

DETAIL SPECIFICATIONS FOR WATER SYSTEM


The Public Works Department reserves the right to review, change or modify these specifications at any time. It shall be the responsibility of any person doing work under these specifications to obtain the most current issue and addendums.

30.0 GENERAL

Materials:

1. Any material or item installed in the water system will be of American origin. Materials and other products manufactured (from ore to finish) outside of the legal boundaries of the United States are not acceptable and will not be installed in the City's water system. A certificate of origin and/or specification compliance may be required.
2. Protective Coating:
  - a. Cast Iron/Ductile Iron Fitting. Interior shall be cement lined and thermo epoxy lined to and including full flange face and/or push on joints.
  - b. Exterior ferrous surfaces and manufacture supplied bolts shall be bituminous coated and PE wrapped.
3. Copper. All below grade copper pipe and fittings will be Polyethylene tube encased, completely sealed at joints and ends.
4. Silver solder. All below grade copper fittings and joints will be silver soldered. Silver Solder Grade 85-15 (15% Silver).
5. Flange Bolts. All below grade flange bolts and nuts will be stainless steel Grade 304.
6. Irrigation Service. All irrigation services will be copper per Plate 304.
7. Backflow Devices. All backflow piping 3/4" to 2" will be Type K Hard. All fittings shall be Silver Soldered. Control gate valve shall be Resilient Seat type, 3/4" to 2". Control valve shall be ball type. All devices shall be tested and approved by USC Foundation.

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8. Valves. All main line valves 6" to 12" shall be approved Resilient Seat Gate Style. Valves larger than 12" shall be Butterfly.
9. Fire Hydrants. All fire hydrants shall be of bronze construction and fluted body style with removable stem inserts.
10. Copper Wire. In continuous runs of PVC pipeline and polyethylene services, a 12 gauge insulated copper wire shall be laid above the pipeline. The wire shall be attached to all gate valves and extended up into valve box, refer to Plate 303. Copper wire shall be continuous. Breaks or joints shall be soldered and insulated.
11. Steel Pipe. Steel pipe used to cross sewer or storm drains shall have minimum thickness of .250 inches as required by Health Department.
12. Water Services. All services shall be the same size from corp stop to discharge point of tail piece. Example: 1" corp stop, 1" service line, 1" meter, 1" tail piece; if required, 1" backflow device.  
  
Services shall be installed at the locations shown on the plans, at right angles to the centerline of the main in public right-of-way within 18" of side property line, and shall be spaced a minimum of 10 feet from any sewer lateral. Services will be permitted in driveway areas only with special written approval.
13. Asbestos-Cement Pipe. The installation of ACP in the water system is not approved by City Council.

30.1

Bronze:

Whenever a part of the fitting is specified to be bronze, it shall be composed of what is known as Red Brass; for example, copper 85%, zinc 5%, and tin 5% with a tensil strength of 30,000 psi, yield strength of 14,000 psi and allowable elongation of 20% unless otherwise specified. In no case shall bronze parts or fittings contain more than 2% aluminum or more than 5% zinc. Certificate of compliance is required from the manufacturer.

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30.3

PVC PIPE

1. Pipe: PVC pipe shall conform to the quality and strength requirements of AWWA C-900 which cover PVC (Polyvinyl Chloride) pipe in sizes 4 - 12 inches. Each standard or random length of pipe shall be clearly marked with the following:
  - a. Nominal size and OD base, i.e., 6" cast iron size.
  - b. Material Code PVC1120.
  - c. Dimensional rates, i.e., DR 25 where DR is equal to Diameter divided by Thickness.
  - d. AWWA Pressure Class CL. 150/DR-18. CL200-DR-14.
  - e. AWWA Designation "AWWA C-900."
  - f. Manufacturer's Trade Name and Production Code.
  - g. Seal (mark) of testing agency.
2. The standard laying length shall be 20' + 1" in all classes and sizes. A maximum of 15% may be furnished in random lengths of not less than 10 feet each.
3. AWWA C-900 pipe has the same outside diameter (OD) as that of cast iron pipe (C.I.P.) in the sizes furnished.
4. One gasket shall be furnished with each length of elastomeric-gasket bell-end and two gaskets shall be furnished with each coupling where couplings are authorized. Prior approval is required for the use of coupling.
5. Pipe surfaces shall be free from nicks, scratches and other blemishes. The joining surfaces of pipe spigots and of integral bell and sleeve reinforced bell sockets shall be free from gouges or other imperfections that might cause leakage.
6. Trade names which are approved are Certainteed "Vinyl Iron Pipe," J.M. Mfg. "Blue Brute Pipe," and Pacific Western.
7. Joint Mechanisms: The joints shall be either of the following:
  - a. Integral Wall Thickness Bell End.  
(Bell and spigot with Elastomeric gasket.)



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- b. Integral sleeve reinforced bell end with elastomeric gasket.

PVC solvent joints, although allowed in the AWWA C-900 Standard, are not approved.

8. PHYSICAL TEST REQUIREMENTS:

Hydrostatic, Burst and Sustained Pressure and Crushing:

Test shall be conducted by a testing laboratory with such testing available for inspection by Water Division. If required, the manufacturer shall supply a Letter of Certification attesting to their pipe meeting these specifications.

- 1. The Hydrostatic Proof Test for every piece of pipe shall be as follows:

<u>CLASS</u>	<u>SUSTAINED PSI</u>
DR = 18 or Class 150	600
DR = 24 or Class 250	800


30.4 STEEL PIPE

- 1. Steel pipe shall conform to the quality and strength requirements of AWWA C-200 or as specified below - that standard pertains to electrically butt-welded straight-seam or spiral seam pipe and to seamless pipe 6" (150mm) in diameter or larger.

The steel shall conform to one of the following:

<u>Specification</u>	<u>Grade</u>	<u>Minimum Yield Point (psi)</u>
ASTM A 283	Grade C	30,000
	Grade D	33,000
ASTM S 570	Grade 30	30,000
	Grade 36	36,000
	Grade 40	40,000
	Grade 45	45,000

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4. BUTT STRAP CLOSURES. The butt straps shall be the same thickness as the pipe wall but not less than 10 gage, at least 10" wide and rolled to fit the the outside cylinder diameter and shall be centered over the ends of the pipe sections they are to join. A standard 5" pipe half coupling shall be shop welded to the top section of the butt strap to permit access for mortar lining the inside of the joint. The coupling shall be sealed with a standard 5" plug field welded to the coupling.

30.8 Gate Valves (4" - 12"):

1. General - Gate valves, including tapping valves 4" or larger shall conform to AWWA Standard Specification C-509-80 or latest revision for resilient seat gate valves for ordinary water works service. Mueller RS or approved equal. Gate valves shall be used on all main line installation and shall be FLxMJ unless otherwise specified.
2. Resilient wedge - Cast iron wedge or disc shall have sealing surface of wedge permanently bonded or with self-locking stainless steel screws with resilient materials. Disc shall have an integrally cast ASTM B-62 bronze stem nut to prevent twisting or angling of the stem or loose stem nut on wedge or disc with non-coated disc guides. The disc coating shall be open on one side or open bottom disc so as to form no cavities or receptacles for accumulation of solids and possible stem binding.
3. Direction of operation - All valves shall open by turning the wrench to the left (counter clockwise).
4. Stuffing Box - Stuffing boxes shall be O-ring seal type.
5. Stem - Non-rising stems shall have Acme thread only. Stem thrust collars are made an integral part of stem.
6. Unobstructed waterway - Each valve shall have a smooth unobstructed waterway free from any sediment pockets.
7. Painting and coating - Exterior shall be asphalt varnish per Federal Specification TT-V-51-E or fusion bonded Epoxy. Interior ferrous surfaces shall be coated with epoxy type coating equal to Kordell 600.

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8. Valve stem extension – A valve stem extension shall be provided for each valve having an operating nut more than 40” below finished grade. Extension stem either of standard manufacture or shop fabricated shall bring the operating nut within 12” of the surface.

The extension stem shall be made of solid round steel bar of a diameter equal to the valve stem diameter with a minimum of 1” diameter or extra heavy steel pipe of diameter equal to one and one-fourth (1-1/4) times the valve stem diameter with a minimum of one and one-fourth (1-1/4) inch diameter.

Solid steel plate having a diameter approximately one-half (1/2) inch less than the valve cover inside diameter which will allow smooth stem operation.  
Standard Plate 303.

- 30.9 Butterfly valve installation is permitted only when specifically called for in the plans and approved by the Water Manager.

- 30.10 Valve Boxes:


Valve boxes shall be Jensen Precast HTV10-3

- 31.10 Fire Hydrants:

Fire Hydrants shall conform to AWWA C-503-75 Sec. 2.6 unless otherwise specified. Hydrant bodies will be all ductile iron  construction. Fluted design.

1. Bury shall have a minimum inlet size of 6” with mechanical joint. Hydrant mounting flange shall be six-hole pattern on 9.44 centers.
2. Hydrant bodies shall have mounting flange with six-hole pattern on 9.44 centers. Required nozzles shall be individually controlled with rubber disc, compression type valve and shall be fitted with threaded protecting caps. Nozzle threads shall conform to ANSI (ASA) B 26 National Standard fire hose coupling screw threads.

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**GENERAL REQUIREMENTS – WATER**

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*Department of Public Works*

APPR.   
ROBERT HEARNE, PE

STANDARD PLAN  
2002

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3. Spools – Break–Away. A spool shall be installed between bury and hydrant body. Spool to be cement mortar and Thermo Epoxy lined, refer 30.02. Six–bolt pattern to be same as hydrant body. Break–away bolts to be installed per Plate 300.
4. Coating. Interior ferrous surfaces of the bury and spool shall be cement mortar and Thermo Epoxy lined, refer 33.1. Exterior painting – all fire hydrants shall be surface prepared to receive paint by scraping and wire brushing, and shall be painted with one coat of surface primer and two coats of finish paint. Refer to section 33.1–4.
- △ 5. Fire hydrants shall have a 6” barrel unless otherwise noted. The sizing and type of City of Oxnard approved hydrants are as follows:

Type Residential R–1	4” x 2–1/2” Jones Triton J–4040 or equal
Type II R–2 or greater Industrial and Manufacturing	4” x 4” x 2–1/2” Jones Triton J–4060 or equal

Written approval before installation of other types, makes, and models will depend on but not limited to availability and interchangeability of repair parts as determined by the Water Division.

6. Minimum Hydrant and Water Flow Requirements

- A. General – A sufficient number of hydrants shall be installed to concentrate the required fire flow within 400’ of any structure.

Hydrants shall be placed at least 50’ from the structure protected. Where this is not possible, they shall be placed where the possibility of injury from building collapse is limited.

\* The flows indicated below are minimum. Additional fire flow may be required based on the types of building construction, distance to exposures, number of stories, type of hazard presented by the proposed use and the ground floor area of the building.

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B. Residential

- \* Fire flow 2500 GPM @ 20 PSI  
Hydrant spacing  
500' for single-family residential with no structure more than 300' from a hydrant.  
300' multiple-family residential with no structure more than 200' from a hydrant.

C. Industrial and Commercial Areas

- \* Fire flow 4500 GPM @ 20 PSI  
Hydrant spacing  
300' and so located that no structure is more than 150' from multiple hydrants. (On-site included.)

D. On-site Hydrants

Location - as designated by the Fire Department.  
Refer: EASEMENT 2.11 A.

No portion of a structure shall be more than 150' from a hydrant.

Fire flow - multiple occupancy residential - 1250 GPM @ 20 PSI minimum individual hydrant flow.

Industrial - 1500 GPM @ 20 PSI minimum individual hydrant flow.


Heavy industrial - 1750 GPM @ 20 PSI minimum individual hydrant flow.

Fire Sprinkler System

Fire Department to determine location of Fire Department connection.

31.1 COUPLINGS AND FITTINGS:

1. Valves shall be Mueller Resilient Gate Valve FL X MJ or approved equal.
2. Couplings shall be FLEXIBLE or FULL CIRCLE. PVC coupling shall meet the requirements of AWWA C-900 and will require prior approval for use.

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3. Rating Dimensions and Tolerance - The PE pipe shall be rated for use with water 200 PSI at 73 degrees F.

The dimensions and tolerances shall comply with iron pipe size (SDR-7) - ASTM for 3/4" and 1" service lines. For 1-1/2" and 2" service lines, the dimensions and tolerances shall comply with copper tubing, size SDR-9 ASTM D2737.

4. Minimum Burst Pressure - The minimum burst pressure at 73 degrees F as determined in accordance with ASTM D-1599 shall be 630 PSI.

5. Marking - PE pipe or tubing shall be permanently indent branded indicating size, manufacturer's name, pressure rating, NSF logo, material designation code, applicable ASTM Specification, date code and any other appropriate code designation.

6. Protection - PE pipe or tubing shall be protected for outdoor storage with suitable wrapping material.


7. Workmanship - The PE pipe or tubing shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions or other defects. It shall be uniform in color, capacity, density and other physical properties.

32.3 Angle Meter Stops - All 3/4" and 1" angle meter stops should be Ford pack joint with insert and wing lock, part number KV-63 or approved equal.

All 1-1/2" and 2" angle meter stops shall be Ford pack joint wing lock with meter flange part number KV-43 with insert for PE services. 1-1/2" and 2" angle meter stops shall be Ford FIP X meter flange wing lock part number FV13 or approved equal for copper service. Bolts and nuts shall be red brass.

32.4 Corporation Stop - All corporation stops shall be Ford valve number FB1001 for PE and FB 800 for copper service or approved equal.

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32.5 Branch Connection (Manifold) - All two branch connections shall be Ford UV-63-42-W. Two branch or manifolds are not allowed automatically for use. Locations and use are to be performed by Water Division upon approval.

32.6 Service Saddles - As listed or approved equal. C-900 PVC shall be single unit iron pipe tap. Ford Cat. No. S71 IP TAP.

AC Pipe. Flat double strap bronze. Ford Cat. No. 202B IP TAP.

Cast Iron/Ductile Iron. Flat double strap ductile or malleable iron. Ford Cat. No. 202B IP TAP.

All service connections 4" or larger connection shall consist of a tee or tapping tee with a flanged outlet and a flange RS gate valve, as specified on plans.


33.0 Miscellaneous Materials:

1. Curb Stops for Blowoffs, etc. - All curb stops for blowoffs, air valves, etc., shall be bronze, as specified in Section 1.01, flatway with tee head. Both inlet and outlet shall be female IPT.
2. Bolts and Nuts - Bolts and nuts for all below ground flanged connections shall be stainless steel, grade 304 - except when attaching hydrants to buries in which case they shall be Cadmium Plated breakaway type.
3. Gaskets - Gaskets for all flanges shall be full face, cloth inserted rubber, with a minimum thickness of one-eighth-inch.

Special Purpose Valves:

4. Air Release Valves - Air release valves shall be APCO #65 or #200A, or approved equal. Valve shall be designed to exhaust air which accumulates in the line while operating under pressure. See Plate W-8 for installation.
5. Size of Valves - Size of valves shall be shown on Water Plan. Tap and service pipe will be same size as valve.


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33.1 Protective Coating

1. Cast iron/ductile iron fittings.
  - a. Interior shall be cement lined per AWWA C-104-74 and thermo epoxy coated to and including full flange force and/or push-on joints.
  - b. Exterior ferrous surfaces and M.J. retaining bolts shall be bituminous coating per AWWA C-106-75 and polyethylene wrapped.
2. Copper tubing and below grade fitting shall be polyethylene encased per Uniform Plumbing Code.
3. Valves, gate and butterfly.
  - a. Interior ferrous surfaces shall be coated with thermo epoxy equal to Kordell 600.
  - b. Exterior shall be asphalt varnish per Federal Specification TT-V-51-E or fusion bonded epoxy.
4. Fire hydrants.
  - a. Exterior painting. One coat of primer, Dunn-Edwards 42-44 and two coats of Dunn-Edwards Hi-Visibility Yellow, Syn-Lustro #10-14.
  - b. Bury and spool. Refer to Section 33.1-1. Delete polyethylene wrap at bury flange.
5. Air-Vac valve cans.
  - a. Exterior galvanized surfaces shall be etched with one coat of GE 123 and one coat of Dunn-Edwards 43-7 Galv-Alum primer and two coats of Water Valve Blue, Dunn-Edwards Syn-Lustro #10-50. Formula 1 gal. 10-50; B2Y24 E-Y24.
  - b. Services with backflow assemblies. Exterior surface shall be painted with one coat of Dunn-Edwards 43-4 Bloc-Rust primer and two coats of Dunn-Edwards Machinery Green #10-6 Syn-Lustro.

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36.1 Pipe Depth to Bottom of Trench from Finished Grade

<u>Size of Pipe</u>	<u>Depth of All Pipe</u>
6"	49"
8"	50"
10"	51"
12"	52"

36.2 Handling and Laying Pipe:

1. General - All foreign matter or dirt shall be removed from the inside of the pipe before it is lowered into its position in the trench, and it shall be kept clean by approved means during and after laying. All openings in the pipeline shall be closed with watertight expandable type sewer plugs or PVC C-900 test plugs at the end of each day's operation or whenever the pipe openings are left unattended. The use of burlap, wood or other similar temporary plugs will not be permitted.

At times when pipe laying is not in progress, the open ends of pipe shall be closed by approved means, and no trench water shall be permitted to enter the pipe.


Whenever water is excluded from the interior of the pipe, adequate backfill shall be deposited on the pipe to prevent floating. Any pipe which has floated shall be removed from the trench and be re-laid as directed by engineer.

Neither PVC or ductile iron pipe shall be deflected vertically or horizontally in excess of the recommendation by the manufacturer of the coupling.

2. Sewer Crossings - (See Department of Health Requirements, Section Three.)
3. Casings - Casings shall be installed where dedicated on the plans by jacking or boring. Casings shall be of smooth steel, coat tar enamel coated with diameter and cylinder thickness as shown on the plans. Installations of the water main within the casing shall comply with the applicable pipe manufacturer's recommendations. Wooden skids used to convey the pipe through the casing shall be sized to maintain a uniform space between the pipe and casing, which shall be filled with a material

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36.5

Thrust Devices:

All fittings, hydrants, reducers, caps and line valves subject to thrust action from line or test pressure shall be chocked against thrust by "poured in place" concrete blocks of sufficient size as determined by the engineer. Thrust blocks shall consist of concrete developing a compressive set strength of 2,000 psi in 28 days, poured against undisturbed earth, in such a manner that all joints are exposed. Socket clamps shall be protected with a coating of mortar or bituminous material.

36.6

Air and Vacuum Valves:

Air release and vacuum valves shall be installed where indicated on the plans and where directed by the engineer. Installation shall consist of a corporation stop, service saddle, copper tubing, curb stop, air-vac valve with return bend, and housing. Valve assembly shall be installed above ground and in accordance with standard Plate 308.

36.7

Services:


1. All services unless otherwise indicated on the plans or specified in the special conditions, of new water services from three-quarters inch to two inches in size shall be as shown on standard Plate 304 and 305 or applicable plates and shall include excavation and back-fill furnishing, installing, testing, and disinfecting of service tubing, tube fittings, corporation stops, and curb or angle stops with an appropriate fitting for meter connection. Services 4" and larger shall include a tee, valve, thrust block, cast iron pipe, and cap or plug. All service runs shall be perpendicular to the main for their entire length.

2. Services - General:

- a. Meter type shall be approved by Water Division.
- b. All polyethylene services shall be perpendicular to the main, with 12 gauge locating wire installed.
- c. Services shall not be installed on private property without public utilities easement.




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3. Irrigation service:


All irrigation services shall be copper/polyethylene encased. Per Plate 304.

4. Two (2) service manifold:

Two (2) service manifold shall be copper. The installation of manifold service requires approval. Water demand calculation shall be included on water plan as submitted by registered engineer.

5. Industrial manifold:

- a. Industrial manifold will be installed at property line between two properties.
- b. Fire sprinkler connection requires double check detector check valve assembly and Fire Department connection.
- c. Domestic and irrigation take-off shall be 2" copper 5 feet long to serve each property. If meter size and water demand cannot be served with 2" pipe, a 4" service lateral 5 feet long shall be installed.
- d. A reduced pressure principal backflow assembly shall be installed on irrigation and domestic services.
- e. Street service lateral size shall be determined by estimated total demand. Material shall be C900 CL200 PVC.
- f. Exact location of backflow assemblies shall be determined by Water Division.

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36.9

Existing Water Services:


1. Transferring Services - If an existing service meets the requirements of these specifications and is deemed acceptable by the Water Manager, it need not be renewed or replaced. It may be disconnected from the existing main and reconnected to the main, all additional material and labor required being furnished by the contractor, unless otherwise specifically provided in the special condition.
  
2. Replacing Services - Galvanized black iron or PVC services not meeting the requirements of these specifications or services acceptable to the Water Manager shall be replaced by new material conforming to the requirements of these specifications. Where an existing service is on flat rate and does not include a meter, the replacement shall consist of connection to the main (with service clamp, if required), service line, meter stop, an idler of approved size and construction, meter box and connection to the customer's service at property line. Unless specifically provided in the special conditions, the contractor shall furnish all necessary labor and materials for the replacement with the approval of the Water Manager.

36.10

Sterilization

After the pipe, services, hydrants and appurtenances have been completely installed, the contractor shall sterilize the installation with a solution of 20 to 50 ppm chlorine to the satisfaction of the County Health Department. He shall furnish all materials required and shall provide any necessary tape for introduction of the chlorine into the line and for flushing out after chlorination. The contractor may use chlorine tablets in place of liquid or gas chlorine. Application of liquid or gas chlorine shall be done through calibrated device which indicates rate of injection and mixing with the water.


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When tablets are used, they shall be affixed to the pipe on the day the pipe is installed in the ground. The contractor shall furnish the City Inspector with an approved chlorine testing device. The minimum number of chlorine tablets to be used per each 13' of pipe will be two for 6" or less diameter pipe, three for 8" pipe, four for 10" pipe, and four for 12" pipe. The chlorine tablets will be attached with #1 Permatex or approved equal to the crown of each section of pipe in order to distribute the chlorine solution evenly. Chlorine and testing of the new installation shall be done prior to making a final connection. This should be done according to State Health Standards.


37.0 Testing and Installation:

When the pipe has been satisfactorily sterilized, flushed, and bled of air, the entire installation, including water main, services, and fire hydrants, shall be subjected to 200 psi pressure for a minimum period of 15 minutes and two hours at 150 pounds, visible leaks in joints repaired. All asbestos-cement pipe shall be filled with water for at least 24 hours prior to testing, and pipe with cement joints shall not be tested until the final joints have cured for 36 hours. The maximum allowable leakage per one inch inside diameter for each 100' of pipe over a 2 hour test at 150 psi shall be as follows:

- a. Welded Steel Pipe .0118 gal.
- b. Concrete Cylinder Pipe .0118 gal.
- c. Polyvinyl Chloride refer to Mfg. test
- d. Ductile Iron Pipe
  - 1) Caulked Joints .0424 gal.
  - 2) Rubber Ring Joints .0212 gal.

All joints which show leakage in excess of the above mentioned table shall be remade or recaulked according to the direction of the engineer. The amount of actual leakage shall be metered with an acceptable calibrated tank. New valves which prove to be leaking will be replaced by the contractor. The installation shall be tested in sections. Each section being defined as the length of pipe between valves.

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38.0

Easements:


1. Where a fire line or a water main crosses private property, a licensed surveyor or registered civil engineer shall stake such line and submit 8-1/2" x 11" copies of the alignment staking notes and grade sheets to the Water Manager for approval prior to the start of any construction. Each sheet is to bear the seal and signature of responsible person. Alignment staking notes shall show and reference all existing monuments used in the survey and all distances set off or measured and all angles set off or measured. The information shown shall be done in a legible professional manner and shall be sufficient for retracement of the survey without any further research. Grades shall be staked a minimum of every 25' with the offset and the cut indicated for each station.

An inclusive water easement will be required for such lines unless it is determined by the City that it is beneficial to both parties involved to allow the water line to be private (see Section 2.118). The easement will be a minimum of 15' wide, with the water line located 5' from one side to allow a 10' work area. The easement will be recorded in the tract or parcel map and will be indicated on the water plans prior to approval by the City. If no map is recorded, the easement shall be recorded on a Grant Deed and registered. All lines from the main up to and including the meter box will be within the easement.

Private property with exclusive easement shall be classified as special application allowed only for supplying on site fire hydrants. Fire line on private property with an exclusive water easement will not be classified as a point of service connection.

2. If the City allows a water line to be private, the line will have a backflow prevention device located so as to prevent possible contamination of the public water from the private line. The location and type of backflow device will be subject to the City's approval prior to installation. Refer standard Plate 311.


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	DRAWN: SOHER <i>Public Works Department</i>	CKD <i>Jay Patel</i> APPR. BY <i>Benjamin Y. Wong</i>	<b>PLATE 39</b> SHEET 1 OF 4





REV.	APPR. BY	DATE

3. Reduced Pressure Principle Backflow Presentation Device. A reduced pressure principle backflow prevention device shall be located as close as practical to the user's connection and shall be installed a minimum of twelve inches (12") above grade and not more than thirty-six (36") above grade measured from the bottom of the device and with a minimum of twelve inches (12") side clearance.
4. Location, size, and type of backflow prevention shall be approved by water supplier. Protection shall be as close to the service connection as practical with a maximum of five feet from street right-of-way and within three feet of side property line. An exclusive easement from City right of way to a maximum of five feet beyond device and two and a half feet on each side of device.
5. All backflow preventers shall be visible from City right of way to allow visual inspection and access at all times. If at any time visual inspection or access is obstructed by fences or any other obstruction, water service will be discontinued per City Code, Chapter 33.

39.2 Basic Service Type Requiring Backflow Preventer:

1. Commercial and industrial manifold services.
2. Non-residential irrigation services.
3. Restaurant services.
4. Fire sprinkler system with Fire Department connection.

Service not listed above may require backflow devices and shall be determined on a case by case basis per Title 17 and Manual of Cross-Connection Control.

 CITY OF <b>San Bernardino</b>	<b>GENERAL REQUIREMENTS - WATER</b>		STANDARD PLAN
	DRAWN: SOHER	CHKD: <i>Jay Patel</i>	APPR. BY: <i>Benjamin Y. Wong</i>
Public Works Department			SHEET 3 OF 4

