Standard Specifications
for
Construction of Water Facilities

Sweetwater Authority
505 Garrett Avenue
Chula Vista, California 91910
SWEETWATER AUTHORITY
505 GARRETT AVENUE
CHULA VISTA, CALIFORNIA 91910

STANDARD SPECIFICATIONS
FOR
CONSTRUCTION OF WATER FACILITIES

MAY 2016
PREFACE

The following STANDARD SPECIFICATIONS FOR CONSTRUCTION OF WATER FACILITIES were approved and adopted by the Governing Board on August 10, 2016, as the standard specifications for work within Sweetwater Authority's jurisdiction.

Previous standard specifications are invalid and all work approved subsequent to the new adoption shall conform to the new standards.

SWEETWATER AUTHORITY

[Signature]
Janet Gonzalez
Secretary to the Board
# SECTION 1 - GENERAL REQUIREMENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-01</td>
<td>Definitions</td>
<td>1-2</td>
</tr>
<tr>
<td>1-02</td>
<td>Requirements for Improvement Plans</td>
<td>2-4</td>
</tr>
<tr>
<td>1-03</td>
<td>Work to be Done</td>
<td>4</td>
</tr>
<tr>
<td>1-04</td>
<td>Depth of Pipe</td>
<td>4</td>
</tr>
<tr>
<td>1-05</td>
<td>Water for Construction</td>
<td>4</td>
</tr>
<tr>
<td>1-06</td>
<td>Materials</td>
<td>5</td>
</tr>
<tr>
<td>1-07</td>
<td>Responsibility for Material Furnished by the Authority</td>
<td>5-6</td>
</tr>
<tr>
<td>1-08</td>
<td>Handling of Pipe and Accessories</td>
<td>6</td>
</tr>
<tr>
<td>1-09</td>
<td>Defective or Damaged Material</td>
<td>6</td>
</tr>
<tr>
<td>1-10</td>
<td>Polyethylene Wrap</td>
<td>6</td>
</tr>
<tr>
<td>1-11</td>
<td>Bolts and Nuts</td>
<td>6</td>
</tr>
<tr>
<td>1-12</td>
<td>Coating Metal Work</td>
<td>6</td>
</tr>
<tr>
<td>1-13</td>
<td>Wet Tapping</td>
<td>7</td>
</tr>
<tr>
<td>1-14</td>
<td>Hi-Line</td>
<td>7</td>
</tr>
<tr>
<td>1-15</td>
<td>Safety Regulations</td>
<td>8</td>
</tr>
<tr>
<td>1-16</td>
<td>Public Convenience</td>
<td>8-9</td>
</tr>
<tr>
<td>1-17</td>
<td>Preservation of Monuments</td>
<td>9</td>
</tr>
<tr>
<td>1-18</td>
<td>Datum Plans and Measurements</td>
<td>9</td>
</tr>
<tr>
<td>1-19</td>
<td>Setting Stakes</td>
<td>9</td>
</tr>
<tr>
<td>1-20</td>
<td>Inspection of Stakes</td>
<td>9-10</td>
</tr>
<tr>
<td>1-21</td>
<td>Inspection of Work</td>
<td>10</td>
</tr>
<tr>
<td>1-22</td>
<td>Days of Work</td>
<td>10</td>
</tr>
<tr>
<td>1-23</td>
<td>Compliance with Laws</td>
<td>11</td>
</tr>
<tr>
<td>1-24</td>
<td>Use of Premises</td>
<td>11</td>
</tr>
<tr>
<td>1-25</td>
<td>Loss or Damage</td>
<td>11</td>
</tr>
<tr>
<td>1-26</td>
<td>Care and Custody of the Work</td>
<td>11</td>
</tr>
<tr>
<td>1-27</td>
<td>Personal Attention</td>
<td>11</td>
</tr>
<tr>
<td>1-28</td>
<td>Removal from Service of Existing Mains and Appurtenances</td>
<td>12</td>
</tr>
<tr>
<td>1-29</td>
<td>Salvage</td>
<td>12</td>
</tr>
<tr>
<td>1-30</td>
<td>Sanitation</td>
<td>12</td>
</tr>
<tr>
<td>1-31</td>
<td>Dust Abatement</td>
<td>12</td>
</tr>
<tr>
<td>1-32</td>
<td>Orderliness</td>
<td>12</td>
</tr>
<tr>
<td>1-33</td>
<td>Work Progress and Payment</td>
<td>12-13</td>
</tr>
<tr>
<td>1-34</td>
<td>Completion of Work</td>
<td>13</td>
</tr>
<tr>
<td>1-35</td>
<td>Acceptance of Work</td>
<td>13</td>
</tr>
<tr>
<td>1-36</td>
<td>Guarantee</td>
<td>13</td>
</tr>
<tr>
<td>1-37</td>
<td>Insurance</td>
<td>14</td>
</tr>
<tr>
<td>1-38</td>
<td>Indemnification</td>
<td>14-15</td>
</tr>
</tbody>
</table>
SECTION 2 - EXCAVATION

2-01. Trenches .......................................................................................................................... 1
2-02. Width of Trench ............................................................................................................... 1
2-03. Water in Trench ............................................................................................................. 1
2-04. Excess Excavation ......................................................................................................... 1
2-05. Pipe Clearance in Rock Excavation .............................................................................. 2
2-06. Protection of Existing Facilities ................................................................................... 2
2-07. Sewer/Storm Drain Crossings ...................................................................................... 2-3
2-08. Changes in Line and Grade .......................................................................................... 3
2-09. Blasting Procedure ........................................................................................................ 3
2-10. Handling of Excavated Material .................................................................................. 3
2-11. Temporary Crossings ..................................................................................................... 3

SECTION 3 - ASBESTOS-CEMENT PIPE REMOVAL

3-01. General............................................................................................................................. 1
3-02. Cutting of Pipe ................................................................................................................ 1
3-03. Disposal.......................................................................................................................... 1

SECTION 4 - POLYVINYL CHLORIDE (PVC) PIPE C900 AND C905

4-01. General............................................................................................................................. 1
4-02. Materials.......................................................................................................................... 1
4-03. High Deflection Couplings ........................................................................................... 2
4-04. Tapping of PVC Mains ................................................................................................... 2
4-05. Installation ....................................................................................................................... 2
4-06. Offset Fittings ................................................................................................................. 2
4-07. Fittings ............................................................................................................................. 2-3
4-08. Tracer Wire....................................................................................................................... 3
4-09. Casing for PVC Pipe ....................................................................................................... 4

SECTION 5 - DUCTILE IRON FITTINGS

5-01. General............................................................................................................................. 1
5-02. Fittings............................................................................................................................. 1
5-03. Assembly of Rubber Gasket Joints .............................................................................. 1
5-04. Coating and Lining ......................................................................................................... 1

SECTION 6 - STEEL WATER PIPE AND FITTINGS

6-01. General............................................................................................................................. 1
6-02. Material............................................................................................................................ 1-2
6-03. Fabrication....................................................................................................................... 2-5
6-04. Installation....................................................................................................................... 5-9
SECTION 7 - VALVES

7-01. General.........................................................................................................................1
7-02. Gate Valves.....................................................................................................................1-2
7-03. Butterfly Valves ..............................................................................................................2-3
7-04. Gate Wells ......................................................................................................................3
7-05. Location of Valves ..........................................................................................................3
7-06. Valve Location Points .....................................................................................................3

SECTION 8 - WATER LATERALS

8-01. General............................................................................................................................1
8-02. Location and Size .............................................................................................................1
8-03. Location of Lateral Taps ..................................................................................................2
8-04. Copper Tubing ................................................................................................................2
8-05. Splices .............................................................................................................................2
8-06. Service Saddles ...............................................................................................................2
8-07. Water Service Fittings ...................................................................................................2
8-08. Poly Water Meter Boxes ................................................................................................2-4
8-09. Installation ......................................................................................................................4
8-10. Connection to Existing Laterals .....................................................................................4-5
8-11. Meter Installation ...........................................................................................................5
8-12. Change of Service ..........................................................................................................5

SECTION 9 – AIR VAC RELIEF ASSEMBLY

9-01. General............................................................................................................................1
9-02. Material ..........................................................................................................................1
9-03. Air Vac Relief Enclosure ................................................................................................1

SECTION 10 - BLOW-OFF ASSEMBLY

10-01. General.........................................................................................................................1
10-02. Material ........................................................................................................................1
10-03. Transmission Main Blow-off Assemblies .....................................................................1

SECTION 11 - FIRE HYDRANT ASSEMBLY

11-01. General........................................................................................................................1
11-02. Fire Hydrants ................................................................................................................1
11-03. Ductile Iron Scored Spools ..........................................................................................1-2
11-04. Hydrant Location ........................................................................................................2

SECTION 12 - CONCRETE FOR PIPELINES AND APPURTEÑANT STRUCTURES

12-01. General........................................................................................................................1
12-02. Thrust-Blocks ................................................................................................................. 1-2

SECTION 13 – DISINFECTION

13-01. General............................................................................................................................. 1
13-02. Basic Disinfection Procedures ......................................................................................... 1-2
13-03. New Main Installation ...................................................................................................... 2-4
13-04. Existing Main Repair ....................................................................................................... 5
13-05. Disposal of Heavily Chlorinated Water ......................................................................... 5-6
13-06. Disinfection of Water-Storage Facilities ....................................................................... 6-8

SECTION 14 – PIPELINE PRESSURE TESTS

14-01. General............................................................................................................................. 1
14-02. Special Requirements for Cement-Lined Steel Pipe ...................................................... 2

SECTION 15 – BACKFILLING AND PAVEMENT REPLACING

15-01. General............................................................................................................................. 1
15-02. Backfill Adjacent to the Pipe (Pipe Zone) ...................................................................... 1-2
15-03. Intermediate Backfill ...................................................................................................... 2
15-04. Pavement Base ............................................................................................................... 2
15-05. Compaction .................................................................................................................... 2
15-06. Repair of Pavement ....................................................................................................... 2-3
15-07. Temporary Pavement .................................................................................................... 3

SECTION 16 – SHUTDOWN PROCEDURES

16-01. Shutdown Procedures .................................................................................................... 1-4

SECTION 17 – CROSS-CONNECTION AND BACKFLOW PREVENTION ORDINANCE

17-01. Introduction.................................................................................................................... 1
17-02. Legal Basis for Program .................................................................................................. 1-2
17-03. Degree of Hazard and Required Backflow Prevention
   Device Determinations ........................................................................................................ 2-6
17-04. Yearly Certification and Testing .................................................................................... 6-7
17-05. Investigation Procedures ............................................................................................... 7-9
17-06. Administration and Record Keeping ............................................................................. 9-10
17-07. Due Process .................................................................................................................. 10

APPENDIX A – Resolution 88-3, Backflow Program Adoption
APPENDIX B – Mandatory Backflow Prevention Device Required at Service Connection
APPENDIX C – Tester Application Form
APPENDIX D – General Evaluation Guide for Backflow Prevention Device Requirements
SECTION 18 – STANDARDIZED BEST MANAGEMENT PRACTICES FOR POTABLE WATER DISCHARGES

18-01. General..............................................................................................................................................1
18-02. Introduction......................................................................................................................................2
18-03. Dewatering Water Mains ...............................................................................................................2-3
18-04. Dewatering Reservoirs or Water Storage Facilities .................................................................3-5
18-05. Unscheduled Water Discharge Events .......................................................................................5-6

INDEX TO STANDARD DRAWINGS ........................................................................................................1-2
SWEETWATER AUTHORITY STANDARD DRAWINGS ......................................................................1-25

ATTACHMENT A- SWEETWATER AUTHORITY APPROVED MATERIALS LIST

A. Air and Vacuum Release Valves
B. Cathodic Protection
C. Fire Hydrants
D. Fittings
E. Miscellaneous
F. Pipe
G. Service Laterals
H. Meter Boxes
I. Valves
Legend

ATTACHMENTS B, C, AND D Reserved for Future Use

ATTACHMENT E – MONITORING AND REPORTING PROGRAM
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SWEETWATER AUTHORITY
STANDARD SPECIFICATIONS

SECTION 1 - GENERAL REQUIREMENTS

1-01. **Definitions:** Whenever the words defined in this section, or pronouns used in their place, occur in these specifications or other related documents, they shall have the meanings here given:

A. Authority means Sweetwater Authority. The Contractor is deemed to have knowledge that said Authority was organized and operates pursuant to the provisions of the California Government Code and Irrigation District Law.

B. The words Governing Board or Board shall mean the Governing Board of the Sweetwater Authority.

C. Engineer shall mean the Director of Engineering, or his or her designee, of the Authority, acting either directly or through properly authorized agents, such as agents acting within the scope of the particular duties entrusted to them. On all questions concerning the acceptance of materials, machinery, the classifications of material, the execution of work, conflicting interests of the Contractors performing related work and the determination of costs, the decision of the Engineer, upon approval of the Board, shall be binding and final upon both parties.

D. The words Private Engineer or Project Engineer shall mean an engineer registered or licensed in California, who is qualified to act as an agent of the owner or an individual in preparing plans of facilities to be accepted by the Authority and incorporated into the Authority system thereafter. As used herein, the term includes persons registered or licensed in the State of California as Civil Engineers or Structural Engineers for any duties, which they are qualified by law to perform.

E. The word Contractor shall mean the person, firm or corporation with whom a contract has been made for the performance of the work or any part thereof covered by these specifications. The Contractor shall at all times be represented on the work in person or by a duly designated agent or superintendent. Instructions or information given by the Engineer to the Contractor's superintendent or agent on the work shall be considered as having been given to the Contractor.

F. Whenever used in these specifications, the following abbreviations shall refer to the agency shown:

AWWA  The American Water Works  6666 West Quincy Avenue
1-02. Requirements for Improvement Plans: The following are some of the Authority's requirements for preparation of improvement plans (refer to Authority’s Design Standards for additional information):

**Vicinity Map:**

A vicinity map of the development will be required on the first sheet of all improvement plans.

**Scale:**

The plan portion of the improvement sheet shall have a scale of 1-inch = 40 feet.

The profile portion of the improvement sheet shall have the same horizontal scale as the plan, and vertical scale of 1-inch = 4 feet. An accurate field survey shall be made of all existing streets and improvements.

Even numbered stations shall occur on main vertical dividing lines. Changes in these scales shall be done only upon prior approval of the Engineer.

**Sheet Size:**

The sheet size shall be 24-inch x 36-inch, or 22-inch x 34-inch plotted on 24-inch x 36-inch.

**Stationing:**

All water main stationing will be based on the street centerline with calculated horizontal offsets at the beginning, end, angles, and all water appurtenances of the pipe run. Stationing for fabricated steel water mains, and water mains located in easements will be based on the proposed water main alignment with coordinates at beginning and end of the pipe run.

**Water, Sewer, and Storm Drain Horizontal Spacing:**

As required by the State Water Resource Control Board, Division of Drinking Water, minimum horizontal distance of ten (10) feet shall be maintained between sewer facilities and water facilities, and four (4) feet between storm drain and water facilities except as provided for in Standard Drawings 14, 14-A and 14-B.
Location of Water Mains:

Water mains shall be located five (5) feet from face of curb on the north or east side of the street. Where an existing line not in this standard location is to be extended/replaced or where streets are curved and the location or side of street is questionable, the location of the proposed line shall be reviewed and chosen by the Engineer.

Air Valves and Blow-Offs:

The water main shall be engineered to eliminate as many low or high points as is possible consistent with minimum cover. Fire hydrants may be used to replace blow-offs and manual air valve installations. The Engineer may require additional air valves and blow-offs.

Pipeline Easements:

Easements for pipelines shall have a minimum width of twenty (20) feet of level usable, unobstructed ground. Where conditions warrant, wider easements may be required. A legal description and one (1)-inch = 100 feet plat of the easement shall be submitted to the Authority for review, along with a closed traverse (1:5000) calculation and a current Lot Book Guarantee or Preliminary Title Report issued by a Title Insurance company, certifying the title of the property being conveyed, together with a copy of the deed to the property. The easement plat and description shall be stamped by a Registered Land Surveyor or a Civil Engineer who is specifically allowed to practice land surveying. Upon approval of the legal description by the Authority, the document will be prepared on a form furnished by the Authority.

Upon completion of the above requirements, the improvement plans may be submitted to the Authority for checking. Original drawings should not be submitted to the Authority until all checking has been completed, at which time the Authority will notify the Private Engineer to submit original drawings for signature.

Changes in approved plans:

A. Prints showing proposed changes shall be submitted to the Authority for review.

B. The plans will be reviewed and, upon approval, the Private Engineer will be notified to make the changes on the original drawings. Two (2) blueline prints of the revised plan may then be submitted to the Authority for final checking and approval. The Private Engineer shall resubmit the check print with the two (2) resubmitted bluelines. An approved Sweetwater
Authority signature block should be added to the plans, which will indicate Authority approval of change made.

C. After these steps have been taken, the Contractor may proceed with the revised construction.

1-03. **Work to be Done**: The work to be done consists of furnishing all materials, equipment, labor and all other items of expense necessary for the installation of a completed facility as shown on the plans and in accordance with the specifications. In some instances, the Authority may furnish certain materials and services, which will be expressly called out on the plans and/or in the specifications.

The work shall be performed in a thorough, workmanlike manner in accordance with the plans and specifications, which have been approved by the Authority. All work shall conform to the lines, elevations and grades shown on said plans and/or as staked out by the Engineer or the Private Engineer in responsible charge of the work.

The Authority’s approval of plans prepared by a Private Engineer denotes agreement with the plan as prepared, and is not an acceptance of responsibility as to accuracy. The Private Engineer shall be responsible for any errors, coordination with other facilities, and interpretation of the plans. The intent is that the completed facility shall be in general conformance with the approved plan and in accordance with the requirements of these specifications. All revisions and changes in the plan must be approved by the Engineer.

1-04. **Depth of Pipe**: All water mains shall have thirty-six (36) inches of cover between the top of pipe and the finished surface, unless otherwise approved or directed by the Engineer. Thirty (30) inches of cover between top of pipe and ground surface shall be maintained during construction unless otherwise approved or directed by the Engineer.

1-05. **Water for Construction**: A backflow prevention device is required on construction meters when the intended use of the meter presents a hazard to the Authority’s system, as determined by the Engineer. Water trucks to be filled through a construction meter must be equipped with an air gap. Portable backflow prevention devices are available from the Authority. All water used on the project and obtained from Authority sources shall be metered through a temporary meter obtained from the Authority by the Contractor. The water and meter shall be paid for by the Contractor in accordance with the Authority’s Rates and Rules.

1-06. **Materials**: All fittings, pipe, valves, and other materials shall be of the makes and types, which have been tested and approved by the Authority. Copies of the current Standard Specifications for Construction of Water Facilities, which includes the Authority approved materials list may be obtained from the
Authority’s website at sweetwater.org or available for purchase from the Engineering Department at the Chula Vista office located at 505 Garrett Avenue, Chula Vista, California.

All materials furnished shall be new and unused, of the quality defined in these specifications, as shown on the current list of Authority approved material and as approved by the Engineer. When materials are delivered to the jobsite which are not on the approved list, are damaged or otherwise unacceptable to the Engineer, they shall be immediately removed from the site.

For consideration of materials not on the Authority’s approved list, the following procedure shall be followed:

A. A letter shall be submitted to the Engineer stating the items requested to be considered for approval.

B. At least one (1) sample of each item to be considered shall be delivered to the Authority’s Operations Center, Purchasing Department, 744 F Street, Chula Vista, California, at no cost to the Authority.

C. All literature, detailed drawings, specifications, and affidavits necessary for evaluation shall be provided.

D. Testing shall be accomplished by the Authority as time and workload permits. It may be necessary to delay testing of an item until it can be evaluated along with other items, and therefore, no time schedule for approval or disapproval is given.

E. Because of standardization, the Authority may limit the number of acceptable items.

F. Items, which are on the approved list, may be disqualified at any time, in the event the quality of the product is no longer acceptable as determined by the Engineer, or if a higher quality material becomes available.

Specialized items, which are not addressed in the approved materials list, shall be submitted and approved by the Engineer prior to shipment to a job site.

1-07. Responsibility for Material Furnished by the Authority: The Contractor's responsibility for material furnished by the Authority shall begin upon Contractor's acceptance at the point of delivery. All material shall be examined and material found to be defective in manufacture or otherwise damaged shall be rejected by the Contractor before Contractor accepts such material as a condition of replacement of the material by the Authority. Material furnished by the Authority and accepted by the Contractor which is later discovered to have been damaged, shall be replaced by the Contractor at his expense. The Contractor shall be
responsible for the safe storage of all materials until they have been incorporated in the completed project.

1-08. **Handling of Pipe and Accessories:** Tools and equipment satisfactory to the Engineer shall be provided and used by the Contractor for the safe and efficient execution of the work. All pipe, fittings, valves and accessories shall be handled in such a manner as to prevent damage.

1-09. **Defective or Damaged Material:** The material shall be carefully inspected for defects. Material found to be defective or damaged shall be rejected and removed from the work. In the event a portion of a length of pipe is damaged, the damaged portion shall be cut off in an approved manner, discarded and the remaining sound portions may be used. Proper care shall be used to prevent damage in handling, moving and placing the material. Tools and equipment satisfactory to the Engineer shall be provided and used by the Contractor. The Contractor shall be responsible for any and all damage to material and shall bear the expense of repairing or replacing same.

1-10. **Polyethylene Wrap:** When not specified by a specific coating system, all ductile-iron materials and metallic pipe and appurtenances, buried in the ground shall be protected with an eight (8)-mil-thick polyethylene sleeve or sheet in accordance with AWWA Standard C-105 A 21.5-82. The polyethylene material shall completely encase and cover all metal surfaces and be secured with an approved 10 mil. PVC tape on both ends of the covered surface. Gate valves shall have only the stem exposed and the film shall be attached so that valve operation will not disturb the wrapping or break the seal. Wrap shall be applied after all nuts and bolts are covered with non-oxide grease.

1-11. **Bolts and Nuts:** All nuts and bolts for mains less than twenty-four (24) inches in diameter shall conform to ASTM Specification A-307, Carbon Steel Externally Threaded Standard Fasteners, unless otherwise shown on the plans or approved by the Engineer. Bolts and nuts shall be Grade B. The bolts shall have hexagonal heads and nuts.

For mains twenty-four (24) inches or larger, nuts and bolts shall be Type 316 stainless steel conforming to ASTM Specification A-320.

All bolt threads shall be lubricated with graphite and oil (anti-seize) prior to installation and shall be given one (1) heavy coat of special rust protective coating after installation. (See paragraph 1-12).

1-12. **Coating Metal Work:** All non-coated metal surfaces buried in the ground, excepting surfaces that are cast-iron, stainless steel, bitumastic coated or non-oxide greased, coal-tar and mortar-coated, shall be given one heavy coat of an approved coating material. The coating shall be applied in accordance with the
manufacturer's recommendations and shall be coated as required by the
Engineer or project specifications.

1-13. **Wet Tapping:** Where connections to existing water mains are made by wet
tapping, the Contractor shall perform all required excavation and furnish and
install the tapping saddle or tapping sleeve and gate valve. An Authority
approved tapping contractor, or the Authority, will make the wet tap according to
the manufacturer's recommended procedures. The Contractor shall pour the
thrust block, backfill, complete all compaction of backfill, set the gate well and
cover, make all necessary pavement repairs and complete the installation in
accordance with the Plans and these Standards. Tapping contractor shall
pressure test tapping sleeve to required pressure. When tapping steel mains,
Contractor shall supply all materials as stated above, including steel backing
collar, if applicable, and tapping nipple.

1-14. **Hi-Line:** Hi-line piping, where shown on the plans or required by the Authority,
shall be furnished, installed and connected by the Contractor to fittings as
specified by the Engineer. Materials to be used for hi-line piping and method of
installations shall be approved by the Authority prior to installation. Installation
may include traffic protection or thermal cover of piping to control water
temperature.

Following disinfection by the Contractor and bacteriological sampling and testing
by the Authority, the Contractor shall maintain continuous service through the hi-
line piping to all consumers normally served, both directly and indirectly, by the
pipeline. Upon completion of the work, the hi-line piping shall be removed by the
Contractor.

All pipe, valves, fittings, hose and connections furnished by the Contractor shall
be new, of good quality, absolutely clean, suitable for conveying potable water,
unless otherwise approved by the Engineer.

1-15. **Safety Regulations:** Precautions shall be exercised at all times for the protection
of persons and property. The safety provisions of applicable laws, building and
construction codes and safety regulations shall be observed.

Attention is called to the “Construction Safety Orders” in Title 8 of the California
Code of Regulations section 1500-1938 and the “General Safety Orders” listed in
Title 8 of the California Code of Regulations section 3200-6184 of the California
Division of Industrial Safety to which the Contractor is required by law to conform.
The Contractor shall provide himself with copies of these rules and orders, which
may be obtained at the offices of the Division, Los Angeles, California.

Safety precautions shall be observed in all phases of the work. Included shall be
trench shoring, bracing, lighting, barricades, and other safety items as set forth in
the regulations of the Occupational Safety and Health of the Division of Industrial
1-16. **Public Convenience:**

A. **Public Traffic:** The Contractor shall at all times conduct his operations in a manner effecting the minimum obstruction and inconvenience to public traffic. The Contractor shall have under construction only that amount of work he can prosecute properly within the limits of the traffic control plan as approved by the agency having jurisdiction over the work area and all safety and signing regulations of the applicable jurisdiction and the rights and convenience of the public.

B. **Work Conditions:** The work shall be carried on with special regard for the rights and convenience of the traveling public and the property owners and residents along the line of work.

C. **Access to Private Property:** The Contractor shall provide necessary access to adjoining private property. Residents shall be notified twenty-four (24)-hours in advance if driveways are to be blocked, allowing removal of cars if desired. Driveways shall not be closed or obstructed longer than is absolutely necessary in the Engineer's opinion, and means of crossing shall be provided during all stages of the work. Work, which impairs access to service stations, stores, and other business establishments, shall be carried on to completion as rapidly as possible and, where necessary, steel plates or continuous bridges shall be provided to facilitate travel across the trench.

D. **Public Safety:** The Contractor shall furnish, erect, and maintain in good order, all warning signs, lights, barriers and other measures designed to protect the traveling public. The warning signs, barriers, lights and other measures shall comply with all current regulations for traffic control applicable to the work area. The applicable ordinances of the public agency having jurisdiction over the maintenance of the street shall also apply.

All barricades shall be plainly marked with the Contractor's name, or each end of the limits of work shall be properly signed with the Contractor's name. If flasher barricades are used, they shall be supplemented with flares or lanterns at locations where conditions are especially hazardous. The Contractor shall take immediate action to correct any hazard affecting public safety. Where the Contractor does not take immediate action, the Authority may take temporary corrective steps and the Contractor shall be charged for all costs involved. Where the Authority has taken temporary corrective steps, the Contractor shall not be relieved of his responsibility for public safety or damage to persons or property. The Contractor shall
correct the hazardous conditions at the earliest possible time and shall notify the Authority that he has done so.

1-17. **Preservation of Monuments:** The Contractor shall preserve all monuments, bench marks, survey marks and stakes, and in case of their removal or destruction by him or his employees, he shall be liable for the costs of their replacement.

1-18. **Datum Plans and Measurements:** All distances and elevations shown on the plans, profiles, or other drawings are based on California Coordinate System NAD 83 (HPGN 1991.35 Epoch) Zone 6, U.S. foot. Elevations to be based on National Geodetic Vertical Datum of 1929 (NGVD 1929) unless otherwise noted. All measurements on the plans are horizontal measurements, unless otherwise shown.

1-19. **Setting Stakes:** All sections of the work to be done shall be staked in the field in a manner consistent with the lines and grades, as shown on the plan with stationing, and cut or fills, or horizontal controls to top of pipe or flow line as required by the Engineer.

A. **Work and/or Layout Contracted by Authority:** The Authority shall be responsible for all field staking or layout. The Contractor shall keep the Engineer informed, a reasonable time in advance, of the times and places at which he intends to do work, in order that lines and grades may be furnished. The Contractor shall give forty-eight (48)-hours notice, in writing, when he will require the field staking services from the Engineer.

B. **Work Contracted by Others:** The Private Engineer shall be responsible for all field staking.

1-20. **Inspection of Stakes:** The Contractor shall examine carefully all construction stakes and, by visual inspection of stakes, string lines and headers set there from, interpret and confirm that the line and grade information is in accordance with the plans. If there is an apparent error or lack of understanding as to what is meant by the staking, the Contractor shall request an interpretation of staking before proceeding with any work.

1-21. **Inspection of Work:** All work and materials furnished under these specifications shall be subject to rigid inspection.

The Contractor shall notify the Engineer twenty-four (24)-hours in advance of any work to be done, in order that inspection may be provided with a minimum of inconvenience to the Engineer, or delay to the Contractor. The Contractor shall perform the work only in the presence of an inspector, unless written permission to work during the absence of an inspector has been granted by the Engineer.
Any work done in the absence of an inspector without permission shall be subject to rejection.

The Engineer shall, at all times, have access to the work during its construction, and shall be furnished with every reasonable facility for ascertaining that materials and workmanship are in accordance with the requirements of these specifications.

When required, the Contractor shall notify the Engineer, a sufficient time in advance, of manufacture or production of materials to be supplied in order that the Authority may arrange for shop or plant inspection and testing. The Engineer shall have access to all parts of the shop or plant where material subject to inspection is being manufactured.

All materials shipped, prior to having satisfactorily passed such testing and inspection by the Engineer shall not be used unless approved by the Engineer.

The Contractor shall also furnish the Authority, in duplicate, certified copies of all factory and mill test reports when required by the Engineer.

Work or material failing to conform to these specifications, although accepted through oversight or otherwise, may be rejected at any time.

1-22. Days of Work: If work is to be done on a holiday, or at any time other than the Authority’s regular forty (40)-hour work week, the Contractor shall give the Authority seventy-two (72)-hours notice, in writing, before proceeding with such work. Such work shall be carried out only upon approval of the Engineer. If such work is carried out without the Engineer's knowledge and approval, the Authority may require any portion of the work to be removed in order that a thorough inspection may be accomplished.

1-23. Compliance with Laws: It shall be mandatory upon the Contractor herein and upon all subcontractors under him to comply fully with all applicable provisions of the Labor Code of the State of California relative to contracts for public works.

1-24. Use of Premises: The Contractor shall confine his operations, including plant and the storage of materials, to the rights-of-way or roadways, as shown on the plans. Special care shall be taken to create a minimum of inconvenience and damage to private property and improvements. Contractor shall have approval of the agency having jurisdiction prior to any stockpile in the public right-of-way. If Contractor stockpiles on private property, Contractor shall provide the Authority with a Letter of Permission from the property owner.

1-25. Loss or Damage: The Contractor shall be held responsible for and be required to make good, at his own expense, all damage to persons or property caused by him or his subcontractors, agents, or the employees of either of them, during the
progress of the work and until its final acceptance. All loss or damage arising from any unforeseen difficulties which may be encountered in the prosecution of the work, or from any action of the elements prior to the acceptance of the work, or from any act or omission not authorized by these specifications on the part of the Contractor or any agent or person employed by him, shall be sustained by the Contractor.

1-26. **Care and Custody of the Work**: The Contractor shall have full care and custody of the work until acceptance and he will be responsible for all damage to existing improvements while the work is in his charge. The Contractor shall maintain guards and watchmen and take any other necessary precautions to protect the work from damage and/or trespassers. All damage done to existing improvements, persons, property and/or utility structures shall be corrected by the Contractor at his own expense.

1-27. **Personal Attention**: The Contractor shall give his personal attention constantly to the faithful prosecution of the work, and shall be present, either in person or through a duly authorized and competent representative, on the site of the work continually during its progress, to coordinate the work and to receive directions and instructions from the Engineer. Whenever the Contractor is not present on any part of the work where it may be desired to give directions, orders may be given by the Engineer, and shall be received and obeyed by the superintendent or foreman who has charge of the particular part of the work in reference to which orders are given.

If any subcontractor or person employed by the Contractor shall fail or refuse to comply with the requirements of these Specifications, or shall appear to the Engineer to be incompetent or to act in a disorderly or improper manner, he shall be discharged immediately on the request of the Engineer, and such person shall not again be employed on the work.

1-28. **Removal from Service of Existing Mains and Appurtenances**: Water mains shall be removed from service and abandoned by cutting and plugging in accordance with Standard Drawing 18. At a minimum, mains shall be cut and plugged every five hundred (500) feet, at the ends of project, and at tie-in points. Backfill, compaction and surface repair of all excavations for the cutting and plugging of abandoned mains shall be made in accordance with these specifications. Where gate valves or blow-offs are to be abandoned, the gate box shall be removed and the street repaired. Water mains larger than twelve (12)-inch diameter shall be abandoned by filling with cement slurry. During slurry-filling, air and water releases shall be installed at the high and low points of the main and observation ports shall be cut into the pipe at approximately two hundred (200) feet on center.

1-29. **Salvage**: When the Contractor is required to remove portions of pipelines or appurtenances from the ground, this shall be considered salvage. All salvage is the property of the Contractor, unless directed by the Engineer. Pipeline or
appurtenance removal, backfill, compaction and surface repair of all excavations for salvage shall be made in accordance with these specifications. If salvage is claimed by the Engineer, the Contractor shall collect and stockpile all salvage in a location safe and free of nuisance to the public and shall deliver it to the Authority's Operations Center. The Authority's Operations Center is located at 744 F Street, Chula Vista, California.

1-30. **Sanitation**: The Contractor shall comply with all applicable rules and regulations established by the State of California pertaining to sanitation. Attention is directed to Section 5416 of the California State Health and Safety Code regarding necessary toilet facilities. Toilet facilities must be equipped with hasps and during non-working hours must be padlocked. The Authority shall be provided a key.

1-31. **Dust Abatement**: The Contractor shall furnish all labor and equipment to carry out effective measures as determined by the Engineer to prevent his operations from producing dust in an amount damaging property or causing a nuisance. The Contractor shall be responsible for any damage resulting from dust originating from his operations. Contractor shall sweep street at the end of each day’s work or as directed by the Engineer. Sweeping shall be accomplished with a self-load motor sweeper with spray nozzle. See Section 18, Best Management Practices Guidelines.

1-32. **Orderliness**: The site and vicinity of the work shall be kept free and clear of all rubbish and debris as the work progresses. Haul routes shall be kept free and clean of rubbish and debris. The Contractor shall remove from the vicinity of the completed work, all material, etc., belonging to him or used under his direction during construction. In the event of his failure to do so, the Authority, the Contractor, may remove the same and his sureties shall be liable for any cost or damage occasioned thereby.

1-33. **Work Progress and Payment**: The percentage of work completed and schedules of payment shall be determined by the Engineer using the following method:

   A. Trench excavated, pipe laid and backfilled and compacted. 55% Complete
   B. Pipeline tested and disinfected 70% Complete
   C. Connections completed and water available for construction 80% Complete
   D. Permanent pavement repair made 95% Complete
   E. Clean-up and final acceptance 100% Complete

1-34. **Completion of Work**: The work shall be considered complete when the Contractor has fulfilled all requirements of these Specifications for installation of facilities, has removed all excess materials and equipment, has swept all paved areas and
has restored the project site as required by any jurisdictional or Authority requirements. The project must be final paved and all punch list items as indicated by the Engineer completed prior to the filing of a Notice of Completion with the County of San Diego.

1-35. **Acceptance of Work:** The work will be accepted upon completion of work as set forth herein and upon expiration of thirty (30) days after recordation of Notice of Completion by Sweetwater Authority. Laborer's and Materialmen's Payment Bonds and Faithful Performance Bond(s) will remain in effect pursuant to California Code of Civil Procedure section 337.15.

1-36. **Guarantee:** The work shall be guaranteed against failure due to defective materials or workmanship for a period of one (1) year from date of the Notice of Completion of the water facilities. The performance bond shall cover the guarantee.

The Contractor shall be notified, in writing, whenever defective material or workmanship is discovered. The Contractor shall make all repairs, at his/her own expense, within five (5) days after receipt of the written notice. Should the Contractor fail to repair the damage within the five (5) days, the Authority may make the necessary repairs and charge the Contractor with the actual cost of the repairs. Where immediate attention is required, the Authority shall have the right to repair the defect or damage and to charge the Contractor with the actual cost of the repairs. All work performed by the Authority shall be covered by the performance bond and the Authority shall have the option, at its sole discretion, to cause the completion of repairs as specified herein, or to cause the surety to complete such repairs.

1-37. **Insurance:** The Contractor shall submit a copy of insurance evidence (Accord Form 25-5, or equivalent) commonly known as "Certificate of Insurance." The certificates are to be completed by the Contractor's Insurance carrier(s) and signed by an authorized agent(s) of the insurance company(ies). The Contractor shall not commence any work under a Contract until such "Certificate of Insurance" are accepted and approved by the Authority. The current insurance requirements and limits are in accordance with the Authority's Special Administrative Policy-Insurance. This policy must be obtained from the Sweetwater Authority Engineering Department. The Authority, its Board, Employees, and Officers shall be named as an additional insured.

1-38. **Indemnification:**

To the fullest extent permitted by law, Contractor shall immediately defend (with counsel of the Authority’s choosing), indemnify and hold harmless the Authority, its directors, officials, officers, agents, employees, and representatives, and each of them, and the State, and its officers, employees, agents and representatives, from and against:
A. Any and all claims, demands, causes of action, damages, costs, expenses, losses or liabilities, in law or in equity, of every kind or nature whatsoever for, but not limited to, injury to or death including wrongful death of any person including the Contractor and/or, Authority its Board and each member of the Board, officers, employees, or authorized/designated volunteers of the Authority or Contractor, and damages to or destruction of property of any person, including but not limited to, the Authority and/or Contractor or their directors, officers, employees, or authorized/designated volunteers, arising out of or in any manner directly or indirectly connected with the Work to be performed under this Contract, including claims made by subcontractors for nonpayment, including without limitation the payment of all consequential damages and attorney’s fees and other related costs and expenses, however caused, regardless of whether the allegations are false, fraudulent, or groundless, and regardless of any negligence of the Authority or its Board and each member of the Board, officers, employees, or authorized/designated volunteers (including passive negligence), except the sole negligence or willful misconduct or active negligence of the Authority or its Board and each member of the Board, its officers, employees, or authorized/designated volunteers. Contractor shall immediately defend upon the Authority’s tender, at Contractor’s own cost, expense and risk, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against the Authority its Board and each member of the Board, its officials, officers, agents, employees and representatives, notwithstanding whether Contractor’s liability is or can be established; Contractor’s obligation to indemnify shall survive the termination or completion of this agreement for the full period of time allowed by law and shall not be restricted by the insurance requirements of this Contract or to insurance proceeds, if any received by the Authority, its Board and each member of the Board, officers, employees, or authorized/designated volunteers.

B. Contractor’s defense and indemnity obligation herein includes, but is not limited to damages, fines, penalties, attorney’s fees and costs arising from claims under the Americans with Disabilities Act (ADA) or other federal or state disability access or discrimination laws arising from Contractor’s Work during the course of construction of the improvements or after the Work is complete, as the result of defects or negligence in Contractor’s construction of the improvements.

C. Any and all actions, proceedings, damages, costs, expenses, fines, penalties or liabilities, in law or equity, of every kind or nature whatsoever, arising out of, resulting from, or on account of the violation of any governmental law or regulation, compliance with which is the responsibility of Contractor;
D. Any and all losses, expenses, damages (including damages to the work itself), attorney’s fees, and other costs, including all costs of defense which any of them may incur with respect to the failure, neglect, or refusal of Contractor to faithfully perform the work and all of Contractor’s obligations under the agreement. Such costs, expenses, and damages shall include all costs, including attorney’s fees, incurred by the indemnified parties in any lawsuit to which they are a party.

Contractor shall immediately defend, at Contractor’s own cost, expense and risk, with the Authority’s choosing, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against the Authority, its officials, officers, agents, employees and representatives. Contractor shall pay and satisfy any judgment, award or decree that may be rendered against the Authority, its officials, officers, employees, agents, employees and representatives, in any such suit, action or other legal proceeding. Contractor shall reimburse the Authority, its officials, officers, agents, employees and representatives for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. The only limitations on this provision shall be those imposed by Civil Code section 2782.
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2-01. **Trenches**: The Contractor shall excavate all trenches to the required grade and alignment, as shown on the plans, as staked in the field, and called for in these specifications. When work is started, the allowable length of open trench shall be determined by the Engineer or the Agency having jurisdiction over the street. When excavating for the installation of pipe, the trenches shall be undercut six (6) inches below the bottom of pipe grade, and the trench shall be backfilled with one hundred percent (100%) import per Section 15 of this specification. The trench shall be excavated only so far in advance of pipe laying as the Engineer or the Agency having jurisdiction over the street will permit. The trench shall be shored and drained, when necessary according to current OSHA requirements, so that workmen may work safely and efficiently.

2-02. **Width of Trench**: The minimum trench width for the various sizes of pipe shall be as follows:

<table>
<thead>
<tr>
<th>Inside Pipe Diameter</th>
<th>Width of Trench</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-inch and 6-inch</td>
<td>20-inch</td>
</tr>
<tr>
<td>8-inch</td>
<td>24-inch</td>
</tr>
<tr>
<td>12-inch and larger</td>
<td>Outside diameter of pipe, plus 12-inch</td>
</tr>
</tbody>
</table>

If Contractor chooses to make the trench wider, it shall be done at their expense for additional import, export, and paving.

2-03. **Water in Trench**: All water encountered must be pumped out of the trench and the trench kept dry until the pipe has been laid and the joints closed. Crushed rock shall be used for bedding or drainage, when required by the Engineer. If Contractor must pump water out of trench, Best Management Practices shall be in place. See Section 18 for general guidelines. Pumping water out of trenches for connections to existing pipes is considered incidental to cost for tie-in.

2-04. **Excess Excavation**: In the event the trench is over-excavated, the trench shall be backfilled to six (6) inches below the bottom of pipe, with a good quality select backfill material, as defined in Section 15. When excavating in soft and unstable soils, the Contractor shall over-excavate the trench and backfill with a material that will, in the opinion of the Engineer, properly support the pipe. The backfill material shall be placed in accordance with the backfill requirements of these specifications.
2-05. **Pipe Clearance in Rock Excavation:** Rocks, boulders and large stones shall be removed to provide a clearance of twelve (12) inches to each side and below all pipe and accessories.

2-06. **Protection of Existing Facilities:** The Contractor shall be responsible for the care and protection of all existing utilities (e.g., sewer lines, water lines, gas mains, electrical and telephone conduits, culverts, or other facilities, or structures) that may be encountered in the area of his work. Prior to construction, the Contractor shall notify each agency of jurisdiction and make arrangements for the locating of their facilities. When an existing facility is damaged or requires special protection due to his/her operation, the Contractor shall notify the Agency of jurisdiction and he shall be liable for the cost of repairs or protection. The Contractor shall also be responsible for the protection of all trees, shrubs, fences and other landscape items adjacent to or within the work area, unless they are indicated otherwise on the plans. In the event of damage to said items, the Contractor shall replace the damaged items in a manner satisfactory to the Engineer.

**Underground Utility Locations:** Contractor is required to obtain an identification number from a Regional Notification Center (Underground Service Alert 1-800-422-4133). This number shall become a part of the permit form the agency having jurisdiction over the street.

Should this identification number not be obtained, the agency having jurisdiction over the street will withdraw its permit and the Contractor will not be permitted to perform further work until the number is obtained. The Contractor shall notify Underground Service Alert at least forty-eight (48) hours in advance of construction so that utilities belonging to other agencies can be marked in the field.

2-07. **Sewer/Storm Drain Crossings:**

A. **Sewer Mains:** When a water main crosses under an existing sewer main, the Contractor shall locate and encase the existing sewer main in concrete in accordance with Standard Drawings 14, 14-A, and 14-B and any additional requirements of the State Water Resource Control Board Division of Drinking Water. The Contractor shall also take all other necessary precautions to insure the integrity and uninterrupted service of the sewer main. If a sewer main is broken during construction, the Contractor shall aid and assist in making the repairs as directed by the Engineer or the agency having jurisdiction over the sewer main. All costs related to the repair shall be paid for by the Contractor. All repairs to sewer mains shall be subject to rigid inspection by the Engineer and the agency having jurisdiction over the sewers. Select backfill, as defined in paragraph 15-02, shall be extended to twelve (12) inches above the sewer main.
B. **Sewer Laterals:** The Contractor shall make every effort to avoid disturbing existing sewer laterals during construction. To prevent damage to the sewer lateral during compaction, the trench shall be backfilled to twelve (12) inches above the lateral. All repairs to sewer laterals shall be subject to inspection by the Engineer and the agency having jurisdiction over the sewers. (See Standard Drawing 14-B.) Select backfill material, as defined in paragraph 15-02, shall be extended twelve (12) inches, above the sewer lateral whether or not the lateral is broken.

C. New water mains and new supply lines shall be installed at least four (4) feet horizontally from, and one (1) foot vertically above, any parallel pipeline conveying storm drainage and shall comply with the State Water Resources Control Board Division of Drinking Water. (See Standard Drawings 14, 14-A, and 14-B).

2-08. **Changes in Line and Grade:** The Engineer shall have the authority to order revisions in the line or grade when conditions are encountered which will require alteration to the plans.

2-09. **Blasting Procedure:** Blasting for excavation will be permitted only after securing approval of the Engineer, and have all necessary permits and/or environmental approvals. Detailed blast plan shall be submitted to Engineer for approval.

2-10. **Handling of Excavated Material:** The excavated material or spoil pile shall be kept in a neat windrow according to current OSHA guidelines and as practical with regard to the men working in the trench. When necessary to maintain vehicular and/or pedestrian traffic, or when required by the Engineer, the Contractor shall remove all excavated material as it is removed from the trench and transport the excavated material to a suitable stockpile area. Contractor shall provide a copy of receipt of final destination of excavation materials. If materials are dumped on private property, provide the Authority with written letter of acceptance and release of liability.

2-11. **Temporary Crossings:** Crossing plates, boards and bridges shall be used when it is necessary to excavate a trench across a public street or any place the public has the right to use under normal circumstances. Such devices shall be designed by a registered civil engineer, or as called for by California Department of Transportation (CALTRANS) specifications for trench plates. Temporary crossings constructed for public pedestrian traffic shall be equipped with rope or wood railings or barricade protection along the sides to provide the maximum safety to the public as directed by the Engineer or agency having jurisdiction over the work area.

2-12. **Undercut Crossings of Authority Pipelines:** Where other utility installations (e.g., water or sewer mains) require crossing under existing Authority pipelines (e.g,
water mains, fire hydrant laterals, etc.) the Contractor shall protect in place existing pipelines during all phases of construction and shall backfill the excavated trench under and around the Authority pipeline to achieve 95 percent relative compaction in accordance with these specifications. Satisfactory evidence in the form of soil compaction reports shall be provided to the Authority to confirm compaction requirements have been met throughout the new utility trench, within a distance equal to two times the new utility trench depth on each side of the undercut Authority pipeline. When satisfactory evidence of compaction is not provided, the Contractor shall be required, at its own expense, to remove the existing backfill from the previously defined trench limits, replace with new compacted backfill, and provide satisfactory evidence of compaction.
3-01. **General**: Asbestos-Cement Pipe is not permitted for new installations. The purpose of this specification section is for connections to existing asbestos-cement pipe during installation of new mains other than asbestos-cement.

3-02. **Cutting of Pipe**: Cutting of pipe shall be accomplished by breaking or snapping with chain cutter or equivalent. Use of power driven abrasive saws or other equipment which may create hazardous asbestos dust conditions while cutting, is strictly prohibited.

3-03. **Disposal**: Contractor may dispose of asbestos-cement pipe from tie-ins to the Authority’s hazardous materials bin located at 744 F Street, Chula Vista. Pipe shall be completely double wrapped with 6 mil polyethylene and 10 mil PVC tape both ends prior to transport to Authority facilities.
SECTION 4 - POLYVINYL CHLORIDE (PVC) PIPE C900 AND C905

4-01. **General:** All material to be furnished must be listed on the Authority's Approved Materials List.

A. AWWA C-900 Polyvinyl Chloride (PVC) pressure pipe shall be either Class 235 (DR 18) or Class 305 (DR 14), as shown on the approved plans. The pipe shall be provided with cast-iron equivalent outside diameter and integral wall-thickened bell and spigot ends. The pipe shall conform to AWWA Standard Specification C-900 for Polyvinyl Chloride (PVC) Pressure Pipe four (4) inches through twelve (12) inches for Water and AWWA M23, PVC Pipe Design and Installation.

B. AWWA C-905 pipe shall be provided with an outside diameter conforming to the dimensions of either steel pipe or cast-iron pipe as shown on the design drawings and/or as directed by the Engineer. The pipe shall conform to AWWA Standard C-905 for Polyvinyl Chloride (PVC) Water Transmission Pipe.

PVC pipe with a cast-iron equivalent outside diameter shall be DR 18 (Pressure Rating 235 psi), DR 21 (Pressure Rating 200 psi), or DR 25 (Pressure Rating 165 psi).

4-02. **Materials:** PVC pipe shall be provided in standard twenty (20)-foot lengths, unless otherwise specified or required on the approved plans. One elastomeric gasket shall be provided for each bell end. Pipe and couplings shall bear indelible identification markings as required by AWWA C-900 and/or C-905.

The manufacturer of each shipment of pipe may be required to provide a written statement certifying that each lot or load of pipe has been subjected to the testing required for PVC pipe and has been found to meet the requirements of AWWA C-900 and/or C-905. PVC pipe shall be stored per the manufacturers’ recommendations. PVC pipe which has been subjected to excessive ultraviolet radiation from the sun shall not be used. The acceptability of pipe faded or damaged by the sun shall be determined by the Engineer.

Pipe with scratches or gouges deeper than the manufacturer’s recommendation shall be rejected and removed from site.
4-03. **High Deflection Couplings:**

A. **C-900:** Pipe installation for horizontal or vertical curve alignments shall be accomplished through the use of high deflection couplings. The couplings shall be provided with two elastomeric gaskets, which allow a maximum of two and one-half degrees (2.5º) deflection at each gasket for a total of five degrees (5º) maximum per coupling. Use of these couplings shall only be allowed with the approval of the Engineer, or as required on the approved plans. PVC pipe shall not be bent between couplings.

B. **C-905:** The maximum deflection allowed for each PVC coupling is one degree (1.0º) deflection at each bell and gasket for a total of two degrees (2º) maximum per coupling.

4-04. **Tapping of PVC Mains:** Bronze saddles shall be used on all services and appurtenance connections. Saddles shall be located a minimum of two (2) feet from any pipe joint, other saddles or fittings. Multiple saddles installed on the same side of the pipe shall be staggered thirty degrees (30º) around the circumference. Only tools recommended by the pipe manufacturer shall be used. Saddles shall be torqued per manufacturer’s recommendation. Torque wrench shall bear date of last calibration. Torque shall be observed by the Engineer Representative.

Tapping sleeves shall be used for Asbestos Cement (AC) pipes, or making large diameter taps. Tapping sleeves shall be well supported independently of the pipe during the tapping and support shall remain in place. Thrust blocks shall be installed in accordance with these specifications. All pipe tapping shall follow the pipe manufacturer’s recommendations and procedures.

4-05. **Installation:** Proper care shall be used to prevent damage while handling, moving and placing the pipe. All pipe, fittings, valves, and other materials shall be lowered into the trench in a manner that prevents damage. Any material damaged during installation shall not be installed.

Bell holes shall be dug at each joint to prevent the pipe from being supported by the bell or fitting. Backfilling shall be in accordance with Section 15. Metallic identification tape shall be installed twelve (12) inches to twenty-four (24) inches below the finished surface directly above the pipeline. Tracer wire shall be installed to all non-metallic pipelines. See Standard Drawing 17.

At all times when the installation of pipe is not being performed, all openings shall be kept tightly closed to prevent the entrance of animals and foreign materials. The Contractor shall keep the interior of the pipe clean, sanitary, and free of foreign materials in accordance with Section 13.
4-06. **Offset Fittings**: PVC pipe may be used to go over or under an obstruction. For C-900 pipe, Class 305 (DR 14) pipe is required for offset fittings. For C-905 pipe either DR 18 or DR 21 pipe shall be used, as required by the Engineer. Concrete anchor blocks shall be installed to offset the vertical thrust. If required by the Engineer, the offset fitting shall be installed in a casing in accordance with Section 4-09.

4-07. **Fittings**: Ductile iron fittings from approved manufacturers shall be used. Mechanical joint fittings manufactured specifically for PVC pipe may be used for all sizes of PVC pipe. In joining with a fitting, the length of pipe shall not be less than two (2) feet. All fittings or valves must be supported by concrete cradles so that the weight of the fitting or valve is not carried by the PVC pipe. All valves and fittings shall be wrapped in 8-mil-thick polyethylene plastic, unless otherwise specified by Engineer. Where mechanical joint fittings are used, the beveled end of pipe shall be removed and made a plain end, prior to insertion into the mechanical joint fitting. MJ fittings shall be torqued with a calibrated torque wrench in the presence of the Engineer.

4-08. **Tracer Wire**: Tracer wire shall be used on all buried water mains for the purpose of providing a continuous signal path used to determine pipe alignment after installation. Tracer wire shall be installed as described below in accordance with the Standard Drawings.

A. Tracer wire shall be installed on all non-metallic pipelines.

B. Wire shall be placed on top centerline of the pipeline and shall run continuously along the entire length of the pipe prior to the placement of trench backfill. Wire shall be mechanically and electrically continuous throughout the pipeline, including within pipe casings.

C. Tracer wire shall be secured to the pipe at six (6) foot intervals with plastic adhesive tape, duct tape, or plastic straps. The wire may alternatively be secured to the pipe by looping the tracer wire around itself so the tracer wire remains continuous atop the pipe during backfill operations.

D. Tracer wire access ports shall be installed in accordance with the Standard Drawings within the concrete splash pad of all fire hydrants installed as part of the work. Tracer wire may terminate within the meter box, blow off boxes, CP test boxes, valve boxes, or air valve enclosures only as directed by the Director of Engineering at intervals of not more than one thousand (1,000) feet. One end of each wire run must terminate at an access port clear of traffic areas. Locations of all tracer wire access ports installed shall be noted on the Record Drawings.
E. Wire shall extend into the access port and terminate with a coiled twenty-four (24) inch length of the wire. All tracer wire not located atop pipe shall be installed within a conduit at a minimum depth of twenty-four (24) inches in accordance with the Standard Drawings.

F. Splices shall be installed only when necessary and shall be made using a wire connector selected from the Approved Materials List.

G. The Contractor shall test tracer wire for electrical continuity in the presence of the Engineer prior to the installation of any paving over the pipelines or appurtenances. Testing shall be accomplished using a progressive Electronics 77M tone generator, or similar device, and a testing telephone handset.

4-09 Casing for PVC Pipe: Casings for PVC pipe shall only be used when specified by the Engineer. Casing design and material shall be as shown on plans and/or as approved by the Engineer. Pipe spacers must be used to prevent the pipe and bells from snagging on the inside of the casing, and to keep the installed line from resting on the bells. Pipe spacers should be thick enough to allow for clearance between the bells and the casing bottom. Pipe spacers shall be approved by the Engineer prior to installation. Any change to the casing sizes shown below shall be presented to the Engineer for approval.
<table>
<thead>
<tr>
<th>Pipe Size (Inches)</th>
<th>Casing Size (Inches), Inside Diameter</th>
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<tbody>
<tr>
<td>4</td>
<td>12</td>
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<tr>
<td>6</td>
<td>14</td>
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<td>24-26</td>
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<td>16</td>
<td>28-30</td>
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<td>30-32</td>
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<td>32-34</td>
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<td>24</td>
<td>36-38</td>
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<td>30</td>
<td>44-48</td>
</tr>
<tr>
<td>36</td>
<td>48-50</td>
</tr>
</tbody>
</table>
5-01. **General:** All material to be furnished must be listed on the Authority's Approved Material List, as noted in paragraph 1-06 of these specifications.

5-02. **Fittings:** Fittings shall conform to either ANSI/AWWA Specifications C-153/A21.53, Ductile-Iron and Gray-Iron Fittings, three (3)-inch through forty-eight (48)-inch, for water or other liquids. Fittings shall be rubber gasket-type, in accordance with ANSI/AWWA C-111/A21.11, except as otherwise required in these specifications or approved on the plans. All fittings shall be as specified by the manufacturer for the type of material called out.

5-03. **Assembly of Rubber-Gasket Joints:** All connecting parts of the pipe, gaskets and fittings shall be assembled in a workmanlike manner in accordance with the manufacturer's recommendation, and ANSI/AWWA Specification C-111/A21.11.

5-04. **Coating and Lining:** All fittings shall be coated and lined as specified herein. Linings shall be cement mortar conforming to ANSI/AWWA Specification C-104/A-21.4 and UL/NSF-61. The exterior surface shall be factory-coated with a petroleum asphaltic coating approximately one (1)-mil-thick. The coating shall be continuous, smooth, neither brittle when cold nor tacky when exposed to the sun, and strongly adherent to the fitting. Lining or exterior coating that does not bond firmly or shows voids or holidays shall be rejected. All metallic fittings shall be wrapped in polyethylene eight (8)-mil plastic in accordance with ANSI/AWWA C-105/A21.5.
SWEETWATER AUTHORITY
STANDARD SPECIFICATIONS

SECTION 6 - STEEL WATER PIPE AND FITTINGS

6-01. General:

A. Description of Work: The Contractor shall furnish and install all piping materials required for the construction of the project, including gaskets, butt straps, nuts and bolts, and closure pieces, as shown on the plans, specified in the specifications or necessary to properly complete the installation.

B. Pipe Identification Symbols: Pipe identification symbols shown on the Plans (for example, fourteen [14]-inch SCMLC-150), designate nominal inside diameter measured to the internal face of cement-mortar-lining (fourteen [14]-inches), type of pipe (steel, cement-mortar-lined and coated), and working pressure (150 psi).

C. Shop Drawings: Shop drawings of all pipe and fittings shall be submitted to the Engineer and shall be approved by him prior to fabrication of the pipe and fittings. Such approval is an additional precaution against errors and is not to be construed as relieving the Contractor of the full responsibility for the accuracy of the shop drawings.

D. Markings: Markings shall include a designation mark for each pipe or fitting furnished, as specified by AWWA C-200-1 Section 1.9. Shop drawings shall include a marking plan showing the location of each pipe and piece furnished.

6-02. Material:

A. Steel: Steel for cylinders shall conform to ASTM designation A570 Grade 36 or ASTM designation A36 with a 36,000 psi minimum yield point and a minimum thickness of 0.25-inches.

B. Stress: Stress in steel cylinders shall not exceed 16,500 psi at the designated working pressure, including an allowance for surge pressure, with no allowance for tensile strength of concrete.
C. **Cylinder Girth Seams:** Cylinder Girth Seams for straight pipe shall not exceed one (1) seam for each twelve (12) feet of length.

D. **Cement:** Cement shall be Portland Cement Type II. Mortar lining shall be NSF 61 approved.

**6-03 Fabrication:**

A. **Steel Pipe and Fittings:** Steel pipe and fittings shall conform to the requirements of the latest revised American Water Works Association Specifications C-200, and C-208, and any revisions thereto, except as modified herein.

   Maximum and minimum diameters at any cylinder section shall not vary more than one percent (1%) of the cylinder outside diameter.

B. **Cylinder and Pipe Lengths:** Cylinder and pipe lengths shall be forty (40) feet, except where shorter lengths are required to fit horizontal and vertical alignment or as approved by the Engineer. Lengths to be used for curved alignment shall be sufficiently shortened to prevent the actual pipe centerline from varying greater than 0.3 feet horizontally from the circular alignment shown on the plans, or greater than 0.2 feet vertically from the elevations and grades shown on the plans.

C. **Interior Mortar Lining:** Interior mortar lining thickness shall conform to AWWA Specification C-205.

D. **Exterior Mortar Coating:** Exterior mortar coating thickness shall conform to AWWA Specification C-205 with the following exceptions:

<table>
<thead>
<tr>
<th>Nominal Inside Diameter</th>
<th>Minimum Coating Thickness (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-inch through 10-inch</td>
<td>1</td>
</tr>
<tr>
<td>12-inch and above</td>
<td>1-1/2</td>
</tr>
</tbody>
</table>

   The mortar coating shall be reinforced with spirally wound No. 14 gauge steel wire spaced one (1) inch on centers positioned approximately in the center of the mortar coating.

   All exterior metal surfaces, except flanges, spigot, and butt strap ends shall be coated.

E. **Exterior Dielectric Coatings:** Exterior dielectric coatings shall conform to AWWA Standards C-214 and shall be a minimum of 80 mils. Field wrapping shall conform to AWWA C-209 Standards.
G. Ends of Sections:

1. **Bell and Spigot**: Ends of sections shall be welded bell and spigot, unless otherwise indicated.

2. **Butt Strap Closures**: Butt strap closures shall be installed at all points where shown on the plans. The butt straps shall be the same thickness as the pipe wall, but not less than 0.25-inches, at least ten (10) inches wide, and rolled to fit the outside cylinder diameter, and shall be centered over the ends of the pipe sections they are to join. A standard steel six (6) inch pipe half coupling and plug shall be shop-welded to the top section of the butt strap to permit access for mortar-lining the inside of the joint on pipes sixteen (16) inches or smaller. For pipes larger than sixteen (16) inches, two (2) standard six (6)-inch pipe couplings shall be shop-welded to the top section of the butt strap. A coupling shall be located forty-five degrees (45°) above spring line on each side of the pipe to permit access for mortar-lining the inside of the joint.

3. **Flanges**: Flanges shall conform to AWWA Specification C-207, except as modified herein or shown on the plans.

Flange inside diameters shall be approximately three-sixteenths (3/16) of an inch larger than the steel cylinder O.D. Flanges shall be drilled and faced to match connecting valves and fittings.

4. **Gaskets**: Gaskets shall conform to AWWA C-207 and be one-eighth (1/8) inch-thick. Full face gaskets shall have bolt holes pre-punched. Gasket material shall be made of non-asbestos inorganic mineral fiber or rubber composition.

5. **Flexible Couplings**: Flexible couplings shall be as listed on the Authority's Approved Materials List.

6. **Welded Joints**: One (1) end of each section shall be swagged out to form a female or bell end which shall permit the male or spigot end to enter approximately one (1) inch with a clearance of approximately one-thirty-second (1/32) inch. The spigot end shall be "sized" to permit it to enter the bell end of the adjacent section.

7. **Special Sections and Fittings**: Special sections and fittings shall conform to the working pressures, grade of steel and cylinder thickness of adjoining standard pipe sections, except that the minimum cylinder thickness shall be 0.25-inches. Fitting
dimensions shall conform to AWWA Specification C-208, except that reducers shall consist of taper sections between six (6)-inch minimum lengths of adjoining pipe. The taper shall be a minimum of twelve (12)-inches in length for each two (2)-inch reduction, and the gauge shall be equal to that of the larger adjoining pipe. The gauge and diameter of the six (6)-inch sections shall match the adjoining pipes. Fittings and special sections shall be fabricated from lined and coated standard pipe sections and manually pointed with mortar.

When configuration will not permit using standard sections, such odd pieces shall be lined and coated in the manner specified for pipe, except that where such operations will not give satisfactory results, equivalent manual methods will be permitted. Except for butt strap closures, field fabricated fittings will not be permitted.

Reinforcing collars and crotch plates for wyes, tees, and crosses shall be provided in accordance with AWWA Specification C208.

8. Factory Inspection Tests: Factory tests shall be performed as set forth in referenced specifications. All fitting girth seams, not hydrostatically tested, shall be dye penetrant tested. Any weld flaws shall be corrected. An Authority representative shall be present during testing at the expense of the Contractor/Supplier unless waived in writing by the Engineer. Inspection shall be done on all aspects of fabrication, including shipping.

6-04. Installation:

A. Excavation and Backfill: Excavation and backfill shall conform to Section 15, or as approved by the Engineer.

B. General Installation Procedures and Workmanship: Prior to laying the pipe, the bottom of the trench shall be graded and prepared to provide uniform bearing throughout the entire length of each joint of pipe. Bell holes of ample dimension shall be dug in the bottom of the trench at the location of each joint to facilitate the joining and inspection. The trench shall have a flat or semicircular bottom conforming to the grade to which the pipe is to be laid. The pipe shall be accurately placed in the trench on the prepared foundation to the lines and grades shown on the plans. Fittings shall be supported independently of the pipe. Slings for pipe handling shall be belts of sufficient width to prevent damage to the lining and coating (cables or chains will not be permitted). Pipe shall be carefully handled to prevent damage to the lining and coating. Speader bars may be required as determined by the Engineer.
No joint shall be backfilled until it has been inspected by the Engineer. Sufficient trench space shall be left open in the vicinity of each joint, to permit visual inspection around the entire periphery of the joint.

C. **Damaged Pipe or Fittings:** Damaged pipe or fittings shall be marked as "DAMAGED – NOT TO BE USED," and removed from the site of the work.

D. **Welded Joints:** Welded joints shall be completed in the trench. When the pipe is being laid, both the spigot and the bell ends shall be thoroughly cleaned of all foreign matter and all protective material shall be removed from the surfaces that are to be in contact at the joints.

For pipe less than sixteen (16) inches in diameter, a half of a standard six (6) inch steel pipe coupling shall be provided at each joint to permit access for mortaring the inside of the joint. After mortaring, the coupling shall be closed with a standard welded-steel plug and welded.

For pipe twenty-four (24) inches in nominal inside diameter, or larger, a one-half (1/2) inch recess between adjacent linings shall be provided and later pointed from the inside with cement mortar and troweled smooth.

All welding shall be done by experienced welders qualified in accordance with the Standards of the American Welding Society. Welders shall furnish proof of certification. Welding electrodes shall comply with the requirements of ASTM Designation A-233.

In all hand welding, the metal shall be deposited in successive layers and the minimum number of passes or beads in the completed weld shall be as follows:

<table>
<thead>
<tr>
<th>Steel Cylinder Thickness (Inches)</th>
<th>Fillet Weld (Minimum No. of Passes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smaller than 3/16-inch</td>
<td>1</td>
</tr>
<tr>
<td>3/16-inch and 1/4-inch</td>
<td>2</td>
</tr>
<tr>
<td>5/16-inch</td>
<td>3</td>
</tr>
<tr>
<td>3/8-inch</td>
<td>3</td>
</tr>
</tbody>
</table>

E. **Butt Strap Closure Joints:** Butt strap closure joints shall be completed in the trench after the pipe has been laid to the alignment and grade shown on the plans. The butt strap shall be of the same thickness as the pipe wall, at least ten (10) inches wide, and rolled to fit the outside diameter,
and shall be centered over the ends of the pipe sections it is to join. They shall be field-welded to the outside of the pipe, along both edges, by full circumferential fillet welds. A half of a standard six (6) inch steel pipe coupling and plug provided shall be shop-welded to the top section of the butt strap to permit access for mortaring the inside of the joint on pipes sixteen (16) inches or smaller. For pipes larger than sixteen inches, two standard six (6) inch steel pipe couplings shall be shop-welded to the top section of the butt strap. A coupling shall be located forty-five degrees (45°) above pipe spring line on each side of the pipe to permit access for mortar lining the inside of the joint. After welding and mortaring, the coupling shall be done in the same manner as specified for welded joints.

The interior of the joints shall be filled with plastic mortar and finished off smoothly with the inside of the pipe. The exterior shall have wire mesh, 2-inch x 4-inch x No. 13 gauge, clean and free from rust, shall be applied to the exterior of the joints so that the wires on the two (2) inch spacing run circumferentially around the pipe. The wires on the four (4) inch spacing shall be crimped in such a manner that the mesh will be held three-eighths (3/8) inch from the metal joint surface. The mesh shall be lapped a minimum of eight (8) inches and shall be securely wired in position. The joint exterior shall be coated with mortar to a minimum thickness of one and one-half (1-1/2) inches.

Immediately prior to applying mortar to the interior or exterior of the joints, a cement wash shall be applied to the metal surfaces to be coated.

F. **Flanged Joints**: Flange faces shall be wire brushed and gaskets shall be thoroughly cleaned just prior to joining. Following the tightening of the bolts, all exposed metal surfaces, shall be coated with an approved primer. Denso paste shall be applied over nuts and bolts, and the entire flange assembly shall be wrapped with Patrolatum wax tape and 8 mil polyethylene, secured with 10 mil. PVC tape.

G. **Flexible Coupling Joints**: Flexible coupling joints shall be completed in the trench after the pipe has been laid to the alignment and grade shown on the plans. Each pipe end, for a distance of six (6) inches to eight (8) inches back from the end, shall be thoroughly cleaned to remove oil, dirt, loose scale, rust and other foreign matter. Flanges, gaskets, and sleeves shall then be assembled on the pipe ends, in accordance with the manufacturers' recommendations. Gaskets, pipe ends, and coupling sleeve flares shall be lubricated with a lubricant to facilitate the joining. Coupling sleeves shall be accurately centered over the pipe ends and one pipe end shall touch the coupling sleeve centering stop, if the coupling sleeve is so equipped.
Bolts shall be tightened to the torque recommended by the manufacturer with a torque wrench, and the torque wrench shall display current calibration date, in the presence of the Engineer.

All exposed coupling and pipe metal surfaces shall be cleaned, primed, diapered, and coated per specification or as required by Engineer, as specified for flanged joints.

H. **Cement Mortar:** Cement mortar for buttering, pointing, and grouting shall be Atlas Tech Patch 20 mixed with the minimum amount of water which will permit placing the mortar. SikaDur® 32, Hi-Mod, High modulus, high strength, epoxy bonding/grouting adhesive shall be used when applying Atlas Tech Patch 20.

I. **Cold Applied Coating and Wrapping:** Cold applied coating and wrapping shall conform to AWWA Standard C209 and shall consist of a primer and pre-fabricated cold-applied tape applied to the exterior surface of steel water pipe special sections, connections, and fittings. Each use of this coating shall be approved by the Engineer. The specific application procedure used for each type of tape coating system shall be as described by the manufacturer. At the user's option, multiple wrapping may be used to obtain any desired thickness but in no instance shall the thickness be less than 20 mils using a minimum overlap of one-half (1/2) width of tape. End laps shall not be less than two (2) inches. Tape less than two (2) feet in length shall not be used unless the pipe's circumference is less than the length of the tape. Where the tape coating joins with a mill-applied coating, it shall overlap the mill coating by a minimum of one (1) tape width and bond to it. In the area to be overlapped, kraft paper, or whitewash shall be removed first. The contractor, at his/her own option, may arrange to have the manufacturer provide assistance in demonstrating the proper method of application. Adequate provision shall be taken to protect the coating from physical damage during subsequent pipe handling, lowering, and backfilling operations. When construction or soil conditions exist where mechanical damage is likely to occur, a suitable overwrap may be required. This will depend largely on the conditions encountered, but, in general, an extra thickness of tape or other spiral wrapping should be used. It should be spiral wrapped if possible and bonded or mechanically held in place. Under these conditions, the tape manufacturer should be consulted for specific recommendations. Maximum and minimum temperatures for application and handling specified by the manufacturer shall be followed.

J. **Concrete Thrust and Anchor Blocks:** See Section 12 and Standard Drawing 11 of these specifications.
K. Preventing Foreign Matter from Entering the Pipe: At all times, when the pipe laying is not in progress, the open end of the pipe shall be closed by an expandable, steel bulkhead, or plugged by other means approved by the Engineer.

L. Testing and Disinfection: All steel pipe water mains and appurtenances attached thereto, shall be tested and disinfected in accordance with the Standard Specifications for Testing and Disinfection, Section 13, and Section 14.
SECTION 7

7-01. General: All material to be furnished must be listed on the Authority's current approved list, as noted in paragraph 1-06 of these specifications. Valves shall be the same size as the mains in which they are to be installed. All valves ten (10) inches and larger shall be butterfly valves. All valves four (4) inches and larger shall be operated by the Contractor, in the presence of the Engineer, prior to installation. A valve card will be supplied by the Authority and completed by the Contractor listing type of valve, valve size, and number of turns, and all other data as required by the Engineer.

7-02. Gate Valves:

A. General Requirements of Gate Valves: Unless otherwise indicated on the plans, all gate valves shall be of the non-rising stem-type. Gate valves three (3) inches and under shall be all bronze, conforming to the requirements of ASTM Standard Specification B-62. Unless approved otherwise by the Engineer, gate valves four (4) inches and larger shall be resilient seated wedge-type conforming to the requirements of American Water Works Association Specification C-509, and to the following requirements:

1. All gate valves shall have a ductile iron body with bronze non-rising stem and stem nut with three (3) "O" rings to seal the stem. The valve shall be coated and lined with factory-applied fusion-bonded epoxy conforming to the requirements of the AWWA C-550 standard. The coating and lining shall be eight (8) to ten (10) mils thick.

2. Valves shall open by turning the stem counter-clockwise.

3. Four (4) inch and larger valves shall have stems provided with two (2) inch square cast-iron or ductile-iron operating nuts, unless otherwise specified.

4. Any valve with an operating nut or slot having a depth of five (5) feet or greater shall have an operator extension, per Standard Drawing 10-A.
B. **Stems**: Valve stems shall be cast, forged or rolled bronze conforming to the requirements of American Water Works Specification C-509. Low-zinc or low-aluminum bronze stems are not required.

C. **Bronze Parts**: All bronze parts shall conform to the requirements of ASTM Designation B-62 and AWWA C-509.

D. **Valve Ends**: Valve ends shall be suitable for the type of pipe and joints used in the water main in which the valves are to be installed, as called for on the plans and/or as specified in these specifications. Overall dimensions and weights of valves shall conform, in all respects, to the Standard Specifications to which references are made herein.

Where mechanical or push-on joint ends are specified, they shall conform to the requirements of AWWA Specification C-111/A 21.11.

Flanged ends shall conform to ANSI Specification B-16.1, Class 125 or ANSI/AWWA C110/A21.10, unless otherwise specified.

7-03. **Butterfly Valves**: Butterfly valves shall conform to the latest revision of AWWA Specification C-504, Rubber Seated Butterfly Valves, except as modified in these specifications or on the plans. Valve bodies shall be ductile-iron. All valves shall be Class 150, unless otherwise shown on the plans and flange bolt holes shall be full-sized holes through the body flanges.

Rubber seats shall be applied to either the body or disc. The mating-seat surface, in either case, shall be 18/8 stainless steel, or bronze, grade A, D, or E.

When valves are for buried service, the valve operator shall be totally enclosed and shall be designed for service in direct contact with backfilled material. The operator shall be water-tight and shall not have gears or indicators outside of the operator casing. The valve operator and other parts requiring lubrication shall be fully lubricated at the factory and shall require no additional lubrication for the life of the valve.

Valve shafts shall be turned, ground and polished 18/8 stainless-steel type 304 with stainless-steel nuts and pins. Minimum shaft diameter shall be as specified in Table 3 of AWWA, C-504 for Class 150-B.

The disc and the exterior and interior of the valve body, except the rubber seat recess and stainless-steel bronze parts, shall be coated with factory-applied fusion-bonded epoxy coating. Projections on the ferrous surfaces shall be ground smooth. After removal of casing irregularities, oil and grease shall be removed from the casing and the surfaces shall be sand or shot-blasted to white metal. After the sand or shot-blasting, surfaces shall be air blown to remove dust.
Fusion bonding epoxy shall immediately follow the sand or shot-blasting. Surfaces to be coated shall be warmed to a minimum of 135°F to insure dryness. The thickness of the coatings, when dry, shall be eight (8) to ten (10) mils when measured by an electric or magnetic thickness gauge.

The epoxy coating and lining shall be formulated from materials deemed acceptable in the Food and Drug Administration Document, Title 21 of the Federal Regulations on Food Additives, Sec. 175.300 and Title 22, Division 4, Chapter 18, Article 1. The coating shall be hard and high-impact resistant. It shall be of a glossy-type that has impact, adhesive and resilient qualities such that it will not bruise or shatter from a blow of wood, rubber, or plastic hammer. When feasible, install operator nut on the curb side.

7-04. **Gate Wells:** All gate wells shall be six (6) inch ABS pipe with a minimum wall thickness of one-quarter (1/4) inch. Install a valve identification card in gate well. Identification tag (plastic tag) shall be installed on a two (2) inch diameter PVC and indicate valve type, size, number of turns, direction, and position. See Standard Drawing 10 and 10-A.

7-05. **Location of Valves:** Valves at intersections are to be located at the branching fitting. Fittings such as tee, cross, or elbow are to be flanged, and the appropriate valve bolted to said fitting. Gate Wells, approved by the Engineer, located in concrete (e.g. sidewalks, driveways), shall be fitted with a Bingham &Taylor P.I. Adapter set flush to finished grade.

7-06. **Valve Location Points:** All gate valves, butterfly valves, blow-offs and drain valves shall have location points engraved and painted yellow with paint shown on the Approved Materials List. The engraving shall be in the top of curb at two (2) points indicated by an inverted T followed by an even foot measurement to the operator nut. See Standard Drawing 12.
SWEETWATER AUTHORITY
STANDARD SPECIFICATIONS

SECTION 8 - WATER LATERALS

8-01. **General:** All material to be furnished must be listed on the Authority's current Approved Materials List, as noted in paragraphs 1-6 of these specifications.

8-02. **Location and Size:** Each meter shall have an individual lateral. The lateral shall include the angle meter stop, meter box, and consumer shut-off valve. Laterals shall be copper only.

Each renewed service shall have an individual lateral, angle meter stops, meter boxes, and consumer ball valves as follows (a renewed service is defined as an existing service which is replaced from the main to the meter box):

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>BOX CONDITION</th>
<th>RESULT= New Meter Box and Consumer Ball Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidewalk</td>
<td>Acceptable</td>
<td>No</td>
</tr>
<tr>
<td>Sidewalk</td>
<td>Not Acceptable</td>
<td>Yes</td>
</tr>
<tr>
<td>Behind sidewalk/in parkway or in native soil</td>
<td>N/A</td>
<td>Yes</td>
</tr>
<tr>
<td>Driveway</td>
<td>N/A</td>
<td>Per Superintendent or Engineer</td>
</tr>
</tbody>
</table>

The lateral shall be located at right angles to the center of the right-of-way, with a minimum of ten (10) foot horizontal separation between the water and sewer laterals, and a four (4) foot horizontal separation between the water and storm drains, unless otherwise approved by the Engineer.

The lateral shall terminate in an angle meter stop located as follows:

A. Where concrete or machine-formed asphaltic concrete curbs and sidewalk exist, or are to be constructed. See Standard Drawings 1 and 2.

B. Where there are no curbs, the location of the box shall be as approved by the Engineer, in a location readily accessible to the Authority.

C. Meter boxes will not be located in driveways or driveway aprons, or ADA\(^1\) driveway wings. See Standard Drawing 20.

\(^1\) Americans with Disabilities Act
The minimum lateral size is one (1) inch. See Standard Drawing 1.

8-03. **Location of Lateral Taps**: Lateral taps shall be located in accordance with Standard Drawings 1 or 2.

8-04. **Copper Tubing**: Copper tubing shall conform to the requirements of ASTM Standard Specification No. B-88, for Seamless Copper Water Tube, Type K. It shall be of the size and hardness indicated on the drawings and/or called for in the Specifications.

8-05. **Splices**: Where permitted, in copper tubing, splices in three-fourths (3/4) inch and one (1) inch laterals shall be made by using a compression coupling, or sweat fittings.

Repair splices in one and one-half (1-1/2) inch and two (2) inch copper laterals may be made with a compression coupling or a sweat fitting using lead-free solder shown on the Approved Materials List as approved by the Engineer. No acid core solder will be permitted. Only an approved flux shall be used. New installation of all joint sizes shall be soldered.

8-06. **Service Saddles**: Service saddles shall be of double strap design, with cast-bronze bodies and copper silicon alloy straps and nuts, conforming to ASTM A98.

Saddles shall be used for all service lateral connections and PVC pipe. Steel pipe shall require welding one-half (1/2) coupling and dielectric bushing one-half (1/2) inch larger than coupling stop thread. (Example: 2-inch coupling, 2-inch x 2-1/2-inch bushing). See Approved Materials List for saddles. See Standard Drawing 3.

8-07. **Water Service Fittings**: Corporation stops and angle meter stops shall be of the size shown on the plans. All stops shall have a waterway of full diameter of designated size. All nuts, washers, and contact surfaces shall be faced to a true fit. All tapers shall be carefully ground and show no leakage under hydrostatic test. All fittings and stops shall be finished in a neat and workmanlike manner and the thickness of metal shall be equal around the axis of the waterway. All burrs on the inside of all fittings and stops shall be carefully removed, leaving a clean, smooth waterway.

All water service fittings, including stops, shall be cast of high-grade, no-lead bronze conforming to the UNS/CDA No. C89833 standard.

8-08. **Poly Water Meter Boxes**: Boxes, covers, and lids shall be manufactured to the dimensions shown on the standard drawing.
8-08.1 Replacement only, not for new service installation: Replacement #3 water meter boxes are to be used on existing three-quarter (¾)-inch and one (1)-inch services with a #3 water meter box where the installation of a larger new service installation standard meter box, Section 8-08.2, will interfere with a sidewalk, water meter, or create a hazard.

8-08.2 New service installation and existing replacement water meter boxes: All polymer concrete water meter boxes, covers, and lids for new service installation and replacement of damage or missing water meter boxes, covers, and lids, excepting the replacement of the #3 water meter box as noted in 8-08.1 shall be furnished under this specification and comply with the provisions of this specification.

Polymer concrete water meter box, cover and lid shall be manufactured of polymer concrete material consisting of calcareous and siliceous stone, glass fibers, and thermoset polyester resin. Boxes shall be manufactured to the dimensions and configurations shown on the standard drawings using male and female molds. Covers and lids shall be manufactured to the dimensions and configurations shown on the standard drawings using matched die molds.

Chemical resistance: Polymer concrete material shall be resistant to chemicals commonly found in the soil or in the operating environment. Polymer concrete material shall be tested in accordance with ASTM D-543. The polymer concrete material shall be resistant to sunlight and any climactic condition and shall be tested in accordance with ASTM D-756, procedure “E.”

Color: Meter boxes, covers, and lids shall be “concrete gray” in color.

Manufacturer: Meter boxes, covers, and lids shall be manufactured by Armorcast Products Company or approved equal.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A6001946PCX12</td>
<td>13-inch x 24-inch x 12-inch Polymer Concrete Meter Box</td>
</tr>
<tr>
<td>A6001866DW-SWA</td>
<td>13-inch x 24-inch x 2-inch Polymer Concrete Cover with Drop-In Read Lid</td>
</tr>
<tr>
<td>A6000481D-SWA</td>
<td>7-inch x 13-inch x 1 ¼-inch Polymer Concrete Drop-In Read Lid</td>
</tr>
<tr>
<td>A6001640PCX12</td>
<td>17-inch x 30-inch x 12-inch Polymer Concrete Meter Box</td>
</tr>
</tbody>
</table>
Vertical load test: Polymer concrete box and cover assembly shall withstand a vertical test load of 20,800 pounds (16,000 pounds plus 30% impact factor) load over a 10-inch x 20-inch x 1-inch thick steel plate centered on the cover area and backed with a 10-inch x 20-inch x ½-inch rubber plate. The test loading shall not cause any failure to the box or cover.

8-09. Installation: On all new installations prior to construction of curbs and gutters, service laterals shall be extended two (2) feet above grade, with angle meter stop installed. Lateral shall be disinfected, tested and flushed and left secured to an iron stake or rod. After construction of concrete curbs, service lateral shall be adjusted to position and elevation and meter box set to finished grade.

8-10. Connection to Existing Laterals:

A. Where the plans specify connection to an existing copper lateral, the contractor shall connect with copper tubing of the same size and in no case be less than one (1)-inch copper. Existing pipe plan shall be joined using a three (3)-piece compression coupling manufactured by Jones, Ford, or Dresser. Where existing pipe is three-quarter (3/4)-inch, the new one (1) inch lateral pipe shall be joined using a three-quarter (3/4)-inch by 1-inch, three (3)-piece adapter coupling manufactured by Jones, Ford, or Dresser.
B. Where the plans specify connection to an existing plastic lateral, the Contractor shall field verify to determine the material type.

- Polybutylene plastic pipe shall be replaced with copper tubing the same size and in no case, smaller than one (1) inch.

- PVC pipe shall be reconnected with PVC of the same size and in no case be less than the original service size. Existing pipe shall be joined using a three (3)-piece compression coupling manufactured by Jones, Ford, or Dresser.

8-11. **Meter Installation**: Application for service and installation of meters shall be in accordance with the Authority's Rates and Rules. See Standard Drawings 1, 2, 4, and 4-A.

8-12. **Reconnection of Service**: When it is necessary to reconnect laterals during a water main replacement project, the following procedure shall be followed:

A. The Contractor shall be responsible for any damages associated with interruption of service to the customer, resulting from the severance of an existing lateral during water main installations.

C. During the installation of a new water main, the Contractor shall install service saddles, required corporation stops and dry-tap the pipeline.

D. The Contractor shall give the Authority a minimum of forty-eight (48) hour notice prior to the reconnection of a service lateral. The Authority will provide the Contractor written notifications indicating the time and date the customer water service will be temporarily shut down due to reconnection work. The Contractor is required to provide each customer affected by the reconnection written notice twenty-four (24) hours advance of work.

E. After successful installation and testing of the water main, the Contractor shall energize the newly installed water main and disconnect all existing service laterals from the old main and shall connect them to the newly installed water main.
9-01. **General:** All material to be furnished must be listed on the Authority's current Approved Material List, as noted in paragraph 1-06 of these specifications.

An air relief assembly shall be installed in accordance with Standard Drawings 5, 5-A, 5-B, 5-C, and 5-D at location noted on the plans and at such additional locations as required by the Engineer for the removal of air. The tap for the assembly shall be made on to of the pipe in a level section of pipe, no closer than twenty-four (24) inches to a bell, coupling, joint or fitting. Locations shall also conform to the requirements of Section 8-02 (Water Laterals) of these specifications.

9-02. **Material:** All materials shall conform to the requirements of the applicable sections of these specifications.

The air and vacuum relief valve shall have a cast-iron body, cover, and baffle. The float shall be stainless steel, and all other internal parts such as float guides; bushings, lever pins, cotter pins, seat, and baffle retaining screws shall be stainless steel or bronze. Air valve to be installed above grade with enclosure per the Authority Standard Drawing 5, 5-A, 5-B, 5-C, and 5-D.

9-03. **Air Vacuum Relief Valve Enclosure:** Enclosure shall be manufactured from Low Linear Density Polyethylene, with UV inhibitors, in a Sandstone color. Refer to Standard Drawing 5-D and the Approved Materials List for details.
Page intentionally left blank
10-01. **General:** All materials to be furnished must be listed on the Authority’s current Approved Materials List, as noted in paragraph 1-06 of these specifications.

A blow-off assembly (in-line or end of main) shall be installed in accordance with Standard Drawings 9, 9-A, 9-B, 9-C, and 9-D at locations noted on the plans.

10-02. **Material:** All materials shall conform to the requirements of the applicable sections of these specifications.

10-03 **Transmission Main Blow-off Assemblies:** Blow-off assemblies shall be installed in accordance with Standard Drawings 9-B, 9-C, and 9-D.
Page intentionally left blank
11-01. **General:** All material to be furnished must be listed on the Authority's current approved list, as noted in paragraph 1-06 of these specifications.

11-02. **Fire Hydrants:** Fire hydrants shall conform to the requirements of the American Water Works Association Specification C-503 and to the following requirements:

A. Fire hydrants shall be of the type in which the valve stem and carrier assembly is mounted by either a bonnet bolted to the body of the hydrant or threaded in valve seats and nozzles.

B. Flange gaskets shall be made from one-eighth (1/8) inch thick, full faced Aramid Fiber Bound with Nitrile. No Asbestos Content.

C. The exterior of all fire hydrants shall be painted by the manufacturer with two (2) coats of an approved oxide primer and one (1) coat of an approved gloss finish. The Contractor shall apply one (1) additional finish coat after the fire hydrant has been installed. See current Authority’s Approved Materials List for paint.

D. Hose and pumper nozzle threads shall conform to the National Standard adopted by the National Board of Fire Underwriters. Hose nozzles shall be fitted with cast-iron or ductile-iron outlet caps.

11-03. **Ductile-Iron Scored Spools:** A ductile-iron scored spool shall be used to adjust the fire hydrant to grade. The spool shall be considered a part of the fire hydrant assembly, shall have six (6) bolt hole flanges at both ends, shall be complete with gaskets, cadmium-plated nuts and bolts and shall conform to all other requirements pertaining to ductile-iron fittings.

The nuts and bolts connecting the fire hydrant head to the scored spool will be three-quarter (3/4) inch with hexagonal heads. The bolt will have a 31/64-inch hole drilled in the center. The hole shall be filled with caulking when the bolt hole is facing up. The nuts and bolts will conform to ASTM A570 grade 36 with a minimum tensile strength of 22,000 psi.

Spools twelve (12) inches and longer shall be scored on both ends maximum, three (3) inches from back of flange, and a minimum of one (1) inch. Spools less than twelve (12) inches long shall be scored in the middle. The score shall be one-fourth (1/4) inch wide and from one-eighth (1/8) inch minimum to three-
sixteenths (3/16) inch maximum depth. The polyethylene wrap shall be trimmed off even with the finished grade. All exposed parts of hydrant spools and bolts shall be thoroughly cleaned and given two (2) coats of approved yellow paint.

11-04. **Hydrant Location:** A fire hydrant assembly shall be installed in accordance with Standard Drawings 6, 7, and 8, and shall be located as shown on the plans, as staked in the field, or as approved by the Engineer with consultation with the appropriate fire agency.

The center of the fire hydrant shall be located as follows, except as otherwise approved by the Engineer:

A. Where concrete or machine-formed asphalt-concrete curbs exist, or are to be constructed, two (2) feet back of curb face to centerline of fire hydrant. See Standard Drawing 7.

B. Where curb and sidewalk are contiguous, one and one-half (1-1/2) feet back of sidewalk. Where there is insufficient right-of-way back of sidewalk, an easement will be required.

C. Where curb and sidewalk are contiguous and the sidewalk is wider than a normal residential sidewalk, two (2) feet back of curb face to centerline of fire hydrant.

D. Where there are no curbs, the location shall be as approved by the Engineer.

E. Where vertical obstructions exist, a minimum horizontal clearance of eighteen (18) inches shall be provided between the vertical surface and the valve-operating nut in the closed position. Horizontal clearance specified herein shall extend from hydrant flange to six (6) feet above flange.

F. Splash pad shall be installed according to Standard Drawing 7.

The flange elevation (top of scored spool) shall be equal to one-quarter (1/4) inch per foot rise from top of curb, plus two (2) inches minimum to three and one-half (3-1/2) inches maximum. Where there is no curb, the flange elevation shall be approved by the Engineer.

11-05. **Hydrant Type:** 2-port and 3-port fire hydrants shall be allowed as determined by the Authority. Contractors shall default to the 2-port hydrant when the type is not specified or shown on the drawings. In the event 3-port is required by the fire department having jurisdiction, the Contractor, prior to installation, shall request the Authority make a written determination if the 3-port shall be required.
SWEETWATER AUTHORITY  
STANDARD SPECIFICATIONS  

SECTION 12 - CONCRETE FOR PIPELINES AND APPURTENANT STRUCTURES  

12-01. General: All labor, materials, tools, and equipment for the construction of plain and reinforced concrete shall be furnished as shown on the plans and called for in Sections 201, 202, and 303 of the current edition of Standard Specifications for Public Works Construction (Green Book), except as modified in these Standard Specifications and shall consist of class 420-C-2000.

12-02. Thrust-Blocks: Thrust-blocks shall be provided at all valves and fittings. The installation shall be considered a part of the pipeline construction. See Standard Drawing 11.

Each thrust-block shall be designed to have sufficient bearing area and shall be so placed as to safely transmit to the surrounding undisturbed earth or approved fill the maximum forces, which may occur in the pipeline at that point.

Horizontal thrust-blocks shall be shown on the plans for water mains twelve inches (12-inch) and larger. Vertical anchor-blocks for all main sizes shall also be shown on the plans. The plans shall indicate the location and square feet of bearing area for horizontal thrust-blocks and cubic yards of concrete rounded to the nearest quarter for vertical anchor blocks.

Where additional anchorage is necessary, the Engineer may require steel clamps and shackle anchors or welded-steel joints.

Concrete support blocks below valves shall be the full width of the trench shall extend up to the height of adjoining pipe and shall have a minimum depth below valve as follows:

<table>
<thead>
<tr>
<th>Size of Valve</th>
<th>Depth of Block Below Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-inch and 6-inch</td>
<td>6-inch</td>
</tr>
<tr>
<td>8-inch</td>
<td>8-inch</td>
</tr>
<tr>
<td>10-inch</td>
<td>10-inch</td>
</tr>
<tr>
<td>12-inch</td>
<td>12-inch</td>
</tr>
<tr>
<td>14-inch and larger</td>
<td>As required by the Engineer</td>
</tr>
</tbody>
</table>

12-1  
SECTION 12
The bearing faces of the block shall be poured against undisturbed trench walls and bottom. All concrete shall be kept behind the bells and flanges of fittings and valves. Form work shall be constructed wherever necessary to confine the concrete to the prescribed dimensions. All form lumber shall be removed prior to testing and backfilling. No surplus concrete shall be disposed of in the trench.

All thrust-blocks shall be allowed to cure a sufficient time to have developed their initial strength so that there will be no movement in the pipe during filling and testing. If thrust-blocks are needed at connection points to support forces induced by fittings, temporary jacks shall be used so that water service can be restored to Authority customers while concrete develops its initial strength. Accelerators containing calcium chlorides are not permitted. Accelerators, such as Polarset, that do not contain calcium chloride are permitted.
13-01. Introduction:

The Authority makes every effort to ensure that the water leaving all three of its water production facilities is safe to drink (i.e. compliant with all State Board and USEPA Safe Drinking Water Act Regulations). However, once the water leaves the production facility, it is the effectiveness of the field crews, system operators, customer service representatives, and field inspectors that ensures that it remains so. They are charged with maintaining clean pipes and preventing contamination from entering the system during periods of exposure.

This document sets forth the minimum guidelines to be used by every employee who works in the distribution system and whose efforts may affect the quality of the drinking water served to our customers. It focuses on main installation or repair, and on tank and filter disinfection. The principles and practices outlined here can be applied to any appurtenance or facility that comes in contact with the drinking water. Refer to Section 18 of this document for specific discharge BMPs and monitoring requirements, which must be implemented whenever potable or super-chlorinated water is flushed or drained into the MS4 storm drain system.

The procedures found here are summaries of the following:

- AWWA Standard C651, Disinfecting Water Mains
- AWWA Standard C652, Disinfection of Water Storage Facilities
- AWWA Standard C653, Disinfection of Water Treatment Plants
- AWWA Standard C654, Disinfection of Wells

13-02. Basic Disinfection Procedures: Good disinfection practices are the same for new and repaired mains, as well as for tanks. The basic procedures can be summarized in the following steps:

A. **Inspection:** Inspecting all materials to be used to ensure the integrity of the materials.

B. **Preventing contamination in the first place:** For mains, this includes keeping the working area dry and clean as possible, and the pipe ends covered and protected when not working on them. For tanks and filters, this includes wearing sanitized protective clothing and disinfecting equipment and tools before entering.
C. **Cleaning and Flushing**: Heavy, large particles shelter bacteria and can prevent even high concentrations of chlorine from killing the microorganisms. Remove by flushing, swabbing, or other means, any contaminated materials that may have entered the main or tank.

D. **Chlorinating**: All new mains, reservoirs, and filters must be disinfected before placing back in service.

E. **Flushing and De-Chlorinating**: Flush the chlorinated water from the main. Discharge of flushing water shall be de-chlorinated before entering the storm drain.

F. **Backflow Prevention (isolation)**: Isolate from the distribution system, either physically or with an approved device, any heavily chlorinated water.

G. **Documentation**: Documenting that an adequate level of chlorine contacted each pipe to provide disinfection.

H. **Sampling for Bacteriological Quality**: All new or repaired mains and tanks are to be sampled for bacteriological quality after disinfection is complete.

13-03. **New Main Installation**: These procedures are to be followed for new main installations. All new mains are to be disinfected, sampled, and satisfactory results received from the laboratory before they are placed in service.

A. **Preventing Contamination**: In every case, the most important step in disinfection is to prevent contamination in the first place.

   - It is essential that the interiors of pipes, fittings, and valves be thoroughly cleaned and kept clean before final disinfection.

   - All openings in the pipeline should be closed with watertight plugs when stopping work for the day or for breaks.

   - If dirt does enter the pipe, it will need to be cleaned and flushed.

   - All interiors should be swabbed or sprayed with a one (1) percent to five (5%) percent hypochlorite disinfecting solution.

B. **Chlorination**: Three methods of chlorination are described in the AWWA standard: the tablet method, the continuous-feed method, and the slug method. The continuous-feed method is suitable for general application, the slug method is suitable for dry mains up to twenty-four (24) inches in diameter. In general, the Authority will use the tablet method of
disinfection. Either tablets or granules are acceptable for the tablet method described as follows:

1. **If granules** are used, they are to be placed in the upstream end of the first section, at each branch, and every **five hundred (500)** feet.

2. Ounces of calcium hypochlorite granules

<table>
<thead>
<tr>
<th>Pipe Diameter (d) (inches)</th>
<th>Dose = 50 ppm Calcium Hypochlorite Granules (ounces/500 feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
</tr>
<tr>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>14 and larger</td>
<td>$D^2 \times 30$</td>
</tr>
</tbody>
</table>

Where $D$ is the inside pipe diameter in feet: $D = \frac{d}{12}$

3. **If Tablets** are used, 5-g calcium hypochlorite tablets will be placed in each section of pipe, at each hydrant branch and in each hydrant. The tablet shall be attached by a food-grade adhesive on top of the main.

   Number of 5-g calcium hypochlorite tablets required for dose of 50 mg/L:

<table>
<thead>
<tr>
<th>Length of Pipe Section, feet</th>
<th>13 or less</th>
<th>18</th>
<th>20</th>
<th>30</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe Diameter (inches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>10</td>
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<tr>
<td>12</td>
<td>6</td>
<td>8</td>
<td>8</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td>8</td>
<td>12</td>
<td>14</td>
<td>20</td>
<td>26</td>
</tr>
</tbody>
</table>

4. **When the installation is completed**, the main shall be filled with water at a rate to ensure that the water within the main will flow at a velocity no greater than one (1) foot per second. A backflow assembly shall be used to prevent contamination between the new main and the potable water source that the main is filled from, at the closest possible point for filling the new main. This water shall remain in the pipe for at least twenty-four (24) hours. A minimum
chlorine residual of 25 mg/L should be found at each sampling point after the twenty-four (24) hour period. The results must be reported.

5. After the retention period (a minimum of twenty-four [24] hours), the main needs to be flushed until the chlorine residual from the new main is the same as the distribution system water used to flush it. Before releasing the chlorinated water to the storm drain, it shall be dechlorinated by use of a sodium thiosulfate drip solution or other approved dechlorinating method. An adequate amount of reducing agent must be applied to water being disposed of in order to thoroughly neutralize the chlorine residual remaining in the water. Appropriate Best Management Practices (BMPs) must be in place when flushing.

C. **Bacteriological Testing:** After final flushing and before the new main is connected to the distribution system, two consecutive sets of acceptable samples, taken at least sixteen (16) hours apart, shall be collected from the new main. The first sample will be collected after flushing is completed and the water in the new main is the same as that in the distribution system. The second sample will be collected after this water has sat in the new main for a minimum of 16 hours. At least one (1) set of samples shall be collected from every 1,200 feet of the new water main, plus one (1) set from the end of the line and at least one (1) set from each branch. The first bacteriological sample collected will be analyzed for heterotrophic bacteria and total coliform bacteria. The total coliform analytical method will be either membrane filtration or Colilert presence/absence. The second bacteriological sample collected will be analyzed by Colilert only. A sample positive for total coliform or with a heterotrophic plate count greater than 500 colony forming units will be considered not disinfected and will require flushing of the main and resampling. Connections to existing mains will not be made until satisfactory results are received from the laboratory.

D. **Placing Main in Service:** The new main shall not be placed in service nor will connections to existing mains be made until satisfactory results are received from the laboratory.

E. **Tie-ins:** Connections equal to or less than eighteen (18) feet in length shall be swabbed or sprayed with a minimum one percent (1%) through five percent (5%) hypochlorite solution just prior to installation. A bacteriological sample should be collected but the main can be placed in service before the results from the laboratory are received.
Connections greater than eighteen (18) feet should be treated as a new main installation. That is, it should be disinfected for twenty-four (24) hours, flushed and sampled.

13-04. Existing Main Repair: The following procedures only apply when an existing main is partially or wholly dewatered. Existing mains that are repaired while under pressure of at least 5 psi do not need to be disinfected or sampled.

A. Preventing Contamination: As with a new main installation, prevention of contamination is the most important disinfection procedure you can follow. As much as possible, prevent debris from entering an exposed section of pipe.

B. Wet Trenches: If the trench is filled with water to the point that contaminated water is likely to enter the pipe, add liberal amounts of hypochlorite granules or preferable tablets directly to the muddy water.

C. Swabbing or Spraying: The insides of all pipes and pipefittings should be swabbed or sprayed with a one percent (1%) calcium hypochlorite solution before installation. Exposed existing mains should be swabbed inside with a mop as far as one can reach.

D. Flushing: If valve, blow-off or hydrant locations permit, the main should be thoroughly flushed from the end of the shut-off main, towards the repair. Flushing should continue until all air and discolored water is eliminated. Before releasing the chlorinated water to the storm drain, it shall be dechlorinated by use of a sodium thiosulfate drip solution or other approved dechlorinating method. An adequate amount of reducing agent may be applied to water being disposed of in order to thoroughly neutralize the chlorine residual remaining in the water. Appropriate Best Management Practices (BMPs) must be in place when flushing.

E. Sampling: Bacteriological samples are required after repairs and flushing is complete. The samples should be collected downstream of the repair, with five (5) services connections, if possible.

F. Placing Main in Service: It is not necessary to wait for laboratory results before placing the main back in service.

13-05. Disposal of Heavily Chlorinated Water: Chlorine residual water being disposed will be neutralized by treating with one of the chemicals listed in the table below.

Amounts of chemicals required to neutralize various residual chlorine concentrations in one hundred thousand (100,000) gallons of water.
### Residual Chlorine Concentration (mg/l) and Chemicals

<table>
<thead>
<tr>
<th>Residual Chlorine Concentration (mg/l)</th>
<th>Sulfur Dioxide (pounds)</th>
<th>Sodium Bisulfite (pounds)</th>
<th>Sodium Sulfite (pounds)</th>
<th>Sodium Thiosulfate (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.8</td>
<td>1.2</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>2</td>
<td>1.7</td>
<td>2.5</td>
<td>2.9</td>
<td>2.4</td>
</tr>
<tr>
<td>10</td>
<td>8.3</td>
<td>12.5</td>
<td>14.6</td>
<td>12.0</td>
</tr>
<tr>
<td>50</td>
<td>41.7</td>
<td>62.6</td>
<td>73.0</td>
<td>60.0</td>
</tr>
</tbody>
</table>

13-06. **Disinfection of Water-Storage Facilities:** These procedures should be followed for all new water storage tanks and reservoirs, as well as any water storage facilities taken out of service for inspection, cleaning, repairs, painting or recoating, or any other activity that might lead to contamination of the water before the facility is placed in service.

A. **Access:** Before any storage facility is opened, care must be taken to ensure that dirt and other bacterial and chemical contaminating materials are not brought into the tank.

The immediate area around the hatch opening shall be cleaned of all lose dirt and debris. If the tank entrance area is paved or otherwise protected, the area should be hosed cleaned. If the entrance to the tank is not paved but surrounded by earth, then the area surrounding the entrance is to be covered using a protective plastic sheet.

All equipment and clothing, including boots, external air supply lines, and scrappers, that will come into contact with the inside of the tank shall be sprayed, sponged or dipped in a 200 ppm chlorine disinfectant solution immediately before entering the tank.

B. **Cleaning:** The first step, before the actual disinfection of a storage reservoir is thoroughly cleaning the insides of the tank. Before cleaning, all scaffolding, planks, tools, rags, other materials that are not part of the structure of the tank need to be removed. All inside surfaces of the reservoir, including the floors, walls, and ceilings shall be cleaned using a high-pressure water jet and by sweeping, scrubbing, or any other effective means. All water, dirt, and foreign material accumulated during the cleaning operation shall be removed from the tank.

Before final disinfection, inspect and put in satisfactory condition all vent screens, overflow screens, and any other screened openings to ensure...
that birds, insects, and other possible sources of contamination cannot enter the facility.

C. Disinfection: The reservoir may be disinfected using any one of the following three methods.

1. Enough calcium hypochlorite granules can be placed in the inlet line before filling such that the residual in the filled facility is at least ten (10) milligrams per liter (mg/l or parts per million) after twenty-four (24) hour retention period.

2. All surfaces within the storage facility that will be in direct contact with the water, up to the overflow level, will be disinfected by spraying or sponging a 200 mg/l chlorine solution directly onto the surface, thoroughly coating all areas. Ensure that the inlet and outlet lines, as well as the inside of the hatch cover are also disinfected with the solution. Thirty (30) minutes after application of the strong disinfecting solution, the tank shall be filled with potable water to overflow.

3. Enough calcium hypochlorite granules can be placed into the inlet line such that, when the facility is filled to five percent (5%) of the total storage volume, the concentration of the disinfectant will initially be 50 mg/l available chlorine. The solution will be held in the facility for six (6) hours and then filled to overflow. The reservoir will be held full for at least twenty-four (24) hours before sampling.

4. After the correct retention period, the free chlorine residual of the storage facility will be reduced to a level appropriate for distribution (2.0 mg/l), through a combination of waiting for an additional holding time and/or by partial draining and filling with potable water having a lower disinfection residual. Ensure that all drain piping and fill lines are also flushed of the highly chlorinated water.

D. Bacteriological Sampling and Testing: Before the storage facility is placed in service, two (2) consecutive sets of acceptable bacteriological samples, taken at least twenty-four (24) hours apart, shall be collected. The first bacteriological sample collected will be analyzed for heterotrophic bacterial and total coliform bacteria. The total coliform analytical method will be either membrane filtration or Colilert present/absence. The second bacteriological sample collected will be analyzed by Colilert only. A sample positive for total coliform or with a heterotrophic plate count greater than five hundred (500) colony forming units will be considered not disinfected and the situation shall be evaluated by qualified staff. In any
event, repeat samples shall be taken until two consecutive samples are negative, or the storage facility shall again be subject to disinfection.

Test for odor. The water in the full facility should also be tested to assure that no offensive odor exists due to chlorine reactions or excess chlorine residual.
SECTION 14 - PIPELINE PRESSURE TESTS

14-01. General: It shall be the Contractor's responsibility to obtain a successful field test of all pipe and appurtenances installed prior to bacteriological testing. The test shall be performed only in the presence of the Engineer. Field tests shall be conducted between blind flanges, dished heads or against temporary bulkheads in the pipe as determined by the Engineer. All permanent blocking and restraints shall be in place before testing. Temporary blocking during the test will be permitted only at temporary bulkheads. All applicable portions of Section 13, Disinfection, shall also apply.

The Contractor shall provide an acceptable source of water, and all labor and equipment necessary for testing. Test gauge shall display latest test calibration, the Engineer may require additional gauge installation to monitor test.

Before applying test pressure, care shall be taken to ensure the removal of all air within the pipe and appurtenances to be tested. Test to be taken at the lowest point of the main. Test pressure to be one hundred fifty percent (150%) of maximum line pressure and a minimum of one hundred fifty (150) psi test pressure shall not exceed the manufacturer's recommended test pressure. (For example: Class 150, 225 psi; Class 200, 500 psi).

All valves, fire hydrants, lateral connections, fittings, collars or joints and other appurtenances shall be opened to testing unless otherwise approved by the Engineer.

The maximum allowable water loss for PVC pipelines is as shown on the table below. Any material sweating or showing dampness shall be considered defective material and shall be removed and replaced with new material by the Contractor and the line re-tested. No water loss is allowed for welded-steel pipe.

<table>
<thead>
<tr>
<th>Pipe Size (inches)</th>
<th>Leakage Allowable (Gallons per 1000 Feet [50 Joints/Hour])</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Test Pressure (psi)</td>
</tr>
<tr>
<td>4</td>
<td>0.19</td>
</tr>
<tr>
<td>6</td>
<td>0.29</td>
</tr>
<tr>
<td>8</td>
<td>0.38</td>
</tr>
<tr>
<td>10</td>
<td>0.48</td>
</tr>
<tr>
<td>12</td>
<td>0.57</td>
</tr>
</tbody>
</table>
14-02. **Special Requirements for Cement-Lined Steel Pipe:** The pipeline shall be filled with water and placed under pressure for at least twenty-four (24) hours prior to testing.

The test shall be made (in the presence of the Engineer) on all sections of the pipeline in such a manner that all pipe and appurtenances shall successfully withstand the specified pressure, maintained continuously by pumping for a minimum period of four (4) hours. At the end of the fourth (4th) hour, pumping shall be discontinued for one hour and the drop in pressure recorded. After one (1) hour, the test pressure shall be restored by pumping and water then bled off and the quantity measured until the pressure recorded after the fourth (4th) hour is achieved. The quantity of water bled off will determine the amount of water loss.
15-01. **General**: Backfill and pavement replacing shall be in accordance with the following paragraphs and with any additional requirements of the agency having jurisdiction over the maintenance of the roadway.

Backfill shall be composed of the following zones:

A. Backfill adjacent to the Pipe (Pipe Zone).

B. Intermediate Backfill.

C. Pavement Base (in traveled roadways and roadway shoulders).

Only natural occurring materials will be accepted in backfill material. Rock crusher by product (rock dust or manufactured sand) will not be permitted.

15-02. **Backfill Adjacent to the Pipe (Pipe Zone)**: Backfill adjacent to the pipe shall be the material between the bottom of the trench and twelve (12) inches above the top of pipe. After the pipe has been laid in the trench, and has been inspected and approved, it shall be backfilled with a select material. The imported select material shall consist of a good quality, graded, clean decomposed granite, of durable particles free from organic material and other objectionable substances, and shall be of such nature that it can be compacted readily to form a firm stable base. The combined gradation of select backfill material shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the following gradation limits:

<table>
<thead>
<tr>
<th>Sieve Sizes</th>
<th>Percentage Passing Sieves</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8-inch</td>
<td>100</td>
</tr>
<tr>
<td>No. 4</td>
<td>85 - 100</td>
</tr>
<tr>
<td>No. 30</td>
<td>0 - 70</td>
</tr>
<tr>
<td>No. 200</td>
<td>0 - 15</td>
</tr>
</tbody>
</table>

Select imported backfill material shall have a sand equivalent of not less than thirty (30) as determined by ANSI/ASTM D2419 74/79.
Backfill up to the spring line shall be placed at approximately the same elevation on both sides of the pipe to prevent unequal loading and displacement of the pipe.

Backfill up to the spring line shall be compacted by pneumatic tamping in six (6) inch layers.

15-03. Intermediate Backfill: Intermediate backfill shall be the material between twelve (12) inches above the top of the pipe and the pavement base or finish grade where not in traveled roadways. Intermediate backfill shall be placed in maximum twelve (12) inch lifts. The material shall be either decomposed granite or as required by the agency having jurisdiction over the maintenance of the roadway. Decomposed granite shall have durable particles free from organic material and other objectionable substances and shall be of such nature that it can be compacted readily to form a firm stable base.

Intermediate backfill shall have a sand equivalent rating of not less than thirty-five (35) as determined by California Test Method No. 217.

15-04. Pavement Base: Pavement base in traveled roadways and roadway shoulders shall conform to select material as defined in paragraph 15-03 and/or any other requirements of the agency having jurisdiction over the maintenance of the roadway.

15-05. Compaction: Backfill materials shall be moisture conditioned to a level above optimum moisture and compacted to a minimum relative compaction of ninety-five percent (95%) as determined by laboratory test methods for maximum density (ASTM Specification D-1557) and field test methods (ASTM D-1556 for sand cone and ASTM D-2922 and D-3017 for nuclear). Within roadway and roadway shoulder areas, pavement subgrade and pavement base materials shall be compacted to a minimum relative compaction of ninety-five percent (95%) as determined by the test methods specified above. Water settling, jetting, flooding, or puddling of the backfill will not be permitted.

15-06. Repair of Pavement: All pavement repairs shall be made in accordance with the requirements of the agency having jurisdiction over the roadway. In private roadways, pavement repairs shall be made with materials that conform to the original surfacing, producing a pavement repair equal to or better than that of the adjacent area. All existing pavement edges shall be cut vertically with a concrete saw, cleaned, and, except for Portland cement concrete, painted with RC-3 or RC-4 road oil prior to patching. The minimum width of surfacing of the trench to be replaced shall be the width of the trench plus six (6) inches on each side. The minimum thickness of surfacing to be replaced shall be one (1) inch greater than the existing surfacing except that asphaltic surfacing shall be a minimum of four (4) inches thick and Portland cement concrete pavement shall be protected and
cured in accordance with the concrete for pipelines and appurtenant structures section of these specifications. Where asphalt surface replacement is involved, the first course shall be a three-quarter (3/4) inch maximum size aggregate, high-quality, hot-plant mix and shall be compacted to within one (1) inch of the surface by wheel rolling or other approved method, by the agency having jurisdiction over the roadway, or according to agency having jurisdiction over the roadway.

The finish course shall be three-eighths (3/8) inch maximum size aggregate, high-quality, hot-plant topping mix and shall be applied with an approved spreader box, or according to agency having jurisdiction over the roadway.

The entire area of the replace surfacing and overlap on the existing surfacing shall be coated with a road oil seal coat, which shall be covered with sand. Sand to be swept up and removed from site per the Clean Water Act, the same day it is installed. BMPs must be in effect during operation.

15-07. Temporary Pavement: The Engineer may require the Contractor to place and maintain a three (3)-inch thick Cold-Plant mix surfacing over portions of the trench for the convenience of the public until permanent surfacing has been replaced. The material shall be compacted by mechanical equipment designed for asphalt compaction (i.e., steel drum roller). Temporary must be maintained on a daily basis to assure public safety and quality of pavement finish.

When a Contractor delays the placement or repair of temporary pavement, the Authority shall place said pavement and charge the Contractor.
16-01. The Contractor and the Sweetwater Authority Inspection/Engineering Department shall meet to discuss a proposed shut-off of a water main. The following shall be completed prior to any shutdown.

A. If the shutdown cannot be completed by 4:00 p.m., the shutdown will be done at night.

B. Study block map to determine the area to be affected by shutdown, field check for Apartments, Schools, Hospitals, and Businesses.

C. Reproduce area of block map with valves circled in red that Engineering desires the Operations Center to close.

D. Discuss shutdown with Distribution Superintendent and shutdown crew four (4) full work days prior to shutdown, and distribute memo and map regarding shutdown to Operations and the Treatment Plant. Request valves to be operated to assure they will operate during shutdown.

E. Stamp card (shutdown notices) with date and time of proposed shutdown. If multi-units are involved, (apartments, condominiums, mobile home parks, etc.), a copy shall be given to the Manager for distribution to each living unit.

F. From area map and service inventory ledger, produce an address list to be checked off and initialed during notifications.

G. Prior to notification of consumers, Engineering Department to make contact with Operations Center to verify that all valves are working properly. If not, the shutdown will be postponed until the valves are repaired and operate properly.

H. Cards and address list are given to Contractor for use in giving notices. Each address must be initialed by person delivering notice to assure no consumers are missed.

1. Notification must be given a minimum of forty-eight (48) hours prior to shutdown. If the shutdown is for 8:00 a.m. and the area is extensive, notification must be started the day prior to the twenty-four (24) hours in order for all consumers to have twenty-four (24)
hour notice. No exceptions. Schools and Hospitals require forty-eight (48) hour notice not including weekends (for a Monday shutdown, they must be notified by Thursday).

2. Notices will be attached to door knobs and not placed in mail boxes (it is illegal to place anything except posted mail in mail boxes). If door knobs are not accessible, attach the Notice to nearest visible area passed by the consumer. Note on the address list under comments where the notice was placed.

I. After notification, the initialed address sheet must be returned to the Inspector. If any consumers are missed or if consumers who cannot be without service for the planned shutdown period are encountered, the shutdown will be postponed until arrangements can be made for the convenience of the consumer or a potable water supply such as a potable water truck, hi-line piping, or sufficient bottled water to meet consumer's needs are provided.

J. Valves will be closed by Sweetwater Authority Operation's personnel. The Inspector may assist. Check to make sure all valves that are closed and shutdown are reasonably dry. If not, inform Contractor to take steps to handle water.

K. Engineering Department will verify that all fire hydrants are called "out of service" to Operations and that the area affected by the shutdown is verified before notifying fire agencies having jurisdiction over shutdown area.

L. Maintain contact with Operations Center. Keep them informed of progress.

M. After the tie-in is complete and secure, Operations, Engineering Department and Contractor shall turn water on and bleed system of air and dirt, and standby to make sure no leaks appear. Report area secure to Operations Center (or Filter Plant if after hours) only after the inspector has toured the area and checked for the following:

1. Temporary paving is in good condition.

2. Traffic is controlled.

3. There is no danger to the public.

4. Plates are in place and secure.
5. The area is clean and free of loose material that might cause a hazard or damage of any kind.

6. After the water is on, the inspector shall discuss the shutdown and turn on with Operations personnel; inform them of what modifications have been made and what valves are to be used and shut down any new or modified facilities; give Operations a copy of new facilities sketched in red on block map, in case the call out crew is needed to shutdown these facilities in an emergency. The applicable Fire Agency is to be notified that the area is back in service.

N. The inspector shall fill out and file with Operations Center a "Report of Service Interruption" in which the person operating the valve states that valves are operational and have been left open. Discuss the events of shutdown and/or tie-in with Operations. Give sketches if area of new facilities affect feed to the distribution system or affects a large area.

O. Connections to Existing Mains: The Contractor shall make all connections unless otherwise shown on the plans. The Contractor shall give the Authority five (5) working days notice prior to the proposed connection. Connections shall be made between Tuesday and Friday with a maximum shutdown period of six (6) hours during the normal workday unless directed otherwise by the Engineer. No Friday shut-downs will be allowed unless approved by the Engineer. When, in the opinion of the Engineer, conditions are such that an six (6) hour shutdown is insufficient time to accomplish the work, or said shutdown will work a hardship on business or consumers, then the connections shall be made at night.

The Contractor may be required to include a potable water truck, hi-line hose and fittings as a part of his/her equipment for making connections, and Contractor shall furnish said equipment and shall alleviate hardship cases incurred during shutdowns for connections.

The Contractor shall determine in advance of construction the location and grade of all existing pipelines to which the new lines will connect. When the grade of the existing main is below the grade of the new main, a sufficient length of the new line shall be lowered to prevent the creation of a high point or an abrupt change of grade in the new line. When the grade of the existing main is above the grade of the new main, the Contractor shall furnish and install any fittings needed to meet the grade of the existing pipe.
The Contractor shall furnish and install all temporary and/or permanent blocking necessary to eliminate a shutdown of the main when connecting to existing valves. The Contractor shall replace the gate well and cover and adjust the well to grade.

The Authority will operate all existing valves and assist in the dewatering of existing mains.

If, for any reason, the Contractor is improperly prepared, the Engineer may postpone the shutdown and require that the work be rescheduled for another day. If progress is inadequate to complete the connections in the time specified, the Engineer shall order necessary corrective measures and all costs shall be paid for by the Contractor.

P. Hi-Line: Hi-line piping shall be furnished, installed, disinfected, and connected by the Contractor (See Section 1-14).

After disinfection, the Contractor shall maintain continuous service through the hi-line piping to all consumers normally served both directly and indirectly by the pipeline. Upon completion of the work, the hi-line piping shall be removed by the Contractor.

The hi-line pipe shall be installed in such a manner that it will not present a hazard to traffic and will not interfere with access to homes and driveways along its route.

All pipe, valve fittings, hose and connections furnished by Contractor shall be of good quality, absolutely clean inside and suitable for conveying potable water in the opinion of the Engineer. Only hot-dipped galvanized or Schedule 80 PVC pipe and fittings shall be used for hi-line piping unless otherwise approved by the Engineer.

All costs involved in furnishing, installing, disinfecting, connecting and removing the hi-line pipe, including excavation, backfill and pavement repairs shall be paid for by the Contractor.
SWEETWATER AUTHORITY
STANDARD SPECIFICATIONS

SECTION 17 - CROSS-CONNECTION AND BACKFLOW PREVENTION PROGRAM

17-01. **Introduction:** Compliance with these Standard Specifications is required for the purpose of:

A. Providing minimum standards for the protection of the public water supply—both as system protection and as internal protection, such as the isolation of the industrial system from the public potable water system at a location other than the point of delivery. It is recognized that in its application, the Cross-Connection Control and Backflow Prevention Program Manager may require a higher level of protection for a particular application if it is considered necessary in his judgment for adequate protection.

B. Protecting the public potable water system at the service connection by isolating within the consumer's premises any contamination, which may result from backflow or unapproved water sources.

C. Providing means whereby the consumer may segregate the domestic and industrial uses into separate systems to prevent possible contamination of the private potable water system, which may result from backflow.

17-02. **Legal Basis for Program:**

A. "Regulations Relating to Cross-Connections." California Administrative Code, Title 17, Section 7583-7605.


17-03. **Degree of Hazard and Required Backflow Prevention Device Determinations:**

---

SECTION 17
A. Definitions. The following definitions have been excerpted from Title 17, Section 7583, "Regulations Relating to Cross-Connections."

Cross-Connection

"Cross-Connection" is an unprotected actual or potential connection between a potable water system used to supply water for drinking purposes and any source or system containing unapproved water or substance that is not or cannot be approved as safe, wholesome, and potable. By-pass arrangements, jumper connections, removable sections, swivel or changeover devices, or other devices through which backflow could occur, shall be considered to be cross-connections.

Approved Water Supply

"Approved Water Supply" is a water supply whose potability is regulated by a State or local health agency.

Auxiliary Supply

"Auxiliary Water Supply" is any water supply other than that received from a public water system.

Double Check Valve Assembly

"Double Check Valve Assembly (DC)" is an assembly of at least two independently acting check valves including tightly closing shut-off valves on each side of the check valve assembly and test cocks available for testing the water tightness of each check valve.

Air-Gap Separation

"Air-gap Separation (AG)" is a physical break between a supply line and a receiving vessel.

Reduced Pressure Principle Backflow Prevention Device

"Reduced Pressure Principle Backflow Prevention Device (RP)" is a backflow preventer incorporating not less than two check valves, an automatically operated differential relief valve located between the two check valves, a tightly closing shut-off valve on each side of the check valve assembly, and equipped with necessary test cocks for testing.
The following definition has been excerpted from the "Manual of Cross-Connection Control Procedures and Practices":

Pressure Vacuum Breaker

The term "Pressure Vacuum Breaker" shall mean an assembly containing an independently operating loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly is to be equipped with properly located test cocks and tightly closing shut-off valves located at each end of the assembly. This assembly is designed to protect against a health hazard (i.e., contaminant) under a backsiphonage condition only.

B. Degrees of Hazard. The following definitions have been excerpted from the "Manual of Cross-Connection Control Procedures and Practices":

Three degrees of hazard are considered: severe, moderate, and minor. These degrees of hazard are defined as follows:

SEVERE: A cross-connection or potential cross-connection involving any water or substance capable of causing death or spreading disease and/or illness.

MODERATE: An existing cross-connection or a high probability of a cross-connection being made between the domestic water piping and any pipe, vat, or tank intended for carrying or holding potable water, which has a probability of becoming contaminated with any substance.

MINOR: A cross-connection or potential cross-connection involving any substance, which has a low probability of becoming a moderate hazard and would be aesthetically objectionable if introduced into the domestic water supply.

D. Backflow Prevention Device Requirements. The degree of hazard from an actual or potential cross-connection and the type of backflow prevention device required to be installed in order to protect the Authority's system shall be determined by the Authority in accordance with the following references:


AWWA Standard C-510-07, Backflow Prevention Devices and double check valve backflow prevention assemblies.

AWWA Standard C-511-07, Reduced pressure principle backflow prevention assemblies.

An approved backflow prevention device shall be purchased, installed, and maintained by the owner/consumer on each service line to a water user's premise in accordance with the Mandatory Backflow Prevention Device Required at Company Service Connection (Appendix B), the General Evaluation Guide for Backflow Prevention Device Requirements (Appendix D), and the field survey and decree of hazard evaluations which are based upon the cross-connection control information obtained from the cited references. Devices must be installed in an approved manner, as per the appropriate Standard Drawing provided by the Authority (Appendix E).

<table>
<thead>
<tr>
<th>Degree of Hazard</th>
<th>Type of Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe</td>
<td>Air gap or Reduced Pressure Principle Device</td>
</tr>
<tr>
<td>Moderate</td>
<td>Reduced Pressure Principle Device</td>
</tr>
<tr>
<td>Minor</td>
<td>Reduced Pressure Principle Device</td>
</tr>
</tbody>
</table>

Any backflow prevention device required herein should be a model and size approved by Sweetwater Authority. The term "Approved Backflow Prevention Device" shall mean a device that has been manufactured in full conformance with the Standards established by the American Water Works Association entitled:

AWWA C-510 Standards for Double Check Valve Backflow Prevention Devices or AWWA C-511 Standards for Reduced Pressure Principle Assemblies
and shall also be listed as having met the laboratory and field performance specifications of the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California entitled:

Specifications of Backflow Prevention Devices — current edition, and appear on this list.

All devices used as meter protection shall be listed on the State of California list of currently approved backflow assemblies.

It shall be the responsibility of the water user at any premises where backflow prevention devices are installed to have the devices certified (this is inspected and tested) on a yearly basis. These devices shall be repaired, overhauled, or replaced at the expense of the water user whenever said devices are found to be defective.

All presently installed backflow prevention devices which do not meet the requirements of this program now, but which were approved devices at the time of their installation, and which have been properly maintained, shall be accepted as "approved" as long as the device passes the inspection and certification requirements. Whenever the existing device is moved from its present location or when it becomes unrepairable or when it requires continual maintenance in order to pass the yearly certification test, then the device shall be replaced by an approved backflow prevention device meeting the requirements of the current version of the Cross-Connection Control and Backflow Prevention Program.

17-04. Yearly Certification and Testing:

A. Testing and Maintaining Backflow Prevention Devices. The water user, who is the owner of the device, is responsible for providing maintenance and periodic testing of the backflow prevention device installed on the service connection to his or her premises. This must be done on a yearly basis, as a minimum, as is stated in California Code of Regulations Title 17, Division 1, Chapter 5, Subchapter 1, Group 4, Article 2, Subsection 7605:

"Frequency of Inspection of Protective Devices. It shall be the duty of the water user on any premise on which backflow protective devices are installed, to have competent inspections and tests made at least once a year, or more often, where successive inspections indicate repeated failure."

B. Tester Application Form (See Appendix C)
C. All testing of devices shall be performed by personnel that meet the certification requirements of the American Water Works Association, or any other agency such as the County of San Diego or the State of California, which conducts a certification process approved by the Authority. Inspection reports, (Test form 1) (Appendix C), shall be forwarded to the Sweetwater Authority.

Those individuals performing yearly testing and certification of backflow prevention devices should supply the Authority with a copy of their certificate and include a description of their training and experience in the field of device testing. Also, complete and return the Sweetwater Authority tester application form to the Authority's Program Manager (Appendix C).

D. In special circumstances as determined by the Authority, the Authority's certified tester may perform the yearly certification and testing. The Authority will collect a fee for this test of each device in accordance with the Authority's Rates and Rules fee schedule.

17-05. Investigation Procedures:

A. Inspections of Consumer's Premises.

1. New service applications for commercial, agricultural, industrial, and multi-residential water service will be forwarded to the Cross-Connection staff for review of and possible inspection of the new facilities being constructed. The Authority staff, using the mandatory and general evaluation guidelines for cross-connection control, will determine whether an actual or potential cross-connection exists, the degree of hazard involved, the type of backflow prevention device required to protect the public water system and the proper location for the installation of the device. Water service will commence once the installation and testing meets the Authority's staff approval.

2. Existing services and existing facilities will be inspected, surveyed, and reviewed on a "priority" basis as time permits. A "priority" is established by the degree of hazard normally found at certain facilities; however, new service applicants for enlargement of existing service facilities will answer questions concerned with cross-connection control upon request for such action. The response to the questions may result in an inspection, a survey or a review of the changes in water usage being proposed by the applicant. Using the mandatory and general evaluation guidelines for cross-connection control, the Authority staff will determine whether an actual or potential cross-connection exists, the degree
of hazard involved, the type of backflow prevention device required to protect the public water supply and the proper location for the installation of the device.

3. Existing facilities which are suspected of having cross-connections internally or which are reported to the cross-connection staff as having internal cross-connections will be inspected, surveyed, and reviewed on a priority basis. Facilities which have undocumented devices, whether internal or external to the premises, will be incorporated into the Cross-Connection Program permanent records as they are found. In any case, existing facilities, which are likely to have cross-connections, will be inspected on a “time permitting” basis, either independently or in conjunction with a local health agency official. Records of such activities will be kept on file.

B. Discontinuation of Water Service. Delivery of water shall be discontinued if the Authority, County Health Department, or State Water Resources Control Board Division of Drinking Water personnel determine that:

1. The Authority's water system is being polluted or is in immediate danger of contamination from a cross-connection.

2. A backflow prevention device has not been installed after due notice has been given.

3. The Authority has not been provided the annual test results after due notice has been given.

4. A defect found in a backflow prevention device has not been corrected after due notice has been given to make repairs.

Service will not be restored until the backflow prevention device has been installed, tested, or repaired at the consumer's expense and is certified to be in good working order or the cross-connection is abated to the satisfaction of the Authority. "Any such turnoff shall require the Authority's standard fee to reinstate service."

17-06. Administration and Record Keeping:

A. Permanent Files

Active: Adequate records will be kept and maintained on file for reference. These records will include, under the heading of the name of the owner and/or water supervisor of the premises, the following information:
1. Date of inspection.

2. Results of inspection.

3. Required protection and installation date of the required device.

4. List of all backflow prevention devices on the premises.

5. Test and maintenance reports.

6. All correspondence between the Authority, the local health agency, and the consumer.

7. Date last tested.

8. Records of inspection and testing to determine if:
   a. Devices are frequently or sufficiently tested to detect failure.
   b. There are an unusual number of failures of a particular device model or component.
   c. Causes of failure can be eliminated.

Inactive: All inactive files shall be kept and maintained in order to assure the Authority that if the particular service should become active again, the available information is readily at hand.

B. Correspondence and Form Letters

A copy of all correspondence shall be kept in the file designated for that particular account. Such correspondence shall remain on file until the backflow potential has been removed. Once a particular account has been determined to be inactive, it will remain in the inactive file and be available in the event there is a future need to find names, phone numbers, or device serial numbers, as when the service or file is reactivated or when the owner reuses the device at a new location.

Correspondence will be sent by certified mail, return receipt requested, in order to verify mailing dates, date of receipt, and receiving party.

17-07. Due Process: In the event of disputes between the Authority staff enforcing the elements of the Cross-Connection Control and Backflow Prevention Program and the water user or certified tester, the first level of appeal will be to the General
Manager of Sweetwater Authority. The disagreement will be presented in writing to the General Manager by the Cross-Connection Program Manager. The water user or certified tester will be invited to present written material to the General Manager supporting their side of the case. The General Manager will issue a decision, in writing, to both parties and the basis for reaching this decision. Discussions in a group meeting of all "involved" individuals may precede or follow the Authority's General Manager's decision, appeal to the Governing Board of Sweetwater Authority can be requested. The existing documentation and supplementary oral testimony (if required or requested) will be heard by the Governing Board or by a Committee of the Governing Board. The recommendation of the Committee to the Governing Board will be voted upon at a regularly scheduled meeting. The decision of the Governing Board will be binding for Sweetwater Authority and the water user or certified tester in this matter.
(Insert a copy of Resolution No. 88-3 here)
## SECTION 17
### APPENDIX B

**MANDATORY BACKFLOW PREVENTION DEVICE REQUIRED AT SERVICE CONNECTION**

<table>
<thead>
<tr>
<th>Customer Activity of Facility</th>
<th>Type of Backflow Prevention Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auxiliary water supply (not interconnected)</td>
<td>RP</td>
</tr>
<tr>
<td>Auxiliary water supply (interconnected)</td>
<td>RP</td>
</tr>
<tr>
<td>Auxiliary water supply (interconnected – meets standards and monitored by the County Health Department)</td>
<td>RP</td>
</tr>
<tr>
<td>Cal-Trans irrigation/landscaping</td>
<td>RP</td>
</tr>
<tr>
<td>Locations using gray water</td>
<td>RP</td>
</tr>
<tr>
<td>Marinas – piers and docks</td>
<td>RP</td>
</tr>
<tr>
<td>Oil and gas production facilities</td>
<td>RP</td>
</tr>
<tr>
<td>Radioactive material processing plant</td>
<td>RP</td>
</tr>
<tr>
<td>Sewage pump stations</td>
<td>RP</td>
</tr>
<tr>
<td>Sewage treatment plants (State Water Resources Control Board Division of Drinking Water makes final determination)</td>
<td>AG or RP</td>
</tr>
<tr>
<td>Premises where inspection restricted</td>
<td>RP</td>
</tr>
<tr>
<td>Where cross-connection is maintained</td>
<td>RP or AG</td>
</tr>
<tr>
<td>Waterfront (harbor facilities)</td>
<td>RP</td>
</tr>
<tr>
<td>Plants w/toxic materials using extensive pressure systems</td>
<td>RP</td>
</tr>
<tr>
<td>Reclaimed water systems (State Water Resources Control Board Division of Drinking Water as final determination)</td>
<td>RP</td>
</tr>
<tr>
<td>Where, in the opinion of the utility, either the “internal protection of cross-connections is not adequate or the integrity of said protection cannot be guaranteed.”</td>
<td>AG or RP</td>
</tr>
</tbody>
</table>

*RP = Reduced Pressure Device
AG = Air Gap*
TESTER APPLICATION FORM

If you would like your name placed on our list of Certified Testers, please supply us a copy of your current tester certificate. Please read and sign the tester requirements section of this application and return, with all requested documents to: Sweetwater Authority Cross-Connection Control and Backflow Prevention Program Manager.

Your name (as you would like it to appear on our list):

Business Name:________________________________________________________
Tester Name:_________________________ Number:____________________
Address:________________________________________________________________
City:______________________________ State:____________________
Phone Number:________________________________________________________________

TESTER REQUIREMENTS

Applicant hereby agrees to:

1. Provide accurate test results using Sweetwater Authority test forms or County of San Diego County Health Department approved test form only.
2. Use only USC approved test procedures.
3. Test or repair only approved assemblies.
4. Sign only those test reports that he/she personally performed.
5. Make only needed repairs or replacements.
6. Send copies of test results to proper agencies and individuals no later than ten (10) days from receipt of payment.
7. Have test kits calibrated yearly according to USCFCCHR current specifications.
8. Keep tester certificate current and send the Authority a copy of the update when due.
9. Note on test form any noticeable problems with assembly installation.
10. Behave in a courteous and professional manner.

I, the undersigned, understand that failure to meet any of these requirements may result in exclusion from the list of certified testers.

Signed:_________________________________________ Date:______________

17-12

SECTION 17
GENERAL EVALUATION GUIDE FOR BACKFLOW PREVENTION DEVICE
REQUIREMENTS

<table>
<thead>
<tr>
<th>Customer Activity or Facility</th>
<th>RP</th>
<th>DC</th>
<th>NONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air-conditioning plant (using water)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aircraft/missile plants</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal grooming shops</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal clinics</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automobile repair shops (regular or as determined by field evaluation)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automobile repair shops (w/specialized cleaning equipment, where internal protection is not adequate)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automotive plants</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auxiliary water supplies (not interconnected)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auxiliary water supplies&lt;sup&gt;3&lt;/sup&gt; (interconnected)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barber shops (determined by field evaluation)</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Bars and taverns (determined by field evaluation)</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Battery manufacturing</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beauty shops (determined by field evaluation)</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>Beverage bottling plants</td>
<td>X</td>
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<td>Boat manufacturing</td>
<td>X</td>
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<tr>
<td>Breweries</td>
<td>X</td>
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</tr>
<tr>
<td>Building w/boilers, cooling towers (determined by field evaluation)</td>
<td>X</td>
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<tr>
<td>Buildings w/storage tanks (domestic quality) (where storage not connected to supply-side of system)</td>
<td>X</td>
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<tr>
<td>Buildings w/low HD sewage lift stations</td>
<td>X</td>
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<tr>
<td>Canners – packing houses reduction plants</td>
<td>X</td>
<td></td>
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<tr>
<td>Car wash with water reclamation system</td>
<td>X</td>
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<tr>
<td>Car wash – coin-operated (determined by field evaluation)</td>
<td>X</td>
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<tr>
<td>Customer Activity or Facility</td>
<td>RP</td>
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<tr>
<td>------------------------------------------------------------------------------------------------</td>
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<tr>
<td>Chemical plants dry processing and packaging</td>
<td>X</td>
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<tr>
<td>Chemically treated (non-potable) water system</td>
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<tr>
<td>Chemically treated (potable) water system</td>
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<tr>
<td>Cleaning and dye works</td>
<td>X</td>
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<tr>
<td>Colleges (determined by evaluation as to auxiliary supplies and complexity of piping)</td>
<td>X</td>
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<tr>
<td>Commercial laundries</td>
<td>X</td>
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<tr>
<td>Convalescent homes (determined by field evaluation/plan check)</td>
<td>X</td>
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<tr>
<td>Dairies and cold storage plants</td>
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<tr>
<td>Dental/doctor offices (where internal protection is not adequate)</td>
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<tr>
<td>Dialysis clinics</td>
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<td>Film processing laboratories</td>
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<tr>
<td>Fire protection systems* (per State Manual with exception of Class I and II systems as designed by State Code)</td>
<td>X</td>
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<tr>
<td>Food processing facilities (for low inlets only – tanks, vats, etc.)</td>
<td>X</td>
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<td>Ice manufacturing plants</td>
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<td>Hospitals</td>
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<tr>
<td>Laboratories (determined by field evaluation)</td>
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<tr>
<td>Landscaping/irrigation (see State manual – Irrigation Systems)</td>
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<tr>
<td>Manufacturing processing and fabrication facilities</td>
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<tr>
<td>Manufacturing, processing (using toxic materials under pressure)(^3)</td>
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</tr>
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<td>Marinas(^3)</td>
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<tr>
<td>Medical offices (determined by field evaluation)</td>
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<td>Medical laboratories</td>
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<td>Mobile home parks generally permanent installation – DC required where on-site separation water and sewer requirement not met</td>
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<tr>
<td>“True” mobile home park requires minimum RP Assembly</td>
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</tr>
<tr>
<td>Mortuaries and morgues</td>
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<tr>
<td>Motion picture studios</td>
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<tr>
<td>Multiple meters (conn.) (irrigation or industrial) domestic/potable water systems</td>
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<td>Oil and gas production facilities[^3]</td>
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<td>Office complex single service (depends on general type of lease offices and complexity of inspection)</td>
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<td>Paper and paper production plants</td>
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<tr>
<td>Photograph studios w/processing equipment</td>
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<td></td>
</tr>
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<td>Plating plant</td>
<td></td>
<td>X</td>
<td></td>
</tr>
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<td>Radiator works (shops)</td>
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<td>X</td>
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</tr>
<tr>
<td>Recreation parks (RV vehicles – readily movable trailers, etc.)</td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>Rest homes</td>
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</tr>
<tr>
<td>Reclaimed water systems[^3]</td>
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</tr>
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<td>Restaurants (with adequate internal protection)</td>
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<td>Restricted, classified or other closed facilities[^3]</td>
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<tr>
<td>Rubber (tire plants)</td>
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<td>X</td>
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<tr>
<td>Sand and gravel plants (sometimes air-gapped equipment may be satisfactory)</td>
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<tr>
<td>Sanitary dump (for recreational vehicles)</td>
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</tr>
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<td>Schools – without auxiliary supply (single service and adequate internal protection (to be determined by field evaluation)</td>
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<tr>
<td>Services – domestic (interconnected)</td>
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<td>Services, industrial – irrigation (interconnected)</td>
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<td>Sewer pump stations[^3] (State Water Resources Control Board Division of Drinking Water has authority to decide if air-gap required or if RP permitted)</td>
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<tr>
<td>Customer Activity or Facility</td>
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<td>------------------------------------------------------------------</td>
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<tr>
<td>Sewer treatment plant – air-gap (State Water Resources Control Board Division of Drinking Water has authority to decide if air-gap required or if RP permitted)</td>
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<td>Solar heating systems (determined by field/plan check)</td>
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<td>Storm drainage facilities (individually evaluated)</td>
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<td>Waterfront facilities(^3)</td>
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<td>Where a cross-connection is maintained(^3)</td>
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<td>Wineries</td>
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</table>

\(^3\) Listed as mandatory requirement.

\(^*\) Structures three (3) stories or more, loop systems, fire systems fed from different water mains, and all waterfront facilities.

DC = Double Check Valve Assembly
18-01. General: The passage of the Clean Water Act in 1972 required the United States Environmental Protection Agency (USEPA) to set standards for surface water quality, mandate sewage treatment and regulate wastewater discharges into the nation's surface waters. The Porter Cologne Act is the principal law governing water quality regulation in California and established the California State Water Resources Control Board (State Board) and the nine California Regional Water Quality Control Boards (Regional Boards) to implement and enforce the Clean Water Act in California. The State Board provides program guidance and oversight, allocates funds, and reviews Regional Board decisions.

The State and Regional Boards regulate discharges primarily through National Pollutant Discharge Elimination System (NPDES) permits. The NPDES permits are used to enforce the Waste Discharge Requirements (WDRs), which are specific to each permit. The WDRs typically take the form of effluent and receiving water limitations.

The State Board issues NPDES General Permits to cover discharges which occur on a statewide basis such as discharges from drinking water systems that typically originate from distribution system water main installation, repair, dewatering, flushing, and pressure testing activities.

Locally, Public Water System discharges of potable water and untreated groundwater into the regional MS4 storm drain system will ultimately flow into a Water of the U.S., which are described in the Water Quality Control Plan for the San Diego Basin (Basin Plan). The State and Regional Boards utilize the (Basin Plan) to identify bodies of water (i.e. Waters of the U.S.) and their beneficial users, and establish water quality objectives, and implementation programs to protect the receiving water environment.

A. The State Board has adopted Statewide General Permit Order WQ 2014-0194-DWQ, which became effective on January 1, 2016 and covers public drinking water system discharges to Waters of the U.S.. The monitoring and reporting (MRP) requirements established for this permit are provided in Attachment E. A record of BMPs implemented and monitoring data for each discharge must be maintained in Maximo and is used to generate self-monitoring reports. For all super-chlorinated discharges (i.e. chlorine residuals > 4 mg/L), well development and/or rehabilitation discharges,
and large volume discharges (greater than one acre-ft), monitoring for chlorine residual, volume, pH (only for super-chlorinated discharges), and a visual estimate of turbidity (grab samples only required for well development) must be conducted (refer to Table E-1 and Table E-2 of Attachment E for further details).

In addition, three locations, within the Authority's distribution system, have been chosen as "representative" of our three treatment facilities and have special monitoring requirements as described in Tables E-3 and E-4 of Attachment E. The annual representative (flushing) monitoring sites are James, Court, in Chula Vista, Eta Street in National City, and the corner of J Avenue and 26th Street in National City.

The Authority is required to notify the Regional Board a minimum of three days prior to the initiation of a planned discharge > 1 acre-ft and within 24 hours of becoming aware of an adverse effect or impact on the beneficial uses of a receiving water due to non-compliance with the permit.

B. Order WQ: 2014-0194-DWQ. establishes General Waste Discharge Requirements for Drinking Water System Discharges to Waters of the United States. Effluent limitations for this permit include chlorine residual, which must be not detected (i.e. < 0.1 mg/L), sediment, and turbidity. The following Standardized Best Management Practices are designed to comply with this Order and include the following basic procedures.

1. The discharge must be effectively regulated by the public agency.
2. The discharge may not adversely affect the quality or the beneficial uses of the waters of the state.
3. Potable/super-chlorinated water must be dechlorinated prior to discharge.
4. The discharge may not cause erosion and/or sedimentation.

C. In order to comply with the requirements of Order WQ2014-0194-DWQ the Authority has adopted Standardized Best Management Practices (SBMP) to effectively regulate and monitor all potable water discharges during the following events.

1. Dewatering of water mains.
2. Dewatering of reservoirs or water storage facilities.
3. Unscheduled discharges.
18-02. **Introduction:** These SBMPs should be utilized by potable water agency personnel at all time when responding to or performing any unscheduled or scheduled water discharge events. The purpose of these SBMPs is to ensure that the potable water agency, hereafter referred to as “Discharger,” is in full compliance with the legal requirements as described in the overview section of this document. The Authority SBMPs are based upon guidance contained in the AWWA California-Nevada Section Best Management Practices (BMP) Manual For Drinking Water System Releases.

Additionally, the Discharger will provide comprehensive education and training to its employees regarding potable water and hydrostatic test water discharges and the type of materials equipment, and methods used to mitigate these events. This training will ensure that all discharge events will be responded to or performed by knowledgeable, experienced personnel that will protect the environment to the maximum extent feasible.

**A. Reporting a Water Discharge Event:**

In order to be effective in the implementation of the Discharger's goal, it is imperative that a scheduled or unscheduled water discharge event be reported expeditiously and comprehensively to the correct personnel of the Discharger.

All water discharge events must be reported to the Discharger's person or department charged with recording each discharge event in Maximo and/or reporting to the State Board, hereafter to as the Discharger Reporting Authority (DRA), and give the following information prior to the discharge event whenever possible:

1. Reason for discharge event
2. Location of the event
3. Type of event
4. Name, location, and description of the storm drain, drainage swale, or surface water body that will receive the discharge
5. Potential danger or impact
6. The estimated discharge flow or size of water main
B. Specific SBMPs follow for water discharge events in each of these categories:

1. Dewatering Water Mains (include flushing)
2. Dewatering Reservoirs or Storage Tank Facilities
3. Unscheduled Water Discharge Events

18-03. Dewatering Water Mains and Other Delivery System Infrastructure:

A. The dewatering of water mains and other infrastructure is scheduled and prepared for in advance. Listed below are typical dewatering events that are covered in this category:

1. Dewatering mains for maintenance and construction activities
2. Flushing mains to alleviate water quality issues
3. Flow testing fire hydrants
4. New pipeline flushing and testing
5. Conveyance system tests
6. Start-up of new facilities
7. Preventive maintenance of water conveyance equipment
8. Corrective maintenance of water conveyance equipment
9. Discharges to increase chlorine residual
10. Discharges in response to water aesthetic complaints
11. Discharges from disinfection of new pipelines and facilities
12. Discharges due to nitrification and other bacterial events

B. The following protocol must be followed when dewatering water mains:

1. Notify the Discharge Supervisor and/or DRA at least twenty four hours prior to commencement the dewatering activity and relay all pertinent information with regard to each specific event.
2. Investigate potential alternative beneficial use of as much water as possible prior to discharge. Alternative beneficial uses include delivery to customer services, transfer of water to other system storage facilities, and spreading and hauling.

3. Isolate and lockout the sources of the pipeline being drained.

4. Conduct a physical site survey to verify SBMPs will mitigate environment impact from the proposed dewatering efforts.

5. Clear the flow path of all loose debris, surface contaminants and/or hazardous materials that could be carried into storm drains or surface waters during dewatering operations. Do not remove native vegetation.

6. Prevent erosion in unpaved or vegetated areas by utilizing burlap gravel bags, sandbags, straw wattles, silt fencing, plastic sheeting, and/or hay bales to decrease the velocity of discharged water.

7. Control the flow rate at the point of discharge to ensure effectiveness of erosion control and dechlorination efforts.

8. Dechlorinate the stream at the point of discharge using sodium thiosulfate, ascorbic acid, or other dechlorinating agent. Monitor and record chlorine residual, pH (if super-chlorinated), and a visual estimate of turbidity during the first 10 minutes of each discharge and as necessary thereafter according to the MRP procedures provided in Attachment E. The Chlorine residual must be not detected (i.e.<0.1 mg/L).

9. When discharging directly into receiving waters, record visual observations on clarity, erosion, and sedimentation within one hour after the event 100 feet upstream of the discharge point and 100 feet downstream of the discharge point.

10. When discharging directly into receiving waters, record the temperature of the water within one hour after the event 100 feet upstream of the discharge point and 100 feet downstream of the discharge point.

11. Upon completion of discharge event, clean up the event site and remove all erosion control material.
12. If necessary, repair erosion and remove sediment caused by the discharge.

13. Notify the Discharge Supervisor and/or DRA of the completion of the discharge event and any other pertinent information regarding the operation.

14. Complete and file all monitoring and discharge reports.

It is imperative that the flow rates be controlled during discharge events so necessary adjustments to erosion-prevention material and dechlorination efforts can be made in order for the Discharger to efficiently and effectively meet its goals.

18-04. Dewatering Reservoirs or Water Storage Facilities:

A. Dewatering reservoirs and water storage facilities is required in order to perform preventative maintenance and inspection of interior coatings and to remove any objectionable materials inside the structures.

Because reservoirs and water storage facilities are critical elements of the public water supply system, close coordination efforts are required between the Distribution System Operators, Water Quality Specialist, and the Discharge Supervisor to minimize any disruptions to the public water supply. In addition, returning potable water reservoirs to service requires strict adherence to sanitary procedures including disinfection and bacteriological analysis prior to supplying the public. It is not the intention of this document to address operational issues, as they are often system specific and covered in operational guidelines.

B. The following protocol must be followed when dewatering reservoirs and other water storage facilities:

1. Notify the Discharge Supervisor and/or DRA at least twenty four (24) hours prior to commencing the dewatering activity and relay all pertinent information for each specific event.

2. Allow the level of the reservoir or tank to drop to the minimum operating level (if water quality allows) using system demand.

3. Investigate beneficial use of as much water as possible prior to discharge. Uses include: delivery to customer services, transfer of water to other system storage facilities, spreading and hauling. It is not always possible to utilize alternate disposal methods due to time constraints, cost, and public impact.
4. Isolate and lockout the tank or reservoir from the distribution system.

5. Conduct a physical site survey to verify SBMPs will mitigate environment impact from the proposed dewatering efforts.

6. Clear the flow path of all loose debris and potential surface contaminants that could be carried into storm drains or surface waters during discharge activities. Do not remove native vegetation.

7. Prevent erosion and sedimentation by properly installing gravel bags, sandbags, straw wattles, silt fencing, plastic sheeting, hay bales and other erosion prevention materials to decrease the velocity or the effect of discharged water.

8. Dechlorinate the water in the tank using sodium thiosulfate, ascorbic acid or other dechlorinating agent. Monitor and record chlorine residual, pH (if super-chlorinated), and a visual estimate of turbidity during the first 10 minutes of each discharge and as necessary thereafter according to the MRP procedures provided in Attachment E. The Chlorine residual must be not detected (i.e. < 0.1 mg/L).

9. The flow rate at the point of discharge must be controlled during discharge events to ensure effectiveness of erosion control and dechlorination efforts.

10. When discharging directly into receiving waters, record visual observations on clarity, erosion, and sedimentation within one hour after the event 100 feet upstream of the discharge point and 100 feet downstream of the discharge point.

11. When discharging directly into receiving waters, record the temperature of the water within one hour after the event 100 feet upstream of the discharge point and 100 feet downstream of the discharge point.

12. Upon completion of discharge event, clean up the event site and remove all erosion control material.

13. If needed, repair erosion and remove sediment caused by the discharge.
14. Notify the Discharge Supervisor and/or DRA of the completion of the discharge event and any other pertinent information regarding the operation.

15. Complete and file all monitoring and discharge reports.

*It is imperative that the flow rates be controlled during discharge events so necessary adjustments to erosion prevention material and dechlorination efforts can be made in order for the Discharger to efficiently and effectively meet its goals.*

18-05. Unscheduled Water Discharge Events:

A. Unscheduled water discharge events cannot be scheduled or planned for in advance. However, the Discharger can mitigate the effects of these occurrences by ensuring that a fully equipped leak crew is available twenty-four (24) hours a day to respond to each reported incident. Typically, unscheduled discharge events are the results of the following activities:

1. Water main breaks due to natural disasters, i.e., earthquakes, undermining of pipelines due to excessive flooding, or runoff.

2. Damage to existing pipelines by various construction activities.

3. Demolition of fire hydrants by vehicular accidents.

4. Vandalism and theft of backflow prevention devices or fire hydrants.

5. Water distribution infrastructure material or equipment failures.

During the above mentioned unscheduled discharge events, the water released will generally enter the storm drain system or drainage swale uncontrolled until the leak crew isolates pertinent valves within the system to prevent further uncontrolled discharge.

B. The following protocol must be followed when responding to unscheduled discharge events:

1. Notify the Discharge Supervisor and/or DRA of the event.

2. Isolate and lockout the source of the leak to minimize the amount of the release.
3. Prevent erosion and sedimentation by properly installing gravel bags, sandbags, straw wattles, silt fencing, plastic sheeting, hay bales, and other erosion prevention materials to decrease the velocity or the effect of discharged water.

4. As quickly as possible, begin dechlorinating the water being released using sodium thiosulfate, ascorbic acid or other dechlorinating agent. Monitor and record the chlorine residual, pH (if super-chlorinated), and a visual estimate of turbidity during the first 10 minutes after application of the dechlorinating agent and as necessary thereafter according to MRP procedures provided in Attachment E. The chlorine residual must be not detected (i.e. < 0.1 mg/L).

5. Notify the Discharge Supervisor and/or DRA and relay all pertinent information with regard to each specific event. Conduct a physical site survey to quantify damage (if any) caused by the leak or discharge.

6. If possible, when discharging directly into receiving waters, record visual observations on clarity, erosion, and sedimentation within one hour after the event 100 feet upstream of the discharge point and 100 feet downstream of the discharge point.

7. If possible, when discharging directly into receiving waters, record the temperature of the water within one hour after the event 100 feet upstream of the discharge point and 100 feet downstream of the discharge point.

8. Upon completion of discharge event, clean up the event site and remove all erosion control material.

9. If needed, repair erosion and remove sediment caused by the discharge.

10. Notify the Discharge Supervisor and/or DRA of the completion of the discharge event and any other pertinent information regarding the operation.

11. Complete and file all monitoring and discharge reports.
Page intentionally left blank
<table>
<thead>
<tr>
<th>INDEX</th>
<th>Dwg. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STANDARD DRAWINGS</strong></td>
<td></td>
</tr>
<tr>
<td>1&quot; Copper Service</td>
<td>1</td>
</tr>
<tr>
<td>1-1/2&quot; and 2&quot; Copper Service</td>
<td>2</td>
</tr>
<tr>
<td>Service Taps</td>
<td>3</td>
</tr>
<tr>
<td>Meter Boxes for Existing 1-inch Services</td>
<td>4</td>
</tr>
<tr>
<td>Poly Concrete Meter Boxes</td>
<td>4-A</td>
</tr>
<tr>
<td>1-inch Air Relief Assembly</td>
<td>5</td>
</tr>
<tr>
<td>2-inch Air Relief Assembly</td>
<td>5-A</td>
</tr>
<tr>
<td>4-inch Air Relief Assembly</td>
<td>5-B</td>
</tr>
<tr>
<td>Air/Vacuum Enclosure Locations</td>
<td>5-C</td>
</tr>
<tr>
<td>1-inch, 2-inch, and 4-inch Air Valve Enclosures</td>
<td>5-D</td>
</tr>
<tr>
<td>Fire Hydrant</td>
<td>6</td>
</tr>
<tr>
<td>Fire Hydrant Locations</td>
<td>7</td>
</tr>
<tr>
<td>Guard Post for Fire Hydrant</td>
<td>8</td>
</tr>
<tr>
<td>2-inch End of Main Blow-off Assembly</td>
<td>9</td>
</tr>
<tr>
<td>2-inch In-Line Blow-Off Assembly</td>
<td>9-A</td>
</tr>
<tr>
<td>WSP 6-inch In-Line Blow-Off Assembly</td>
<td>9-B</td>
</tr>
<tr>
<td>PVC 6-inch In-Line Blow-Off Assembly</td>
<td>9-C</td>
</tr>
<tr>
<td>PVC 6-inch End Of Main (EOM) Blow-Off Assembly</td>
<td>9-D</td>
</tr>
<tr>
<td>Gate Box Detail</td>
<td>10</td>
</tr>
<tr>
<td>Valve Extension</td>
<td>10-A</td>
</tr>
<tr>
<td>Thrust Blocking</td>
<td>11</td>
</tr>
<tr>
<td>Valve Location Points</td>
<td>12</td>
</tr>
<tr>
<td>Private Utility Crossing</td>
<td>13</td>
</tr>
<tr>
<td>Sewer Lateral Crossings Above Water Mains</td>
<td>14</td>
</tr>
<tr>
<td>Sewer Main Crossing</td>
<td>14-A</td>
</tr>
<tr>
<td>Sewer Main Crossing Notes (Sheet 1 of 3)</td>
<td>14-B</td>
</tr>
<tr>
<td>Sewer Main Crossing Notes (Sheet 2 of 3)</td>
<td>14-B</td>
</tr>
<tr>
<td>Topic</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Sewer Main Crossing Notes (Sheet 3 of 3)</td>
<td>14-B</td>
</tr>
<tr>
<td>Air-Gap Separation</td>
<td>15</td>
</tr>
<tr>
<td>Backflow Protection Assembly, RP or DC</td>
<td>15-A</td>
</tr>
<tr>
<td>Domestic Fire Backflow Assembly</td>
<td>15-B</td>
</tr>
<tr>
<td>Backflow Assemblies Post Meter</td>
<td>15-S1</td>
</tr>
<tr>
<td>Vacuum Breakers</td>
<td>15-S2</td>
</tr>
<tr>
<td>Pipe Bedding and Backfill</td>
<td>16</td>
</tr>
<tr>
<td>Warning Identification Tape and Tracer Wire</td>
<td>17</td>
</tr>
<tr>
<td>Plugging Abandoned Water Mains/Services</td>
<td>18</td>
</tr>
<tr>
<td>1-inch Sample Station</td>
<td>19</td>
</tr>
<tr>
<td>1-inch Sample Station Pad and Enclosure</td>
<td>19-A</td>
</tr>
<tr>
<td>1-inch Sample Station Enclosure Locations</td>
<td>19-B</td>
</tr>
<tr>
<td>Water Meter Clearance Adjacent to Driveway</td>
<td>20</td>
</tr>
<tr>
<td>Private Security Gate Locks</td>
<td>21</td>
</tr>
<tr>
<td>Private Security Gate Locks</td>
<td>21-A</td>
</tr>
<tr>
<td>Shallow Main Protection</td>
<td>22</td>
</tr>
<tr>
<td>Water Facility Crossing Protection</td>
<td>23</td>
</tr>
<tr>
<td>Water Main Cathodic Protection</td>
<td>24</td>
</tr>
<tr>
<td>Water Meter Clearance Requirements</td>
<td>25</td>
</tr>
</tbody>
</table>
ATTACHMENT A TO SWEETWATER AUTHORITY STANDARD SPECIFICATIONS

SWEETWATER AUTHORITY APPROVED MATERIALS LIST

Date: May 2016

1. This list is on file with the Sweetwater Authority Engineering Department and is subject to change.

2. All bronze components in contact with potable water shall be lead free in accordance with Assembly Bill 1953 (AB 1953), excluding service saddles, backflow preventers for nonpotable services, such as irrigation and industrial, and water distribution main gate valves that are greater than two (2) inches.

3. This list supersedes all previous Approved Materials Lists.

Approved By:

Ron R. Mosher, Engineering Director

12/28/2016

Date
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Air and Vacuum Release Valves</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>Cathodic Protection</td>
<td>1</td>
</tr>
<tr>
<td>C</td>
<td>Fire Hydrants</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>Fittings</td>
<td>2</td>
</tr>
<tr>
<td>E</td>
<td>Miscellaneous</td>
<td>2 and 3</td>
</tr>
<tr>
<td>F</td>
<td>Pipe</td>
<td>3</td>
</tr>
<tr>
<td>G</td>
<td>Service Laterals</td>
<td>3 and 4</td>
</tr>
<tr>
<td>H</td>
<td>Meter Boxes</td>
<td>4 and 5</td>
</tr>
<tr>
<td>I</td>
<td>Valves</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Legend</td>
<td>5</td>
</tr>
</tbody>
</table>
## SWEETWATER AUTHORITY
## APPROVED MATERIALS LIST

*(SEE STANDARD SPECIFICATIONS FOR SPECIFIC REQUIREMENTS)*

### A. Air and Vacuum Release Valves

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION OF FITTING</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR &amp; VACUUM VALVES</td>
<td>CAST-IRON OR DUCTILE-IRON, FIPT OUTLET, 1&quot;, 2&quot; AND 4&quot; WITH STAINLESS STEEL TRIM</td>
<td>APCO 143C, 145C, 149C, VAL-MATIC 201C, 202C, 204C CLA-VAL, CRISPIN</td>
</tr>
<tr>
<td>AIR VACUUM VALVE ROUND VENT</td>
<td>LOW DENSITY POLYETHYLENE MATERIAL WITH UV INHIBITORS (COLOR: SANDSTONE)</td>
<td>ARMORCAST, PIPELINE PRODUCTS</td>
</tr>
</tbody>
</table>

### B. Cathodic Protection

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION OF FITTING</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELASTOMERIC CAP</td>
<td>ROYSTON HANDY CAP II, ROYSTON PRIMER 747</td>
<td>ROYSTON</td>
</tr>
<tr>
<td>TAPE</td>
<td>POLY-GUARD 600 &amp; 600 PRIMER PROTECTO WRAP 200 &amp; 200 GT POLYKEN TAPE &amp; 927 PRIMER DENZO PETROLATUM WAX TAPE TRENTON TAPE #1 &amp; PRIMER WRAP-TITE PETROLATUM TAPE</td>
<td>POLY-GUARD, PROTECTO WRAP, POLYKEN, DENZO, TRENTON, WRAP-TITE</td>
</tr>
</tbody>
</table>

### C. Fire Hydrants

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION OF FITTING</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRE HYDRANTS</td>
<td>BRONZE, CAST-IRON, OR DUCTILE-IRON; WET BARREL, 6-HOLE FLANGE, 9-1/2&quot; BHC, 3/4&quot; BOLTS, 1 - 2-1/2&quot; &amp; 1 - 4&quot; HOSE OUTLET. STANDARD INDUSTRIAL LOCATIONS MAY REQUIRE 2 - 2-1/2&quot; WITH 1 - 4&quot; OUTLETS, HYDRANTS TO BE EPOXY-LINED. CAPS SHALL BE BRASS, CAST-IRON, OR DUCTILE-IRON. NO PLASTIC CAPS ON HYDRANT PORTS.</td>
<td>JONES #J-3700, J-3765, J-4040, &amp; J-4060; CLOW 850, 860; AMERICAN AVK 2470 &amp; 2490</td>
</tr>
<tr>
<td>PAINT</td>
<td>FIRE HYDRANTS, GATE WELL COVERS</td>
<td>SHERWIN WILLIAMS</td>
</tr>
<tr>
<td>SPOOL, FIRE</td>
<td>DUCTILE-IRON, CEMENT-LINED</td>
<td>SOUTH BAY, CLOW, SIGMA</td>
</tr>
</tbody>
</table>
### D. Fittings

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION OF FITTING</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESSORY KITS</td>
<td>MECHANICAL JOINT</td>
<td>STAR, TYLER</td>
</tr>
<tr>
<td>COUPLINGS, DEFLECTION</td>
<td>PVC, 6&quot; - 12&quot;, CL 200</td>
<td>CERTAINTEED</td>
</tr>
<tr>
<td>COUPLINGS, TRANSITION</td>
<td>STEEL, BOLTED; SLIP X SLIP 3/4&quot; - 36&quot;. TRANS. AC X CI, AC X WS, CI X WS; CI, AC STANDARD &amp; OD PIPE.</td>
<td>FORD, DRESSER, BAKER, *HYMAX, JCM, ROMAC, CLOW, SMITH-BLAIR, POWERSEAL * Emergency Repairs Only</td>
</tr>
<tr>
<td>COUPLINGS</td>
<td>MALLEABLE OR DUCTILE IRON GROOVED-TYPE MECHANICAL</td>
<td>VICTAULIC, GROOVE COCK</td>
</tr>
<tr>
<td>COUPLINGS</td>
<td>GROOVE GRIP</td>
<td>GUSTIN-BACON, TYLER</td>
</tr>
<tr>
<td>FITTINGS, DUCTILE IRON</td>
<td>AWWA APPROVED C-153 SHORT-SHORT BODY, AWWA APPROVED C-110 FULL-BODY, CEMENT-LINED, ASPHALT SEAL LINED AND COATED,</td>
<td>TYLER, CLOW, UNION, STAR, SIGMA</td>
</tr>
<tr>
<td>PIPE RESTRAINER</td>
<td>DUCTILE IRON</td>
<td>ROMAC, STAR, UNIFLANGE, EBAA, SIGMA</td>
</tr>
<tr>
<td>SLEEVES, TAPPING OUTLET SAME SIZE OF RUN</td>
<td>STAINLESS STEEL TAPPING</td>
<td>APAC, CLOW, JCM, MUELLER, ROMAC, SMITH-BLAIR, TYLER</td>
</tr>
<tr>
<td>SLEEVES, TAPPING OUTLET SMALLER THAN RUN</td>
<td>STAINLESS STEEL TAPPING, STEEL FAB (EPOXY-LINED &amp; COATED)</td>
<td>CLOW, MUELLER, APAC, JCM, ROMAC, BAKER, SMITH-BLAIR, TYLER, FORD</td>
</tr>
</tbody>
</table>

### E. Miscellaneous

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION OF FITTING</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADAPTER, PVC</td>
<td>PVC S X MIPT, SCHEDULE 80 BLOW-OFFS, SCHEDULE 40 RECONNECTS.</td>
<td>LASCO, PACIFIC WESTERN, DURA</td>
</tr>
<tr>
<td>BLOW-OFF ASSEMBLY</td>
<td>2&quot; #6109</td>
<td>A.Y. MC DONALD</td>
</tr>
<tr>
<td>CLAMPS, REPAIR (PIPE SAVER)</td>
<td>STAINLESS STEEL; FULL SEAL; SINGLE &amp; DOUBLE LUG. SIZES 2&quot; - 18&quot;. A.C.; C.I.; AC-CI. SERVICE SEAL W/ 3/4&quot;, 1&quot;, &amp; 2&quot; IPT OUTLETS</td>
<td>MUELLER, DRESSER, BAKER, JCM, APAC, SMITH-BLAIR, ROMAC, POWERSEAL, FORD, CLOW</td>
</tr>
<tr>
<td>CLAMPS, REPAIR</td>
<td>STAINLESS STEEL; SINGLE &amp; DOUBLE LUG. SIZES, 3/4&quot; - 12&quot; FOR STEEL PIPE. O.D. &amp; I.D</td>
<td>FORD, MUELLER, JCM, POWERSEAL, APAC, ROMAC, SMITH-BLAIR, SPEARS, NIBCO, CLOW</td>
</tr>
<tr>
<td>DISINFECTION</td>
<td></td>
<td>ANY MANUFACTURER WITH NSF61 APPROVAL</td>
</tr>
</tbody>
</table>
### MATERIALS

<table>
<thead>
<tr>
<th>MATERIALS</th>
<th>DESCRIPTION OF FITTING</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>GASKET MATERIAL</td>
<td>1/8&quot; THICK, MEET AWWA C207 (NON-ASBESTOS)</td>
<td>AMERICAN RUBBER, CALPICO, TRI-PAC, NEWBY, HOFFMEYER</td>
</tr>
<tr>
<td>INSERTS</td>
<td>STAINLESS-STEEL (RECONNECTIONS ONLY)</td>
<td>FORD, JONES, MUELLER</td>
</tr>
<tr>
<td>METALLIC TAPE</td>
<td>WARNING ALARM TAPE, MIN 6&quot; WIDE/ 1000 FT. ROLLS</td>
<td>ALARM TAPE, ALLEN SYSTEM, LIVEGARD INC., CAL-PICO</td>
</tr>
<tr>
<td>TRACER WIRE</td>
<td>#12 AWG SOLID COPPER UF TYPE WIRE WITH CROSS LINKED POLYETHYLENE INSULATION, WHITE OR YELLOW IN COLOR</td>
<td>COSBERG INDUSTRIES PAIGE, BARON</td>
</tr>
<tr>
<td>PIPE, COPPER</td>
<td>COPPER TUBING, TYPE &quot;K&quot;, 3/4&quot; &amp; 1&quot; &amp; 1-1/2&quot;, &amp; 2&quot; (HARD OR SOFT)</td>
<td>MUELLER, HALSTEAD, CERRO, CAMBRIDGE - LEE</td>
</tr>
<tr>
<td>SOLDER, FLUX</td>
<td>LIQUID AND PASTE-TYPE, NON-TOXIC NSF 61 APPROVED</td>
<td>ALL STATE AQUA SAFE 100</td>
</tr>
<tr>
<td>SOLDER</td>
<td>LEAD-FREE, SILVER SILICONE 15%</td>
<td>ANY MANUFACTURER WITH NSF61 APPROVAL</td>
</tr>
<tr>
<td>WIRE, TRACER CONNECTOR</td>
<td>DIRECT BURY SILICONE–FILLED CAPSULE TUBE WITH STANDARD WIRE NUT OR SILICONE-FILLED WIRE NUT CONNECTIONS FOR TRACER WIRE CONNECTIONS</td>
<td>3M DBR-6 KING 4 KING 5 KING 6</td>
</tr>
</tbody>
</table>

### Pipe

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION OF FITTING</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIPE, LUBRICANT</td>
<td>LUBRICANT FOR RUBBER RINGS</td>
<td>RECOMMENDED BY PIPE MANUFACTURER, BLUE-LUBE</td>
</tr>
<tr>
<td>PIPE, PVC</td>
<td>PVC, SCHEDULE 80 SERVICE RECONNETS ONLY</td>
<td>JM EAGLE; CERTAINEED CORP.; VINYLTECH</td>
</tr>
<tr>
<td>PIPE, PVC</td>
<td>MAIN LINE PIPING AWWA SPEC C-900 4&quot; - 12&quot;, C-905 (14&quot;-36&quot;)</td>
<td>JM EAGLE; CERTAINEED CORP.; VINYLTECH DIAMOND PIPE; NORTH AMERICAN PIPE CORP.</td>
</tr>
<tr>
<td>PIPE, FPVC</td>
<td>FUSIBLE PVC ™</td>
<td>UNDERGROUND SOLUTIONS</td>
</tr>
</tbody>
</table>

### Service Laterals

<table>
<thead>
<tr>
<th>TYPE</th>
<th>DESCRIPTION OF FITTING</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADAPTER</td>
<td>SOLDER X FIPT; SOLDER X MIPT; SIZES 3/4&quot;, 1&quot;</td>
<td>MUELLER, CHASE</td>
</tr>
<tr>
<td>BRASS FITTINGS</td>
<td>TEES, VALVES, CAPS, UNIONS</td>
<td>LEE BRASS COMPANY, NIBCO, AMCOST</td>
</tr>
<tr>
<td>CORPORATION STOPS</td>
<td>BRONZE. SIZES 3/4&quot;, 1&quot;, 1-1/2&quot;, 2&quot;, MIPT X MIPT, MIPT X COMP</td>
<td>JONES, FORD, MUELLER, A.Y., Mcdonald</td>
</tr>
<tr>
<td>COUPLINGS, COPPER</td>
<td>SIZES 3/4&quot;, 1&quot;, 1-1/2&quot;, 2&quot;. S X S FITTING.</td>
<td>MUELLER, CHASE, NIBCO, LEE, ECKHART, FORD, A.Y. MCDONALD</td>
</tr>
<tr>
<td>COUPLINGS, SERVICE</td>
<td>BRONZE. 2 PC, 3 PC, FLAIR NUT FITTING. 3/4&quot; &amp; 1&quot;.</td>
<td>JONES, FORD, MUELLER, A.Y. MCDONALD</td>
</tr>
<tr>
<td>COUPLINGS, SERVICE COMPRESSION</td>
<td>BRONZE, PVC. 3 PC COMP X COMP SIZES 3/4&quot;, 1&quot;, 1-1/2&quot;, 2&quot;. COPPER &amp; PVC OR PLASTIC PIPE</td>
<td>BRONZE: DRESSER, MUELLER, A.Y. MCDONALD, FORD PVC: PACIFIC WESTERN, FLO CONTROL.</td>
</tr>
<tr>
<td>CURB STOP/ANGLE METER STOP</td>
<td>BRONZE W/SWIVEL METER NUT, LOCK WING. 3/4&quot; &amp; 1&quot; COMPRESSION. 1-1/2&quot; &amp; 2&quot; BRONZE, METER FLANGE LOCK WING. COMPRESSION FITTING FOR PVC OR COPPER PIPE</td>
<td>FORD, A.Y. MCDONALD, JONES</td>
</tr>
<tr>
<td>ELLS, BRONZE</td>
<td>3/4&quot;, 1&quot;, 1-1/2&quot; &amp; 2&quot; IPT STANDARD</td>
<td>MUELLER, LEE, NIBCO, ELKHART, A.Y. MCDONALD, FLAGG</td>
</tr>
<tr>
<td>ELLS, SWEAT</td>
<td>COPPER, BRASS, BRONZE; S X S FITTING. 3/4&quot;, 1&quot;, 1-1/2&quot;, &amp; 2&quot;</td>
<td>MUELLER, CAMBRIDGE-LEE, NIBCO, ELKHART, A.Y. MCDONALD</td>
</tr>
<tr>
<td>ELLS, PVC</td>
<td>SCHEDULE 80 &amp; SCHEDULE 40 RECONNECTIONS</td>
<td>LASCO, PACIFIC WESTERN, DURA, SPEARS, NIBCO</td>
</tr>
<tr>
<td>METER BUSHINGS</td>
<td>BRONZE, 1-1/4&quot; X 1&quot;</td>
<td>JONES, FORD, A.Y. MCDONALD</td>
</tr>
<tr>
<td>PIPE</td>
<td>COPPER TUBING, TYPE &quot;K&quot;, 3/4&quot; &amp; 1&quot; (HARD OR SOFT)</td>
<td>MUELLER, HALSTEAD, CERRO, CAMBRIDGE-LEE</td>
</tr>
<tr>
<td>PIPE</td>
<td>COPPER TUBING 1-1/2&quot; &amp; 2&quot;, TYPE K (HARD OR SOFT)</td>
<td>NIBCO, ECKHART, FORD, CAMBRIDGE-LEE</td>
</tr>
<tr>
<td>SADDLES, SERVICE</td>
<td>BRONZE, FOR C-900 PVC PIPE-ipt OUTLET SIZES: 3/4&quot;, 1&quot;, 1-1/2&quot;, &amp; 2&quot;. BOLD STYLE ONLY.</td>
<td>JONES #996, FORD S-91, MUELLER H-13000, A.Y. MCDONALD #3806</td>
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<tr>
<td>SADDLES, SERVICE</td>
<td>BRONZE, FOR C-905 PVC PIPE-ipt OUTLET SIZES: 3/4&quot;, 1&quot;, 1-1/2&quot;, &amp; 2&quot;</td>
<td>JONES #969, FORD #S-912</td>
</tr>
<tr>
<td>SADDLES, SERVICE</td>
<td>BRONZE FOR AC PIPE</td>
<td>JONES #979</td>
</tr>
<tr>
<td>SADDLES, SERVICE BRONZE, DOUBLE STRAP</td>
<td>FOR AC OR CI PIPE, IPT OUTLET. SIZES: 3/4&quot;, 1&quot;, 1-1/2&quot;, &amp; 2&quot;</td>
<td>JONES, FORD, MUELLER, MCDONALD</td>
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</tbody>
</table>

### H. Meter Boxes

<table>
<thead>
<tr>
<th>SIZE &amp; USE</th>
<th>ITEM</th>
<th>PART NUMBER</th>
<th>DIMENSIONS</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>#3 (REPLACEMENTS ONLY)</td>
<td>METER BOX</td>
<td>P-W3</td>
<td>9&quot; X 14&quot; X 12&quot;</td>
<td>J &amp; R</td>
</tr>
<tr>
<td>PEDESTRIAN</td>
<td>METER BOX LID</td>
<td>A6000482SM</td>
<td>9&quot; X 14&quot;</td>
<td>ARMORCAST</td>
</tr>
<tr>
<td>TYPE</td>
<td>DESCRIPTION OF FITTING</td>
<td>MANUFACTURER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GATE VALVE BOX</td>
<td>ABS SCHEDULE 80 SDR 35 PIPE WITH GALVANIZED STEEL INSERT</td>
<td>APACHE, PLASTICS SERVICES, INC., COLBY, J.M., CERTAINTEED, PACIFIC WESTERN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VALVES, BUTTERFLY</td>
<td>AWWA APPROVED C 504 CL 150 B (SEE SECTION 7-3), EPOXY COATED</td>
<td>PRATT, CRISPIN K-FLO, KENNEDY, M &amp; H, CMB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VALVE, CAP</td>
<td>CAST IRON CAP, CAST IRON CAP ADAPTER FOR CONCRETE PLACEMENT</td>
<td>BINGHAM &amp; TAYLOR P.I. ADAPTER, MUELLER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VALVES, CONSUMER</td>
<td>BALL-TYPE, BRONZE, LEVER HANDLE, SWIVEL METER NUT FIPT. 3/4&quot; &amp; 1&quot;</td>
<td>FORD, JONES J-1908, A.Y. McDonald</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All meter boxes shall be supplied with pick slots; through pick holes are not allowed. "SWEETWATER AUTHORITY" shall be stamped on the lid.

I. Valves
<table>
<thead>
<tr>
<th>VALVES, CONSUMER</th>
<th>BALL-TYPE, LEVER-HANDLE, METER FLANGE, FIPT, 1-1/2&quot; &amp; 2&quot; (BRONZE)</th>
<th>FORD, JONES, A.Y. MCDONALD</th>
</tr>
</thead>
<tbody>
<tr>
<td>VALVES, GATE</td>
<td>WHEEL-TYPE</td>
<td>NIBCO, STOCKHAM, HAMMOND</td>
</tr>
<tr>
<td>VALVES, RESILIENT WEDGE</td>
<td>AWWA APPROVED C509 WITH LOW ZINC STEM WITH INTERIOR EPOXY-COATED</td>
<td>AMERICAN, CLOW, MUELLER, DRESSER, M &amp; H, KENNEDY, AMERICAN AVK</td>
</tr>
</tbody>
</table>

**LEGEND:**
- **S** = Sweat Joint
- **MIPT** = Male Iron Pipe Thread
- **CC** = Corporation Thread
- **COMP** = Compression
- **FIPT** = Female Iron Pipe Thread
ATTACHMENT E – MONITORING AND REPORTING PROGRAM

Table of Contents

I. General Monitoring Provisions ................................................................. E-2
II. Monitoring Requirements for Planned Discharges ......................................... E-3
III. Receiving Water Monitoring Requirements during non-compliance with this Order ... E-5
IV. Post-Notification of Emergency or Non-Compliant Discharges that Adversely Affect or Impact Beneficial Uses ................................................................. E-6
V. Pre-Notification of Large Planned Discharges Greater than One Acre-foot (325,850 gallons) .... E-6
VI. Reporting and Recordkeeping Requirements .................................................. E-7

List of Tables

Table 1  Event Monitoring of Superchlorinated Discharges, Well Development and/or Rehabilitation, and Individual Discharge Events Greater than 325,850 Gallons ........................................ E-3
Table 2  Event Frequency Requirements for Superchlorinated Discharges, Well Development and/or Rehabilitation Discharges to a Water of the U.S., and Discharges Greater than 325,850 Gallons ........................................ E-3
Table 3  Annual Representative Monitoring Requirements ........................................ E-4
Table 4  Annual Representative Monitoring Frequency Requirements .......................... E-4
Table 5  Monitoring Periods and Reporting Schedule .............................................. E-7
ATTACHMENT E – MONITORING AND REPORTING PROGRAM

Discharges from drinking water systems, as authorized by this Order, shall be properly managed to not adversely affect or impact beneficial uses of a receiving water body. The purpose of the monitoring and reporting requirements contained in the following Monitoring and Reporting Program is to provide information demonstrating that management practices are properly implemented to protect surface water quality. The objective of the monitoring is to validate that the management practices are performing properly to maintain compliance with this Order and protect receiving waters from adverse impacts to beneficial uses.

Title 40 Code of Federal Regulations part 122.48 requires that all National Pollutant Discharge Elimination System (NPDES) permits specify monitoring and reporting requirements. California Water Code sections 13267 and 13383 also authorize the State Water Resources Control Board (State Water Board) and a Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This Monitoring and Reporting Program establishes monitoring and reporting requirements, which implement the federal and State of California regulations.

Dischargers authorized under this Order shall comply with all Standard Provisions in Attachment D related to monitoring, reporting and recordkeeping.

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the nature of the monitored discharge after implementation of best management practices (BMPs). All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the discharge flow joins or is diluted by any other waste stream or body of water.

B. Chemical analyses that require laboratory testing are not required in this Order (with the exception of application requirements for discharge into a water body with already established TMDL requirements identified in Section K of the Fact Sheet and/or TMDL-related requirements prescribed to the water purveyors listed in Attachment G). The Discharger shall conduct onsite field measurements for pH, turbidity, and total chlorine residual per quality assurance and quality control (QA/QC) protocol that conform to U.S. EPA guidelines, or procedures approved by the American Water Works Association or other professional drinking water industry association.

C. The Discharger shall maintain sufficient resources, including trained personnel and properly calibrated and maintained field instruments to adequately perform all field measurements required in this Order. Onsite field measurements shall be performed using handheld devices by trained personnel acting on the Discharger’s behalf. A manual containing the proper operating procedures for all onsite field monitoring equipment, shall be maintained onsite or at the water purveyor’s office, and shall be available for inspection by State or Regional Water Board staff.
D. Appropriate field meter devices shall be selected consistent with accepted scientific practices and used to ensure the accuracy and reliability of measurements of monitored discharges. All devices shall be properly maintained and calibrated per manufacturer instructions and as necessary to ensure their continued accuracy.

II. MONITORING REQUIREMENTS FOR PLANNED DISCHARGES

A. Event Monitoring Requirements for Superchlorinated, Well development and/or rehabilitation, and Large Volume Discharges.

The Discharger shall monitor all superchlorinated discharges, all discharges from well development and/or rehabilitation activities, and individual discharges greater than 325,850 gallons (one acre-foot) for the constituents specified in Table E-1 and per the frequency specified in Table E-2.

Table 1 - Event Monitoring of Superchlorinated Discharges, Well Development and/or Rehabilitation, and Individual Discharge Events Greater than 325,850 Gallons

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Sampling</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine, Total Residual</td>
<td>mg/L</td>
<td>1/Event</td>
<td>Grab¹</td>
</tr>
<tr>
<td>Volume</td>
<td>Gallons</td>
<td>1/Event</td>
<td>Estimate⁵</td>
</tr>
<tr>
<td>pH</td>
<td>Standard Units</td>
<td>1/Event</td>
<td>Grab</td>
</tr>
<tr>
<td>Turbidity</td>
<td>NTU</td>
<td>1/Event</td>
<td>Visual Estimate</td>
</tr>
<tr>
<td>Turbidity for Well Development and/or Rehabilitation Only</td>
<td>NTU</td>
<td>1/Event</td>
<td>Grab¹</td>
</tr>
</tbody>
</table>

¹ A handheld field meter shall be used, provided the meter utilizes a U.S. EPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer’s instructions. The Discharger shall maintain a calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program.

² Sampling shall take place downstream of management practices, as feasible.

³ Total chlorine residual shall be monitored with a method sensitive to and accurate at a minimum level of 0.1 mg/L. False positives are acceptable if explanation of the cause is included.

⁴ Total Chlorine Residual monitoring is not required of non-chlorinated discharges.

⁵ Calculated estimate using available meter reading information or visual estimate.

⁶ pH monitoring is required for superchlorinated discharges only.

Table 2 - Event Frequency Requirements for Superchlorinated Discharges, Well Development and/or Rehabilitation Discharges to a Water of the U.S., and Discharges Greater than 325,850 Gallons

<table>
<thead>
<tr>
<th>Duration of Discharge</th>
<th>Sampling Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 20 minutes</td>
<td>One sample is required during the first 10 minutes of the discharge.</td>
</tr>
<tr>
<td>20 minutes to 60 minutes</td>
<td>One sample is required during the first 10 minutes of the discharge, plus a second sample is required within the last 10 minutes of the discharge.</td>
</tr>
<tr>
<td>Greater than 60 minutes</td>
<td>One sample is required within the first 10 minutes, a second sample is required within the next 50 minutes, and a third sample is required approximately within the last 10 minutes of the discharge or as close to the end of the discharge as is feasible.</td>
</tr>
</tbody>
</table>
B. Annual Representative Monitoring Requirements

This Order allows discharges of similar nature to be monitored on a representative basis. Representative monitoring is the use of monitoring results of one water quality monitoring sample to represent other discharges expected to have the same water quality. A representative monitoring measurement must represent discharges of similar nature, meaning discharges that have all the following items in common:

(a) The same general water source (ground water or surface water of similar water quality), and
(b) The same water treatment, and
(c) The same type of implemented BMPs.

The Discharger shall monitor all planned discharges not listed in Section II.A above, using representative monitoring, as previously defined in this section, for the constituents specified in Table E-3 and per the frequency specified in Table E-4.

### Table 3 - Annual Representative Monitoring Requirements

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Sampling</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine, Total Residual 3,4</td>
<td>mg/L</td>
<td>1/Year</td>
<td>Grab 1</td>
</tr>
<tr>
<td>Volume</td>
<td>Gallons</td>
<td>1/Year</td>
<td>Estimate 5</td>
</tr>
<tr>
<td>Turbidity</td>
<td>NTU</td>
<td>1/Year</td>
<td>Visual Estimate</td>
</tr>
</tbody>
</table>

1 A handheld field meter shall be used, provided the meter utilizes a U.S. EPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer’s instructions. The Discharger shall maintain a calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program.

2 Sampling shall take place downstream of management practices, as feasible.

3 Total chlorine residual shall be monitored with a method sensitive to and accurate at a minimum level of 0.1 mg/L. False positives are acceptable if explanation of the cause is included.

4 Total Chlorine Residual monitoring is not required of non-chlorinated discharges.

5 Calculated estimate using available meter reading information or visual estimate.

### Table 4 - Annual Representative Monitoring Frequency Requirements

<table>
<thead>
<tr>
<th>Duration of Discharge</th>
<th>Sampling Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 20 minutes</td>
<td>One sample is required during the first 10 minutes of the discharge.</td>
</tr>
<tr>
<td>20 minutes to 60 minutes</td>
<td>One sample is required during the first 10 minutes of the discharge, plus a second sample is required within the last 10 minutes of the discharge.</td>
</tr>
<tr>
<td>Greater than 60 minutes</td>
<td>One sample is required within the first 10 minutes, a second sample is required within the next 50 minutes, and a third sample is required approximately within the last 10 minutes of the discharge or as close to the end of the discharge as is feasible.</td>
</tr>
</tbody>
</table>

In its annual report, the Discharger shall:

(a) Submit a copy of its site schematic submitted in its application for enrollment with labeled representative monitoring locations, and
(b) Identify the portions of its system that the representative monitoring results represent, and
(c) Identify all changes in its representative monitoring locations that have occurred during the monitoring-year.

C. Annual Discharge Volume Monitoring Requirements

The Discharger shall keep:
(a) A record of the number of direct discharges to a water of the U.S. that is greater than 50,000 gallons, during each calendar year,
(b) An estimate of the total volume discharged to surface water during each calendar year, and
(c) An estimate of the total volume of discharge water directed to a reuse or beneficial use in accordance with section VI. of this Order.

D. Monitoring Not Required

Monitoring is not required for any discharges that:
(a) Do not ultimately reach a water of the U.S., and
(b) Are put to multiple uses or beneficial reuse, in accordance with section VI. of the Order, prior to surface water discharge.

E. Increase in Monitoring Requirements

The Deputy Director may increase the monitoring or frequency at any time to ensure the protection of beneficial uses of the receiving water. Any requirement for increased monitoring will be based on site-specific data or information that indicates a site-specific discharge threatens to cause or contribute to an exceedance of a receiving water quality criteria or objective.

III. RECEIVING WATER MONITORING REQUIREMENTS DURING NON-COMPLIANCE WITH THIS ORDER

The receiving water must be monitored for all direct planned discharges that do not comply with the requirements contained in section IV of the Order and the discharge potentially causes or contributes to an adverse effect or impact to beneficial uses. Receiving water monitoring shall be conducted during or immediately after the Discharger became aware of a non-compliant discharge that adversely effects or impacts beneficial uses of the receiving water. The Discharger shall monitor the point of confluence of the discharge and the receiving water. If the receiving water presents hazards to the monitoring personnel, visual monitoring shall be conducted using telephoto lenses and binoculars. If further hazards exist beyond such measures, monitoring is not required, and the hazards shall be documented in the corresponding monitoring report.

Receiving water monitoring shall consist of digital photographs and documentation of observed effects and impacts the discharge has on the receiving water body including the presence or absence of:
   a. Erosion;
b. Floating or suspended matter;
c. Discoloration;
d. Impact on aquatic life;
e. Visible films, sheens, or coatings; and
f. Potential nuisance conditions.

Photographs and documented observations of the receiving water conditions shall be included in the annual monitoring report, and made available to State and Regional Water Board staff upon request.

Receiving water monitoring is not required for emergency discharges.

IV. POST-NOTIFICATION OF EMERGENCY OR NON-COMPLIANT DISCHARGES THAT ADVERSELY AFFECT OR IMPACT BENEFICIAL USES

Within 24 hours of the Discharger becoming aware of an adverse effect(s) or impact on beneficial uses of the receiving water body due to non-compliance with this Order, or due to a system failure or emergency involving a discharge from its drinking water system, the Discharger shall notify the corresponding Regional Water Board and the MS4 operator if applicable, and shall confirm this notification in writing within five days.

The notification shall include all of the following:

a. The location and extent of non-compliance or emergency discharge;
b. The cause of the non-compliance or emergency discharge;
c. The date, time and expected duration of the non-compliance or emergency discharge;
d. The estimated volume of discharge;
e. The applicable receiving water body; and
f. The corrective actions taken (or being taken) to prevent future non-compliance or repair the system failure.

V. PRE-NOTIFICATION OF LARGE PLANNED DISCHARGES GREATER THAN ONE ACRE-FOOT (325,850 GALLONS)

Three (3) days prior to initiation of a planned discharge (or retroactively within 24-hours after the Discharger is informed to conduct an urgent planned discharge) of a volume equal to or greater than one acre-foot (325,850 gallons), the Discharger shall notify the MS4 operator if applicable, and the appropriate Regional Water Board and provide:

a. The start date of discharge
b. The location of discharge and the applicable receiving water
c. The estimated volume of discharge, and
d. The reasons for discharge
VI. REPORTING AND RECORDKEEPING REQUIREMENTS

A. Self-Monitoring Report Requirements

1. Self-monitoring reports including compliant and non-compliant discharge monitoring information shall be maintained in the Discharger’s main office and made available upon request of State and Regional Water Board staff.

2. Monitoring periods and reporting for all required monitoring shall be completed according to the schedule in Table E-5 below. Each discharge event that meets the conditions in section II and Table E-1 of this MRP shall be monitored.

<table>
<thead>
<tr>
<th>Sampling Frequency</th>
<th>Monitoring Period</th>
<th>Record Keeping Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/Event or Year</td>
<td>January 1 thru December 31</td>
<td>1 March</td>
</tr>
</tbody>
</table>

3. The Discharger shall arrange and summarize any reported numerical data in a tabular format. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

4. If no discharge occurred during the reporting period, the monitoring report shall report that there was no discharge.

5. Authorized Dischargers shall maintain the results for all monitoring specified in this Monitoring and Reporting Program and as specified in this Order. If a Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the self-monitoring report.

B. REPORTING REQUIREMENTS TO STATE WATER BOARD

1. Dischargers shall report to the State Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act" of 1986.

2. By March 1 of every year, all non-compliant discharge monitoring information contained in the Discharger’s self-monitoring report for the past calendar year shall be submitted to the State Water Board annually and shall include all non-compliant monitoring results required in this Monitoring and Reporting Program. All non-compliant discharge monitoring information shall be accompanied by the corrective actions the Discharger has taken to return the discharge to compliance. Dischargers shall also submit the annual discharge volume monitoring requirements specified in section II.C of this Attachment.
3. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify discharge events of non-compliance with the permit; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified non-compliance shall include a description of the requirement that was violated and a description of the violation.

4. Monitoring reports shall be submitted to the State Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

State Water Resources Control Board
Division of Water Quality
NPDES Permitting Unit
1001 I Street, 15th Floor
Sacramento, CA 95814

5. At any time during the term of this permit, the Deputy Director may notify authorized Dischargers to electronically submit monitoring reports using the State Water Board’s California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, each Discharger shall submit a hard copy of its monitoring reports. Subsequent guidance will be provided to the Discharger upon the Deputy Director’s notification for electronic submittal of reports. (Direction and guidance for electronic SMR submittals is currently available on the CIWQS Web site at http://www.waterboards.ca.gov/water_issues/programs/ciwqs/chc_npdes.shtml)
See Standard Drawing 4 for replacement only
See Standard Drawing 4-A for New Construction

1" copper pipe
Type K Soft

Service
1"

Meter
\( \frac{3}{8} \)" or 1"

Angle Ball Valve
1" (Locking)

Consumer Ball Valve

See Standard Drawing 4

NOTES:
1. Consumer Ball Valve furnished by contractor as part of water service.
2. See Section 8 of specifications.
3. Meter box becomes the property of SWA after acceptance.
4. All pipe & appurtenances beyond meter are customer responsibility.

NOTE 1

Wrap w/ 8 mil Polyethylene and 10 mil PVC Tape

1" Corporation Stop

Horizontal line

Saddle

FILE: ENG\GEN\STANDARD DRAWING REV SWA-STANDARDS-2016

1" COPPER SERVICE

REVISIONS | DRAWN BY:JDM | APPROVED BY:
NO. 2 | DATE: 10-27-04 | [Signature]
DATE: 04-07-16 | SCALE: NONE | STANDARD DRAWING 1
Notes:
1. Consumer Ball Valve furnished by contractor as part of water service.
2. See Section 8 of Specifications.
3. Meter box becomes the property of Authority after acceptance.
4. All pipe & appurtenances beyond meter are customer responsibility.
**FIG. 1: SADDLES**
For PVC or AC Water Mains

- 2-Piece Coupling (F.I.P.T. x COMP)
- Corporation Stop (M.I.P.T. x M.I.P.T)
- Copper Service Pipe
- 45°
- Horizontal Line
- Bronze saddle on all mains except steel mains.
- Wrap w/ 8 mil Polyethylene and 10 mil PVC Tape

**FIG. 2: DIRECT TAPS**
For Steel Water Mains

- Tape 24" of service with approved wrap
- Corporation Stop
- H.D. Welding Coupling
- 45°
- Horizontal Line
- Nylon Dielectric Bushing
- Steel Water Main

**Notes:**
1. Black iron heavy duty welding coupling with Nylon Dielectric Bushing required for all service taps on steel mains.
2. Full Seal, Stainless Steel Tapping Sleeve can be used in lieu of Bronze Saddle for AC Water Mains.
NOTES*:
1. Steel traffic lid required if box is subject to wheel loading, as determined by the Engineer.
2. Lid shall have "SWEETWATER AUTHORITY" engraved.
3. If meter box is to be replaced, see STD. DWG. 4-A.

* This data is for lid replacement only.
NOTES:
1) Lids to be marked (SWEETWATER AUTHORITY)
2) See approved materials list for manufacturers.
3) Install 20k lb. load rated cover and lid when subject to traffic as determined by Engineer.

SWEETWATER AUTHORITY

<table>
<thead>
<tr>
<th>SERVICE SIZE</th>
<th>&quot;W&quot;</th>
<th>&quot;L&quot;</th>
<th>&quot;D&quot;</th>
<th>CONC. REF.</th>
<th>LID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1'</td>
<td>13'</td>
<td>24'</td>
<td>12'</td>
<td>#38</td>
<td>7&quot;x13&quot;</td>
</tr>
<tr>
<td>1-1/2&quot; + 2&quot;</td>
<td>17&quot;</td>
<td>30&quot;</td>
<td>12&quot;</td>
<td>#66</td>
<td>9&quot;x14&quot;</td>
</tr>
</tbody>
</table>

POLY CONCRETE METER BOXES

REVISIONS: DRAWN BY: KL/JDM
NO. DATE: 08-31-04
DATE: SCALE: NONE

STANDARD DRAWING 4-A
NOTES:
1. See pertinent notes on Std. Dwgs. 1 & 3 for service tap.
2. Locate riser out of traveled way as determined by Engineer.

<table>
<thead>
<tr>
<th>ITEM #</th>
<th>REQ</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1&quot; 90' bronze or PVC street ell w/ Hytech screen</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1&quot; Combination Air &amp; Vacuum relief valve</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1&quot; (M.I.P.T. x Comp) adapter</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Foam sleeve ½&quot; thick</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1&quot; Copper tubing-Type &quot;K&quot; (soft or hard)</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1&quot; 90' copper ell (solder x solder)</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>1&quot; Angle Ball Valve (F.I.P.T. x Comp) with 1-¾&quot; x 1&quot; Bushing and 1&quot; MIPT x S</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>6&quot; Cast-iron gate box cover, marked &quot;WATER&quot;</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>6&quot; I.D. A.B.S. plastic gate box (1 piece), Min.¼&quot; thickness</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>1&quot; (F.I.P.T. x Comp) 90' bend</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>1&quot; Corporation Stop</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>1&quot; Saddle or Weld Nipple</td>
</tr>
</tbody>
</table>
NOTES:
1. See pertinent notes on Std. Dwg. 2 for service tap.
2. Locate riser out of traveled way as determined by Engineer.

<table>
<thead>
<tr>
<th>ITEM</th>
<th># REQ</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2&quot; 90° bronze or PVC street ell w/ Hytech screen</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>2&quot; Combination Air &amp; Vacuum relief valve</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>2&quot; Cplg (M.I.P.T. X Comp)</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>Foam sleeve 3/4&quot; thick</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2&quot; copper tubing—Type &quot;K&quot; (soft or hard)</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>2&quot; 90° copper ell (solder x solder)</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>2&quot; Angle Ball Valve (Fig x Comp) with (Fig x F.I.P.T.) M.I.P.T. x solder adapter</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>6&quot; Cast-Iron gate box cover, marked &quot;WATER&quot;</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>6&quot; I.D. A.B.S. plastic gate box (1 piece), Min. 1/4&quot; thickness</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>2&quot; 90° bronze street ell (F.I.P.T x solder)</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>2&quot; (M.I.P.T. x M.I.P.T.) Corp Stop</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>2&quot; Saddle or Weld Nipple</td>
</tr>
</tbody>
</table>
See Std. Dwgs. 5-C and 5-D for air valve enclosure and pad installation.

Profile

NOTES:
Locate riser out of traveled way as determined by Engineer.

<table>
<thead>
<tr>
<th>ITEM #</th>
<th># REQ</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>4&quot; 90° bronze or PVC street ell w/ Hytech screen</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>4&quot; Combination Air &amp; Vacuum relief valve</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>4&quot; Threaded nipple with 4&quot; threaded flange</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>4&quot; Manufactured flanged steel spool</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>4&quot; Flange x MJ 90° bend</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>4&quot; CL-235 PVC pipe, if &lt; 20' Level, if &gt; 20' 1% of rise</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>4&quot; Flange x MJ butterfly valve</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>6&quot; Cast-iron gate box cover, marked &quot;WATER&quot;</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>6&quot; I.D. A.B.S. plastic gate box (1 piece), Min. 1/4&quot; thickness</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>4&quot; Flange 90° bend</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>Flanged Tee (size varies) with 4&quot; Flange with nipple</td>
</tr>
</tbody>
</table>

Sweetwater Authority

4" Air Relief Assembly

Revisions Drawn By: FJM
Date: 10-27-04
Date: 04-07-16
Scale: None

Standard Drawing 5-B
Valve Enclosure* manufactured from Low Linear Density Polyethylene with UV Inhibitors

<table>
<thead>
<tr>
<th>CHART</th>
</tr>
</thead>
<tbody>
<tr>
<td>1” A.V.</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
</tbody>
</table>

* Color of enclosure to be Sandstone
3.5' x 4' x 4" Concrete pad set to grade with contiguous top of sidewalk or curb.

**PROFILE**

**ITEM #** | **# REQ** | **DESCRIPTION**
--- | --- | ---
1 | 1 | 6" APPROVED TYPE fire hydrant 9-1/2" d.la. bolt circle on flange. Break away bolts required.
2 | 1 | 6" x 12" Grooved Spool 1" min., 3" max. from T & B of conc. pad
3 | 1 | 6" x 36" Fire Hydrant Bury Ell
4 | — | 6" PVC CL 235 Pipe
5 | 1 | 6" Gate Valve
6 | — | See Std. Drawings 10 and 10-A for gate box detail
7 | — | Tee on new mains or tapping sleeve on existing mains.
8 | — | Thrust Blocking (See Std. Dwg. 11)
9 | — | Metallic Tape

**SWEETWATER AUTHORITY**

**FIRE HYDRANT**

**REVISIONS**

**DRAWN BY:** JDM

**APPROVED BY:**

**NO. 2**

**DATE:** 04-03-08 **SCALE:** NONE

**DATE:** 10-29-04

**STANDARD DRAWING 6**
CASE 1

When 5' sidewalks are adjacent to 6" curb, hydrants shall be placed 7' from curb face.

CASE 2

When sidewalks are constructed with widths greater than 6' from curb face to outside edge of sidewalk, hydrants shall be placed 24" from the curb face.

CASE 3

When inverted shoulder section is permitted and curb, gutter, and sidewalks are waived, the hydrants shall be placed 24" behind the edge of pavement.

NOTES:
1. Concrete pad where required (see Standard Drawing 6).
2. Final location of fire hydrant to be approved in field by local fire department.
Edge of pavement or curb

36"

45° Or as approved by the Engineer.

12"

36" 36"

PLAN

4" steel pipe filled with concrete and painted in accordance with fire hydrant standards.

34"

38"

Concrete

12" Dia.

SECTION

Concrete
8" Gate Box Cover marked "WATER". Galvanized steel insert per Standard Drawing 10

Nozzle cap

Operating nut

6" min. 12" max. to top of cap

2" A.Y. McDonald Blow-off (F.I.P.T. x M.I.P.T.)

2" MIPT x S adapter

8" A.B.S. Gate Box

2" Type "K" hard copper or brass nipple

Fill Gate Box with D.G. or sand up to 12" from top of nozzle

Rest gate box material on concrete block.

MJ Cap on main with 2" F.I.P.T.

2" Copper M.I.P.T. x S Adapter

Wrap cap with 8 mil Polyethylene and 10 mil PVC tape

2" 90° brass street El

Thrust block per Std. Dwg 11

PROFILE

Note:
1. For water mains 4"-12" only.
2. Special design for main size greater than 12".

SWEETWATER AUTHORITY

REVISIONS | DRAWN BY: JD | APPROVED BY:             | 2" END OF MAIN
NO. 5      | DATE: 10-29-04 |                     | BLOW-OFF ASSEMBLY
DATE: 04-07-16 | SCALE: NONE | STANDARD DRAWING 9
8" Gate Box Cover marked "WATER". Galvanized steel insert per Standard Drawing 10

Nozzle cap
Operating nut

6" min. 12" max. to top of cap

Wrap with 8 mil Polyethylene and 10 mil PVC tape.

2" A.Y. McDonald Blow-off (F.I.P.T. x M.I.P.T.)

2" MIPT x S Adapter

2" Type 'K' hard copper riser, length as required.

Fill Gate Box with D.G. or sand up to 12" from top of nozzle

8" ABS Gate Box

S x M.I.P.T. Adapter

2" F.I.P.T x F.I.P.T. 90° Brass Ell.

2" Brass nipple or Type "K" hard copper (6" min.) connect copper with 2" MIPT x S adapters.

Pour 1 foot wide concrete support. (6" thick min.)

PROFILE

2" Corp. Stop M.I.P.T. x M.I.P.T.

2" x *(Dia. of Pipe) Bronze/Brass Double Strap Saddle

*Pipe size 6" to 16" only.

Special design for main size greater than 16"

NOTE: Solder (S) joints as required.
NOTE:
1. Pipe wrap & cathodic protection per the Authority Engineering Department requirements.
3. All Mechanical Joints to be restrained.

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<th>DESCRIPTION</th>
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<tr>
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<td>2.5' of 6&quot; O.D.W.S. Pipe with Flange per AWWA Requirements.</td>
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<tr>
<td>2</td>
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<td>FLG x MJ Gate Valve</td>
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<tr>
<td>3</td>
<td>-</td>
<td>6&quot; Non-Metallic Gate Box Per Std. Dwgs. 10 &amp; 10-A</td>
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<tr>
<td>4</td>
<td>-</td>
<td>CL 235 PVC Pipe as required</td>
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<tr>
<td>5</td>
<td>1</td>
<td>6&quot; Blind Flange</td>
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<tr>
<td>6</td>
<td>1</td>
<td>6&quot; FLG x MJ Adapter</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>6&quot; FLG x MJ Tee</td>
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<td>6&quot; FLG x MJ Adapter</td>
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<tr>
<td>9</td>
<td>-</td>
<td>12&quot; non-metallic Gate Box per Std. Dwg. 10.</td>
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<tr>
<td>10</td>
<td>1</td>
<td>6&quot; companion flange w/ 6&quot; Sch 80 PVC plug.</td>
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<tr>
<td>11</td>
<td>-</td>
<td>12&quot; Cast Iron well cap labeled &quot;SWEETWATER&quot;</td>
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</tbody>
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SWEETWATER AUTHORITY

FILE: ENG\GEN\STANDARD DRAWING REV\SWEA-STANDARDS-2016

WSP 6' IN-LINE BLOW-OFF ASSEMBLY

REVISIONS DRAWN BY: JDM APPROVED BY:
NO. 5 DATE: 11-01-04
DATE: 05-23-16 SCALE: NONE

STANDARD DRAWING 9-B
NOTE:
1. Pipe wrap & cathodic protection per the Authority Engineering Department requirements.
3. All Mechanical Joints to be restrained.

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<tr>
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<td>1</td>
<td>12&quot; non-metallic Gate Box per Std. Dwg. 10.</td>
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<td>10</td>
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<td>1</td>
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SWEETWATER AUTHORITY

REVISIONS DRAWN BY: JDM APPROVED BY:
NO. 5 DATE: 11−01−04
DATE: 05−23−16 SCALE: NONE

PVC 6" IN-LINE BLOW-OFF ASSEMBLY

STANDARD DRAWING 9−C
END OF MAIN (EOM) PROFILE

NOTE:
1. Pipe wrap & cathodic protection per Sweetwater Authority’s Standard Specifications.
3. All Mechanical Joints to be restrained.

<table>
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<th>ITEM #</th>
<th># REQ</th>
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<tr>
<td>2</td>
<td>1</td>
<td>MJ x FLG Reducer</td>
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<tr>
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<td>6&quot; FLG x MJ Gate Valve</td>
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<tr>
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<td>–</td>
<td>CL 235 PVC Pipe as required</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>6&quot; Gate Box Per Std. Dwg. 10- &amp; 10-A</td>
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<tr>
<td>6</td>
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<td>6&quot; Blind Flange</td>
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<td>12&quot; non-metallic Gate Box per Std. Dwg. 10.</td>
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</table>

SWEETWATER AUTHORITY

REVISIONS DRAWN BY: JDM APPROVED BY:
NO. 3 DATE: 04–07–08
DATE: 05–23–16 SCALE: NONE

PVC 6” (EOM) BLOW-OFF ASSEMBLY STANDARD DRAWING 9-D
See Detail 'A' 

6" Cast-Iron Gate Box Cover labeled SWEETWATER.

Pavement 

Subgrade 

Base Material 

(1) Piece 6" I.D. ABS Pipe 

Gate Valve 

Set Directly On Valve Bonnet 

Water Main 

Gate Box Lid To Be Flush With Finished Paving 

12" Galvanized Steel Insert 

6" ABS Riser 

NOTE: Gate box similar for all gates and blow-off assemblies.
Concrete support install under all Gate Valves 

4" max 

30" Min. 

1'-3" 

DETAIL 'A'
**NOTES:**

1. Based on 150 psi static pressure, plus AWWA surge pressure, and 1500 psf soil bearing pressure.
2. For poor soil conditions, see Engineering Department for Thrust Block dimensions.
3. For main sizes greater than 12”, see Engineering Department for Thrust Block dimensions.
4. For vertical thrust, see Engineering Department for Anchor Block dimensions.
5. Proposed modifications based on soil bearing capacity greater than 1500 psf shall be verified by the SWA Engineering Department.
Corner Condition

Mid-Block Condition

Sweetwater Authority

Valve Location Points

Revisions
Drawn By: JDM
Approved By: [Signature]

No.
Date: 09-22-04
Date:
Scale: None

Standard Drawing 12
**NOTES:**

If Private Utility crosses a Sweetwater Authority water main within public right-of-way, or within a Sweetwater Authority owned Easement, the private utility shall be encased. Casing shall be centered at Sweetwater Authority's water main and extend, five feet minimum from both sides of the Sweetwater Authority water main or extend full length of the easement, whichever is greater. Inspection by Sweetwater Authority will be required prior to acceptance. Excavation, backfill, and compaction in accordance with Sections 2 and 15 of the Standard Specifications. If Sweetwater Authority's water main is metallic, an acceptable cathodic protection system for the Sweetwater Authority water main shall be provided by the private utility owner.
CASE 1
NEW SEWER

CASE 2
NEW WATER MAIN

NOTE: Zones identical on either side of center line.
Zone "P" is a Prohibited Zone, Section 64630(e) (2)
California Administration Code, Title 22.

CROSSINGS

NOTE: Zone "P" is a Prohibited Construction Zone.
Case 1 - New sanitary sewer main and a new or existing water main; alternative construction criteria apply to the sanitary sewer main.

Case 2 - New water main and an existing sanitary sewer main; alternative construction criteria may apply to either or both the water main and sanitary sewer main.

Case 1: New Sanitary Sewer Main Installation (Parallel Construction or Crossings Std Dwg. 14-A)

Zone Special Construction Required for Sanitary Sewer Main

A Sanitary sewer mains parallel to water mains shall not be permitted in this zone without prior written approval from the Engineering Department and public water system.

B If the water main paralleling the sanitary sewer main does not meet the Case 2 Zone B requirements, the sanitary sewer main should be constructed of one of the following:

1. High-density-polyethylene (HDPE) pipe with fusion welded joints (per AWWA C906);
2. Extra strength vitrified clay pipe with compression joints;
3. Class 4000, Type II, asbestos-cement pipe with rubber gasket joints;
4. PVC sewer pipe with rubber ring joints (per ASTM D3034) or equivalent;
5. Ductile iron pipe with compression joints; or
6. Reinforced concrete pressure pipe with compression joints (per AWWA C302-95).

C If the water main crossing above the sanitary sewer main does not meet the Case 2 Zone C requirements, the sanitary sewer main should have no joints in Zone C and be constructed of one of the following:

1. HDPE pipe with fusion-welded joints (per AWWA C906);
2. Ductile iron pipe with hot dip bituminous coating and mechanical joints (gasketed, bolted joints);
3. A continuous section of Class 200 (AWWA C900) PVC pipe or equivalent, centered over the pipe being crossed;
4. A continuous section of reinforced concrete pressure pipe (per AWWA C302) centered over the pipe being crossed; or
5. Any sanitary sewer main within a continuous sleeve.

D If the water main crossing below the sanitary sewer main does not meet the requirements for Case 2 Zone D, the sanitary sewer main should have no joints within four feet from either side of the water main and should be constructed of one of the following:
1. A continuous section of ductile iron pipe with hot dip bituminous coating; or
2. One of the Zone C options 1, 3, 4, or 5 above.

Case 2: New water mains Installation (Figures 1 and 2)

Zone Special Construction Required for Water Main

A. No water mains parallel to sanitary sewer mains shall be constructed without prior written approval from the Engineering Department.

B. If the sanitary sewer main paralleling the water main does not meet the Case 1 Zone B requirements, the water main should be constructed of one of the following:
   1. HDPE pipe with fusion welded joints (per AWWA C906);
   2. Ductile iron pipe with hot dip bituminous coating;
   3. Dipped and wrapped one-fourth-inch-thick welded steel pipe;
   4. Class 200, Type II, asbestos-cement pressure pipe;
   5. Class 200 pressure rated PVC water pipe (DR 14 per AWWA C900 or equivalent; or
   6. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300 or C302 or C303).

C. If the sanitary sewer main crossing above the water main does not meet the Case 1 Zone C requirements, the water main should have no joints in Zone C and be constructed of one of the following:
   1. HDPE pipe with fusion-welded joints (per AWWA C906);
   2. Ductile iron pipe with hot dip bituminous coating;
   3. Dipped and wrapped one-fourth-inch-thick welded steel pipe;
   4. Class 200 pressure rated PVC water pipe (per AWWA C900); or
   5. Reinforced concrete pressure pipe, steel cylinder type, per AWWA (C300 or C301 or C303).

D. If the sanitary sewer main crossing below the water main does not meet the requirements for Zone D Case 1, the water main should have no joints within four feet from either side of the sanitary sewer main and should be constructed as for Zone C.

E. New water mains and new supply lines shall be installed at least 4 feet horizontally from, and one foot vertically above, any parallel pipeline conveying: (1) Disinfected tertiary recycled water (defined in section 60301.230), and (2) Storm drainage.
NOTES AND DEFINITIONS:
1. HEALTH AGENCY — The State Water Resource Control Board, Division of Drinking Water. For those water systems supplying fewer than 200 service connections, the local health officer shall act for the Division of Drinking Water.

2. WATER SUPPLIER — "Person operating a public water system" or "supplier of water" means any person who owns or operates a public water system.

3. LOW HEAD WATER MAIN — Any water main which has a pressure of five p.s.i. or less at any given time at any point in the main.

4. Dimensions are from outside of water main to outside of sewer line or manhole.

5. COMPRESSION JOINT — A push-on joint that seals by means of the compression of a rubber ring or gasket between the pipe and a bell or coupling.

6. MECHANICAL JOINTS — Bolted joints.

7. RATED WORKING WATER PRESSURE OR PRESSURE CLASS — A pipe classification system based upon internal working pressure of the fluid in the pipe, type of pipe material, and the thickness of the pipe wall.

8. FUSED JOINT — The jointing of sections of pipe using thermal or chemical bonding processes.

9. SLEEVE — A protective tube of steel with a wall thickness of not less than one-fourth-inch into which a pipe is inserted.

10. GROUND WATER — Subsurface water found in the saturation zone.

11. HOUSE LATERAL — A sewer connecting the building drain and the main sewer line.
Public water supply. No connections or tees between meter and tank on this line. Installation above ground and visible as shown. This installation is subject to annual inspection by Sweetwater Authority.

Tank should be of substantial construction and of a kind and size to suit consumer's needs. Tank may be situated at ground level (with a pump to provide adequate pressure) or be elevated above the ground.

DETAIL - AIR GAP SEPARATION
Not to scale
Approved backflow prevention device.
If Fire Service, 5" - 2" Water Meter shall be set by SWA.

Sweetwater Authority Responsibility
Consumer Responsibility

P.L. or Easement.

Flg 90° bend
Stl. Flg x Flg spool
Finished grade

6.0"
MJ x Flg, 90° bend

2" thick Foam or Neoprene Sleeve

4" concrete slab 4' wide 6.0" reinforced with #4 rebar 12" O.C. each way to be used when using RP type Backflow Assembly.

Concrete thrust blocks

NOTES:
1. Not to be installed below ground or in vault.
2. Use only approved Backflow Prevention Detector Assembly provided by the Contractor/Property owner.
3. Sweetwater Authority to provide, install, and maintain 5" detector meter.
4. Property owner is required to maintain and repair the Backflow Prevention Assembly.
5. Property owner is responsible to have the device tested upon installation and thereafter annually by a certified Tester, with an original copy of the test results sent to the Authority.
6. A-B must be designed by a Registered Civil Engineer and submitted on the project improvement plan.
7. All installations shall meet the minimum requirements of the California Plumbing Code.

PROFILE Not to scale

SIZES H (IN.)
2-1/2" - 4" 24"
6"-10" 30"

SWEETWATER AUTHORITY

REVISIONS DRAWN BY: JDM APPROVED BY:
NO. 2 DATE: 09-23-04
DATE: 01-12-10 SCALE: NONE

BACKFLOW ASSEMBLY

STANDARD DRAWING 15-A
NOTES:
1. No connections or tees between meter and backflow prevention device.
2. All installations shall meet the minimum requirements of the California Plumbing Code.
3. Property owner is responsible to have the device tested upon installation and thereafter annually by a certified Tester, with an original copy of the test results sent to the Authority.

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<thead>
<tr>
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<th>H (IN.)</th>
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<tbody>
<tr>
<td>3/4&quot; - 2&quot;</td>
<td>12&quot;</td>
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</tbody>
</table>

Typical Installation for Backflow Assembly
(2-inch shown)

Concrete Thrust Blocks as required.

12" x 12" x 12"
1" Gravel Sump (optional)

Flow

Min. 12"

Easement edge or fl

Sweetwater Authority

Backflow Assembly

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<th>REVISIONS</th>
<th>DRAWN BY: JDM</th>
<th>APPROVED BY:</th>
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Note: Property owner is responsible to have the backflow prevention device tested upon installation and thereafter annually by a certified Tester, with an original copy of the test results sent to Sweetwater Authority.

**IN BASEMENT**

Curb

Face of building

Water Meter

Easement edge or PL

Approved backflow prevention device.

Drain required to remove water. (Sump pump optional)

**SIZE**

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**IN BUILDING**

Curb

Face of building

Water Meter

Drain required to remove water. (Sump pump optional)

**SWEETWATER AUTHORITY**

**REVISIONS**

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<th>NO. 1</th>
<th>DATE: 04-07-16</th>
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**DRAWN BY:** JDM

**APPROVED BY:**

**STANDARD DRAWING**

**BACKFLOW ASSEMBLIES POST METER**

**DATE:** 09-30-04

**SCALE:** NONE
NOTE:

1. Downstream side of vacuum breaker may be maintained under pressure by a valve, but there may be absolutely no means of imposing pressure by pump or other means.

2. All installations shall meet the minimum requirements of the California Plumbing Code.

3. Property owner is responsible to have the device tested upon installation and thereafter annually by a certified Tester, with an original copy of the test results sent to Sweetwater Authority.
NOTE:

Pavement replacement shall be governed by Agency having jurisdiction.

*Minimum Relative Compaction
Water meter, see notes 3 & 5
Install warning/identification tape 12" - 24" below finished surface, see notes 5, 6, & 7.

Property line

Overlap tape

Tracer Wire see note 2

Water Main

CI cover marked "TRACER"

CP test box, see note 3

Tracer wire, see note 3 & 8

SECTION AT WATER LATERALS

Water Main see note 2

Gate box & "Slider"

Gate box see note 3

Plan View

Tracer wire termination options

Tracer Wire access port see note 8

Air/Vacum see note 3

AV

tw

Fire Hydrant see note 3

Warning/ID Tape see note 5, 6, & 7

Water Service see note 3

W

tw

LEGEND ON PLANS (TRACER WIRE)

SWEETWATER AUTHORITY

REVISIONS DRAWN BY:JDM APPROVED BY:

NO. 2 DATE: 10-03-04

DATE: 04-07-16 SCALE: NONE

WARNING IDENTIFICATION TAPE AND TRACER WIRE

STANDARD DRAWING 17
Abandoned pipe

Plug with suitable material to hold concrete as approved by Engineer.

Cut 1 ft. hole in pipe & plug 2 ft. of pipe with concrete.

Plug with suitable material to hold concrete as approved by Engineer.

Abandoned pipe

NOTES:
1. Where a section of the pipe is removed and each end is plugged with concrete it shall be considered as one plug.
2. Where a cap or plate is required instead of concrete, it shall be considered part of the plug.
Gooseneck & ½" FIPT Ball Valve included with Sample Station.

Connect to ½" FIPT Ball Valve with ½" x 1" reducer MIPT x Solder Adapter.

1" Type "K" hard copper
Fill housing with Pea Gravel.

Sample Station provided by Koraleen Enterprises.

16" x 16" x 12" deep concrete footing.

See Standard Drawing 19-A for Pad and Enclosure Detail

Pavement

Metallic Tape

12" min. radius

1" Corporation Stop

Wrap w/ 8 mil Polyethylene and 10 mil PVC Tape

1" copper pipe
Type K Soft

Saddle

1" 90° bend (S x S)

1" Type "K" hard copper
Angle Ball Valve (Compression x FIPT)
Connected to 1" Type "K" hard copper with 1" MIPT x Solder Adapter.
Place concrete pad parallel with street or sidewalk.

Sample Station provided by Koraleen Enterprises.

2" - 26" #4 rebar (Typ.)

Concrete pad & base

16" x 16" x 12" deep concrete footing.
DETAIL - METER BOX LOCATION ADJACENT TO DRIVEWAY

No concrete shall be placed until forms and meter location are inspected and approved by Sweetwater Authority.
REQUIRED SWEETWATER AUTHORITY EASEMENT

Security Box With Sweetwater Authority PadLock See Note 1

NOTES
1. Owner/Developer may be required to enter into a "Hold Harmless Agreement" with Sweetwater Authority as a condition of approval.
2. Gate must be able to be manually operated in case of a power failure.
3. No gate may be less than 15' wide.
4. Location of gate to be approved by Sweetwater Authority.
KEY LOCK BOX
6"x6"x4" Type 3R Hinge Cover Enclosure

CONSTRUCTION
- Enclosure and door are fabricated from 16 gauge galvanized steel.
- Enclosure has embossed mounting holes on the back.
- Cover has padlock hasp and sealing hole provisions at the bottom.

FINISH
- Wash and phosphate undercoat ANSI 49 gray
- Enamel paint finish
OPTION "A"

PVC pipe depth range (18" – 30")

OPTION "B"

Steel pipe depth range (12" – 18")

Note:
1. The details shown represent the minimum protection required.
2. Option "B" protection plan shall be used in area where the pipe has insufficient cover to utilize PVC pipe Option "A".
3. Steel pipe with welded fittings; fabrication varies.

SWEETWATER AUTHORITY

SALLOW MAIN PROTECTION

REVISIONS: NO. 1
DRAWN BY: JDS
DATE: 07-18-06
APPROVED BY:
DATE: 04-07-16
SCALE: NONE

STANDARD DRAWING 22
1. BOND WIRES:
   a. Bond wires will be #4 HMWPE shielded stranded copper cathodic cable, black in color.
   b. Bond wires will be as short as possible with sufficient length as not to stress wires across the fitting. All bolted or mechanical fittings connected to metallic pipe and/or multiple fittings will have bond wires. Number of wires for metallic pipe greater than 12" in diameter as required by the Engineer.

2. ALUMINO–THERMIC WELD:
   a. One weld per wire
   b. Weld metal charges for steel (F–80 Cad–Weld) are to be used for steel only. Weld metal charges for cast iron and other alloys (FX–19) are to be used for cast iron and alloys only.
   c. Surfaces to receive welds are to be wire brushed, cleaned and free of debris.
   d. After the weld has cooled all slag will be removed with a similar metal wire brush.
   e. Welds will be tested by striking the weld with a hammer while tugging on the wire. If the weld fails the surface will be wire brushed, cleaned and free of debris and a new weld will be made using a fresh wire end.
   f. Coating of the weld will be 1.5 Mils of Roy–Bond 747 primer and covered with Roy–Bond Handy Cap 2.

3. WIRE:
   All wire will be the type specifically designed for cathodic protection. Size, type, and shield color will be that which is specified by the Engineer. All wire with damaged shield or broken strands will be replaced. All wire will be of sufficient length to reach from structure to the point of connection; having the required slack. No splices will be permitted.
No concrete shall be placed until forms and Water Meter Box locations are inspected and approved by Sweetwater Authority.

Proposed wall or fence

2' clear min.

Sweetwater Authority Water Meter Box

Sidewalk

2' clear min.

2' clear min.

No encroachment within 2-feet from edge of water meter box

Curb Typ.

Sidewalk Typ.

Fence or wall

2' clear min.

CASE 1- METER BOX LOCATED BEHIND SIDEWALK

Curb Typ.

Meter

2' clear min.

Fence or wall

CASE 2- METER BOX LOCATED BEHIND CURB

SWEETWATER AUTHORITY

WATER METER CLEARANCE REQUIREMENTS

REVISIONS

DRAWN BY: FJM

APPROVED BY:

NO. 1

DATE: 01-25-10

DATE: 04-07-16

SCALE: NONE

STANDARD DRAWING 25