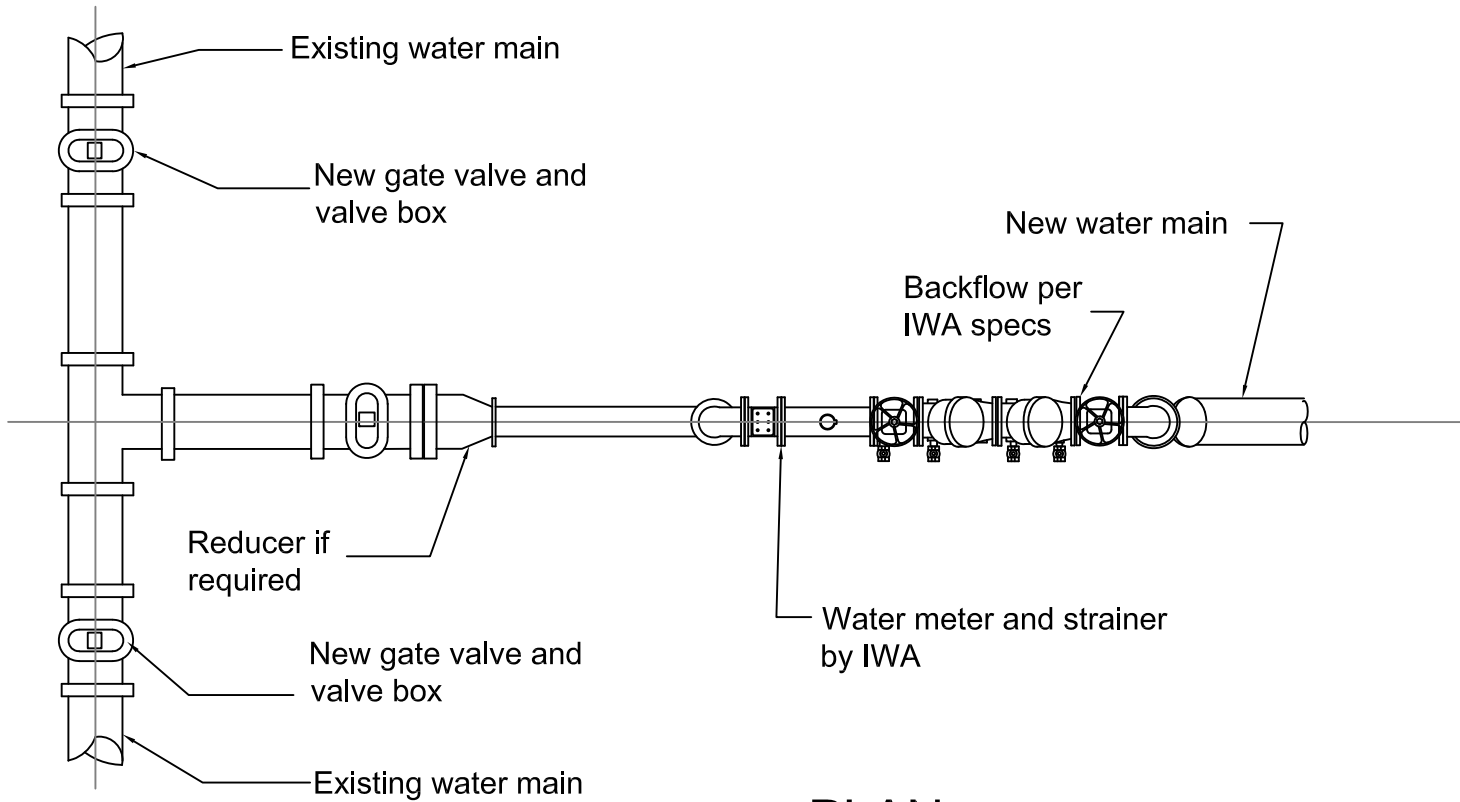


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3651 SANIBEL-CAPTIVA ROAD, SANIBEL FL 33957
 TELEPHONE: (941) 472-1502 - FAX: (941) 472-1505
 INTERNET: www.islandwater.com

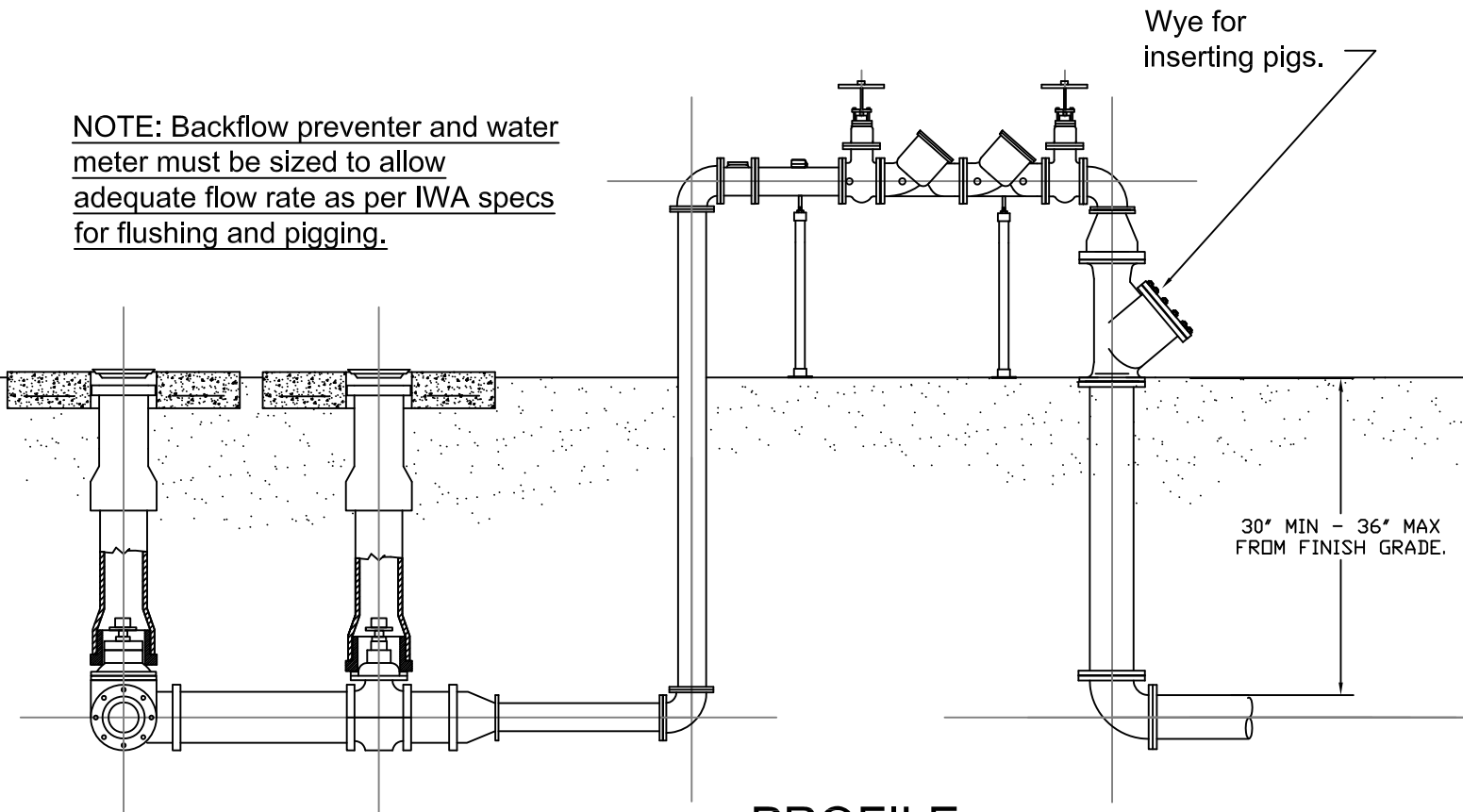
**TYPICAL SERVICE INSTALLATION
 1-1/2" AND LARGER**

DATE REVISED	REV
9-20-02	N/A
SCALE	
0" = 000'	
K-5	



PLAN

NOTE: Backflow preventer and water meter must be sized to allow adequate flow rate as per IWA specs for flushing and pigging.

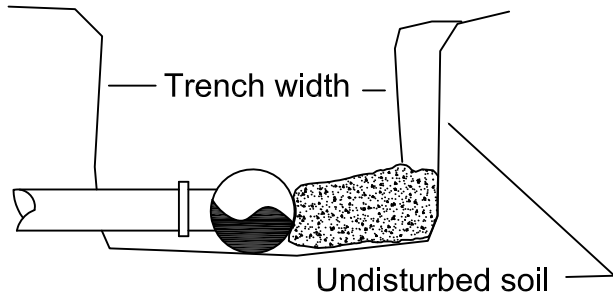


PROFILE

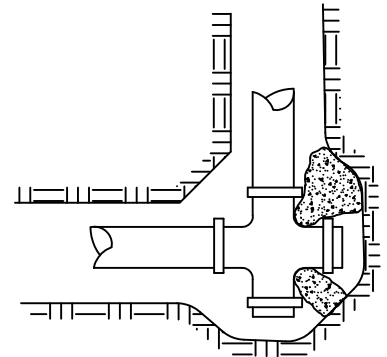
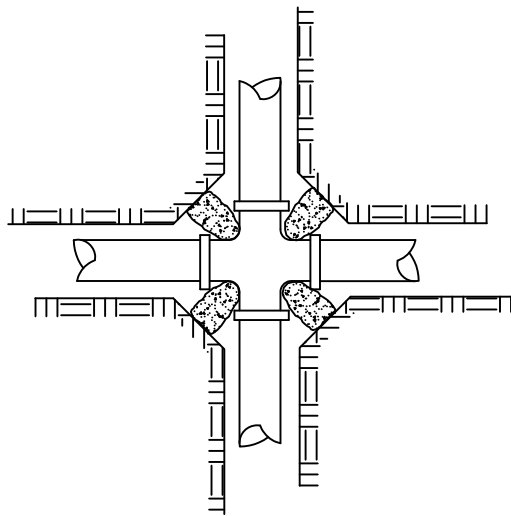
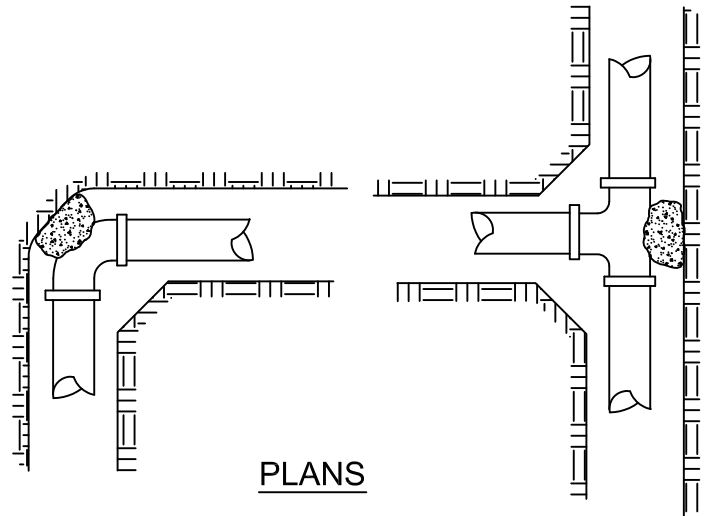
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 TELEPHONE: (941) 472-1502 - FAX: (941) 472-1505
 INTERNET: www.islandwater.com

**TYPICAL
 TEMPORARY
 CONNECTION**

DATE REVISED	REV
9-27-02	N/A
SCALE	
0" = 000'	
K-6	

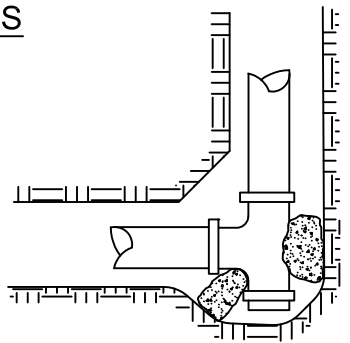
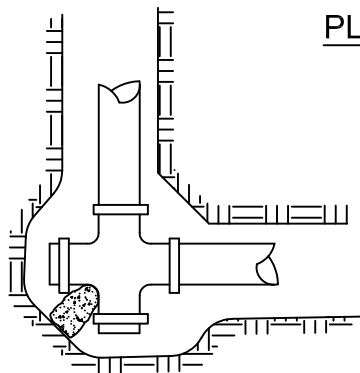


TYPICAL SECTION



NOTE:

See Table 4 for minimum thrust block sizes.
 All fittings shall be wrapped with 4mil. poethylene film before pouring thrust blocks.



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3651 SANIBEL-CAPTIVA ROAD, SANIBEL FL 33957
 TELEPHONE: (941) 472-1502 - FAX: (941) 472-1505
 INTERNET: www.islandwater.com

**TYPICAL THRUST
 BLOCKS**

DATE REVISED	REV
2-8-00	N/A

SCALE
 0" = 000'

K-7

Minimum thrust block sizes in square feet of concrete contact with undisturbed soil on the vertical trench wall.

Pipe Size	Tee	90 deg.	45 deg.	22.5 deg	11.25 deg.
2"	1.0	2.0	1.0	1.0	1.0
4"	1.5	2.0	2.0	1.0	1.0
6"	2.0	3.0	2.0	1.5	1.0
8"	4.0	5.0	3.0	1.5	1.5
10"	5.0	7.0	3.5	2.5	2.0
12"	8.0	10.0	5.0	3.5	2.0
14"	11.0	14.0	7.5	4.4	2.5
16"	14.0	19.0	10.0	5.0	2.5
18"	18.0	24.0	13.0	7.5	3.0
20"	22.0	29.0	16.0	8.0	4.0

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 INTERNET: www.islandwater.com

TABLE 4

DATE REVISED	REV
2-16-00	N/A

SCALE
 0" = 000'

K-8