APPENDIX

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A	LIST OF AUTHORIZED MATERIALS FOR POTABLE WATER PROJECTS

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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.

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 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 be in compliance 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 or approved equivalent material by the Water Utilities Department.

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-nch 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 or approved equivalent material by the Water Utilities Department.

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 wrapped with one layer of Polywrap-C (8 mils) as manufactured by Northtown Company products, or approved equal; and shall be encased with six (6) inches of neutral sand or approved equivalent material by the Water Utilities Department.

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) Water Mains:

1. DIP and 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 DIP and 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 DIP and 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. 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.

7. DIP shall be approved on a case-by-case basis by the Water Utilities Department.

J. Polyvinyl Chloride (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):

Pipe Length	Minimum Allowable Radius
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.

b. **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.

c. **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.

d. **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.

e. **Branch Connections:** Branch connections for laterals, turnouts, services and appurtenances shall use DryConn Direct Bury Lug Aqua, or approved equal.

f. 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.

g. **Valve Box for Tracer Wire:** Valve boxes shall be Brooks No. 1-RT Traffic Valve Box, or approved equal. Valve box lids shall be the same color as the tracer wire they house.

h. **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 or ring-type. 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.