

CITY OF OCEANSIDE

WATER UTILITIES DEPARTMENT

WATER, SEWER, AND RECYCLED WATER DESIGN & CONSTRUCTION MANUAL

SECTION 2

POTABLE WATER SYSTEMS - DESIGN GUIDELINES

TABLE OF CONTENTS

<u>PARAGRAPH</u>	<u>TITLE</u>	<u>PAGE</u>
2.1	GENERAL.....	2-1
2.2	FIRE FLOWS.....	2-2
2.3	PRESSURES.....	2-3
2.4	MAINS.....	2-3
2.5	VALVES.....	2-4
2.6	FIRE HYDRANTS.....	2-5
2.7	WATER SERVICES.....	2-6
2.8	PRESSURE BOOSTING STATIONS.....	2-6
2.9	SERVICE CONNECTIONS TO EXISTING LINES.....	2-6
2.10	WATERLINE PLACEMENT.....	2-7
2.11	BACKFLOW PROTECTION.....	2-7
2.12	LIST OF AUTHORIZED MATERIALS USED IN THE CITY WATER SYSTEM.....	2-8
2.13	REQUIREMENTS FOR FIRE PROTECTION SYSTEMS.....	2-16

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 Recycled Water Design & Construction Manual.
- B. If a conflict arises between the requirements in this manual, the order of precedence shall take place:
 - a. Sections 1-4, Required Notes, & Appendix
 - b. Standard Drawings
 - c. Standard Specifications
- C. 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 Water Resources Control Board – Division of Drinking Water
 - 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. 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 for fire protection, 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 Pump Stations

2. Pressure Regulating Stations
3. Pressure Relief Stations
4. Reservoirs
5. 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 currently utilizes the latest edition California Fire Code (CFC) requirements for determining fire flow requirements for buildings. The latest edition CFC incorporates many factors in determining fire flows, such as building construction type, building square footage, and fire protection systems. Several factors are combined to determine the minimum required fire flow requirements.

Although General Guidelines contained in Table 2.1 represent typical fire flows for various land use categories, minimum fire flow calculations are governed by the latest edition CFC, Section 507, for each specific building type and construction.

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 2.1: General Fire Flow Guidelines

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

All new developments that are required to have a fire suppression system shall have the system approved by the Fire Marshal. Sprinkler calculations shall be provided to the Fire Department for review and to verify the fire service connection and backflow assembly is properly sized.

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 at the water meter.

2.4 MAINS

- A. Minimum diameter shall be 8 inches.
- B. All mains not meeting the minimum main diameter and material requirements shall be replaced to meet current design standards. This is applicable for all new commercial, industrial, institutional, and residential developments of four (4) units or more. Where the full replacement length along the frontage property is deemed in excess of the overall project cost, the developer may pay an in-lieu fee upon the approval of the Water Utilities Director.
- C. All lines are to be looped.
- 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. For fire flow conditions, velocities shall not exceed 15 FPS for less than 12-inch existing mains, and velocities shall not exceed 10 FPS for 12-inch existing mains and above. For new mains, velocities shall not exceed 10 FPS with the fire flow demand flowing through one hydrant.
- G. 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.
- H. All mains shall be shown in profile on the improvement plans.
- I. 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.
- J. Where water and sewer mains are located within the same easement, the minimum easement size shall be 30 feet wide.
- K. Easements shall be easily accessible to City maintenance equipment. Access shall be unobstructed with all-weather driveways and capable of withstanding a 40 ton load.
- L. No trees, plantings, fences, structures, or building overhang shall be located within City easements.
- M. Homeowners who purchase property containing a City easement will be responsible for the maintenance of that easement property.
- N. No building foundations will be allowed within 10 feet of the outside edge of a City easement.
- O. 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. All domestic water services shall meet the low "E" standards. Both the Ford FB-81-777 with QT67 or A.Y. McDonald 76107 with 6122 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 WATER SERVICES

- A. All new single-family residential water meter services shall be 1-inch per Oceanside Standard Drawing W-4. Water services 1-1/2" to 2" and larger than 2" shall be per Oceanside Standard Drawings W-5 and W-10, respectively.
- B. One separate meter service shall be installed to each lot and a "W" will be stamped on the curb face at the lateral location.
- C. Minimum water service size shall be 1-inch copper.
- D. No service shall be installed in a driveway.
- E. 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 behind 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.
- F. Minimum separation between water services and sewer laterals shall be 10 feet.
- G. Minimum separation between multiple water services less than 2-inches shall be 18-inches staggered per AWWA C605-13 and 2-ft from fittings. For fire services or services greater than 2-inches, the separation shall be 5-feet or greater to avoid a monolithic thrust block.
- H. Unless otherwise approved, all services shall be perpendicular to the main.
- I. No meter service run will originate from a fire hydrant or fire line.
- J. Only one meter shall be installed per each service run.
- K. Water meter shall be sized by the designer or engineer in accordance with the most current adopted edition of the California Plumbing Code and reviewed by the Water Utilities Department.
- L. Any single-family residence required to provide a fire-suppression system (fire sprinklers) shall provide a Residential Dual Check Valve as indicated on Oceanside Standard Drawing W-30.
- M. All services for water meters, fire protection, fire hydrants, air vacuum and release valve assemblies, and blow off assemblies shall have a minimum 3-feet of cover.

2.8 PRESSURE BOOSTING STATIONS

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

2.9 SERVICE CONNECTIONS TO EXISTING LINES

All connections to existing water mains shall be either by City approved hot tapping contractor or by cutting in a tee with associated appurtenances. The connections shall be determined by the Water Utility Department and 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 horizontal minimum separation shall be maintained from sewer, or recycled waterlines, unless otherwise approved by Division of Drinking Water.

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. Multi-family residential units are not required to have a RP Assembly after the water meter unless noted otherwise by the Water Utilities Department.
- C. If an auxiliary water source is used for fire service, then a Reduced Pressure-Detector Check Assembly (W-29) 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. If the RP assembly requires to be located further than 18-inch away from the meter, the Water Utilities Department shall approve the final location and necessary requirements.
- 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 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 FOR POTABLE WATER PROJECTS

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 Ductile Iron, J-3700 Brass, or AVK-2470 for residential and James Jones J-4060 Ductile Iron, J-3765 Brass, or AVK-2490 for 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. Private fire hydrants shall be primed and painted with Pro-Line 1000 OSHA Safety Red.

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

1. 4-inch (4") shall be the standard size.
2. The unit shall be AVK Series 67 Post/Flushing Single Hose with a 4-inch threaded inlet and a 2½-inch fire hose thread outlet.
3. All above-ground pipe and appurtenances shall be primed and painted Fire Hydrant Yellow with Pro-Line 1000 marine enamel.

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

1. All combination air valves are to be 2-inch (2") and shall be constructed per Oceanside Standard Drawing W-3.
2. Approved 2" model is A.R.I. Flow Control Accessories Model D-040 "BARAK" with a non-slam, discharge throttling attachment and screen.
3. Valve materials are required to comply with NSF/ANSI 61 requirements.
4. All combination air valves shall be housed in an air valve enclosure, unless noted otherwise.
5. Approved air-vacuum valve enclosure models are to be Pipeline Products model VCAS-1830-SM or Armorcast model P6002002-SND.
6. Three-inch (3") and larger combination air 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, all break-off bolts shall be epoxy-filled.
2. Flange Nuts and Bolts:
 - a. Bolts and nuts for above ground installation shall be cadmium-plated carbon steel ASTM A307, Grade "B" or approved 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 approved 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 approved equal.
 - c. Outer covering: After applying the primer and wax-tape, cover the flange with Trenton Poly-Ply or approved equal.
4. Polyethylene Encasement:
 - a. All buried Ductile Iron Pipe (DIP), fittings, couplings, tie rods, expansion joints, and valves shall be encased with two (2) layers of 8-mil thick polyethylene (PE) sleeve per AWWA C105 and the Standard Specifications for Public Works Construction (SSPWC or Greenbook) Sections 209-1.1, 212-12, and 306-8.2.
 - b. All buried potable water copper pipes shall be encased in one layer of blue Polywrap-C (6 mils) as manufactured by Northtown Company products. See Standard Drawings 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.

E. Hydraulic Valves: Cla-Val with factory fusion epoxy coated 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 Residential or Commercial Connections:

1. 1-inch: Type "K" seamless soft copper tubing with no joints from corporation stop to curb stop per Oceanside Standard Drawing W-4. All new residential dwellings shall have a minimum 1-inch water service connection.
2. 1½-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 1/8-inch x 36-inch, Wolverine "Silvaloy 0".
5. All buried copper pipes shall be encased in one layer of blue Polywrap-C (6 mil) as manufactured by Northtown Company products.
6. The use of threaded bushings and reducers on water service lines shall not be allowed.
7. All water services will be encased with a minimum of 6" neutral sand.

G. Service Saddles:

1. All 1-inch service saddles are to have NPT iron pipe (IP) threaded taps.
2. All 1-1/2-inch and 2-inch service saddles are to have IP threaded taps.
3. For PVC C-900 use Ford S-912 (4"-8"), Ford 202-BS (10"-30") or A.Y. McDonald 3846 (4"-16").
4. For DIP use Ford 202-B (4"-30"), Apac Products No. 113 (14"-30") or A.Y. McDonald 3826 (4"-16").
5. Threads on nuts and bolts must be coated with non-oxide grease or anti-seize before installation Section 2.12.D.
6. Service saddles shall be encased with six (6) inches of neutral sand.

H. Tapping Sleeves:

1. No size-on-size hot taps are allowed.
2. All 4-inch and larger service taps (outlet size) shall be Smith-Blair 622 carbon steel tapping sleeve on 6" to 30" water mains or approved equal.
3. All cement-coated steel cylinder pipe shall be Koppl Pipeline Services fabricated tapping sleeve only. Sleeve shall be installed and tapped by Koppl Pipeline Services. No weld-on nozzles will be permitted.

4. All buried nuts, bolts, and washers shall be Type 316 stainless steel.

I. Ductile Iron Pipe (DIP) Fittings:

1. Fittings shall conform to AWWA C151/ANSI 21.51 and to Section 2.09-1 of the SSPWC (Greenbook), latest revision.
2. The interior of all fittings shall be double cement-mortar-lined per AWWA C104, or as specified in the Project Contract Documents for capital improvement projects.
3. The exterior of all fittings shall be a shop coat with one prime coat of asphaltic coating approximately 1 mil thick per AWWA C151, or as specified in the Project Contract Documents for capital improvement projects. .
4. Pipe class shall be shown on the plans and is subject to the approval of the Water Utilities Department.
5. DIP shall be approved on a case-by-case basis by the Water Utilities Department.

J. Polyvinyl Chloride (PVC) Water Mains:

1. All water mains 16-inches and below shall be PVC unless directed by the Water Utilities Department.
2. Shall conform to AWWA C-900, C-905, CL 165 and CL 235 pipe with rubber ring bell end, or plain end with rubber ring coupling. Solvent welded joints are not permitted.
3. Provide pipe with ductile iron equivalent outside diameter (OD) and Class 165 minimum, or pressure rating as required.
4. 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.
5. 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.

K. Tracer Wire for Piping:

1. Tracer wire shall be installed on all plastic pipes, laterals, services and appurtenances. The wire shall be installed in such a manner as to be able to properly trace all pipelines and services without loss or deterioration of signal or without the transmitted signal migrating off the tracer wire.
 - a. **Open-Trench Installation:** Direct burial #12 AWG Solid (0.0808" diameter), steel core soft drawn tracer wire, 250# average tensile break load, 30 mil high molecular-high density polyethylene jacket complying with ASTM-D-1248, 30 volt rating. Color shall be "blue" for domestic water (potable) pipelines as manufactured by Copperhead Industries part number 1230-SF, or approved equal.
 - b. **Directional Bore or Jacked Installation:** Direct burial #12 AWG Solid (0.0808" diameter), steel core hard drawn extra high strength horizontal directional drill tracer wire, 1150# average tensile break load, 45 mil high molecular-high density polyethylene jacket complying with ASTM-D-1248, 30 volt rating. Color shall be "blue" for domestic water (potable) pipelines as manufactured by Copperhead Industries part number 1245-EHS, or approved equal. Connectors, test stations, and grounding shall be as specified in the Project Contract Documents for capital improvement projects.
 - c. **Connectors:** Splices along the continuous run of tracer wire for repair of a wire break or replacement of failed segment of wire shall use 3M Brand DBR Direct Bury Splice Kit or approved equal.
 - d. **Branch Connections:** Branch connections for laterals, turnouts, services and appurtenances shall use DryConn Direct Bury Lug Aqua, or approved equal.
 - e. **Alternatives:** Approved alternatives for connectors and branch connections must securely connect two or more wires, effectively moisture seal by means of a dielectric non-hardening silicone sealant. The manufacturer must be approved for direct burial and rated for a minimum of 50V.
 - f. **Grounding of Tracer Wire:** Use a minimum 20 feet of #14 HDPE copper clad wire connected to grounding anode rod. Grounding rod shall be Copperhead 1 Lb., Drive-In Magnesium anode (Part #ANO-1005 with Part #SCB-01SR Connector), or approved equal.

L. Bedding and Backfill:

1. Pipe bedding and trench backfill shall conform to San Diego Regional Standard Drawing WP-02, 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 Recycled Water Design & Construction Manual.

M. Valves under 14-inch:

1. ¾-inch and 1-inch Corporation Stops for meter service saddles will be AWWA taper thread IP by flare: Ford FB7000-3-NL or FB7000-4-NL or A.Y. McDonald 74704B per Oceanside Standard Drawing W-4.
2. ¾-inch and 1-inch Meter Angle Stops (Street side of meter): Ford ¾ inch BA23-332W-NL, Ford 1--inch BA23-444W-NL or A.Y. McDonald 74602B. The center flow line is to be 10 inches below the finished grade per Oceanside Standard Drawing W-4.
3. ¾-inch and 1-inch Meter Service Valve (house side of meter): Ford B-13-332W-HB-34S-L or B-13-444W-HB-34S-NL or A.Y. McDonald 76101MW/SHDLB. This will be furnished and installed by City forces when meter is set at contractor's expense.
4. 1½-inch and 2-inch Ball Valves for meter service saddles and 2-inch Ball Valves for 2-inch combination air valve saddles will be male iron pipe (MIP) thread inlet by female iron pipe (FIP) thread outlet with 2-inch gate valve operating nut adapter: Ford B-81-777-NL with QT67 or A.Y. McDonald 76107 with 6122.
5. 1½-inch and 2-inch Meter Service Valves (street-side meter): Ford BFA-13-666W-NL (1-1/2"), BFA-13-777W-NL (2") or A.Y. McDonald 74604B. The center of the flow line shall be 10 inches below finished grade per Oceanside Standard Drawing W-5.
6. 1½-inch and 2-inch Meter Service Valves (house-side of meter): Ford BF-13-666W-NL (1-1/2"), BF13-777W-NL (2") or A.Y. McDonald 74604B. This will be furnished and installed by City forces when meter is set at contractor's expense.
7. 2-inch Ball Valve just under combination air valve inside the valve cover: Ford B11-777-NL or A.Y. McDonald 76101 per Oceanside Standard Drawing W-3.
8. Residential dual check valves after water meters for combination domestic and fire service shall be Zurn Model 700 XL for ¾" and 1" or Watts Series LF07S for 1" and 2".
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.

N. Butterfly Valves (BFV):

1. Valves 14 inch or larger will be Butterfly Valves (BFV), which shall comply with ANSI/AWWA C504. The only approved butterfly valves are the Pratt Groundhog BFV and Mueller Co. BFV. Any butterfly valves other than the two listed above shall be submitted to the Water Utilities Department for review and approval. The submittal shall contain all data and test results verifying

that the requested butterfly valve is equivalent in all respects to the butterfly valves specified. The determination of the Water Utilities Department regarding the substitution being equal shall be final.

2. Butterfly Valves, including operators, shall be protectively coated with an epoxy product that is blue in color and certified NSF/ANSI 61 compliant.
3. The exterior of exposed service valves shall be coated with Tnemec Series 141 Epoxoline, 3M Scotchkote 162PWX, or approved equal. The exterior coating shall be factory-applied in not less than two (2) coats to a total dry film thickness (TDFT) of 8 to 10 mils and shall be holiday free.
4. The exterior of buried service valves shall be coated with Tnemec Series 141 Epoxoline, 3M Scotchkote 162PWX, or approved equal. The exterior coating shall be factory-applied in not less than two (2) coats to a TDFT of 16 to 18 mils and shall be holiday free.
5. The interior ferrous surfaces, including contiguous flange faces shall be protectively coated with either Tnemec Series 141 Epoxoline, 3M Scotchkote 162PWX, or approved equal. Said coating shall be applied in not less than two (2) coats to TDFT of 10 to 12 mils and shall be holiday free.
6. 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), or as recommended by the coating product manufacturer.
7. If any epoxy coating material, other than Tnemec 141 Epoxoline or 3M Scotchkote 162PWX 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.
8. To assure a thorough “Tnemec” or “3M” interior 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 742 Putty” as manufactured by Socco Plastic Coating Company of Rancho Cucamonga, California (909-987-4753); or an approved equal.
9. During the application of the Tnemec or “3M” coatings, the seating surfaces shall be masked. However, the coating shall cover all junctions between dissimilar metals.
10. The valve manufacturer shall factory-apply all epoxy interior linings and exterior coatings. .
11. All surfaces that are to receive protective coatings shall be prepared, primed, and coated per the manufacturer’s recommendations. All coating products shall conform to the San Diego Air Pollution Control District Rule 67.0, which limits volatile organic compounds (VOC’s) per gallon of coating product.

12. The valve manufacturer shall shop-apply all epoxy interior linings and exterior coatings.
13. The manufacturer shall perform the following tests and submit them to the Water Utilities Department for review and approval:
 - a. Seat Bond ASTM D429 Method B, to withstand 75 lb. pull
 - b. Leakage Test AWWA C504
 - c. Hydrostatic Test AWWA C504
 - d. Interior and Exterior Holiday and Lining Thickness Certified Test
14. Wax tape, wrap, and encase all buried butterfly valves per Section 2.12.

O. 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.

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

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

Q. 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 1208 for traffic speeds below 35mph and Model SBF 1208N for traffic speeds 35mph and above) with “Oceanside Water” stamped on the cover. Private valve 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.

R. 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.

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

1. Use ductile iron Tyler/Union or Star Pipe Products push-on fittings conforming to AWWA/ANSI C110/A21.10 or AWWA C153 with a maximum rated working pressure of 250 PSI. For a maximum rated working pressure of 350 PSI, flanged ductile iron fittings shall conform to AWWA/ANSI C115/A21.15.

2. Provide fittings with bells and rubber O-ring gaskets specifically designed for ductile iron equivalent outside diameter PVC pipe.
3. Mechanical joint fittings are typically not permitted unless under special circumstances which would require the Water Utilities Department review and approval.
4. Polyethylene wrap and encase in 6 inches of neutral sand per Section 2.12.

T. Couplings:

1. All couplings shall be submitted to Water Utilities Department for review and approval.
2. High deflection, stop, and repair couplings for C900 PVC pipe shall be manufactured by CertainTeed, IPEX, or an approved equal.
3. Transition couplings for joining dissimilar materials shall be manufactured by Smith-Blair, Romac, Dresser, or an approved equal.
4. Use of flexible couplings are not allowed.

U. Flanges:

1. Flanges on ductile iron pipe and fittings shall conform to AWWA/ANSI C110/A21.10 having face and drilling pattern identical to AWWA/ANSI C115/A21.15 or ANSI B16.1 Class 125 flanges with maximum allowable pressure rating of 250 psi for 12-inch and smaller, and 250 psi for 14-inch to 48-inch diameter pipe.
2. Protect buried service flanges per Section 2.12.
3. Ductile iron pipe and fittings over 250 psi working pressure shall be submitted to Water Utilities Department for review and approval on a case-by-case basis.

V. Flange Gaskets:

Gaskets for AWWA/ANSI C110/A21.10 flanged ductile iron pipe and fittings with ANSI B16.1 Class 125 or ANSI B16.5 Class 150 flange dimensions shall be full-faced. Gaskets shall be non-asbestos, made of aramid fiber NBR binder, 1/8-inch thick, and conforming to AWWA Standard C111. The gaskets shall be Tripac 8137 or Garlock Style 3760-U (12-inch and larger), or an approved equal.

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 post indicator valve 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 Director 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