

CITY OF OCEANSIDE

WATER UTILITIES DEPARTMENT

WATER, SEWER, AND RECLAIMED WATER DESIGN & CONSTRUCTION MANUAL

SECTION 2

POTABLE WATER SYSTEMS DESIGN GUIDELINES

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SECTION 2 – POTABLE WATER SYSTEMS DESIGN GUIDELINES

2.1 GENERAL

A. All water works construction shall conform to the most recent edition of the City of Oceanside's Water, Sewer, and Reclaimed Water Design & Construction Manual. If the standard that is sought does not appear in this manual, then the following standards shall be utilized in the order listed:

1. State of California Department of Health Services
2. American Water Works Association (AWWA) Standards
3. San Diego County Regional Standard Drawings
4. Standard Specifications for Public Works Construction (SSPWC or "Greenbook"), latest Edition.

** Exceptions to this and all other guidelines appearing in this manual may be allowed only upon the written approval of the Water Utilities Director.

B. All fire hydrants, blow offs, detector checks, air/vacuum assemblies, water sampling stations, reduced pressure principle backflow (R.P.) devices, and meter services will be located out of driveways, sidewalks, walkways, and/or any concrete structures. All references to Section 3.15 of the Engineer's Design and Processing Manual must also be adhered to.

C. Distribution line construction materials shall be ductile iron per AWWA C-151 with double inside mortar lining per AWWA C-104 and double outside 8 mil polyethylene encasement per AWWA C-105 or PVC per AWWA C-900 and C-905.

D. Transmission line construction materials shall be as determined by the Water Utilities Director. For steel and ductile iron pipe, lay drawings must be submitted and approved before ordering materials.

E. Pressure systems in excess of 200 psi may require specialized design and materials.

F. The construction of all water systems from the main line to the double check valve shall be governed by this section. The City of Oceanside Fire Department shall review and approve the underground fire systems from the double check valve to the building.

G. Telemetry and Control equipment is required for:

1. Water Booster Stations
2. Disinfecting Facilities
3. Regulator Stations
4. Pressure Relief Stations
3. Check Valve Stations
6. Reservoirs
7. Wells

H. Demands:

1. Average daily water demands shall be:

| LAND USE CATEGORY | GALLONS PER DAY/PER ACRE |
|----------------------------------|--------------------------|
| Single Family Res. (1-2 DU/ac) | 1,200 |
| Single Family Res. (2-4 DU/ac) | 2,100 |
| Single Family Res. (4-8 DU/ac) | 2,400 |
| Single Family Res. (8-12 DU/ac) | 2,500 |
| Single Family Res. (12-15 DU/ac) | 2,800 |
| Single Family Res. (15-20 DU/ac) | 3,200 |
| Single Family Res. (20-30 DU/ac) | 4,100 |
| Agricultural Acres | 1,750 |
| Industrial Acres | 2,000 |
| Open Space Acres | 1,300 |
| Commercial Acres | 1,850 |
| Institutional Acres | 1,675 |

DU – Dwelling Unit

2. Peak Factors:

- | | | |
|----|----------------------|---------------|
| a. | Average Daily Demand | ADD = 1.00 |
| b. | Maximum Daily Demand | MDD = 2.0*ADD |
| c. | Peak Hourly Demand | PHD = 3.0*ADD |

2.2 FIRE FLOWS

The City of Oceanside, on January 1996, adopted Ordinance No. 096-02 establishing the City's Fire Guidelines. This Ordinance adopts the 1994 Uniform Fire Code (UFC), with certain amendments and deletions as the basis for minimum Fire Flow Protection. The worst-case scenario was used for modeling purposes. These guidelines take into account materials of construction, square footage, number of stores, and separation distance from other buildings. All private fire lines are governed by the UFC. All fire line plans shall be reviewed and approved by the City.

The typical fire flow for the different land use categories are shown in the following Table. All fire flows are measured with a 20-PSI Residual Pressure.

TABLE 4.2: Design Fire Flows

| Land Use Classifications | Design Fire Flow (GPM) | Duration (HOURS) | Residual Pressure (PSI) |
|-------------------------------------|------------------------|------------------|-------------------------|
| Residential - Single Family | 1500 | 2 | 20 |
| Residential - Multi-Family | 3000 | 2 | 20 |
| Commercial | 4000 | 4 | 20 |
| Industrial | 4000 | 4 | 20 |
| Governmental - Institutional | 4000 | 4 | 20 |

2.3 PRESSURES

- A. Minimum residual pressure shall be 20 PSI at design fire flow plus maximum day domestic demand.
- B. Minimum residual pressure shall be 35 PSI at peak hour domestic demand.
- C. Minimum residual pressure shall be 45 PSI at peak day.
- D. When static pressures exceed 80 PSI at property line, pressure-reducing valves will be required at the building. The pressure regulator shall be Class 150 or greater.
- E. All new single-family residential water service in each pressure zone shall be provided with a minimum static pressure of 50 PSI, unless otherwise approved by the Water Utilities Director.
- F. All new developments that are required to have a fire suppression system shall have the system approved by the Fire Marshall.

2.4 MAINS

- A. Minimum diameter shall be 8 inches.
- B. All mains not meeting the minimum main diameter shall be upsized to meet current design requirements.
- C. All lines are to be looped. Variations in looped lines shall only be approved by the Water Utilities Director.
- D. Minimum depth of cover required:
 - 1. 36 inches for 12-inch mains and smaller.
 - 2. Mains over 12 inches require special design.
- E. Design shall be based on maximum day requirements plus fire flow. Maximum velocity shall be 7.5 FPS not including fire flow.
- F. Thrust blocks shall be installed in accordance with Standard Drawing W-27. When water pressures exceed 200 PSI and/or soil-bearing pressures are less than 2000 PSF a special design shall be required by a Registered Civil/Structural Engineer.
- G. All mains shall be shown in profile on the improvement plans.
- H. All water mains not located within the Public right-of-way shall be provided with a minimum 20-foot wide water easement. In some cases, a wider easement may be required, as determined by the Water Utilities Director.
- I. Where water and sewer mains are located within the same easement, the minimum easement size shall be 30 feet wide.

- J. Easements shall be easily accessible to City maintenance equipment. Access shall be unobstructed with all weather driveways and capable of withstanding a 35 ton load.
- K. No trees, plantings, fences, structures, or building overhang shall be located within City easements.
- L. Homeowners who purchase property containing a City easement will be responsible for the maintenance of that easement property.
- M. No building foundations will be allowed within 10 feet of the outside edge of a City easement without written approval from the Water Utilities Director.
- N. Unless otherwise approved by the Water Utilities Department, the shortest pipe length shall be no less than 6 linear feet.

2.5 VALVES

- A. Maximum valve spacing:
 - 1. 500 feet in residential areas and high-point areas.
 - 2. 1,000 feet on arteries and secondary feeders, supply lines and combination arteries and supply lines.
- B. Valve locations: as required by the Water Utilities Director.
- C. Butterfly Valves shall conform to the "Standard for Rubber Seated Butterfly Valves", per AWWA C-504, as last revised and shall be tested and certified with the valve actuator installed on the valve.
- D. Gate Valves sizes 3 inches through 12 inches shall conform to the "Standard for Resilient Wedge Gate Valves for Water and Sewerage Systems", per AWWA C-509, and C-550 for Interior Epoxy coating, and C-110 for Ductile Iron 250 PSI, latest revision. Gate valves shall be as described in Section 2.12.
- E. All dead ends and stub outs shall be equipped with standard blow-off assembly per Oceanside Standard Drawing W-2.
- F. Both the Jones J-1945 and Ford FB-1700 Brass Ball Corporation Stops are acceptable for the 1½ inch and 2 inch service taps per Oceanside Standard Drawing W-5.
- G. All line valve installations shall comply with Oceanside Standard Drawing W-22.
- H. Valve Box and Covers shall conform to Oceanside Standard Drawing W-23.
- I. All tee intersections and cross intersections shall have a valve at each branch.
- J. Valve locations shall be designed so that no more than three valves have to be operated to shut down a line.

2.6 FIRE HYDRANTS

- A. Fire Hydrants shall be located and installed per the requirements of the most current Fire Code, "Requirements for Protection Facilities" and the City Fire Marshall.
- B. Hydrant locations:
 - 1. On the prolongation of the BC radial or property line.
 - 2. On the near side of the main. Off the largest new main at the intersection of mains.
 - 3. Spacing shall be 300 feet along streets, driveways, or designated fire lanes.
 - 4. All portions of commercial or industrial buildings shall be within 150 feet of an approved fire hydrant accessible to the fire department vehicles.
 - 5. A fire hydrant shall be required on cul-de-sac streets where the cul-de-sac is long enough so that the front door of the last house on the back of the cul-de-sac is over 150 feet from the nearest fire hydrant, as provided by State law.
 - 6. Place a blue 2-way marker at all fire hydrant locations per Oceanside Standard Drawing M-13.
- C. Specification
 - 1. All fire hydrant lines shall be provided with a shut off valve at the main, and shall conform in all aspects to the Oceanside Standard Drawing W-1.
 - 2. Paint all fire hydrants per Section 2.12.

2.7 HOUSE SERVICES

- A. One separate service shall be installed to each lot and a "W" will be stamped on the curb face at the lateral location.
- B. Minimum size shall be $\frac{3}{4}$ inch copper. 1-inch copper shall be used where available pressure is less than 50 PSI.
- C. No service shall be installed in a driveway.
- D. Where site improvements or building pad orientation for a lot are not known at the time of street construction, a service run shall be installed to 6-inches behind the back of the curb—or 6-inches in back of the sidewalk if the curb and sidewalk are adjacent to each other—for a meter connection. Location of the service run should be located 5 feet off the lot line to preclude conflict with future driveways.
- E. Minimum separation between water services and sewer laterals shall be 10 feet, unless otherwise approved by the Water Utilities Director.
- F. Minimum separation between multiple water services shall be 3 feet.

- G. Unless otherwise approved, all services shall be perpendicular to the main.
- H. No service run will originate from a fire hydrant or fire line.
- I. Only one meter will be installed per each service run.
- J. Any home being required to provide a fire-suppression system (fire sprinklers) shall provide an approved backflow prevention device either W-12 or W-13. As an alternative, the home could provide a separate fire service with a W-14.

2.8 PRESSURE BOOSTING STATIONS

Pressure Boosting Stations shall not be permitted unless otherwise indicated in the City Master Plan or unusual circumstances make one necessary. Approval shall be obtained from the Water Utilities Director.

2.9 CONNECTIONS TO EXISTING LINES

All connections to existing lines by hot tapping shall be made by a City of Oceanside approved contractor and shall conform to Oceanside Standard Drawing W-7. The approved contractor list is available from Water Utilities Department.

2.10 WATERLINE PLACEMENT

Waterlines shall be offset 10 feet to the south or 10 feet to the east of the centerline of the street. A 10-foot minimum separation shall be maintained from sewer, or reclaimed waterlines, unless otherwise approved by the Water Utilities Director and the Department of Health Services.

2.11 BACKFLOW PROTECTION

The type of protection that shall be provided to prevent backflow into the City's water supply shall be commensurate with the degree of hazard that exists on the consumers' premises. The protection shall comply with the State of California Title 17 requirements, City of Oceanside Ordinance, and shall conform to Oceanside Standard Drawings W-12, W-13, W-14 and W-29.

- A. All double-check, detector-check and Reduced Pressure Principal (RP) assemblies shall be on the State of California List of Approved Assemblies.
- B. Provide all industrial, commercial, agricultural, and irrigation services with a RP Assembly.
- C. If an auxiliary water source is used for fire service, then a Reduced Pressure-Detector Check Assembly is required.
- D. All temporary construction meters shall be protected with a RP assembly.

- E. An approved double check—detector check assembly shall be provided for all private fire services.
- F. City of Oceanside Water Utilities Department shall approve the type of assemblies for other various applications.
- G. The RP assembly shall be located above ground, on private property, at the right-of-way within eighteen inches (18") of the meter.
- H. The entire RP Assembly shall be factory assembled.
- I. Upon installation, the Contractor/Developer shall have the RP Assembly tested and certified by a tester who is on the City's current approved list. A written test report shall be submitted to the City of Oceanside Water Utilities Department prior to use. Thereafter, annual testing is required. All initial and subsequent testing and written test reports will be at the owner's expense.
- J. All properties having both a domestic water service and a well shall have a RP device as approved by the Water Utilities Department.

2.12 LIST OF AUTHORIZED MATERIALS USED IN THE CITY WATER SYSTEM

All brass products up to and including 2-inch, that may come in contact with any potable water meant for human consumption, shall conform to California AB 1953 low-lead law. Currently Irrigation only and Reclaimed Water systems are exempt from this law.

A. Fire Hydrants (Oceanside Standard Drawing W-1):

- 1. Fire hydrants shall be type James Jones J-4040 or AVK-2470 for residential and James Jones J-4060 or AVK-2490 or commercial and industrial.
- 2. Hydrants shall be Ductile Iron cast and the flange drilling shall have 6 holes.
- 3. The hydrant outlet valves shall have a 1½-inch operating nut.
- 4. Hydrant shall be primed and painted Fire Hydrant Yellow with Pro-Line 1000 marine enamel.

B. Blow-off Valves (Oceanside Standard Drawing W-2):

- 1. 6 inch (6") shall be the standard size.
- 2. The head will be a James Jones J-344 H.P. with a 4 inch threaded inlet and a 2½ inch fire hose thread outlet.
- 3. All aboveground pipe and appurtenances shall be primed and painted Fire Hydrant Yellow with Pro-Line 1000 marine enamel.

C. Air Release Valves (Oceanside Standard Drawing W-3):

- 1. All air release valves are to be a minimum of 2 inches (2").
- 2. Approved 2" model is Vent-O-Mat Model 050RBX2521CS4.

3. Valves are to have stainless steel trim.
4. Valves shall be epoxy-coated inside and outside. Epoxy Coating shall be approved and applied by the valve manufacturer.
5. Three inch (3") and larger air release valves will be submitted to the Water Utilities Department for approval.

D. Pipe, Fitting, Valve, and Nut and Bolt Material and Protection:

1. Fire Hydrant base and Blow-off companion flange Nuts and Bolts: Bolts are to be cadmium plated break-off bolts with non-oxide grease applied to the threads on the bolt and nut per Oceanside Standard Drawing W-1 and W-2.
2. Flange Nuts and Bolts:
 - a. Bolts and nuts for above ground installation shall be cadmium-plated carbon steel ASTM A307, Grade "B" or equal.
 - b. All Nuts, Bolts, Screws & Washers for buried services shall be Type 316 Stainless Steel.
 - c. Install all Nuts and Bolts to the proper torque requirements of the manufacturer.
 - d. Non-oxide grease will be applied to the threads of the plated nuts and bolts and anti-seize will be applied to the threads of the Stainless Steel nuts and bolts prior to installation in the flange.
3. Flange Coatings:
 - a. Primer: All buried service fittings, flanges, valve flanges, and valve bonnet nut and bolt surfaces shall be primed, coated with a paste-like consistency. Primer shall be Trenton Wax-Tape Primer or equal.
 - b. Wax-Tape: Cover flange, all irregular surfaces, and metallic pipe to 6-inches from backside of flange. Wax-Tape shall be Trenton #1 Wax-Tape or equal.
 - c. Outer covering: After applying the primer and wax-tape, cover the flange with Trenton Poly-Ply or equal.
4. Polyethylene Encasement:
 - a. All Ductile Iron Pipe, fittings and valves are to be encased with two (2) layers of 8-mil thick clear or black polyethylene (PE) sleeve in accordance with SSPWC (Greenbook) Section 207-9.2.6.
 - b. All buried copper pipes shall be encased in one layer of Polywrap-C (6 mil) as manufactured by Northtown products. See Std. Drawing W-3, W-4, W-5, W-8, and W-12.

5. All valves and fittings shall be encased with 6 inches of neutral sand or approved equivalent material by the Water Utilities Department.
- E. Hydraulic Valves: Cal-Val with factory fuse coated epoxy coating inside and outside of the body with stainless steel trim:
1. Standard Check Valve per Oceanside Standard Drawing W-15.
 2. Standard Relief Valve per Oceanside Standard Drawing W-16.
 3. Standard Pressure Reducing Valve per Oceanside Drawing W-17.
- F. Water Services to House or Commercial Connections:
1. $\frac{3}{4}$ Inch and 1 inch: Type "K" seamless soft copper tubing with no joints from corporation stop to curb stop per Oceanside Standard Drawing W-4.
 2. $1\frac{1}{2}$ Inch through 2 inch: Type "K" rigid copper pipe with all joints silver soldered per Oceanside Standard Drawing W-5.
 3. 3 inch and larger per Oceanside Standard Drawing W-7.
 4. Silver solder shall be type $\frac{1}{8}$ inch x 36 inch, Wolverine "Silvaloy O".
 5. All buried copper pipes shall be encased in one layer of Polywrap-C (6 mil) as manufactured by Northtown products.
 6. All water services will be encased with a minimum of 6" neutral sand or approved equivalent material by the Water Utilities Department.
- G. Service Saddles:
1. All $\frac{3}{4}$ inch and 1 inch service saddles are to have AWWA tapered thread taps (CC thread).
 2. All 1-1/2 inch and 2 inch service saddles are to have iron pipe taps (IP thread).
 3. For PVC C-900 use James Jones J-996 (4"-12"), James Jones J-969 (14"-16"); or Ford S-912 (4"-8"), Ford 202-BS (10"-30").
 4. For DIP use James Jones J979 (4"-16"), Ford 202-B (4"-30"), or Apac Products No. 113 (14"-30").
 5. Threads on nuts and bolts must be coated with non-oxide grease or anti-seize before installation Section 2.12.D.
 6. Saddle must be completely encased in neutral sand or approved equivalent by the Water Utilities Department before backfilling.
- H. Ductile Iron Pipe (DIP) Water Mains:
1. Conform to AWWA C-151 and shall conform to Section 207-9 of the Standard Specifications for Public Works Construction (Greenbook), latest revision.

2. All ductile iron pipe shall be double lined inside with cement mortar, per AWWA C-104.
3. All ductile iron pipe shall be encased in two (2) layers of 8-mil polyethylene, per AWWA C-105. See Section 2.12.D.4 – Polyethylene Encasement.
4. Pipe class shall be shown on the plans and is subject to the approval of the Water Utilities Director.
5. The maximum deflection for DIP shall be 2-½ degrees per joint (4 inch through 12 inch).
6. 3-inch minimum width color coded detector tape marked “WATER” in 1 ½ inch black letters shall be placed on the compacted and graded sand bedding one foot above and centered over the DIP water main prior to backfilling the trench.

I. Polyvinyl Chloride pipe (PVC) Water Mains:

1. Shall conform to AWWA C-900, C-905, CL-150 and CL-200 pipe with rubber ring bell end, or plain end with rubber ring coupling. Solvent welded joints are not permitted.
2. Provide pipe with ductile iron equivalent outside diameter (OD) and class 150 minimum, or pressure rating as required.
3. For 4 inch through 12 inch PVC, deflections at the joints shall not be permitted. Curves and deflections shall be made only with the use of high deflection C-900 PVC couplings or the approved ductile iron fittings. A maximum of 5 degrees per coupling shall be permitted. The improvement plans shall clearly indicate the location of the couplings and the pipe lengths.
4. Minimum allowable radius for PVC pipe, using deflector couplings shall be as follows: (Less than 10 foot pipe length shall not be permitted):

| <u>Pipe Length</u> | <u>Minimum Allowable Radius</u> |
|--------------------|---------------------------------|
| 20 Feet | 250 Feet |
| 10 Feet | 125 Feet |

5. 3-inch minimum width color coded detector tape marked “WATER” in 1 ½ inch black letters shall be placed on the compacted and graded sand bedding one foot above and centered over the PVC water main prior to backfilling the trench.
6. Tracer wire shall be as follows:
All non-metallic pipelines, including water service laterals, shall be provided with a No. 10 AWG insulated copper wire laid along the top of the pipe and held in place with ties or hitches. The ties or hitches shall be spaced not more than 10 feet apart. The copper wire is to be used in the future as a means of locating the pipe with an electronic-type pipe locator.

J. Bedding and Backfill:

1. Pipe bedding and trench backfill shall conform to San Diego Regional Standard Drawing W-21, except that compaction in the pipe zone, middle zone, and upper zone shall be 95%.
2. Where neutral materials, sand or native materials are specified, they shall meet the testing specification requirements of the "Construction Guidelines and Requirements" section of the Oceanside Water, Sewer and Reclaimed Water Design & Construction Manual.

K. Valves under 14 inch:

1. $\frac{3}{4}$ inch and 1 inch Corporation Stops for meter service saddles will be AWWA taper thread (CC thread) by flare: James Jones E-1930 or Ford FB600-3-NL or FB600-4-NL per Oceanside Standard Drawing W-4.
2. $\frac{3}{4}$ inch and 1 inch Meter Angle Stops (Street side of meter): James Jones E-1964W, Ford $\frac{3}{4}$ inch BA23-332W-NL or Ford 1 inch BA23-444W-NL. The center flow line is to be 10 inches below the finished grade per Oceanside Standard Drawing W-4.
3. $\frac{3}{4}$ inch and 1 inch Meter Service Valve (house side of meter): James Jones E-1908W Ball Valve or Ford B-13-232W-HB-34S-L or B-13-444W.-HB-34S-NL To be furnished and installed by City forces when meter is set at contractor's expense.
4. $1\frac{1}{2}$ inch and 2 inch Ball Valves for meter service saddles and 2 inch Ball Valves for 2 inch air release saddles will be male iron pipe (MIP) thread inlet by female iron pipe (FIP) thread outlet with 2 inch gate valve operating nut adapter: James Jones E-1945 with 281-NB or Ford B-81-777-NL with QT67.
5. $1\frac{1}{2}$ inch and 2 inch Meter Service Valves (street-side meter): James Jones E-1912W or Ford BF-13-777W. The center of the flow line shall be 10 inches below finished grade per Oceanside Standard Drawing W-5.
6. $1\frac{1}{2}$ inch and 2 inch Meter Service Valves (house-side of meter): James Jones E-1912W or Ford BF-13-666W-NL, BF13-777W-NL. To be furnished and installed by City forces when meter is set at contractor's expense.
7. 2 inch Ball Valve just under air release valve inside release valve cover: James Jones E-1900 or Ford B11-777-NL per Oceanside Standard Drawing W-3.
8. The use of threaded bushings and reducers on water service lines is not allowed.
9. 3 inch to 12 inch Gate Valves will be: Clow, Mueller, or American Flow Control Series 2500 resilient wedge gate valve per AWWA C509 with a fully encapsulated gate, low zinc stem, and factory fused epoxy coating inside and outside. All nuts and bolts shall be Type 316 Stainless Steel.
10. Coat, wrap, and encase all buried gate valves per Section 2.12.

L. Butterfly Valves (BFV):

1. Valves 14 inch or larger will be Butterfly Valves. The only acceptable butterfly valve shall be a Pratt Groundhog Valve, which has been tested and certified, per all of the AWWA standards, with the valve actuator installed.
2. Butterfly Valves, including operators, shall be protectively coated. Exterior surfaces shall be coated for buried service in accordance with Section 4.2 of AWWA C-504.
3. All interior ferrous surfaces, or butterfly valves, including contiguous flange faces shall be protectively coated with Keysite No. 750, a product of the Soc-Co Plastic Coating Company of Rancho Cucamonga, California, 3-M Company No. 302, or equal. Said coating shall be applied in not less than three (3) coats to a dry-film thickness of not less than ten (10) or more than twelve (12) mils and shall be "holiday" free.
4. All surfaces to receive epoxy coating shall be thoroughly cleaned of all contaminants, i.e., oil, grease, wax, etc., by solvent washing or steam cleaning. Surface projections shall be removed and sharp edges rounded to assure proper application of the epoxy coatings. Immediately prior to applying epoxy coating, surfaces to receive this coating shall be blast cleaned to white metal in accordance with Steel Structures Painting Council Surface Preparation Specifications, No. 5 White Metal Blast Cleaning (SSPC – SP5-63).
5. Coat, wrap, and encase all buried butterfly valves per Section 2.12.
6. To assure a thorough "Keysite" or "3-M" coating, epoxy paste-type filler shall be used to fill any crevices and to modify any sharp inside corners. Said epoxy filler shall be "Keysite No. 742, A and B Epoxy Filler No. 2098", as manufactured by Wyndham Chemical, Inc., Santa Fe Springs, California; or an approved equal.
7. During application of "Keysite" coating the seating surfaces shall be masked. However, the coating shall cover all junctions between dissimilar metals.
8. If any epoxy coating material, other than Keysite No. 750, or 3-M Company 320 is proposed to be used to coat the valves furnished here under, the epoxy coating material shall be submitted to the Water Utilities Department for review and approval.
9. The valve manufacturer shall apply all epoxy lining.

M. Standard Vault (Oceanside Standard Drawing W-19):

1. All vaults, manholes, pits, etc. shall be designed per all current applicable codes and regulations: Title 8, CALIFORNIA CODE OF REGULATIONS, Cal/OSHA, ANSI, etc. for "Confined Space" and "Fall Protection".
2. The Design Engineer shall certify that all vaults, manholes, pits, etc. meet all current applicable codes and regulations for "Confined Space" and "Fall Protection" at the time of construction.

N. Vault Lids (Oceanside Standard Drawing W-20):

1. Aluminum Bilco or USF frame and cover appropriately sized for each vault, shall be rated for H-20 loading, and shall provide a full wall-to-wall opening.

O. Valve Box, Cover, and Can (Oceanside Standard Drawing W-23):

1. Potable water manufactured by South Bay Foundry, San Diego, California, No. GV-8 (Model SBF 1208N) with "Oceanside Water" stamped on the cover. Private line covers shall be stamped "Private Water".
2. Valve Can: 6 Inch SDR-35 PVC, one-piece gravity sewer pipe centered over valve operating nut and set plumb.

P. Valve Stem Extension (Oceanside Standard Drawing W-24):

1. Provide a stainless steel valve stem extension where the depth from the finish surface to the top of valve operating nut exceeds nine (9) feet.

Q. Fittings – Ductile Iron Only – Cast Iron Not Permitted:

1. Use ductile iron Tyler Grip-Tite or Nappco push-on fittings conforming to AWWA C-110 or C-153 with a minimum rated working pressure of 250 PSI.
2. Provide fittings with bells and rubber O-ring gaskets specifically designed for ductile iron equivalent outside diameter PVC pipe.
3. Mechanical joint fittings not permitted. Use of flex couplings is not allowed.
4. Polyethylene wrap and encase in 6 inches of neutral sand per Section 2.12.

R. Flanges:

1. Flanges on ductile iron pipe and fittings shall conform to AWWA C-115 or ANSI B16.1 Class-250. Protect buried service flanges per Section 2.12.

S. Flange Gaskets:

1. Full face, cloth-inserted rubber, 1/8-inch thick, conforming to AWWA Standard C-111.

2.13 REQUIREMENTS FOR FIRE PROTECTION SYSTEMS

A. General

The City of Oceanside Fire Department shall inspect underground fire mains and fire sprinkler or standpipe systems on private property, from the double check detector assembly to the building.

All systems shall be designed and installed as per City of Oceanside Standards and the applicable Fire Code Referenced NFPA Standards 13 and 24, AWWA Standards, San Diego County Regional Water Standards and Manufacturer's Installation Specifications.

B. Plan Approval Process

Developers shall submit the following information to the Fire Department prior to installation of systems for Plan Review.

1. Plans are to be to scale with nationally recognized standards. Plans and associated specifications shall include sizing and type of material of piping and all appurtenances for installation.
2. Show each location of post indicator valves, fire department connections, essential valves, check valves, and backflow prevention assemblies.
3. PVC Pipe to be at least C-900 Class 150 or as required on the Plans or in the Specifications.
4. 3-Inch minimum width detector tape marked "WATER" shall be placed on the compacted and graded sand bedding, one (1) foot above and centered over the PVC water main prior to backfilling the trench.
5. Joining methods-thrust blocks, concrete pads, and depth of bury. (Thrust restraints Tables-NFPA 24).
6. Post Indicator Valve is required to be equipped with a tamper switch and monitored by a central station.
7. The Fire Department connection/post indicator valve shall be located within 40 feet of the building served or as approved by the City Fire Marshal.
8. Plans must be an Engineering Plan that is prepared by a licensed Civil Engineer.
9. Plans must be As-built by a licensed Civil Engineer.

C. Test Procedures for all Underground Systems

NOTE: The following inspections shall be required by Oceanside Fire Department shall inspect underground fire mains and fire sprinkler or standpipe systems on private property as listed below.

1. Visual Inspection of installation in trench prior to burial:
 - a. Installation of listed and approved pipe, fittings, valves and connections.
 - b. Installation of all thrust blocks and concrete pads that are required, such as those under post indicator valves, fire department connection fittings, and double check detector check valves.
 - c. Depth of burial (36 inch minimum).
 - d. Rods, nuts, bolts, washers, clamps, and other retraining devices cleaned and coated with approved corrosion-retarding material (non-oxide grease).

- e. Neutral sand or approved equivalent by the Water Utilities Department on site.
 - f. Post Indicator Valve shall be installed to insure 18-inch clearance from all obstructions and 36-inch minimum height from final grade.
 - g. Double Check-Detector Check shall be installed per Oceanside Standard Drawing W-14.
2. Inspections After Burial (piping may be center loaded during hydrostatic test):
- a. Backfilling.
 - b. Pressure Test.
 - c. Underground flush is to be done prior to connecting riser.
 - d. Final Inspection.
3. Test Procedures and Inspections
- a. Perform as required in the Appendix titled, "Construction Guidelines and Requirements" of this Water, Sewer, and Reclaimed water Design & Construction Manual.

D. Pressure Test

- 1. Pressure test to be conducted for a period of two (2) hours at a pressure of 200 PSI from the building, through the Post Indicator Valve, prior to connection to City main.

E. Underground Flush

- 1. Flushing of underground systems shall be conducted with a minimum of 2-½ inch hoses, properly anchored to insure safety.

F. Acceptance Procedures

- 1. The installer shall perform all required acceptance tests above, under the supervision of the Oceanside Fire Department.

END OF POTABLE WATER SYSTEMS DESIGN GUIDELINES