WATER

(Part III)

* General Requirements

WATER DISTRIBUTION SYSTEM

(General Requirements)

1. Proposed water mains must be in accordance with the City of Troutdale's Public Facilities Plan. Main sizes must deliver adequate fire flows (of no less than 1000 gpm for single dwelling residential areas, and no less than 1500 gpm for commercial and industrial developments) plus normal system demand while maintaining a minimum residual pressure of 20 psi, as required by law. During normal demand periods, a minimum pressure of 45 psi is required. If this pressure is not available in the zone in which the new pipe is being placed, means to increase pressure, to no less than 45 psi, will be required. Associated expenses will be incurred by the developer.

2. All proposed water main additions to the City's existing water system shall be added to our current automated water model, and simulations performed of future on-site water demands for fire, peak hours, and normal domestic, industrial and commercial usage. Other demand situations may be required and run by the City. All simulations shall be done and approved by the City prior to "final" approval of construction plans. All costs associated with these water model analysis will be forwarded to the developer for reimbursement.

3. All construction/installation of water mains shall be done in a safe, neat and workmanlike manner, and under supervision by City forces at all times. All safety requirements from OSHA and other State regulating agencies must be met.

4. Water mains shall be looped wherever feasible. Water mains must be looped within cul-de-sacs if the street exceeds 350 feet in length and serves more than 12 lots.

5. Water main pipe material shall be Class 52 ductile iron only.

6. Air relief valves, pressure relief valves, pressure reducing valves, backflow prevention valves, etc., shall be used where necessary.

7. Hydrants shall be spaced such that all residential structures can be reached with 400 feet of hose. Hydrants shall be within 150 feet of commercial and industrial structures. This distance requirement may vary as directed by the fire marshal. Therefore, these distances are subject to change before these standards are updated.

8. Hydrants should be located at street intersections and at cul-de-sac entrances rather than at mid-block when possible. The typical location for fire hydrants is at the end of the curb returns and/or in direct alignment to a common property line to two lots. Do not place fire hydrants in the middle of a lot frontage. Connect fire hydrants to the largest main or to the main which provides a looped flow. Connection of a fire hydrant

to a main less than 6-inches is prohibited, and if two or more fire hydrants are required, an 8" minimum diameter pipe shall be used.

9. A minimum of a 6-inch diameter main shall be installed if the line will be extended in the future.

Amended see IC#12 - P1

10. Fire hydrant styles shall be Mueller 200, Kennedy Guardian K-81, Clow Medallion, or Waterous Pacer 6790 with two hose connections and one pumper nozzle. All fire hydrants to become public shall be painted safety yellow and all private hydrants painted safety red.

Amended see IC#38

11. Blow-off assemblies are required at all dead-end lines. Locate blow-off assemblies four feet from face of curb, within the street (see Drawing No. IV-17 for further detail).

12. An 18-inch minimum horizontal separation is required between service taps on a water main line.

13. When water service is extended to a property, it must be done by means of a properly-sized water main (minimum diameter 4" if serving fewer than 12 lots and no fire hydrants; minimum diameter 6" otherwise brought at least to the property line of the affected parcel. Service lines will not be used to extend water service within public right-of-way or across a third party's property

14. Lots may be served by a single or a double service line. The single service lines shall be 3/4 inch minimum diameter, and the double service lines shall be a 1-inch minimum diameter, type "K" copper pipe material. Only two 3/4-inch diameter water service lines are allowed to be branched off from a 1-inch diameter service line tap. Water services, meters and meter boxes must be placed far enough away from fire hydrants and/or light poles to avoid conflict with curb weepholes. All "public" parcels designated as open, and to be used as greenways, must be served with a water service large enough to adequately irrigate the site. Location and size of service for irrigation or otherwise will be determined by the City.

Superseded see IC# 2

15. Each half of a duplex shall be served with individual service lines and individual meters.

16. Four-inch water lines shall service no more than twelve lots, and no fire hydrants. The City reserves the right to require that a larger size diameter pipe be used - determined by the type of project at hand.

17. Class 52 ductile iron may be tapped direct (with no saddle but with corporation stop) for 3/4 inch and 1-inch size services. Saddles shall be used on all taps greater than 1 inch in diameter.

18. **All elbows/bends on water mains shall have thrust blocks as shown on the enclosed Standard Drawings.**

19. **A water sampling station(s) may be required at all new subdivisions, and as part of new commercial and industrial developments when additions to the water distribution system are included. See drawing IV-7. The exact location for the sampling station(s) will be determined by the City on a per-project basis.**

20. **A depth of 36-inches from finished grade to the top of the water main is required. Placing water lines deeper or shallower than 36" inches is prohibited. As such, it may be necessary to have an Oregon State licensed surveyor field stake the ultimate elevation of the water main if the water main is placed before curbs and gutters are in place.**

21. **All new pipes must be properly flushed, pressure tested, and chlorinated by the contractor, and inspected by City forces. Bacteriological samples will be taken by the City when requested by the general contractor. The operation of nearby water valves (opening and closing) by the contractor during flushing is strictly prohibited. This will only be done by City forces, when so requested by the contractor. This is required for private and public lines larger than 1-inch. The discharge of over chlorinated water with a total chlorine residual greater than 3 mg/L regardless of volume, shall not be discharged to surface waters or storm sewers.**

22. **All backflow prevention devices (double check backflow preventors, reduced pressure backflow preventors, pressure and atmospheric vacuum breakers, etc.) must be approved by the Oregon State Health Division. All service lines greater than 1-inch shall have a double check backflow preventor as minimum protection. All 3/4-inch and 1-inch water services shall have a minimum of a single check valve installed by the City if a backflow prevention device is not required of the property owner and/or developer. All irrigation systems shall have a double check backflow preventor device.**

23. **The builder/developer must provide the City any guarantee or warranty normally furnished with the purchase of equipment or materials used in connection with the project at hand. In addition, they must furnish a written warranty providing satisfactory in-service operation of work performed by affected contractor (including, but not limited to mechanical, electrical, on-site permanent concrete structures, water main, valves, fire hydrants, etc.) for a period of two (2) years following date of project acceptance.**

Deleted meter types - see IC#14

24. **The following is a list of acceptable/existing materials and/or equipment currently in use by the City's water distribution system:**

Water meters:

Meter sizes/ types Superceded - see IC #39

- 3/4" and 1" size: Sensus SRI with gallon register
- 1 1/2" and 2" size: Sensus SRI or Neptune with gallon register
- Fire hydrant meter: Neptune's Trident
- Compound Meter: Sensus only
- Turbine Meter: Sensus and Neptune's Trident

Superseded by IC #14

*Note: All meters that are installed inside a vault considered to be a confined space must have a remote readout configuration.

Water Valves:

- 4", 6" and 8" diameter: gate valves must meet or exceed AWWA C-500 standards
- 10" and 12" diameter: butterfly valves must meet or exceed AWWA C-504 standards

Water Pipe:

- Large diameter (4" and greater): ductile iron, class 52
- Fittings: Ductile Iron Class 350
- 1 1/2" and 2" diameter: Type K, soft or rigid copper
- 3/4" and 1": Type K, soft copper
- 3/4" and 1" brass fittings: McDonald MAC-PAK, Mueller C110 and Ford PAC joint (includes ball and key style fittings)
- Use Mueller C110 fittings for 2" and larger diameter fittings

Meter Boxes:

Superceded see IC# 7 Paragraph A

Superceded by IC #27 Paragraph A.

*See IC 32 for additional specifications

- With 3/4" and 1" meters: Brooks 36-H or meter box equipment company #66H with reader lid for landscaped areas; and Brooks 36T or meter box equipment company #66H or equal, when placed in concreted areas.
- With 1 1/2" meters without by-pass plumbing: Brooks 38-H or meter box equipment co. #68
- With 2" meters without by-pass plumbing: Brooks 65-H or meter box equipment co. #69

Automatic Valves:

- Clayton

Pilot Control Valves:

- **Clayton 20-200 PSI**

Valve Boxes:

- **Model #910**

Backflow Devices:

- **All must be Oregon State Health approved.**

Fire Service Vaults with Fire Department Connections:

- **4"- use 676-WA**
- **6" - use 687-WA**
- **8" - use 5106-LA**
- **10" - use 5106-LA**

Fire Service Vaults without Fire Department Connections:

- **3" - use 466 or 660**
- **4" - use 577-WA**
- **6" - use 676-WA**
- **8" - use 687-WA**
- **10" - use 5106-LA**

Gauges:

- **0-200 PSI, 3 1/2" face**

Meter Vaults:

2" - with bypass plumbing vault. Shall meet minimum clearances as shown in Construction Detail IV-12. Reference to construction Detail IV-12 is made to observe minimum clearances in vault only.

- **3" - use 676-WA**
- **4" - use 687-WA**
- **6" - use 687-WA**
- **8" - use 810-LA**

*** Note: All vaults with remote readouts must have a Brooks 37 lid in addition to the normal doors.**

Vault Doors:

- Shall be galvanized diamond plate and spring assisted model #332P. H-20 rating for traffic areas, and H-10 for landscaped areas.

Note: The above equipment and materials are listed for information only. An "equal" substitute of materials and/or equipment can be proposed to the City for consideration and approval.

25. **All new connections to existing water mains require issuance of a public works permit and inspection by the City prior to backfilling. A permit fee of $50.00 will be assessed for each connection/inspection.**

26. **All other construction practices (relating to water) within the City's public right-of-way, not covered in these "general requirements" and/or in the "construction details" sections, shall comply with the rules and regulations in the most recent editions of the American Public Works Association Standard Specifications for Public Works Construction, the Standards of the American Water Works Association and the Oregon State Health Division rules.**

Deleted - Replaced by IC #22.

27. **As required by OAR 333-61-060, all construction plans of public improvements involving the construction of new water distribution lines must be sent to the OSHD for their review and approval. This will be done by the City upon submittal of accepted drawings and the required fee by the developer. OSHD approval must be sent to the City before an authorization to begin construction can be granted.**

28. **Public water lines within streets will only be installed in public rights-of-way. Any waterline installed within private streets will be privately owned and maintained. Public responsibility for the water distribution system stops at the water meter.**

29. **All new improvements proposed for construction and intended for public dedication (once these facilities are constructed to City standards) must be proposed to the City in writing, by the developer and/or legal owner of the project, prior to the receipt of an authorization to begin construction from the City. This formal written request from the developer/owner to the City must be reviewed and approved by the City, and then signed by both parties to formally bind both parties to the agreement.**

WATER

(PART IV)

* Construction Details

(HORIZONTAL) BEARING AREA OF THRUST BLOCKS IN SQUARE FEET									(VERTICAL) VOLUME OF THRUST BLOCK IN CUBIC YARDS			
FITTING SIZE	TEE, WYE, DEAD END AND HYDRANT	STRADDLE BLOCK	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22-1/2° BEND	11-1/4° BEND	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
				A-1	A-2							
4	1.0	1.6	1.4	1.9	1.4	1.0	---	---	---	---	---	---
6	2.1	3.7	3.0	4.3	3.0	1.6	1.0	---	1.3	---	---	---
8	3.8	6.5	5.3	7.6	5.4	2.9	1.5	1.0	2.3	1.1	---	---
10	5.9	10.2	8.4	11.8	8.4	4.6	2.4	1.2	3.7	1.8	---	---
12	8.5	14.7	12.0	17.0	12.0	6.6	3.4	1.7	5.5	2.8	1.2	---
14	11.5	---	16.3	23.0	16.3	8.9	4.6	2.3	7.6	3.9	1.7	---
16	15.0	26.1	21.3	30.0	21.3	11.6	6.0	3.0	9.9	5.1	2.3	0.9
18	19.0	---	27.0	38.0	27.0	14.6	7.6	3.8	---	---	---	---
20	23.5	40.8	33.3	47.0	33.3	18.1	9.4	4.7	---	---	---	---
24	34.0	58.8	48.0	68.0	48.0	26.2	13.6	6.8	---	---	---	---

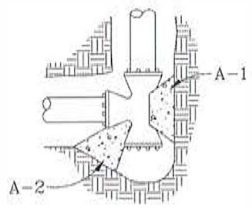
NOTES:

1. ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 PSI 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:

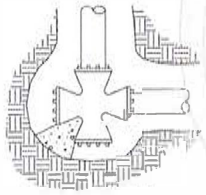
   BEARING AREA = (TEST PRESSURE / 150) x (2000 / SOIL BEARING STRESS) x (TABLE VALUE)

2. ABOVE VOLUMES BASED ON TEST PRESSURE OF 150 PSI AND THE WEIGHT OF CONCRETE = 4050 POUNDS PER CUBIC YARD. TO COMPUTE FOR DIFFERENT TEST PRESSURES, USE THE FOLLOWING EQUATION:

   VOLUME = (TEST PRESSURE / 150) x (TABLE VALUE)



TEE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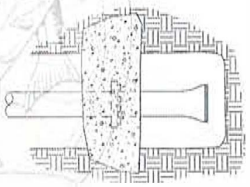
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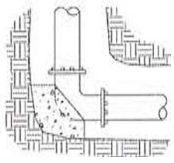
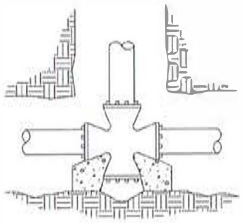

BEND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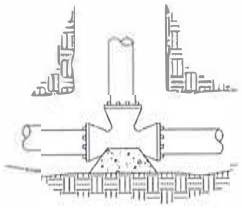
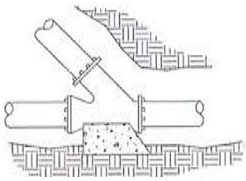
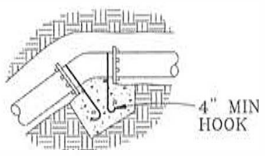

TEE


WYE



VERTICAL BEND

RODS FOR VERTICAL BENDS		
FITTING SIZE	ROD SIZE	EMBEDMENT
12" AND LESS	#6	30"
14"-16"	#8	36"

GENERAL:

1. CONCRETE BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. ALL CONCRETE TO BE 2400 PSI @ 28 DAYS, MINIMUM.
3. INSTALL ISOLATION MATERIAL BETWEEN PIPE AND/OR FITTINGS BEFORE POURING CONCRETE BLOCKING.
4. CONCRETE SHALL BE KEPT CLEAR OF ALL JOINTS AND ACCESSORIES. DO NOT POUR CONCRETE DIRECTLY ON PIPE.
5. TIE RODS SHALL BE DEFORMED GALVANIZED COLD ROLLED STEEL, 40000 PSI TENSILE STRENGTH.
6. ALL THRUST BLOCKS MUST BE INSPECTED BY CITY FORCES BEFORE COVERING.

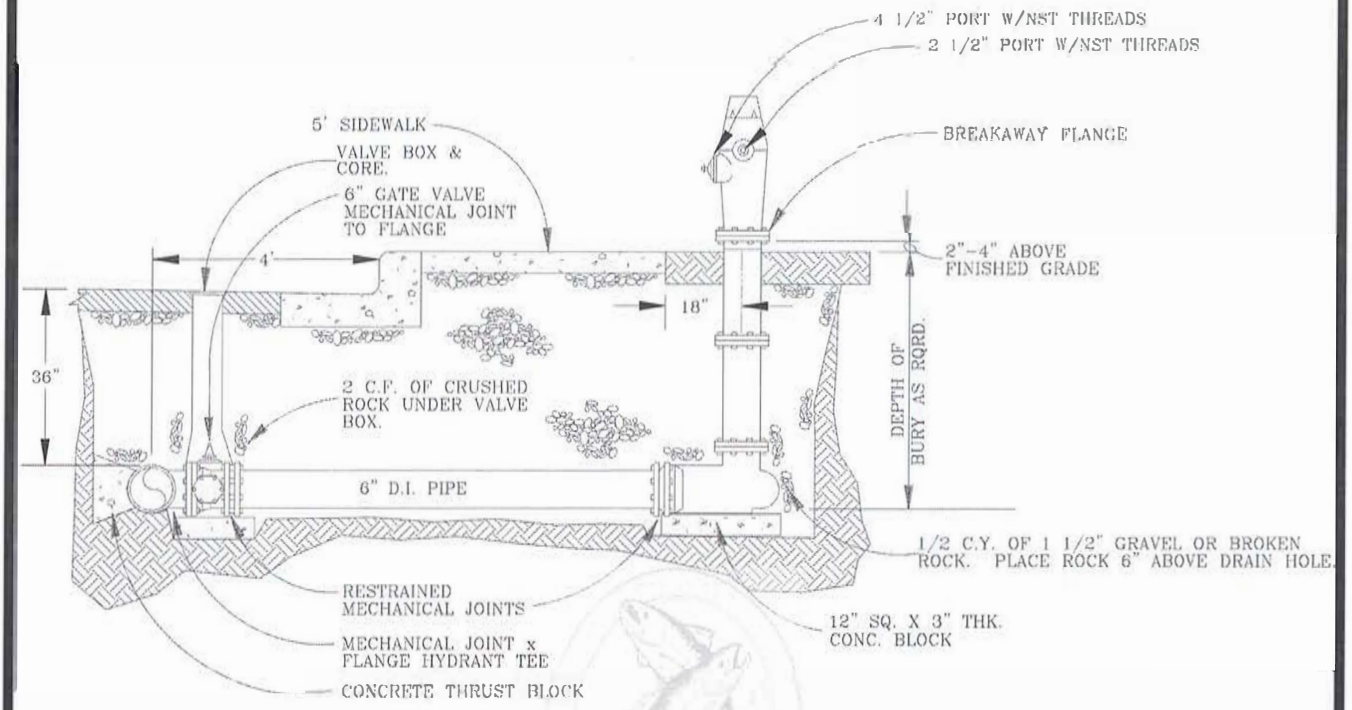
CITY OF TROUTDALE

THRUST BLOCKS

DATE: UPDATED 1997

DRAWING NO. IV - 1

FILENAME: APWA0036.DWG



BEHIND SIDEWALK INSTALLATION

GENERAL NOTES

1. WHEN PIPE IS SHORTER THAN 18', NO JOINTS ARE ALLOWED. USE MECHANICAL JOINT RETAINER GLANDS. TWO 3/4" GALVANIZED TIE RODS MAY BE USED IN LIEU OF THRUST BLOCKS FOR INSTALLATIONS LESS THAN 18' LONG. TIE RODS SHALL BE COATED WITH TWO COATS OF BITUMASTIC.
2. WHEN PIPE IS LONGER THAN 18', RESTRAINED MECHANICAL JOINTS ARE NOT REQUIRED.
3. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED AS PER THRUST BLOCK STANDARD DRAWING # IV - 1
4. FIRE HYDRANT PUMPER PORT SHALL FACE DIRECTION OF ACCESS TO THE HYDRANT.
5. FIRE HYDRANTS SHALL BE PLACED TO PROVIDE A MINIMUM OF 5' CLEARANCE FROM DRIVEWAYS, LIGHT POLES, METER SERVICES & BOXES AND OTHER STRUCTURES.
6. PUBLIC HYDRANTS SHALL BE PAINTED SAFETY YELLOW; PRIVATE HYDRANTS SAFETY RED.
7. HYDRANTS ALLOWED:
   A) MUELLER 200
   B) WATEROUS PACER 6790
   C) KENNEDY K-81 GUARDIAN
   D) CLOW MEDALLION
   E) OR APPROVED EQUAL

   Superseded see IC#12 P2 11/2/04

   ALL HYDRANTS MUST HAVE 1-1/2" OPERATING NUT & NATIONAL STANDARD FIRE HOSE THREAD.
8. ENSURE THAT THE FIRE HYDRANT IS INSTALLED HORIZONTALLY & VERTICALLY LEVELED.

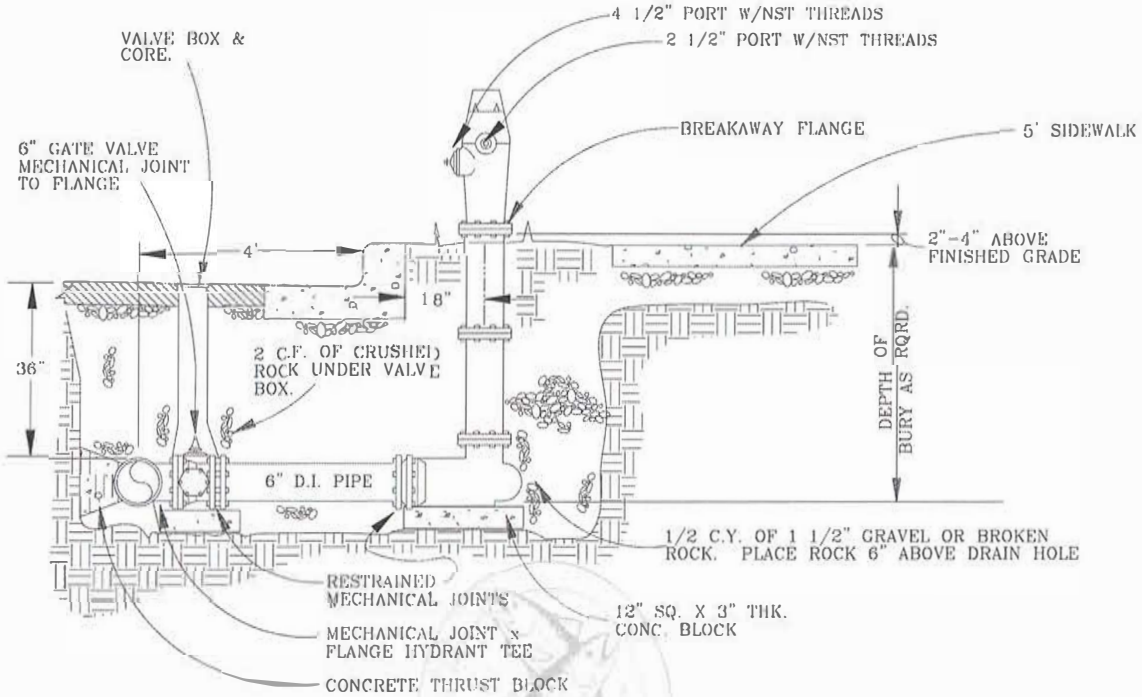
Superseded see IC#20 P1 5/17/12

CITY OF TROUTDALE

FIRE HYDRANT ASSEMBLY (BEHIND SIDEWALK)

DATE	DRAWING NO.
UPDATED 1997	IV - 2

FILENAME APWA0112.DWG



BEHIND CURB INSTALLATION

GENERAL NOTES

1. WHEN PIPE IS SHORTER THAN 18', NO JOINTS ARE ALLOWED. USE MECHANICAL JOINT RETAINER GLANDS. TWO 3/4" GALVANIZED TIE RODS MAY BE USED IN LIEU OF THRUST BLOCKS FOR INSTALLATIONS LESS THAN 18' LONG. TIE RODS SHALL BE COATED WITH TWO COATS OF BITUMASTIC.
2. WHEN PIPE IS LONGER THAN 18', RESTRAINED MECHANICAL JOINTS ARE NOT REQUIRED.
3. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED AS PER THRUST BLOCK STANDARD DRAWING # IV - 1
4. FIRE HYDRANT PUMPER PORT SHALL FACE DIRECTION OF ACCESS TO FIRE HYDRANT.
5. FIRE HYDRANTS SHALL BE PLACED TO PROVIDE A MINIMUM OF 5' CLEARANCE FROM DRIVEWAYS, LIGHT POLES, METER SERVICES & BOXES AND OTHER STRUCTURES.
6. PUBLIC HYDRANTS SHALL BE PAINTED SAFETY YELLOW; PRIVATE HYDRANTS SAFETY RED.
7. HYDRANTS ALLOWED:
   A) MUELLER 200
   B) WATEROUS PACER 6790
   C) KENNEDY K-81 GUARDIAN
   D) CLOW MEDALLION
   E) OR APPROVED EQUAL

   Superseded see IC#12 P3 11/2/04

   ALL HYDRANTS MUST HAVE 1-1/2" OPERATING NUT & NATIONAL STANDARD FIRE HOSE THREAD.
8. ENSURE THAT FIRE HYDRANT IS INSTALLED HORIZONTALLY & VERTICALLY LEVELED.

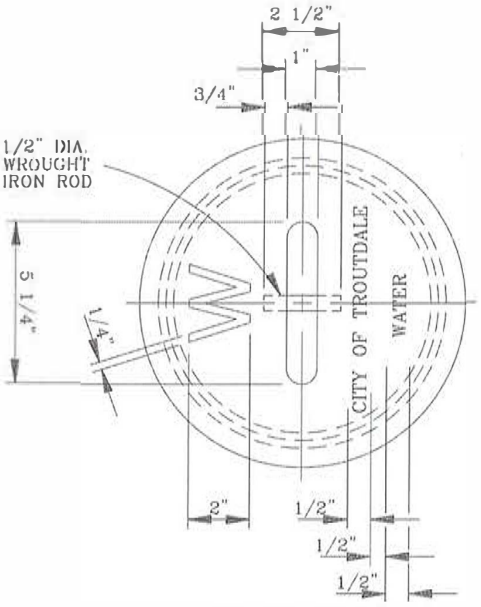
Superseded see IC#20 P2 5/17/12

CITY OF TROUTDALE

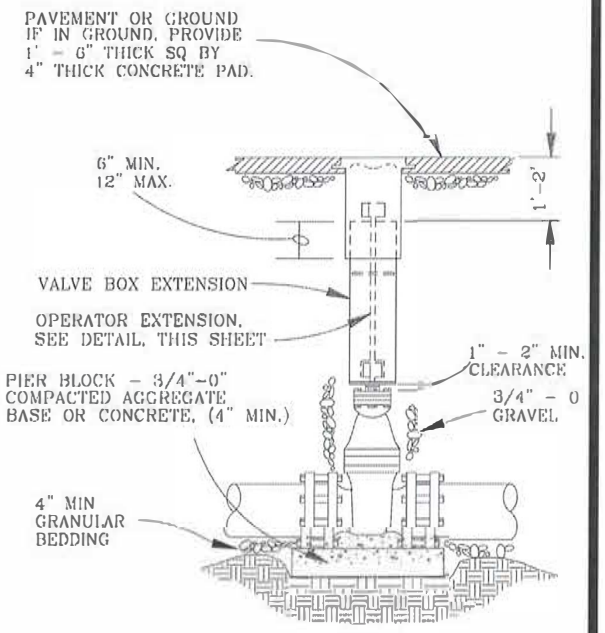
FIRE HYDRANT ASSEMBLY (BEHIND CURB)

DATE:	DRAWING NO.
UPDATED 1997	IV - 3

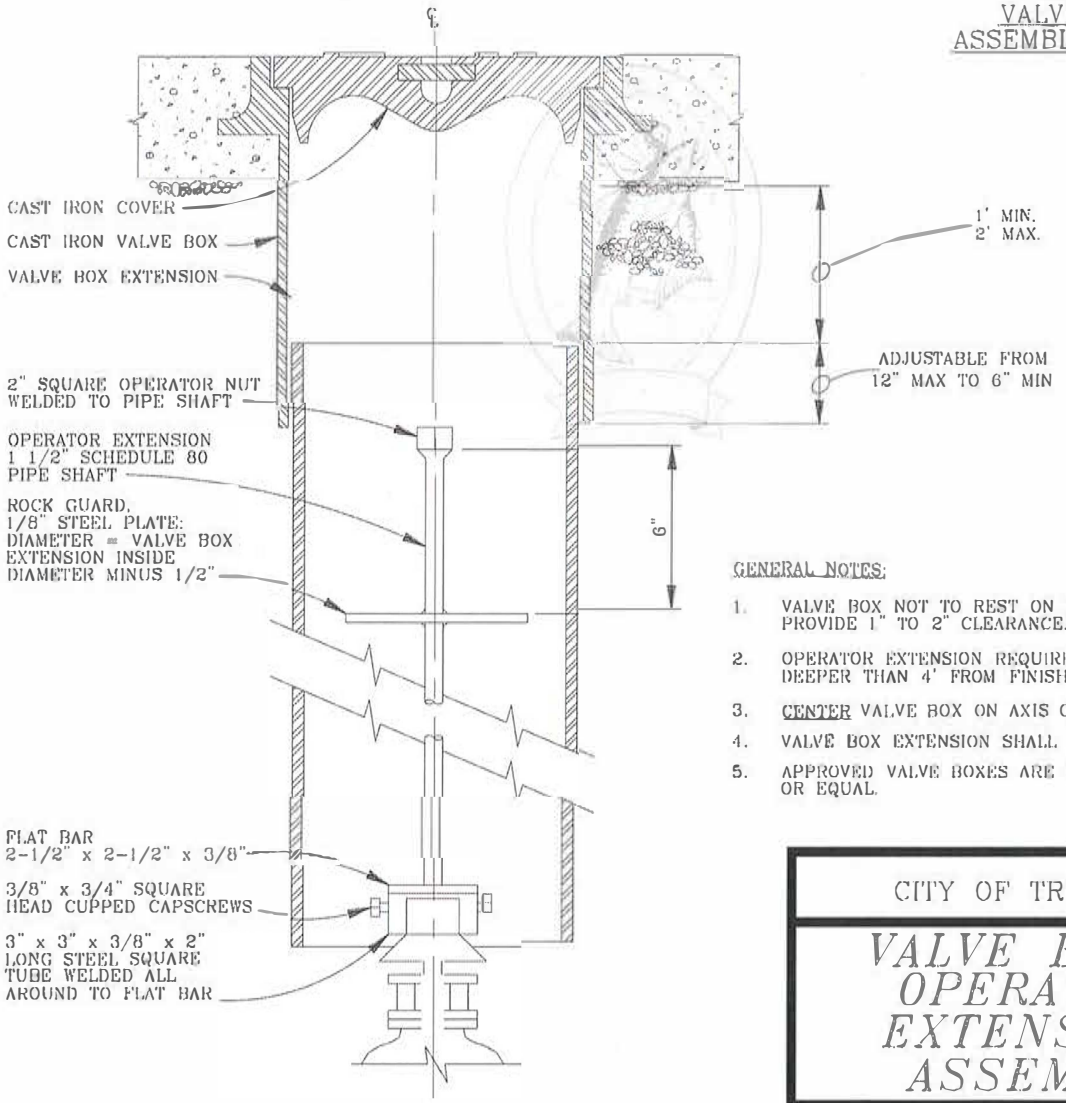
FILENAME: ADWA0110.DWG



COVER PLAN



VALVE BOX
ASSEMBLY DETAIL



VALVE BOX EXTENSION SECTION

GENERAL NOTES:

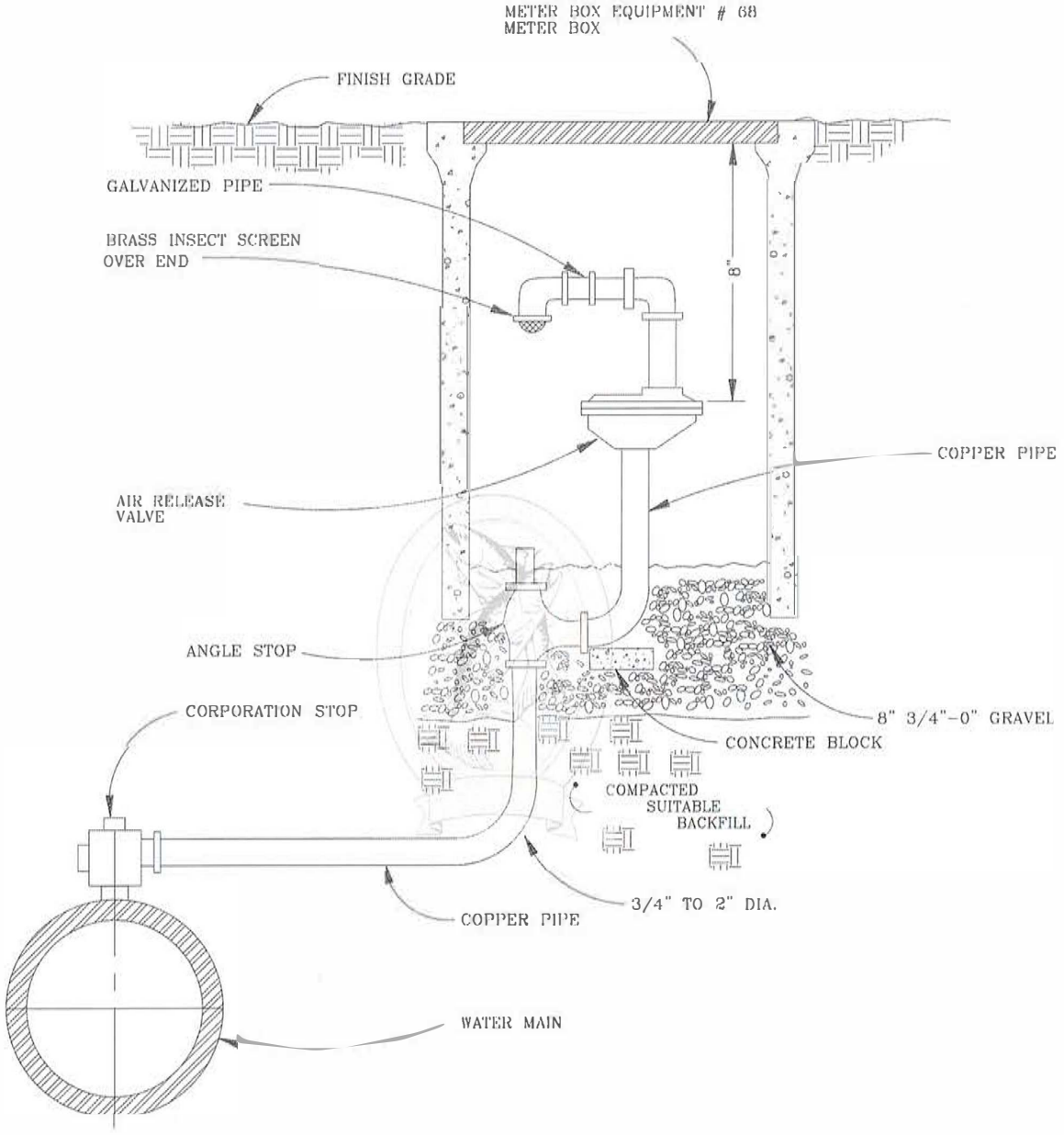
1. VALVE BOX NOT TO REST ON OPERATING ASSEMBLY. PROVIDE 1" TO 2" CLEARANCE.
2. OPERATOR EXTENSION REQUIRED WHEN VALVE NUT IS DEEPER THAN 4' FROM FINISH GRADE.
3. CENTER VALVE BOX ON AXIS OF OPERATOR NUT.
4. VALVE BOX EXTENSION SHALL BE CAST IRON.
5. APPROVED VALVE BOXES ARE STYLES 910, OR EQUAL.

CITY OF TROUTDALE

VALVE BOX & OPERATOR EXTENSION ASSEMBLY

DATE:	DRAWING NO.
UPDATED 1997	IV - 4

FILENAME: APWA0038.DWG



GENERAL NOTES:

1. AIR-RELEASE AND VALVE ASSEMBLIES SHALL BE INSTALLED AT WATERMAIN HIGH POINTS. THE BREATHER TUBE SHALL EXTEND ABOVE GROUND FACING DOWNWARD. ELBOW MUST BE SCREENED AS SHOWN.
2. PIPE AND VALVE SIZES SHALL BE SPECIFIED FOR EACH PROJECT BY THE DEVELOPER'S ENGINEER AND/OR THE CITY.

CITY OF TROUTDALE

AIR RELEASE VALVE ASSEMBLY

DATE: UPDATED 1997

DRAWING NO. IV - 5

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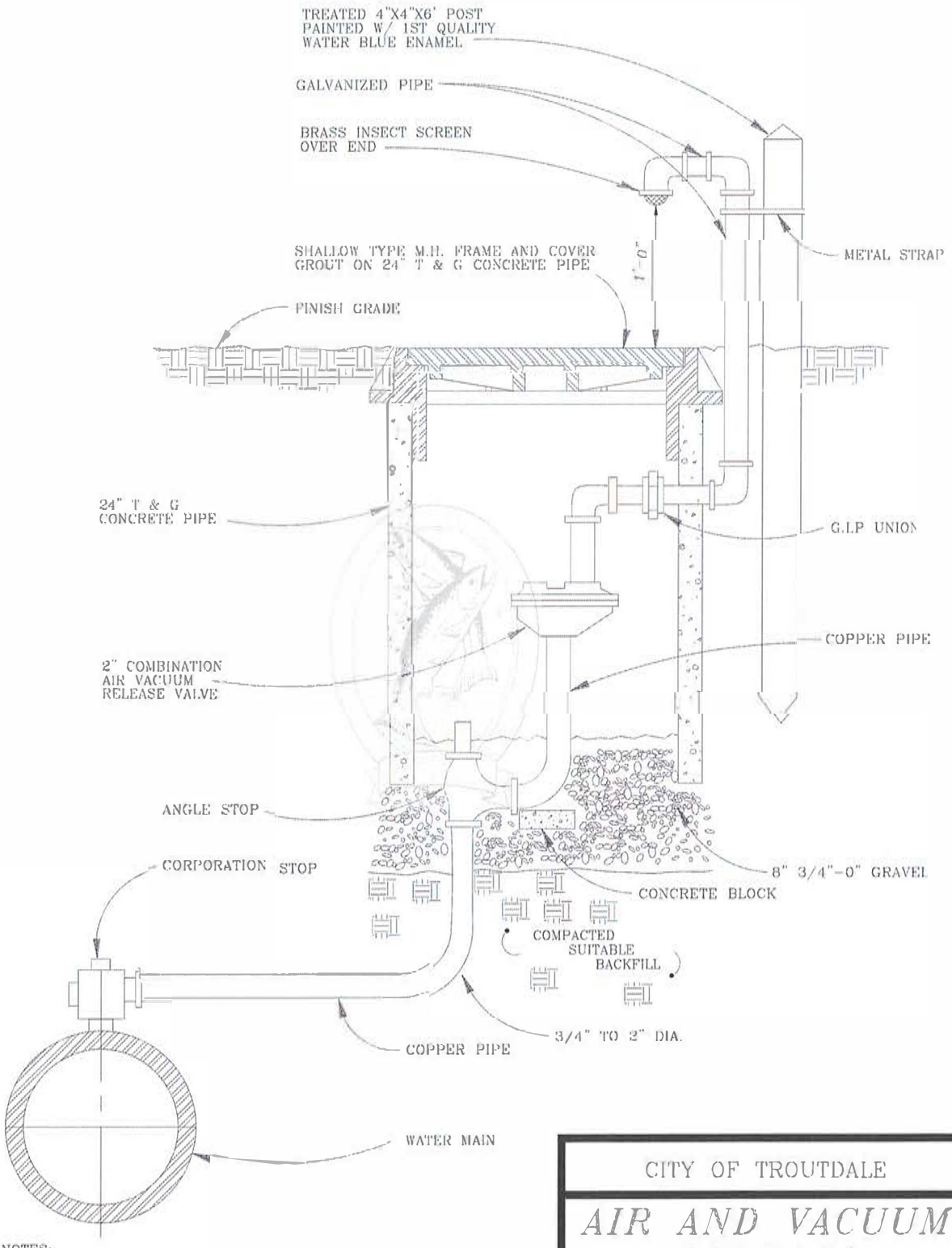

GENERAL NOTES:

1. AIR AND VACUUM RELEASE VALVE ASSEMBLIES SHALL BE INSTALLED AT WATERMAIN HIGH POINTS. THE BREATHER TUBE SHALL EXTEND ABOVE GROUND FACING DOWNWARD. ELBOW MUST BE SCREENED AS SHOWN.
2. PIPE AND VALVE SIZES SHALL BE SPECIFIED FOR EACH PROJECT BY THE DEVELOPER'S ENGINEER AND/OR THE CITY.

CITY OF TROUTDALE

AIR AND VACUUM RELEASE VALVE ASSEMBLY

DATE:	DRAWING NO.
UPDATED 1997	IV – 6

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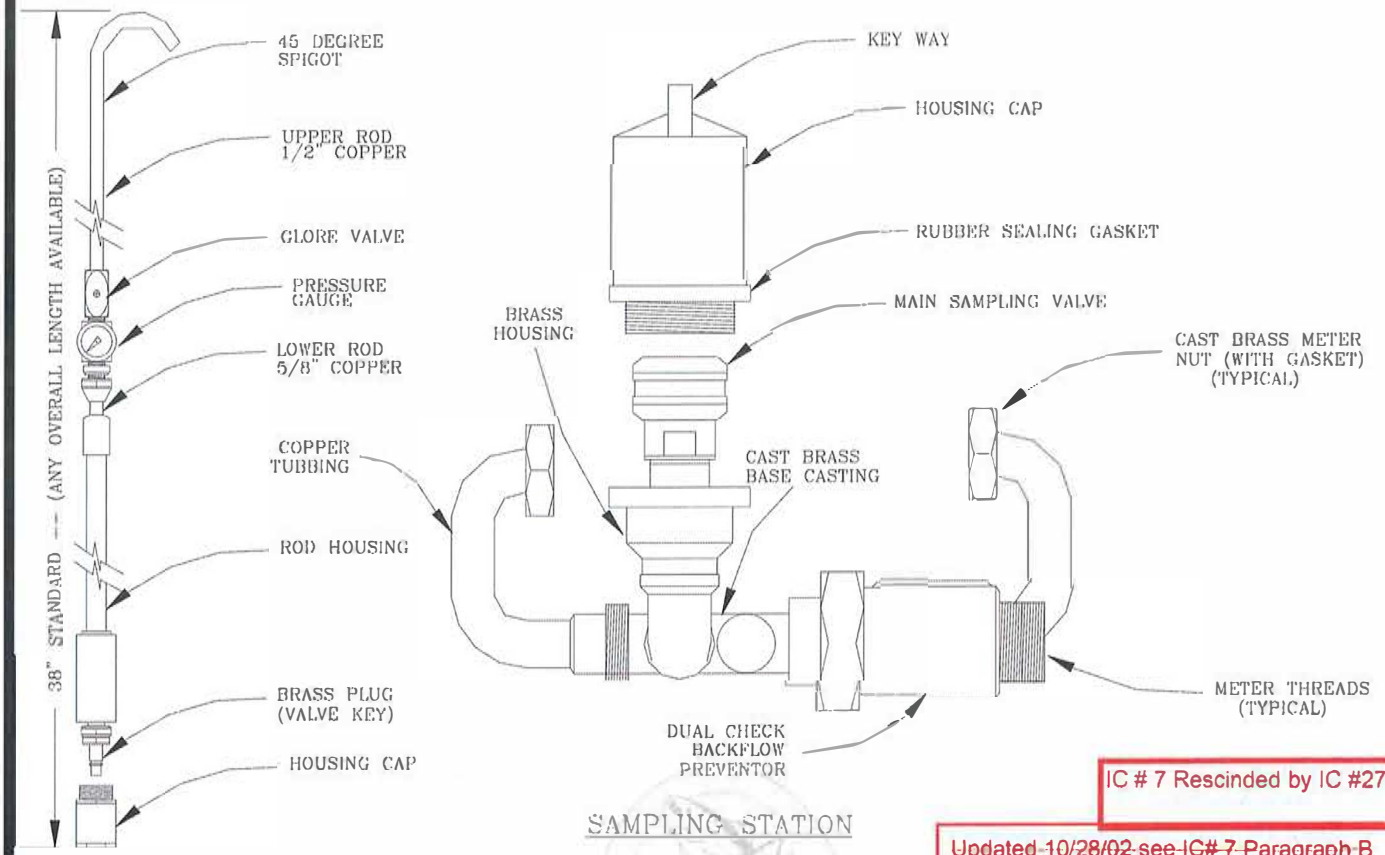


SAMPLING STATION

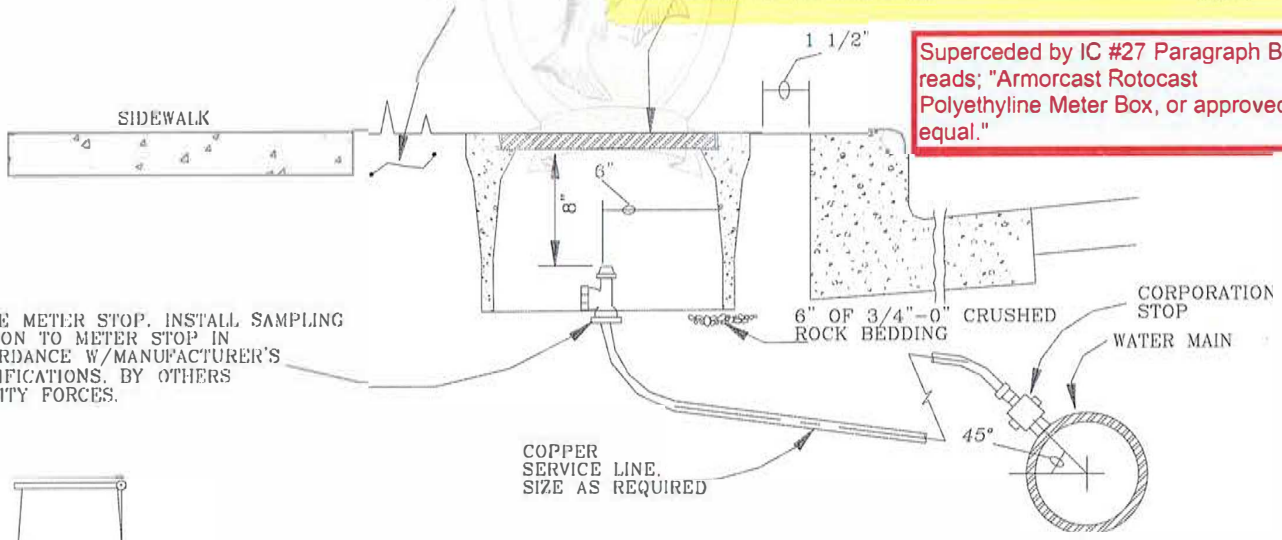
PROBE ROD

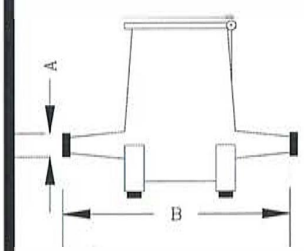
IC # 7 Rescinded by IC #27

Updated ~~10/28/02 see IC# 7 Paragraph B~~

Mid-States Plastics meter box BCF 1118-12-RL for 3/4" meter or Mid-States Plastics meter box BCF 1324-12-RL for 1" meter

Superceded by IC #27 Paragraph B - reads; "Armorcast Rotocast Polyethyline Meter Box, or approved equal."





METER DIMENSIONS			
METER SIZE	5/8"	5/8" X 3/4"	3/4"
(A) THREADS	3/4"	1"	1"
(B) LAYING LENGTH	7 1/2"	7 1/2"	9"

GENERAL NOTES:

1. USE SAMPLING STATION MODEL # 1500L OR EQUAL.
2. USE PROBE ROD, MODEL # 150G.
3. USE THIS SAMPLE STATION CONFIGURATION UNLESS OTHERWISE DIRECTED BY THE CITY.
4. GIVE THE PROBE ROD TO THE CITY CREWS (PUBLIC WORKS INSPECTOR).

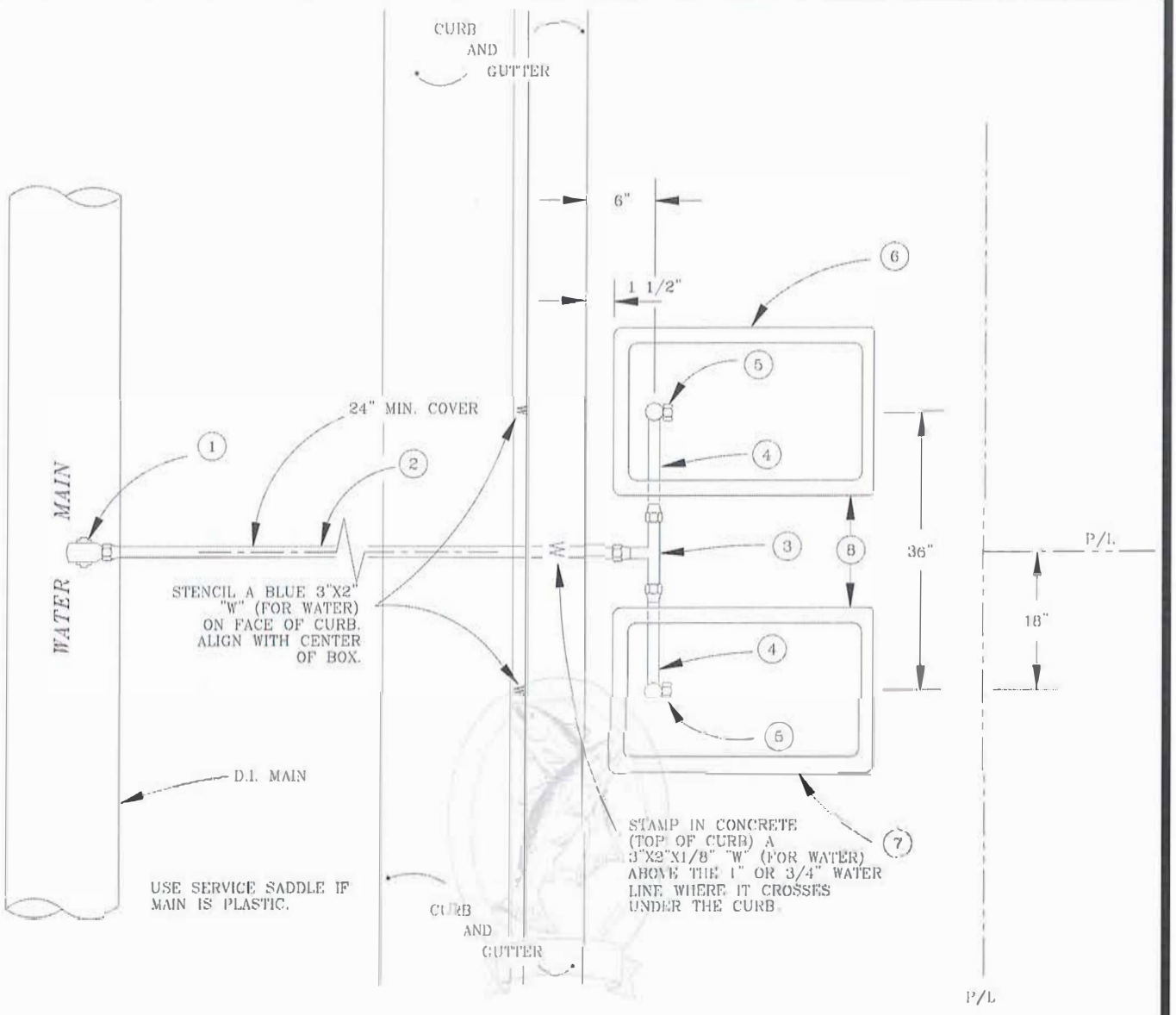
CITY OF TROUTDALE

WATER SAMPLING STATION

DATE: UPDATED 2003

DRAWING NO. IV - 7

FILENAME: APWA0124.DWG



NOTES:

1. CORPORATION STOP SET AT 45° ANGLE, AS SHOWN ON DRAWING # IV - 9.
2. 1" SOFT TEMPER TYPE 'K' COPPER TUBING COMPLYING W/ASTM B-88.
3. 3/4" X 3/4" X 1" "BULLHEAD" TEE ALL COPPER FLARE.
4. 3/4" SOFT TEMPER TYPE 'K' COPPER TUBING COMPLYING W/ASTM B-88.
5. 3/4" ANGLE METER STOP.
6. MID-STATES PLASTICS METER BOX BCF 1118-12-RL.
7. MID-STATES PLASTICS METER BOX BCF 1118-12-RL.
8. TWO 3/4" SERVICES MAY BE PROVIDED WHEN THE 1" SERVICE WOULD BE IN CONFLICT WITH A STREET LIGHT POLE. THE DISTANCE BETWEEN METER BOX EDGES MUST BE 4'.

Updated 10/28/02
see IC# 7
Paragraph C

note 6 & 7 Superceded
by IC #27
see IC for wording

3. SET TOP OF ANGLE METER STOP 6" BELOW TOP OF CURB, AS SHOWN ON DRAWING # IV - 9.
4. TOP OF METER BOX FLUSHED WITH TOP OF CURB. MUST BE AS SHOWN ON DRAWING # IV - 9.
5. METER BOX SHALL BE CENTERD OVER THE COMPLETED METER ASSEMBLY.
6. ACCEPTABLE BRASS FITTINGS: MUELLER C 110, FORD PAC JOINT OR MCDONALD MAC PAC, OR EQUAL.
7. A "W" (FOR WATER) PAINTED ON THE FACE OF THE CURB AND STAMPED IN CONCRETE MUST BE PROVIDED AS SHOWN.
8. ONLY 2, 3/4-INCH DIAMETER WATER SERVICES ARE ALLOWED TO BRANCH OFF FROM A 1-INCH DIAMETER WATER SERVICE LINE.

GENERAL:

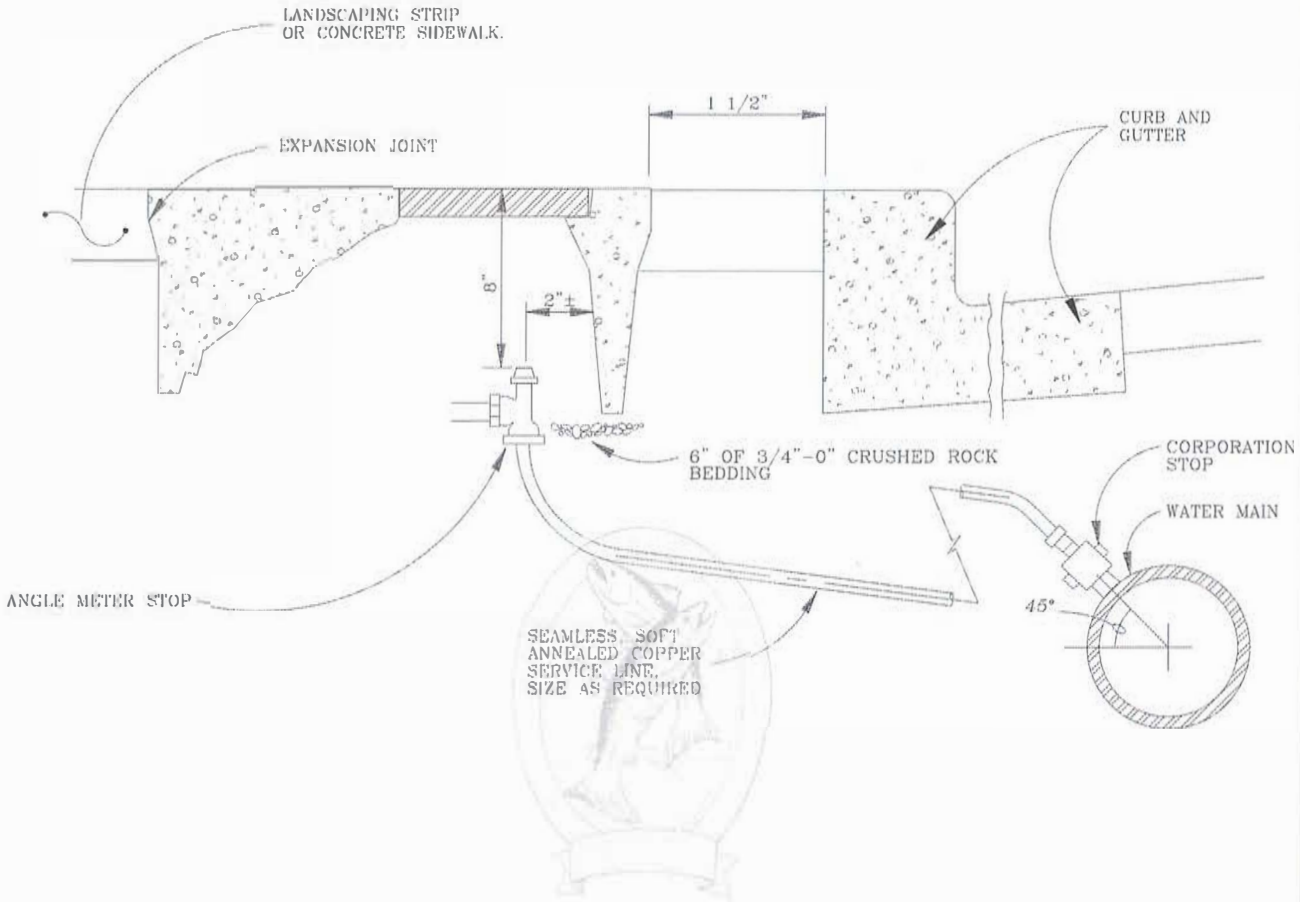
1. "EQUAL" SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE CITY.
2. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING GRANULAR SOILS COMPACTED TO 95%, MAXIMUM RELATIVE DENSITY.

CITY OF TROUTDALE

1" DOUBLE WATER SERVICE

DATE:	DRAWING NO.
UPDATED 2003	IV - 8

FILENAME: AI-WA0120.DWG



GENERAL NOTES:

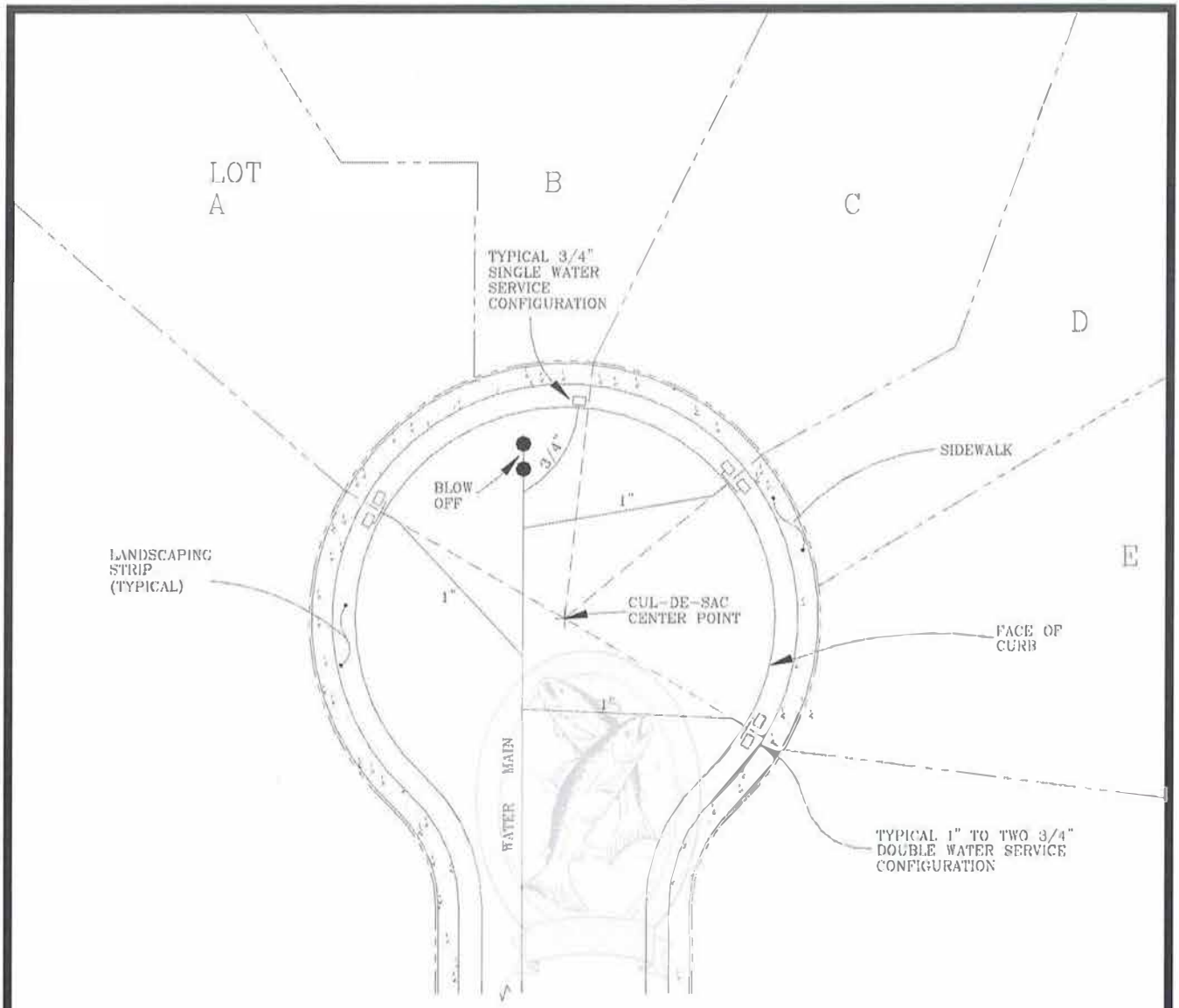
1. REFER TO DRAWING # IV – 8, FOR DETAILS ON INSTALLATION OF A 1" DOUBLE WATER SERVICE, AND FOR ADDITIONAL HORIZONTAL LOCATION INFORMATION.
2. ANGLE METER STOP SHALL BE SET TO A TOLERANCE OF +/– 1".
3. STAMP (IN CONCRETE – ON TOP OF CURB) AND STENCIL A BLUE "W" ON FACE OF CURB WHERE SERVICE LINE CROSSES THE CURB, AS SHOWN ON DRAWING # IV – 8.
4. CORPORATION STOPS MUST BE AT LEAST 18" APART.
5. METER BOX SHALL BE INSTALLED FLUSHED WITH TOP OF CURB.
6. 3/4" & 1" BRASS FITTINGS SHALL BE EITHER MUELLER C110, FORD PAC JOINT, MCDONALD MAC PAK, OR APPROVED EQUAL.
7. THIS DETAIL APPLIES TO METER INSTRUCTIONS WITHOUT BYPASS PLUMBING CONFIGURATION.

CITY OF TROUTDALE

3/4" TO 2" SINGLE WATER SERVICE

DATE:	DRAWING NO.
UPDATED 1997	IV – 9

FILENAME: APWA0043.DWG



GENERAL NOTES:

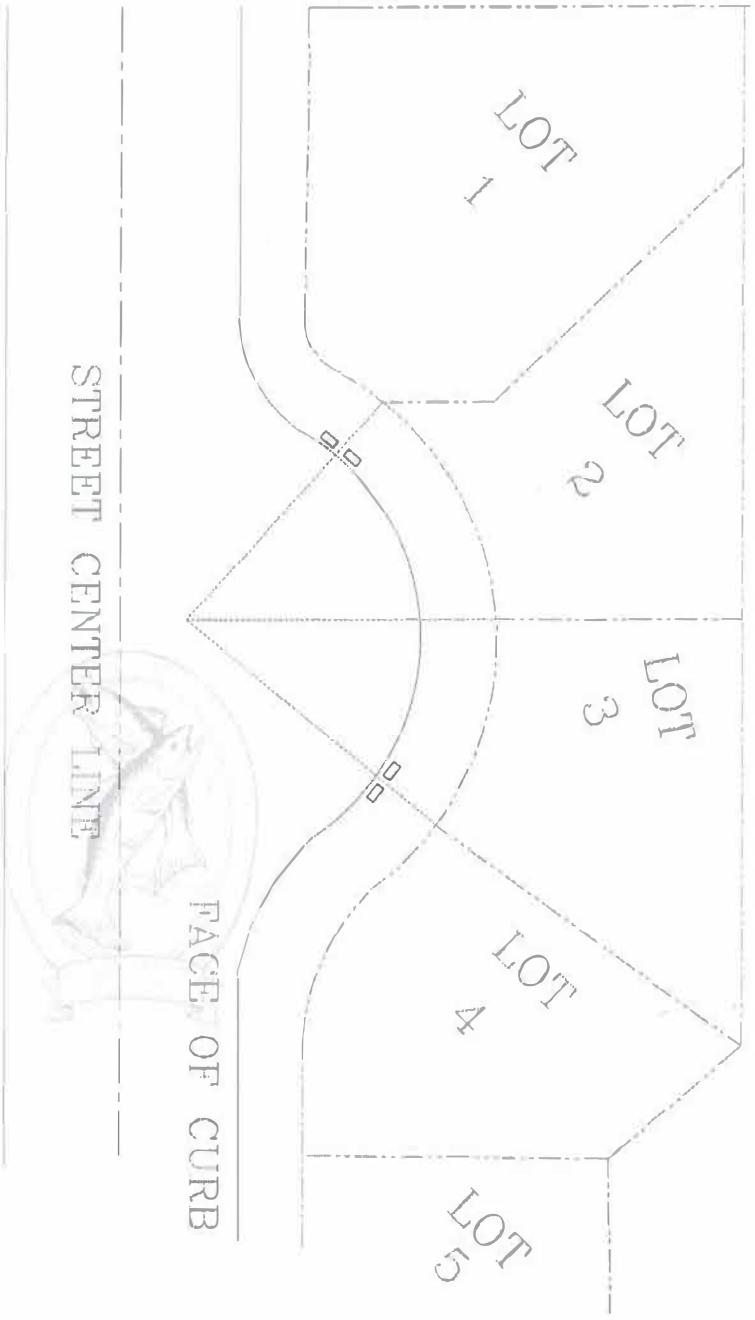
1. LOCATION OF THE METERS AND METER BOXES MUST BE WITH THE SIDES OF THE BOXES PARALLEL TO AN IMAGINARY LINE (SHOWN ABOVE AS DASHED LINES) EXTENDING FROM THE PROPERTY CORNER OF THE RESPECTIVE LOT IN THE CUL-DE-SAC TO THE CENTER POINT OF THE CUL-DE-SAC.
2. REFER TO DRAWING IV-9 FOR FURTHER DETAIL.

CITY OF TROUTDALE

IN CUL-DE-SAC DOUBLE & SINGLE WATER SERVICE CONFIGURATION

DATE:	DRAWING NO.
UPDATED 1997	IV - 10

FILENAME: APWA0137.DWG



NOTES:

METER BOXES MUST BE PARALLEL TO AN IMAGINARY LINE DRAWN FROM THE PROPERTY CORNER TO THE RADIUS POINT OF THE HALF CUL-DE-SAC, AS SHOWN.

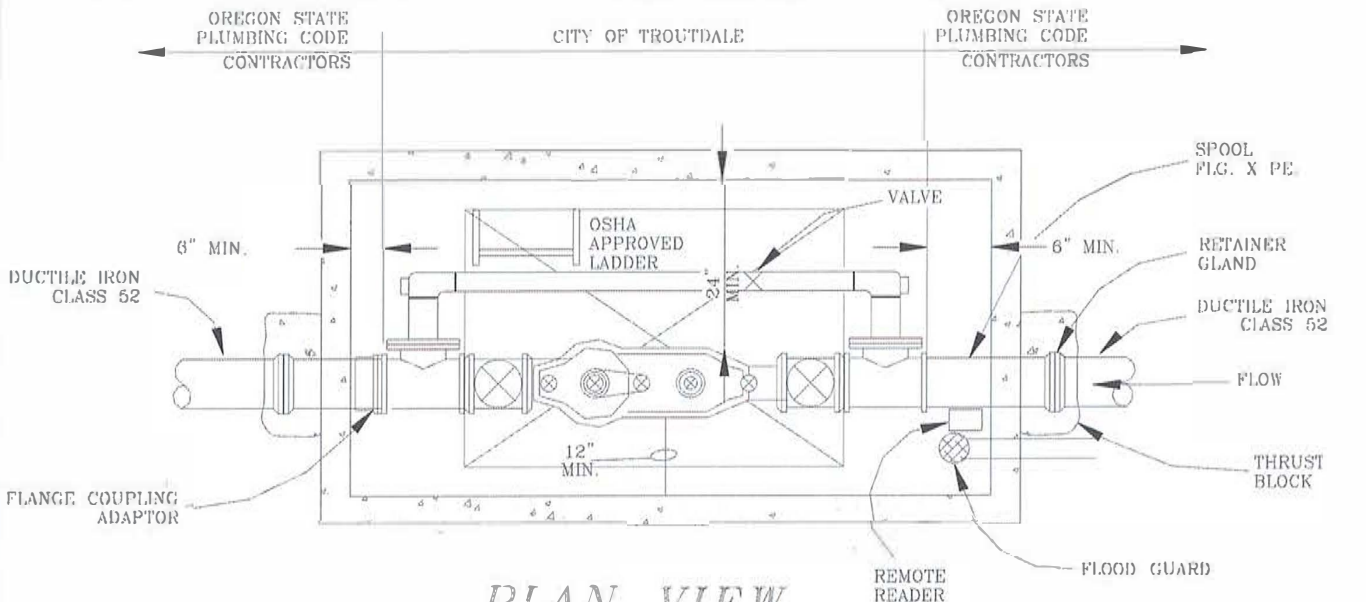
CITY OF TROUTDALE

IN-HALF CUL-DE-SAC

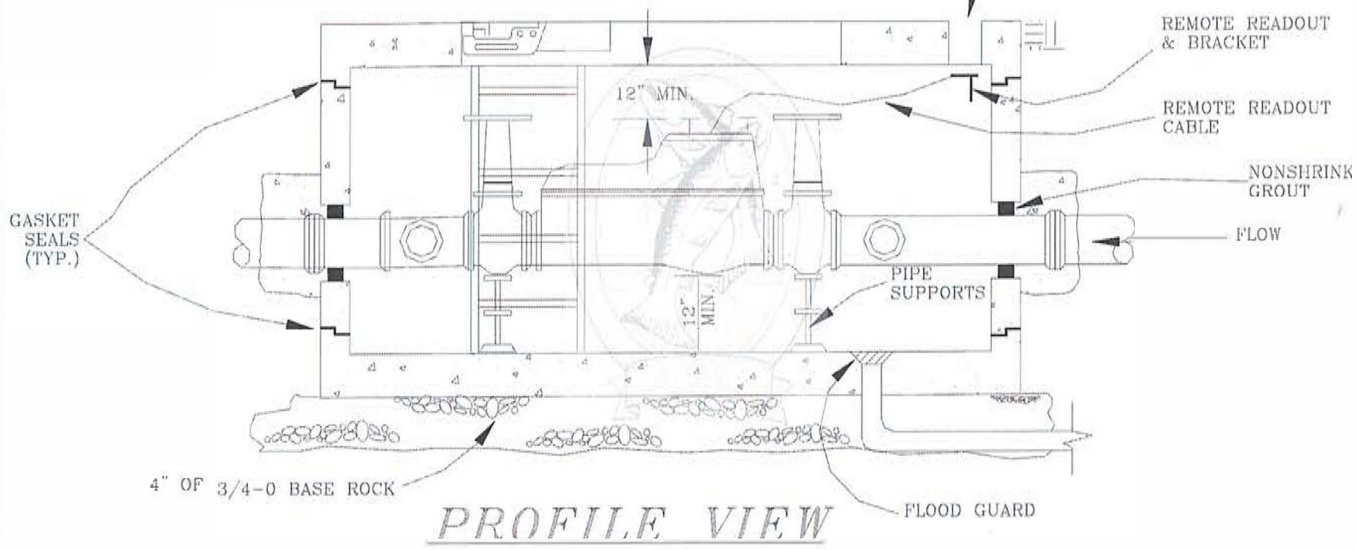
DOUBLE/SINGLE SERVICE CONFIGURATION

DATE	DRAWING NO.
UPDATED 1997	IV - 11

FILENAME: APWA0141.DWG



PLAN VIEW



PROFILE VIEW

GENERAL NOTES:

1. THE INSTALLATION/REMOVAL OF EQUIPMENT IN VAULT WILL DETERMINE THE NUMBER OF DOORS REQUIRED. DOORS SHALL BE GALVANIZED DIAMOND PLATE AND SPRING ASSISTED W/H-20 RATING FOR TRAFFIC AREAS; AND, H-10 RATING FOR LANDSCAPED AREAS. CONTRACTOR TO VERIFY NUMBER OF DOORS.
2. ALL VAULTS SHALL DRAIN TO STORM SYSTEM WHEN POSSIBLE. WHEN NOT, A FRENCH DRAIN FACILITY NEAR THE VAULT MUST BE PROVIDED.
3. REFER TO DRAWING # IV - 14 FOR BYPASS PLUMBING DETAILS; AND, TO DRAWING # IV - 13 FOR ADDITIONAL INFORMATION ON THE REMOTE READER. TYPE OF SERVICE WILL DETERMINE IF METER BYPASS PLUMBING IS NECESSARY.
4. TYPE OF VAULT REQUIRED WILL BE DETERMINED AS FOLLOWS: NOTE, VAULTS WITH REMOTE READOUTS NEED TO HAVE LIDS WITH BROOKS 37 READER LIDS IN THEM.

SIZE	VAULT SIZE (OR EQUAL)
3"	676-WA
4"	687-WA
6"	687-WA
8"	810-LA

NOTE: 2" METER WITH BYPASS VAULT MUST MEET MINIMUM CLEARANCES.

5. ALL SERVICE LINES GREATER IN SIZE THAN 1" SHALL HAVE A DOUBLECHECK BACKFLOW PREVENTION DEVICE AS MINIMUM PROTECTION.
6. LADDER LOCATION DEPENDS ON APPLICATION. FIELD APPROVAL NEEDED FOR LADDER LOCATION.
7. VAULTS WITH AN ELECTRICAL PANEL SHALL COMPLY WITH THE MOST RECENT ADOPTED CODE(S) FOR WORKMANSHIP AND MATERIALS. ELECTRICAL PERMITS AND SUBSEQUENT INSPECTIONS ARE REQUIRED.

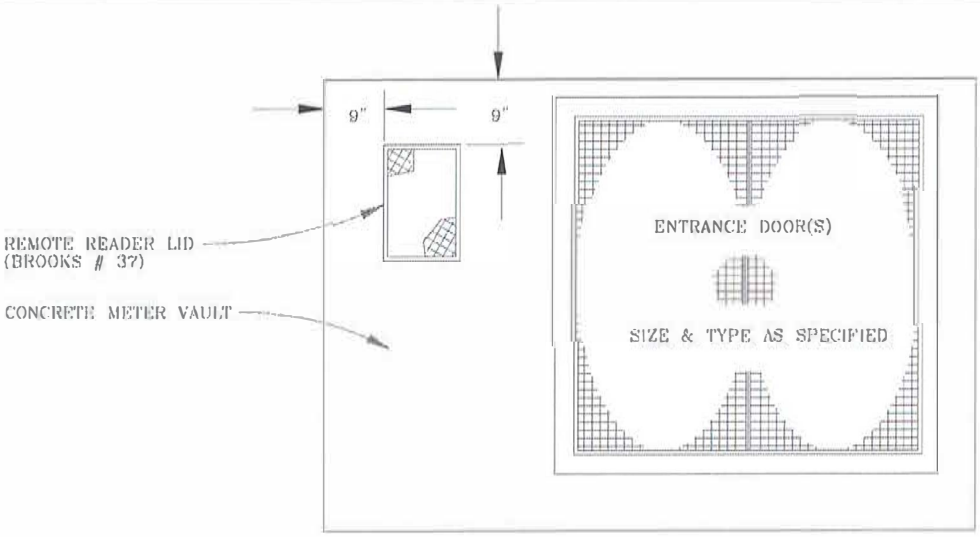
CITY OF TROUTDALE

3" DIAMETER (& LARGER) WATER METER VAULT

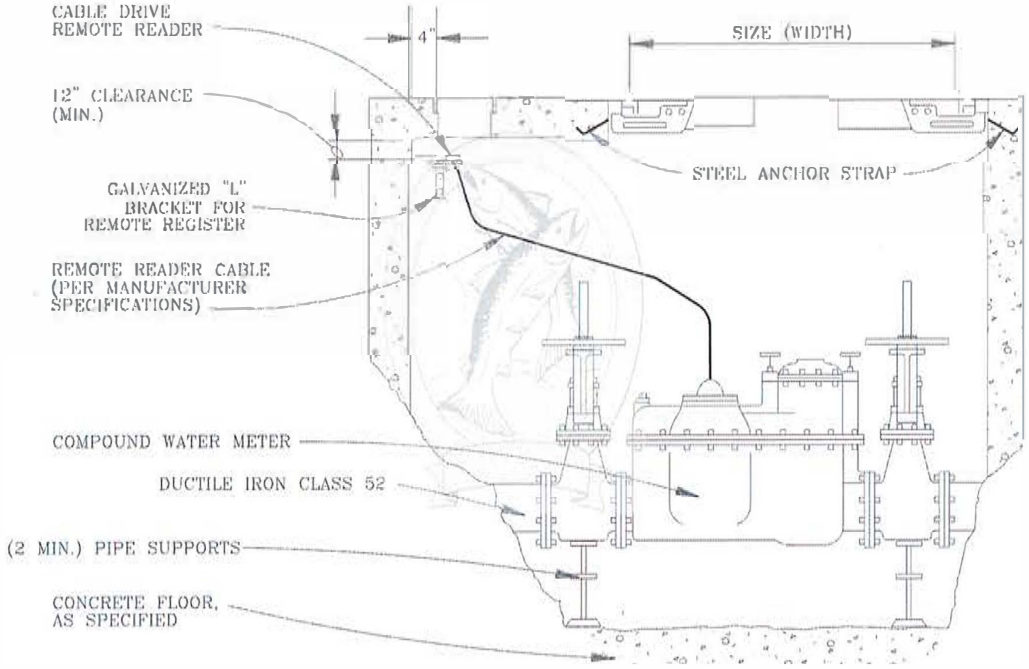
DATE: UPDATED 1997

DRAWING NO. IV - 12

FILENAME: APWA0123.DWG



PLAN VIEW



ELEVATION VIEW

GENERAL NOTES:

1. THE INSTALLATION/REMOVAL OF EQUIPMENT IN VAULT WILL DETERMINE THE NUMBER OF DOORS REQUIRED. CONTRACTOR TO VERIFY NUMBER OF DOORS.
2. ALL VAULTS SHALL DRAIN TO STORM SYSTEM WHEN POSSIBLE. WHEN NOT, A FRENCH DRAIN FACILITY NEAR THE VAULT MUST BE PROVIDED.
3. DOORS SHALL BE GALVANIZED DIAMOND PLATE AND SPRING ASSISTED W/H-20 RATING FOR TRAFFIC AREAS; AND, H-10 RATING FOR LANDSCAPED AREAS.
4. REFER TO DRAWING # IV - 14 FOR BYPASS PLUMBING DETAILS.
5. TYPE OF VAULT REQUIRED WILL BE DETERMINED AS FOLLOWS; NOTE, VAULTS WITH REMOTE READOUTS NEED TO HAVE LIDS WITH BROOKS 37 READER LIDS IN THEM.

SIZE	VAULT SIZE (OR EQUAL)
3"	676-WA
4"	687-WA
6"	687-WA
8"	810-LA

6. TYPE OF SERVICE WILL DETERMINE IF METER BYPASS PLUMBING IS NECESSARY.
7. ALL SERVICE LINES GREATER IN SIZE THAN 1" SHALL HAVE A DOUBLECHECK BACKFLOW PREVENTION DEVICE AS MINIMUM PROTECTION.

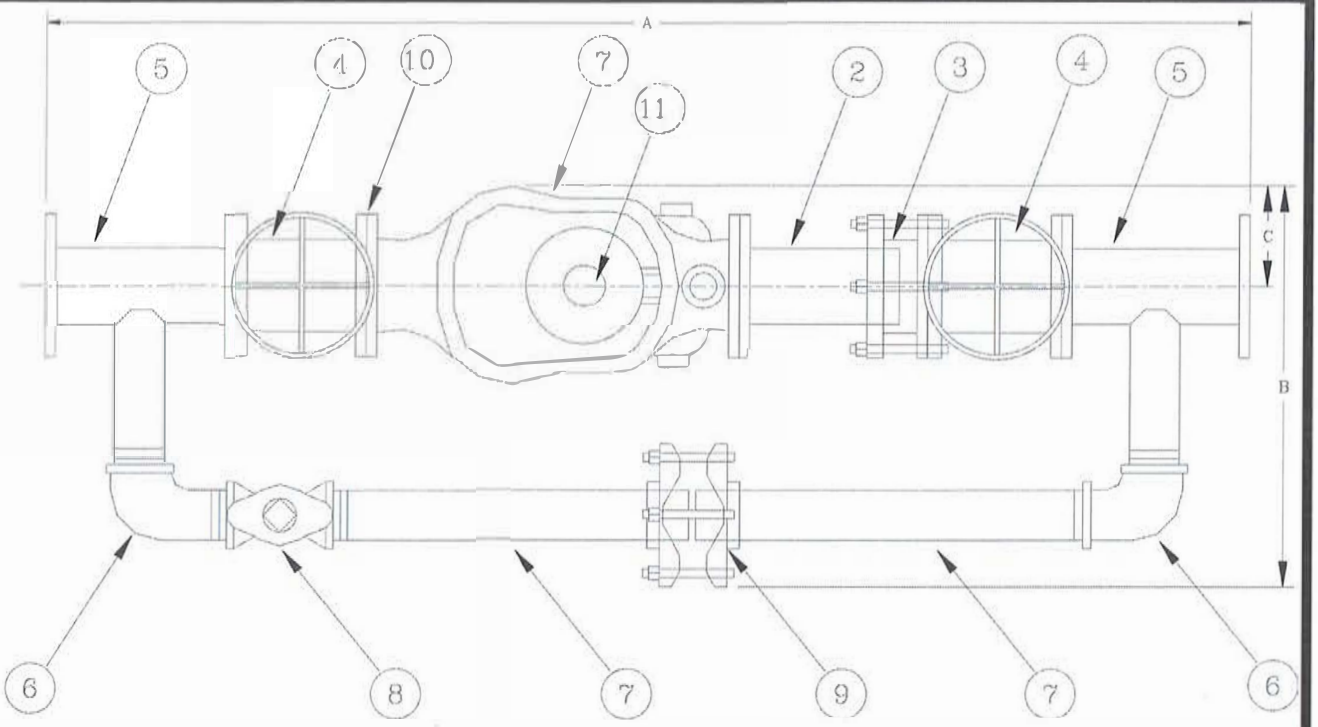
CITY OF TROUTDALE

METER WITH REMOTE READER AND VAULT

DATE: UPDATED 1997

DRAWING NO. IV - 13

FILENAME: APWA0046.DWG



1. Spool Piece
2. Adapter
3. Valves
4. Reducing Tee
5. 90° Elbow
6. Bypass Piping
7. Coupling
8. Bypass Valve
9. Adapter Spool (12" size only)
10. Gallon Register

GENERAL NOTES:

1. Type of service determines if meter bypass plumbing is necessary.
2. All meters must be pre-approved by the City.
3. Installation must be restrained to resist axial forces due to internal pressure/flow.
4. Dimensions are in inches.
5. Elbows may be screwed or butt-weld flange, depending on size.
6. Valves may be ball or gate type, depending on size.
7. Meter vault must be approved by the City.
8. Meter test connections required on all 2" meters or larger.

DIMENSIONS	DUCTILE IRON			BRONZE
SIZE:	3"	4"	6"	2"
A. Overall Length	63	73	86	45
B. Overall Width	19	21	26	17 1/2
C. Width, to Mainline Edge	4	5	6	6
Mainline to Max. Edge	16	17	21	15
Mainline to Bottom Surface	4	4.75	5.75	3 3/16
Bypass Size	3	3	4	2
N.P.T. Test Connection	2	2	2	1 1/2

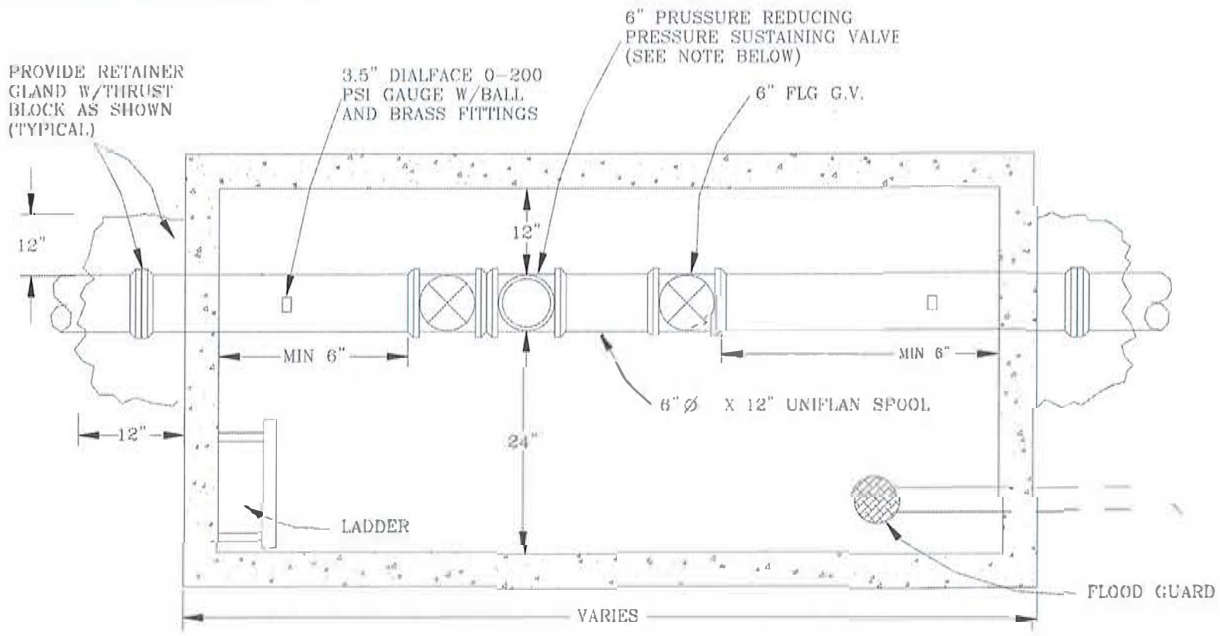
CITY OF TROUTDALE

WATER METER W/BYPASS DETAIL

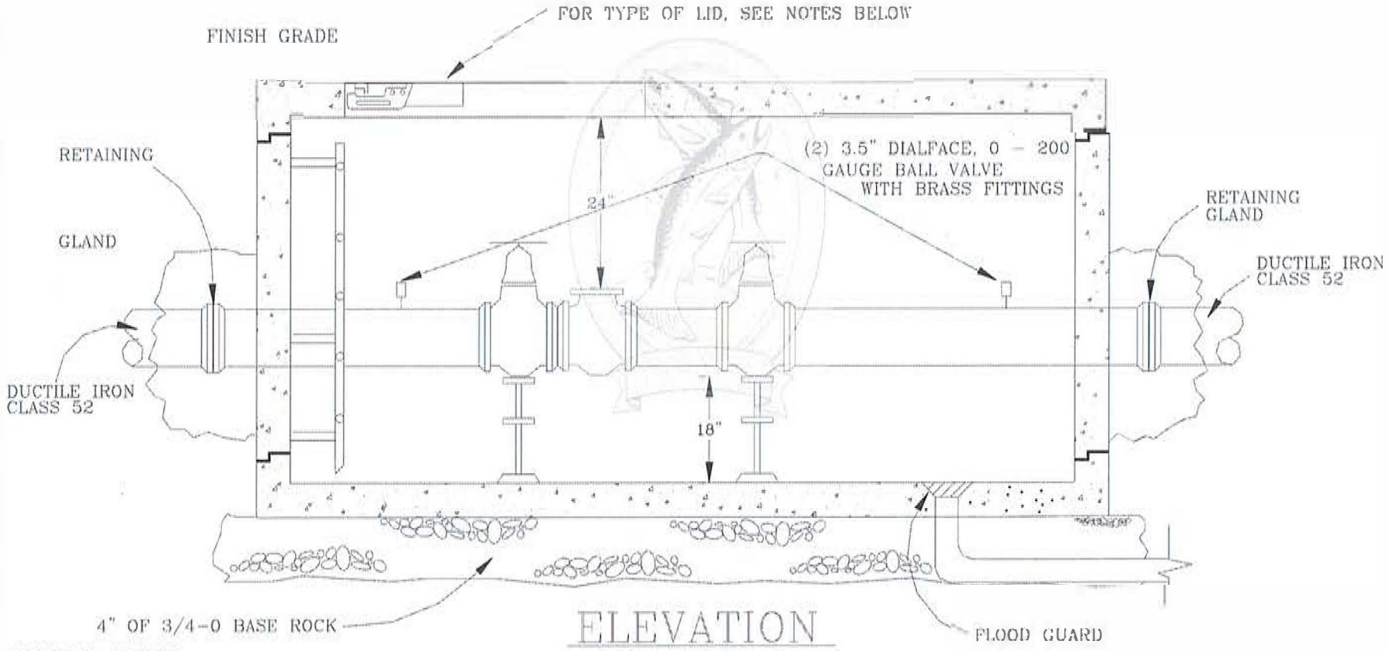
DATE: UPDATED 1997

DRAWING NO. IV – 14

FILENAME: APWA0113.DWG



PLAN VIEW



ELEVATION
NTS

GENERAL NOTES:

1. TYPE OF VAULT REQUIRED WILL BE DETERMINED AS FOLLOWS.

SIZE	VAULT (OR EQUAL)
3"	676-WA
4"	687-WA
6"	687-WA
8"	810-LA

2. LADDER LOCATION DEPENDS ON APPLICATION. FIELD APPROVAL NEEDED FOR LADDER LOCATIONS.
3. AUTOMATIC VALVE SHOULD BE IN PRESSURE REDUCING/ PRESSURE SUSTAINING CONFIGURATION. WILL REQUIRE A CLAYTON AUTOMATIC VALVE BY CLA-VAL COMPANY. PILOT CONTROL SHOULD BE 20-200 PSI. VALVE RATING SHOULD BE 150 ANSI/B16.7
4. THE INSTALLATION/REMOVAL OF EQUIPMENT IN VAULT WILL DETERMINE THE NUMBER OF DOORS REQUIRED.
5. ALL VAULTS SHALL DRAIN TO STORM SYSTEM WHEN POSSIBLE. WHEN NOT, A FRENCH DRAIN FACILITY NEAR THE VAULT MUST BE PROVIDED.
6. DOORS SHALL BE GALVANIZED DIAMOND PLAT AND SPRING ASSISTED W/H-20 RATING FOR TRAFFIC AREAS; AND, H-10 RATING FOR LANDSCAPED AREAS.

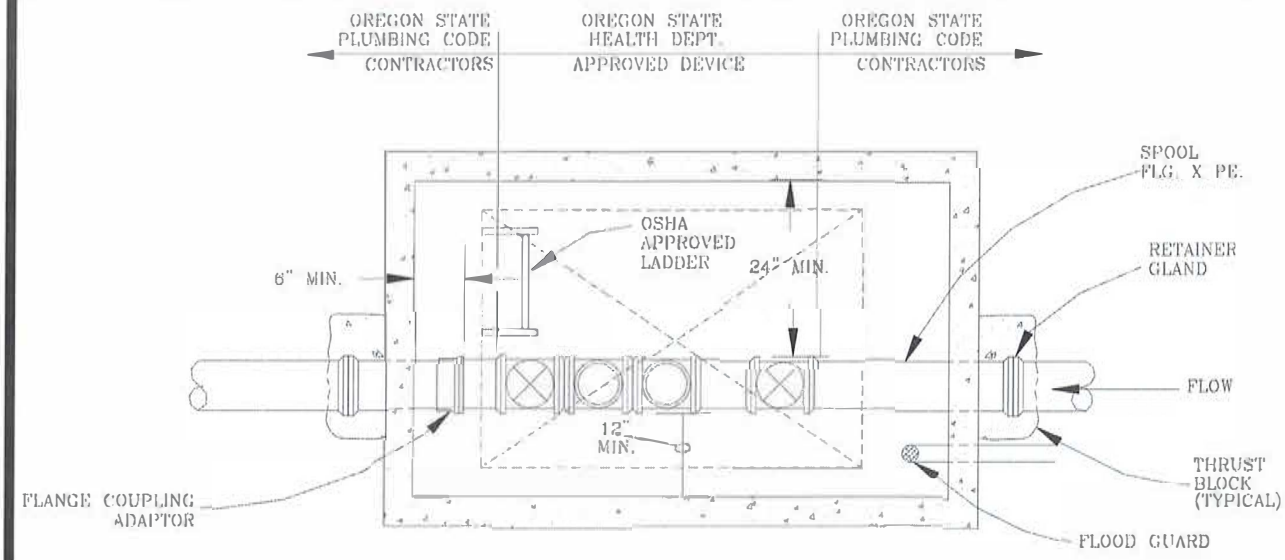
CITY OF TROUTDALE

PRESSURE REGULATING VAULT

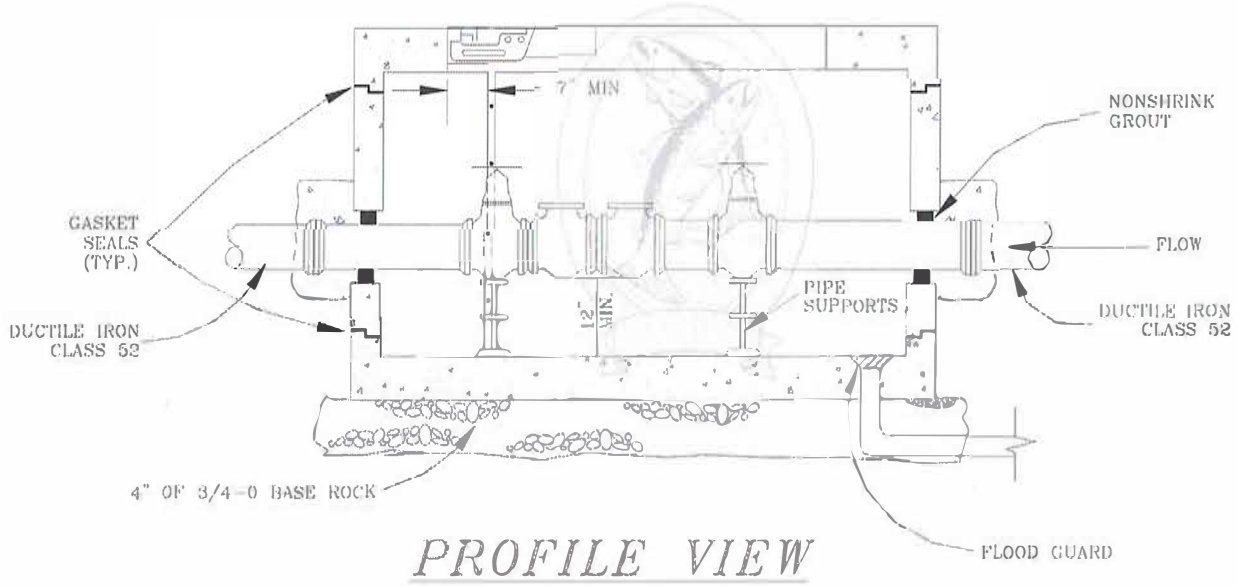
DATE: UPDATED 1997

DRAWING NO.: IV - 15

FILENAME: APWA0102.DWG



PLAN VIEW



PROFILE VIEW

GENERAL NOTES:

1. THE INSTALLATION/REMOVAL OF EQUIPMENT IN VAULT WILL DETERMINE THE NUMBER OF DOORS REQUIRED.
2. DCVA'S MAY BE INSTALLED BELOW GRADE IN A VAULT PROVIDED PLUGS ARE INSTALLED IN THE TEST COCKS & ADEQUATE DRAINAGE IS PROVIDED. DEVICES SHALL NOT BE SUBJECT TO CONTINUOUS IMMERSIONS.
3. DOORS SHALL BE GALVANIZED DIAMOND PLATE AND SPRING ASSISTED W/H-20 RATING FOR TRAFFIC AREAS; AND, H-10 RATING FOR LANDSCAPED AREAS.
4. D.C. BACKFLOW DEVICES USED FOR FIRE STANDBY, REQUIRE A DETECTOR CHECK METER AND BACKFLOW DEVICE.
5. USE ONLY OREGON STATE HEALTH DIVISION APPROVED BACKFLOW DEVICES.
6. TYPE OF VAULT REQUIRED WILL BE DETERMINED AS FOLLOWS:

D.D.C SIZE	VAULT SIZE WITH F.D.C.	VAULT SIZE WITHOUT F.D.C.	H-20 GALV. DOOR SIZE
4"	676-WA	577-LA	36" X 36"
6"	687-WA	676-WA	36" X 36"
8"	5106-LA	687-WA	36" X 36"
10"	5106-LA	5106-LA	36" X 36"

7. LADDER LOCATION DEPENDS ON APPLICATION. FIELD APPROVAL NEEDED FOR LADDER LOCATIONS.

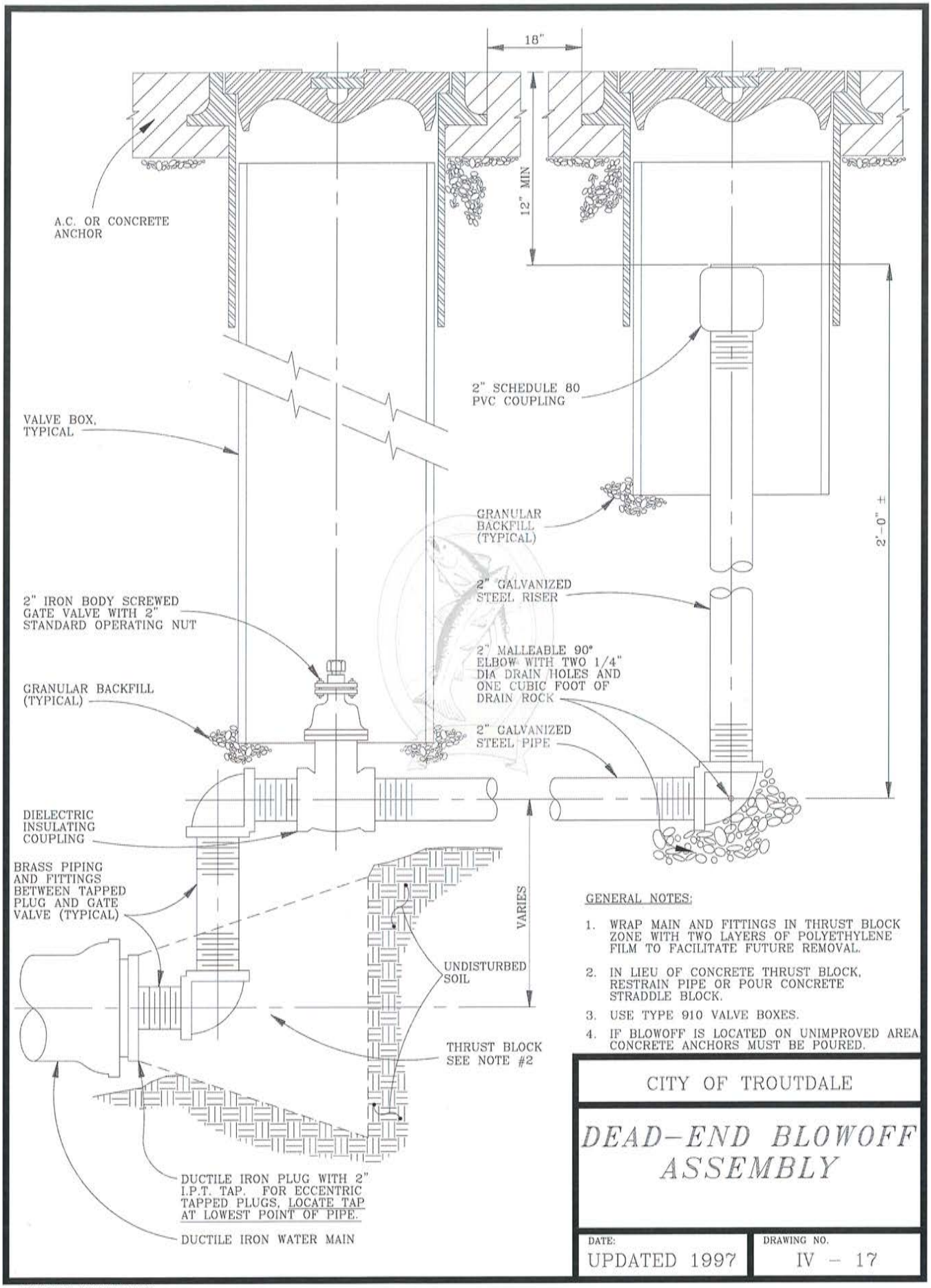
CITY OF TROUTDALE

DOUBLE CHECK BACKFLOW PREVENTOR DEVICE VAULT

DATE: UPDATED 1997

DRAWING NO. IV - 16

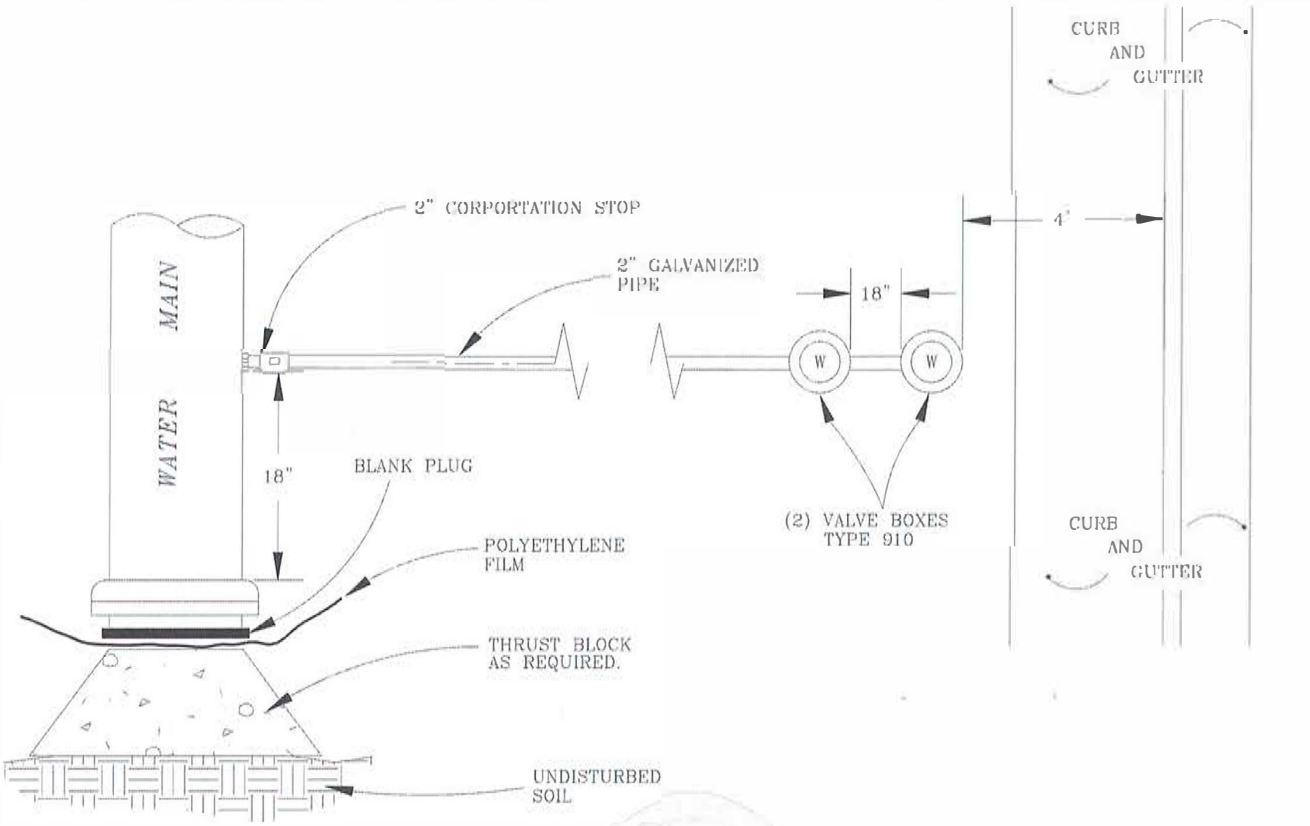
FILENAME: ADWA0122.DWG



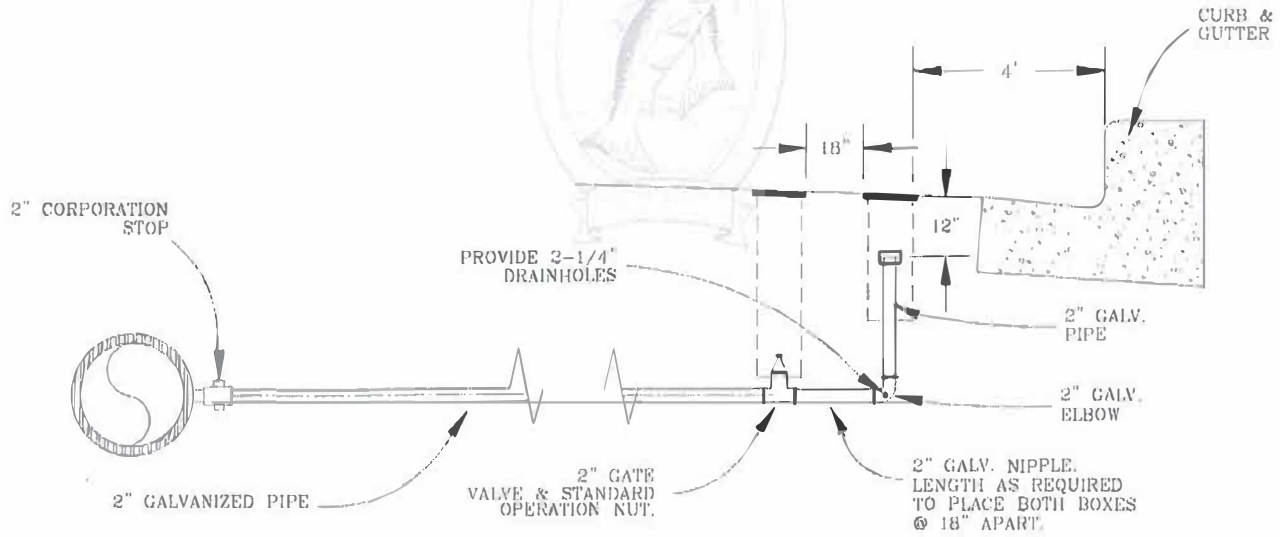
FILENAME: APWA0039.DWG

SEE IC#38

2. Water, Part IV, Construction Details, Drawing No. IV-17 is amended as follows:
The following general note is added: Fire hydrant assemblies are required at all dead dead-end water mains of 6" diameter and greater. Blow-off assemblies are required at all dead-end water mains of 4" diameter or less.



PLAN VIEW



PROFILE VIEW

GENERAL NOTES:

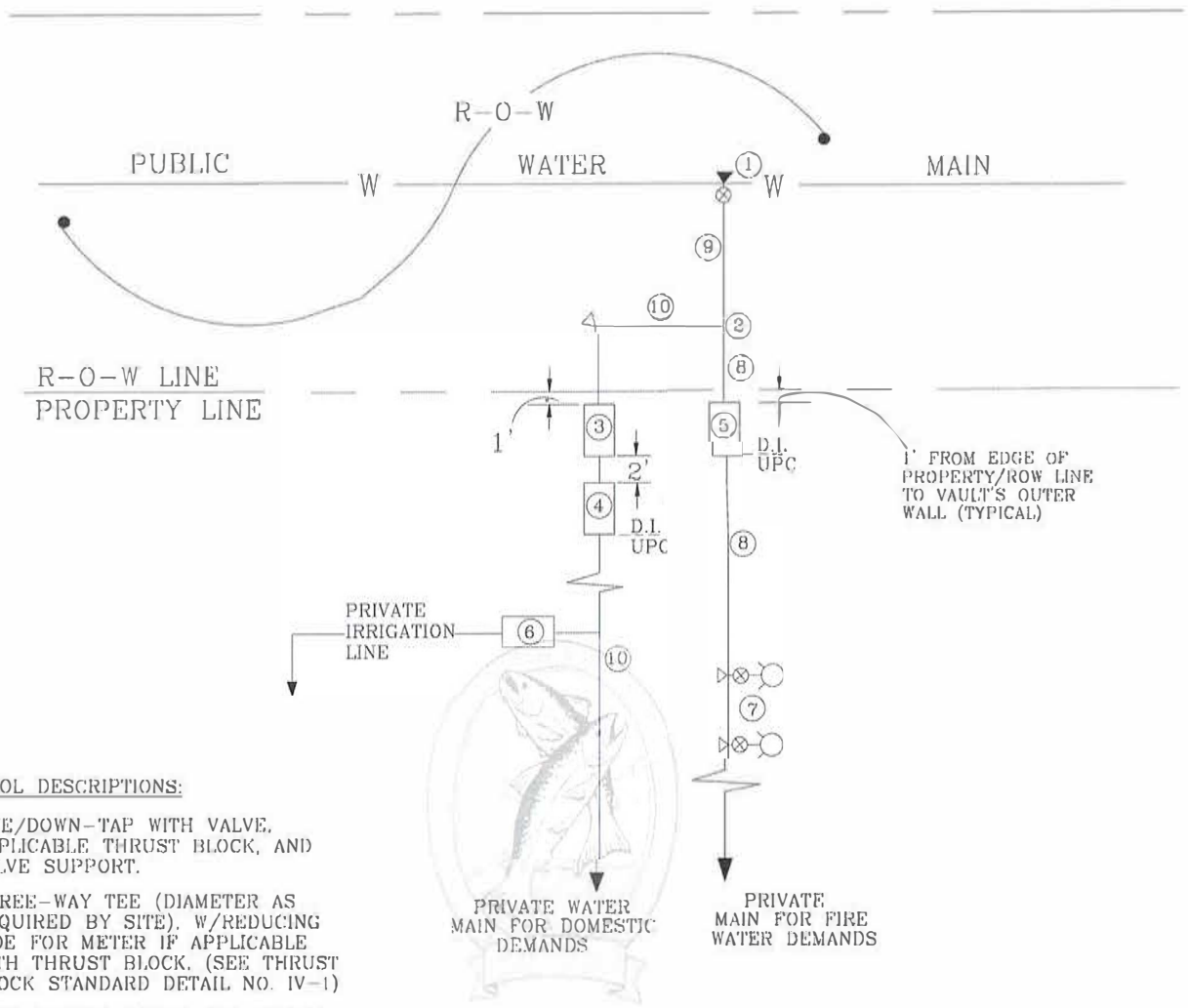
1. WRAP MAIN & FITTINGS IN THRUST BLOCK ZONE W/TWO LAYERS OF POLYETHYLENE FILM TO FACILITATE FUTURE REMOVAL.
2. A STRADDLE BLOCK IS REQUIRED IF WATER MAIN WILL BE EXTENDED IN THE FUTURE. REFER TO DRAWING # IV – 1 FOR DETAILS.
3. USE VALVE BOXES TYPE 910.
4. IF BLOWOFF HAS TO BE LOCATED ON UNIMPROVED SURFACES, A CONCRETE ANCHOR IS REQUIRED.
5. FOR ADDITIONAL DETAIL, PLEASE REFER TO DRAWING # IV – 15, ASSEMBLY.

CITY OF TROUTDALE

IN–LINE BLOWOFF ASSEMBLY

DATE:	DRAWING NO.
UPDATED 1997	IV – 18

FILENAME: APWA0128.DWG



SYMBOL DESCRIPTIONS:

① LIVE/DOWN-TAP WITH VALVE, APPLICABLE THRUST BLOCK, AND VALVE SUPPORT.

② THREE-WAY TEE (DIAMETER AS REQUIRED BY SITE). W/REDUCING SIDE FOR METER IF APPLICABLE WITH THRUST BLOCK. (SEE THRUST BLOCK STANDARD DETAIL NO. IV-1)

③ MAIN MASTER METER WITH BYPASS PLUMBING AND RESPECTIVE VAULT. (SEE STANDARD DETAIL NO. IV-12, IV-13 AND IV-14)

④ BACKFLOW PREVENTION DEVICE WITH RESPECTIVE VAULT.

⑤ DOUBLE DETECTOR CHECK BACKFLOW PREVENTION DEVICE. (SEE STANDARD DETAIL NO. IV-16)

⑥ IRRIGATION BACKFLOW PREVENTION DEVICE WITH RESPECTIVE VAULT, IF APPLICABLE.

⑦ FIRE HYDRANT ASSEMBLY (HYDRANTS TO BE PRIVATELY OWNED UNDER THIS CONFIGURATION). (SEE STANDARD DETAIL NO. IV-2 OR IV-3)

⑧ WATER MAIN FOR FIRE DEMAND. DIAMETER AS REQUIRED BY SITE AND AS INDICATED BY THE DEVELOPER'S PROJECT ENGINEER.

⑨ WATER MAIN TO SERVE SITE. DIAMETER AS REQUIRED BY SITE AND AS INDICATED BY THE DEVELOPER'S PROJECT ENGINEER.

⑩ WATER MAIN TO SERVE DOMESTIC DEMAND. DIAMETER AS REQUIRED BY SITE AND AS REQUIRED BY THE DEVELOPER'S PROJECT ENGINNER.

GENERAL NOTES:

- MATERIALS USED MUST BE D.I. (DUCTILE IRON), CLASS 52, FROM THE TAP TO THE PROPERTY SIDE OF THE BACKFLOW PREVENTION DEVICE VALVE VAULT. UPC-ALLOWED MATERIALS FROM THERE IN.
- EXACT TAP LOCATION POINT TO THE PUBLIC MAIN IS TO BE DETERMINED BY CITY FORCES.

CITY OF TROUTDALE

COMMERCIAL/INDUSTRIAL WATER SERVICE CONFIGURATION

DATE:	DRAWING NO.
UPDATED 1997	IV - 19

FILENAME: APWA0010.DWG