

1.01 POLICY

- A. The District operates and maintains a recycled water distribution system within its service area enabling it to provide disinfected tertiary treated recycled water for a variety of beneficial uses.
- B. The beneficial use of recycled water is regulated by the California State Water Resources Control Board (CWRCB). California Water Code Section 13551 establishes a State policy to encourage the use of recycled water. Permission to use recycled water is based on the ability to adequately treat wastewater to the point that the recycled water (effluent) meets or exceeds the requirements of existing Title 22, Division 4, of the California Code of Regulations. Title 22 was promulgated by the State of California Department of Health Services (CDHS) to ensure proper health protection and specify the treatment degree to match the intended applications.
- C. As set forth in the District's Ordinance No. 68 (Recycled Water), the District shall determine whether a potential service will be furnished with recycled water or potable water. This determination shall be in accordance with standards of treatment and water quality requirements set forth in Title 22 and with the intent of the District to protect the public health. The availability and/or feasibility of making recycled water service available will be considered on a case-by-case basis.

1.02 STATUTORY REQUIREMENTS

All onsite and public recycled water facilities must be consistent with and adhere to the requirements described in the following documents:

- A. EMWD Backflow and Cross-Connection Ordinance 69.1, dated January 10, 1996 or latest edition.
 - B. EMWD Recycled Water Ordinance 68.2, dated August 16, 2006 or latest edition.
 - C. EMWD Recycled Water Guidelines and Best Management Practices.
 - D. California Administrative Code Department of Health Services (Title 22, Division 4).
 - E. Department of Health Services "Guidance Manual for Cross-Connection Control" latest edition.
 - F. California Administrative Code "Regulations Relating to Cross-Connections" (Title 17, Division 1, Chapter 5, Subchapter 1).
 - G. California-Nevada Section American Water Works Association "Guidelines for Distribution of Non-potable Water".
 - H. California-Nevada Section American Water Works Association "Guidelines for the On-Site Retrofit of Facilities Using Disinfected Tertiary Recycled Water".
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- I. Department of Health Services "Guidelines for Use of Reclaimed Water for Construction Purposes".
- J. Riverside County and San Diego County Department of Environmental Health.
- K. Department of Health Services "Guidelines for the Preparation of an Engineering Report for the Production, Distribution, and Use of Recycled Water".
- L. All applicable Federal, State or local statutes, regulations, ordinances.

1.03 GENERAL

It is the responsibility of the user of these documents to make reference to and utilize industry standards not otherwise directly referenced within this document. The Engineer or Landscape Architect of Work may not deviate from the criteria presented in these standards and specifications without prior written approval of the District's Engineer.

1.04 APPROVED USE

- A. These rules and regulations pertain to recycled water service to lands and/or improvements lying within the legal boundaries of the District unless otherwise stated. It is the intent of the District to provide recycled water service in accordance with these rules and regulations to all areas identified in the District's Recycled Water Master Plan, including all subsequent revisions. Recycled water service shall be provided to the service area when related transmission and distribution facilities are completed and service becomes available.
- B. In accordance with the goals of the District, the uses of recycled water include only those uses approved by the District, the California Department of Public Health (CDPH), and for which Title 22 of the California Code of Regulations provides treatment requirements. All potential applications for recycled water shall be reviewed and approved by the District prior to installation of facilities. Prior to approval and at its discretion, the District may set forth specific requirements as conditions for providing service and/or require specific prior approval from the appropriate regulatory agencies.
- C. The facilities shall be constructed in accordance with the procedures and requirements of the District. No recycled water mains or connections to the recycled water mains shall be installed unless shown on approved drawings.

1.05 DEFINITIONS

- A. "Applicant": Party requesting a recycled water service connection and/or recycled water service from the District under the terms of these Standards & Specifications.
- B. "Approved Backflow Prevention Assembly": A device approved by the State of California, the USC Foundation for Cross Connection Control and the District which is installed to protect any water supply (recycled, potable, public, private, or on-site) from contamination through backflow of a substance containing a potential hazard.

- C. "RWUP" Recycled Water Use Plan- Report or summary that identifies and addresses all elements of recycled water use including but not limited to regulatory, operational and implementing facility requirements.
- D. "RWUE" Recycled water use exhibit that identifies project characteristics including approved use areas, restricted use areas, required public infrastructure, number and sizes of all irrigation POC's, recycled water supply information, and project demand information. For further information, refer to the "Recycled Water Use Exhibit Design and Graphic Standards Guide".
- E. "Approved Use Area": A site, with well-defined boundaries, as designated in the approved RWUP / RWUE and On-Site Recycled Water plans, to receive recycled water for an Approved Use and acknowledged by any and all applicable regulatory agencies.
- F. "AWWA Cross-Connection Control Specialist": An individual who has a current Cross-Connection control Specialist Certificate on file with AWWA and the District.
- G. "Backflow": A flow condition, caused by a differential pressure, that causes the flow of water or other liquids, gases, mixtures or substances into the distributing pipes of a water supply from any source or sources other than an approved water supply source.
- H. "CDHS": California Department of Health Services, Division of Drinking Water and Environmental Management.
- I. "CDPH": California Department of Public Health.
- J. "Controller Charts": Engineered drawings that graphically identify in color the area served by each electric control valve as constructed or modified. Controller Charts shall be manufactured by the landscape architect of record once all construction has been completed. It is the responsibility of the contractor to install and locate all equipment as shown on the original construction plans and to mark-up for reference an interim set of controller charts graphically identifying in color the area served by each electric control valve any deviations from the original construction plans. Once the interim set of mark-ups is completed and delivered to the landscape architect of record, it is the responsibility of the landscape architect to verify this information. A final version must be provided to the district in both hardcopy and AutoCAD formats prior to the release of recycled water service.
- K. "Cross-Connection": Any unprotected actual or potential connection or structural arrangement between a public or a consumer's potable water system and any other source or system through which it is possible to introduce into any part of the potable system any used water, industrial fluid, gas, or substances other than the intended potable water with which the system is supplied. By-pass arrangements, jumper connections, removable sections, swivel or change-over devices and other temporary or permanent devices through which, or because of, backflow can occur, are considered to be cross-connections and are prohibited
- L. "Cross-Connection Test": Any test conducted by an American Water Works Association (AWWA) Cross-Connection Control Specialist to determine whether or

not an interconnection between a potable and non-potable system exists. It may be in the form of a differential pressure shutdown test, a dye test or by visual inspection (above grade only)

- M. "Customer/User": Recipient of recycled water service from the District.
- N. "District": Eastern Municipal Water District and/or the Staff thereof.
- O. "Inspector": Any person authorized by the District to perform inspections on or off the customer's site before construction, during construction, after construction and during operation.
- P. "Non-Potable Water": Water that is not acceptable for human consumption in conformance with Federal, State and local drinking water standards.
- Q. "On-grade Piping": Any piping whether permanent or temporary conveying recycled water that does not meet the minimum depth requirements as identified in section 2.02 or 3.03 herein.
- R. "On-site": Any and all recycled water facilities located on the downstream side of the meter. These are facilities that will be owned, operated and maintained by the customer.
- S. "Point of Connection (POC)": The point where the customer's system ties into the District's system. This is at the water meter at the service connection.
- T. "Ponding": Retention of recycled water on the surface of the ground or other natural or manmade surface for a period following the cessation of an approved recycled water use activity.
- U. "Public Facilities": Any and all recycled water facilities located on the upstream side of the meter, including the meter. These facilities are, or will be, owned, operated and maintained by the District.
- V. "Potable Water": Water approved for human consumption that conforms to the latest Federal, State and local drinking water standards.
- W. "PVC": Polyvinyl Chloride
- X. "Irrigation Construction Plans": A set of irrigation plans, details and specifications prepared under the supervision of and signed by a licensed landscape architect that conform to EMWD standards and specifications.
- Y. "Landscape Architect": A registered landscape architect licensed within the State of California and remains in good standing with the licensing board of the State Department of Architecture.
- Z. "Pre-Construction Conference": A meeting held at the District offices that includes the developer or assignee and developers contractor. The pre-construction conference is required prior to any construction activities.

- AA. "Record Drawings": Engineered drawings that depict the completed facilities as constructed or modified.
- BB. "Recycled Water": Tertiary-treated water produced from the treatment of municipal wastewater, as defined in Title 22, Division 4, Chapter 3, Environmental Health of the California Code of Regulations (Code).
- CC. "Recycled Water Agreement": An executed contract between the District and the customer, as a condition for obtaining recycled water service.
- DD. "Reduced Pressure Principal Backflow Prevention Device": A type of backflow prevention device used to protect the public system against non-health or health hazards. The assembly shall include two independently acting approved check valves together with a hydraulically operating, mechanically independent pressure relief valve located between the check valves and at the same time below the first check valve. To allow annual testing, the unit shall also include four resilient seated test cocks and two shutoff valves at each end of the assembly.
- EE. "Regulatory Agencies": Those public agencies legally constituted to protect the public health and water quality, such as California Department of Health Services, California Regional Water Quality Control Board, County of Riverside Department of Environmental Health, and the District.
- FF. "RFI's": Requests for information requested by the developer / contractor to the District in written format in response to the irrigation plans, details and specifications that are answered by the District Engineer.
- GG. "Runoff": When recycled water is allowed to drain outside the approved use area.
- HH. "Site Supervisor": The on-site recycled water supervisor shall be a qualified person designated by the recycled water user and approved by the District. This person shall have attended a site supervisor training class, be knowledgeable in the construction and operation of the recycled water and irrigation systems, and in the application of the Federal, State and local guidelines, criteria, standards, rules and regulations governing the use of recycled water.
- II. "Temporary Recycled Water Service": Recycled water service for construction and/or other temporary purposes, as determined by the District.
- JJ. "USC Foundation": University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCC&HR).
- KK. "Violation": Non-compliance with any condition or conditions of the *Recycled Water Agreement or BMP's* by any person, action or occurrence, whether willfully or by accident.
- LL. "Windblown Spray": Dispersed, airborne particles of recycled water that can be transmitted through the air to locations other than those approved for the direct application of recycled water.

1.06 APPLICATION PROCESS FOR RECYCLED WATER SERVICE

- A. Before submitting an application for irrigation water service, the applicant or his agent shall contact Eastern Municipal Water District New Business Department to determine the availability of recycled water service.
- B. Once availability of recycled water for the project has been confirmed by the District and the project has been determined to be a recycled water candidate, the applicant shall provide the District the following:
 1. Determination of feasibility of recycled water use for the proposed site (obtained from the District).
 2. Recycled Water Use Plan (RWUP). The specific requirements of a RWUP may vary between projects as determined and required by the District. Example requirements include project / regional demand studies, implementing facility requirements, Title 22 Engineering Report, etc.
 3. Recycled Water Use Exhibit (RWUE). Based on the project characteristics, the applicant will be required to provide the District a Recycled Water Use Overall Exhibit (project level) and/or a Recycled Water Use Specific Exhibit (tract level) per the latest revision of the "Recycled Water Use Exhibit Development and Graphic Standards Guide"..
 - a. The Multi-Tract Recycled Water Use Exhibit shall include as a minimum the following information:
 - Title
 - Assessor Parcel Number.
 - Scale
 - North Arrow
 - Vicinity Map
 - Date submitted
 - Street names
 - Proposed Maintenance Entity (Must be approved by identified Maintenance Entity)
 - DOPP Number (This information will be provided by the District).
 - Total project area in acre.
 - Proposed project phasing.
 - Proposed phasing schedule.

- All existing and/or proposed public facilities.
 - Proposed potable and recycled water irrigation use (commercial, industrial, park, streetscape, etc). To clearly identify the location(s) of potable and recycled water use, irrigation areas shall be identified as follow: blue color for potable areas and violet color for recycled water areas.
 - Total potable and recycled irrigation usage in acre(s) for the entire project.
 - Total potable and recycled irrigation usage in acre(s) for each proposed phase.
 - A Registered Civil Engineer or a Registered Landscape Architect shall sign the exhibit.
 - District approval signature block.
- b. The Single-Tract Recycled Water Use Exhibit shall include as a minimum the following:
- Title
 - Assessor Parcel Number.
 - Scale
 - North Arrow
 - Vicinity Map
 - Date submitted
 - Street names
 - Proposed Maintenance Entity (Must be approved by identified Maintenance Entity)
 - DOPP Number (This information will be provided by the District).
 - Tract Number.
 - All existing and/or proposed public facilities.
 - Proposed potable and recycled water irrigation use (commercial, industrial, park, streetscape, etc) per maintenance responsibility area. Each maintenance area shall be identified using colored coded hatch pattern.
 - Proposed potable and recycled meter size(s) and location(s).
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- Proposed Irrigated area for each meter.
- Irrigation Demand Calculation using the District’s Estimated Annual Water Use (EAWU) Equation.

$$EAWU \equiv \frac{(56.65)(k_s)(HA)}{(DE)(AE)(1200)}$$

For further information and definitions, applicant shall refer to the District “Guide for Preparing Water Budgets”, latest edition.

- Estimated Peak Demands per area – Annual, Monthly, and Daily.
 - Watering schedule including proposed duration and number of day(s).
 - Signature of a Registered Landscape Architect.
 - Proposed application method for recycled water. Spray, rotor, drip, flood bubbler, sub-surface, etc.
 - District approval signature block.
- C. Once the RWUP, RWUE and POS (if applicable) are approved, the applicant shall submit to the District plans of the proposed recycled water facilities including on-site irrigation to the District for review and approval. A plan check fee will be collected during the application process. Plans must be approved prior to the installation of any recycled water facilities.
- D. Commercial Projects, Schools and Parks identified as recycled water candidates shall be required to develop a specific RWUE as described in the Recycled Water Use Exhibit Development and Graphic Standards Guide.
- E. Prior to any recycled water service, the, applicant shall enter into an agreement with the District for the use of recycled water.
- F. The District will evaluate requests and, if applicable provide additional requirements, for the approval and use of recycled water in a building or other specific uses on a case-by-case basis.

1.07 DESIGN AND CONSTRUCTION CRITERIA

- A. Public recycled water system shall be designed in accordance with Section 2.
- B. On-site irrigation recycled water system shall be designed in accordance with Section 3.
- C. District will install recycled water meters up to 2-inch unless other arrangements are approved. All meters 3” and up shall be installed by the developer only after EMWD written approval.

D. Size and maximum flow rate of water meters:

Size	Maximum Flow		Size	Maximum Flow
2"	160 gpm		6"	2000 gpm
3"	350 gpm		8"	3500 gpm
4"	1000 gpm		10"	5500 gpm

*Note: The flow rates above represent the maximum continuous flow through the meter and do not take into account flow loss from the service lateral. For applicable service lateral size, refer to PB-10A and PB-1.

*Recycled water irrigation meters are to be INVENSYS (Model Series "W" with ECR & Absolute Encoder Technology

District reserves the right to size meters unless written request is submitted at the time application is made.

E. On-grade piping.

1. On-grade piping shall not be allowed where subject to adjacent pedestrian traffic or vandalism.
2. On-grade piping shall only be installed with prior approval from the District.
3. All recycled water on-grade piping including temporary construction water piping shall be permanently identified and marked for recycled water use.
4. Identification of on-grade piping shall consist of a printed pipe marker identifying the name of the pipe as a recycled water line "Recycled Water Line – Do not Drink" and a flow arrow to indicate direction(s) of flow in the pipe. All markers shall be preprinted. Markers shall be the mechanically attached type that is not easily removable. Markers shall consist of pressure sensitive legends applied to plastic backing which is strapped or otherwise mechanically attached to the pipe. Fasteners shall be non-metallic. Alternate methods of identification may be used only as approved by the District. Markers shall be designed for use in harsh environments where there's significant exposure to sunlight, heat, and/or chemicals.
5. Markers shall be installed at 10 feet intervals and/or as directed by the District Representative or as defined in the latest edition of the California Plumbing Code.

1.08 FEES / DEPOSITS / RATES

- A. The applicant shall be responsible for all deposits and fees related to plan check services and public and on-site inspection services.
- B. The applicant shall be responsible for the installation of all public and on-site facilities and shall reimburse the District for actual costs of labor, material and equipment associated with the plan check, hot tap(s), inspection and testing.
- C. All connection fees must be satisfied before meter will be approved for installation.
- D. Annual on-site recycled water system inspection and any required cross-connection tests will be performed by the District or it's Representative. The customer will be responsible for the fee associated with the actual cost of providing those services.
- E. The rate for recycled water service shall be determined for each separate recycled water application/project and may be based on the actual cost of service including any necessary public or on-site capital facilities financed by the District, cost of capital associated with Operations and Maintenance costs, administration and general expenses, and any potential fees/charges from other regulatory agencies.

1.09 SITE SUPERVISOR

- A. A Site Supervisor must be designated by the owner and approved by the District for every site where recycled water is used. Although the District retains ultimate responsibility for use of recycled water at all sites, the Site Supervisor is the primary means for ensuring safe use of recycled water at a given site.
- B. The following are some of the responsibilities of the Site Supervisor:
 - 1. Control over on-site uses of recycled water: The Site Supervisor is required to be familiar with the entire on-site recycled water system, and with all applicable conditions governing recycled water use at the site. The Site Supervisor shall ensure that recycled water use complies with those conditions. The Site Supervisor shall also be responsible for proper operation and maintenance of the recycled water system and of all backflow prevention devices.
 - 2. Training: Attended an approved 4-hour Site Supervisor training class, such as the Mount San Jacinto College Site Supervisor Training Class. Provide a copy of the certificate of attendance to the District. During its annual inspection of the facility, the District will discuss the customer's method of informing employees about recycled water use on the site.
 - 3. Contact Information and Notification of Changes: The Site Supervisor shall provide the District with an address and phone number(s) where he or she can be contacted at all times. The Site Supervisor shall notify the District of any change in the individual designated to be Site Supervisor, any change in contact information, and any planned modifications or planned additions to the recycled water system. Approval from the District shall be obtained before any modifications are made.

4. Failures and Violations: The Site Supervisor is responsible for notifying the District of any failure of the on-site recycled water system, any cross-connection between the recycled and potable water systems, or any inappropriate uses that occurs. For any condition which has the potential to endanger public health, the Site Supervisor shall immediately notify the District Water Operation Department.
5. Monitoring: The Site Supervisor shall be responsible for any monitoring specified in the customer's Recycled Water Agreement.

1.10 INFORMATION REQUIRED ON PLANS – PUBLIC FACILITIES

Requirements for public facilities are located in Chapter 7, Section 2, of the District's Standards and Specifications for Developers Projects.

1.11 INFORMATION REQUIRED ON PLANS - ON-SITE FACILITIES

Requirements for on-site facilities are located in Chapter 7, Section 3, of the District's Standards and Specifications for Developers Projects.

1.12 RECYCLED WATER SCHEDULING AND EMERGENCY CONNECTIONS

- A. The District reserves the right to control the use of recycled water by scheduling recycled water use to maintain an acceptable residual pressure in the recycled water system.
- B. The District reserves the right to temporarily supply potable water to its customers as an emergency supply via an air-gapped connection in the event recycled water is not available.

1.13 VIOLATIONS

- A. The District reserves the right to determine whether a violation of the customer's Recycled Water Agreement has resulted from any action or occurrence that is the responsibility of a customer. Insofar as the violation of the Agreement constitutes a violation of any regulatory agency requirement, the District shall make its determination with consultation on behalf of the concerned agency. Any fines associated with violation will be the responsibility of the customer.
- B. Violations include, but are not limited to, the following:
 1. Failure to maintain equipment and identification devices (signs, tags, etc.) in good working condition.
 2. Use of recycled water that results in excessive runoff, overspray, or ponding.
 3. Failure to report changes in the recycled water system to the District, including a change in the Site Supervisor.
 4. Use of recycled water for purposes other than specified in the customer's permit.

5. Use of hose bibs on the recycled water system.
 6. Creating an interconnection between the potable and recycled water systems.
- C. If the District's investigation results in the determination that a violation has occurred, then it shall be the responsibility of the customer to initiate corrective action. Pertinent violations will be documented and a copy of this notice will be hand-delivered or mailed to the customer.
1. A timetable for completing the corrective action should be negotiated with the District by the customer. Such corrections can involve human factors, such as additional training or procedural modifications, as well as physical alterations to the system. Corrections not made in accordance with the timetable shall result in the termination of service by shutting off and locking the meter.
 2. If, in the opinion of the District, the violation constitutes an immediate danger to the public health, then service shall be terminated immediately by shutting off the meter or service and locking it. Service shall be resumed only after the violation has been corrected to the satisfaction of the District.
 3. The customer is to maintain a written log of all system failures and violations, including corrective action taken. A copy of the failure log may be requested at any time by the District
 4. Penalties include assessment of monetary fines and/or suspension of service as determined by the District's Representative

1.14 NOTIFICATION OF REPAIRS OR MODIFICATIONS

Customers shall notify the District in writing of any significant proposed repairs or modifications to the on-site recycled water system. Notification shall include a sketch or drawing clearly delineating all changes. Approval shall be obtained from the District prior to implementation of the proposed repairs or modification. Customers shall record all changes on the site's record drawings and submit a copy to the District.

1.15 EMERGENCY PROCEDURES

- A. In the event of an emergency involving the recycled water system, the user shall immediately notify the District by calling central control at (951) 928-3777 Ext. 6265 or 6266 or by contacting the Recycled Water Program Coordinator at (951) 928-3777 Ext. 4412.
- B. Emergencies include, but are not limited to; line breaks in the distribution system and cross-connections between the user's potable and recycled water systems.
- C. In the event of a cross-connection at the user's site, the user shall immediately stop using potable water at the site and shall isolate the on-site potable water system from the public supply at the point of connection. Before potable water service can be resumed, the cross-connection must be removed and the site inspected and approved by the District. If it is determined that recycled water has entered the user's

potable water system, the system must also be disinfected and tested before service can be resumed.

- D. In the case of a major earthquake, the Site Supervisor must inspect the recycled water and potable water systems. If either of the systems is damaged, both the potable water system and the recycled water system shall be shut off at their respective points of connection. The Site Supervisor shall then notify the District and obtain further instructions.
- E. A customer may make emergency modifications or repairs to their system without prior approval of the District when this action will prevent contamination, damage to the system, or a public health hazard. The Site Supervisor shall notify the District of the modifications as soon as possible in order to set up an appointment for a follow-up inspection.

SECTION 2 RECYCLED WATER PUBLIC FACILITIES

2.01 GENERAL

- A. Design of all off-site recycled water facilities shall be as set forth for potable water systems, except as modified or expanded upon herein.
- B. Prior to the design or plan check of any recycled water public facilities, a recycled water use plan (RWUP) including a recycled water exhibit (RWUE) may be required to be submitted to the District and approved. Further information can be found in section 1.06.B and in the " Recycled Water Use Exhibit Design and Graphic Standards Guide "

2.02 DESIGN CRITERIA

- A. A licensed Civil Engineer registered in the State of California shall be responsible for the design of public recycled water facilities, including the preparation of plans and specifications.
- B. All recycled water facilities including pipeline size, alignment, and irrigation service connections must be consistent with and match the approved recycled water use exhibit (RWUE)
- C. Plans for public potable and recycled water systems in the same street or easement shall show both potable and recycled water mains on the same sheets of plans.
- D. Depth of Cover

The top of recycled water transmission pipelines must be a minimum of 66 inches below the finished grade, unless otherwise approved. When recycled and potable water mains are to be installed in the same street or easement, the top of pipe of the recycled water main shall be 12 inches below the bottom of the potable water main. When crossing other utilities, including recycled water laterals, the designer shall indicate on the plans the elevation of the top of the recycled water pipe and the elevation of the bottom of the utility pipe or vice versa.

- E. Standard Location

Recycled water mains shall be located on the northern or eastern side of the street centerline and 7 feet from face of curb or as directed by the District's Representative.

- F. Horizontal Separation

- 1. Horizontal separation shall adhere to the Department of Health Services "GUIDANCE CRITERIA FOR THE SEPARATION OF WATER MAINS AND NON-POTABLE PIPELINES".
- 2. A 4-foot horizontal clearance measured from outside of pipe barrel and/or sleeve shall be maintained at all times when a new recycled water pipeline is built parallel to an existing potable water pipeline. Common trench construction

is not permitted. Horizontal separation of less than 4 feet is not allowed unless authorized in writing by the District and CDPH.

G. Vertical Separation

1. Vertical separation shall adhere to the Department of Health Services "GUIDANCE CRITERIA FOR THE SEPARATION OF WATER MAINS AND NON-POTABLE PIPELINES".
2. At crossings of potable water, recycled water, and/or sewer pipelines, pipelines shall be located from the ground surface in order of descending quality, with potable water above recycled water and recycled water above sewer. The minimum vertical separation shall be 12 inches between the outside top and bottom surfaces of pipes. If a 12-inch vertical separation is not possible, approval must be obtained from the District and CDPH.

H. Recycled Water Identification

1. All new buried constant and intermittent pressure mains and transmission and distribution piping in the recycled water system, including service lines, valves and other appurtenances shall either be colored purple and embossed or be integrally stamped/marked "**CAUTION: RECYCLED WATER – DO NOT DRINK,**" or be installed with a purple identification tape, and a purple polyethylene vinyl wrap.
2. Identification: All pipe stenciling shall be by pipe manufacturer
3. Existing potable or non-potable water lines that are being converted to recycled water use shall first be accurately located and tested in accordance with regulatory requirements. If required, the necessary actions to bring the line and appurtenances into compliance with regulatory standards shall be taken. If the existing lines meet approval of the Recycled Water Operations Department and CDPH, the lines can be approved for recycled water distribution. If verification of the existing lines is not possible, the lines shall be uncovered, inspected, and identified as necessary prior to use.
4. Buried ductile iron pipe and fittings shall be wrapped with a purple colored polyethylene membrane conforming to ANSI A21.5, and installed in accordance with AWWA C105. The polyethylene sheets shall be 8 mils thick, minimum, and be colored purple similar to Pantone 522C.
5. Tracer wire shall be installed along those portions of recycled water main located outside existing or future street pavement. Tracer wire shall be installed as shown in the Details.

6. Identification Tape

- a. Identification tape shall be prepared with white or black printing on a purple field (Pantone 522C) having the words "CAUTION: RECYCLED WATER – DO NOT DRINK." The overall width of the tape shall be at least 3 inches.
 - b. Identification tape shall be installed on the top of the distribution piping longitudinally and shall be centered over the pipe. The identification shall be continuous in its coverage on the pipe and shall be fastened to each pipe length no more than 10 feet apart. Tape attached to sections of pipe before they are placed in the trench shall have flaps sufficient for continuous coverage. Other satisfactory means of securing the tape during backfill of the trench may be used if suitable for the work, as determined by the District Representative.
 - c. The identification tape differentiating the recycled water piping from other utility lines shall be consistent throughout the service area or demand center.
- I. The minimum size distribution main shall be 6 inches. The District shall be the final authority concerning the size and pressure rating of the distribution main.
 - J. Recycled water mains and appurtenances shall be identified with purple-colored coding and identification labels and signs as identified throughout these Standards Specifications.
 - K. Public recycled water mains shall be designed with service laterals perpendicular to the main. Service laterals shall be identified with a purple sleeve or tape that visibly extends to the angle stop. Service laterals shall be a minimum of 2-inch in size unless authorized by the District. Larger sized laterals may be required. A service lateral shall be designed for each lot or area to be served with recycled water only as identified by the approved RWUE. A service lateral shall generally not be designed to serve opposite sides of a street or easement and shall not be located in street medians or center islands.
 - L. Public recycled water systems shall not be designed with fire hydrants, wharf heads, or other appurtenances which would allow recycled water to be used for other than the approved uses unless the appurtenances are expressly approved by the District.
 - M. Public recycled water mains shall not be designed with temporary connections unless expressly approved by the District. When permitted, temporary connections shall be located, sized, and designed according to the requirements of the District.

2.03 PRODUCT

- A. Pipeline Materials

1. Materials for public recycled water systems shall generally consist of those specified for potable water systems as detailed in the current District's Standards and Specifications for Developer Projects.
2. PVC pipe for recycled water system applications and related gate well casings shall be manufactured in the purple color (Pantone 522C). The PVC pipe shall be integrally stamped and/or marked on both sides of the pipe with the wording "CAUTION: RECYCLED WATER – DO NOT DRINK." The lettering shall be minimum 1-inch-high black letters and be repeated every 30 inches. The purple coloring shall be achieved by adding pigment to the PVC material as the pipe is being manufactured.
3. Where PVC pipe cannot be used because of size, depth, or load restrictions, an alternative pipe must be installed, subject to approval by the District. A purple identification tape shall be secured every 3 feet to the top of the pipe. Ductile iron pipe shall conform to Section 15057. Steel pipe shall conform to Section 15061.

B. Valves

1. Valves shall be located as follows:
 - a. At all branches or intersections of mainlines in each direction from such branches or intersections, unless otherwise approved by the District.
 - b. After an end of line blow-off assembly.
 - c. Where the District determines that it is impractical to shut down a "live" main to facilitate a connection, a tapping sleeve with a tapping valve may be used upon written authorization by the District.
 - d. A minimum, every 2,500' of continuous mainline 12-inches and larger / every 1, 000' of continuous mainline 8-inches and smaller.
 - e. As directed by the District' Representative
2. Valves between 4 inches and 12 inches in diameter shall be resilient seat gate valves in accordance with Section 15102.
3. Valves larger than 12 inches in diameter shall be "high-performance" butterfly valves in accordance with Section 15103.

C. Valve Boxes

1. All valve boxes for recycled water facilities shall have triangular valve box covers with the inscription "RECYCLED WATER" cast thereon per Standard Drawing PA-2.
2. All recycled water valve covers shall be painted purple (Pantone 522).

D. Blow-off Assemblies

1. Blow-off assemblies shall be installed at the end of all lines, at all low points, or as directed by the District's Representative. **A minimum of two blow-off assemblies are required between mainline valves and as close as practical to each valve.** Blow-off assemblies shall be per PA-1.
2. The pipeline tap for the assembly shall be no closer than 18 inches from a valve, coupling, joint, or fitting unless it is at the end of the pipeline.
3. The discharge from blow-offs shall be designed to drain into a sewer. Discharge of recycled water to storm drains is restricted. If there is no sewer that can receive the discharge from a blow-off, the Santa Ana Regional Water Quality Control Board and CDHS shall be consulted regarding acceptable alternatives.

E. Air Vacuum and Air Release Valves

Air vacuum and air release valve assemblies shall be installed at all high points and immediately downstream of line valves. Air vacuum and air release valve assemblies shall be as shown on the Standard Drawings and sized in accordance with standard practice. Calculations for sizing air and vacuum valves shall be submitted for review by the District.

F. Devices and appurtenances such as air valve assemblies, backflow preventers, blow-off assemblies, butterfly valves, resilient seated gate valves, services and other items shall be provided in accordance with the various applicable Sections of these Standards & Specifications, Standard Drawings, and Approved Materials List. Color coding and other identification shall be provided as indicated below.

G. Miscellaneous materials such as gate wells, meter boxes, warning tape, tracer wire, copper tubing, ductile iron fittings, brass and bronze fittings and devices, and all related items shall be provided in accordance with the various applicable Sections of these Standards & Specifications, Standard Drawings, and Approved Materials List. Color coding and other identification shall be provided as indicated hereon.

H. Warning Signs and Labels

1. Warning signs and labels shall be post mounted aluminum or vinyl, self adhesive with peel off paper backing, or tag type labels, bearing the warning "RECYCLED WATER – DO NOT DRINK" and "PELIGRO: AGUA IMPURA – NO BEBER", along with the international "DO NOT DRINK" symbol. Warning labels and signs shall have a purple background; color Pantone 522C, with contrasting lettering and markings. The minimum thickness shall be 4 mils for adhesive backed labels and 10 mils for tag type labels. Warning labels shall be firmly attached to all appurtenances with heavy-duty nylon fasteners.
2. In all cases, warning signs and labels must be approved by the District prior to installation. Failure to receive prior approval may result in the owner, applicant, or customer removing such sign(s) and providing approved replacements(s). All costs will be at the applicant's expense.

2.04 RECYCLED WATER STANDARD DRAWINGS

The following is a list of the commonly reference recycled water standard drawings. These drawings are located in Chapter 8 of these Specifications.

PA- 1	Recycled Water 6" Blow-off
PA-2	Recycled Water Valve Cap & Riser Detail
PB- 1	Metered Service Line 3" & Larger Recycled Water Service
PB-3	Recycled Water 1" Air Valve Cover Assembly
PB-4	Recycled Water Installation of Vertical Gate Valves
PB-5	Recycled Water Steel Pipeline Installation
PB-6	Recycled Water Pipe Installation for Ductile & P.V.C. Pipe
PB-8	1" Air Valve Installation
PB-9	2" Air Valve Installation
PB-10	2" Recycled Water Meter Service
PB-10A	2" Recycled Water Service Connection Only
PB-11	1-1/2" Recycled Water Meter Service
PB-12	1" Recycled Water Meter Service
PB-13	3" Recycled Water Meter Service
PB-14	4" Recycled Water Meter Service
PB-15	6" Recycled Water Meter Service
PB-16	8" Recycled Water Meter Service
PB-17	Agricultural Above Ground Metered Service - Recycled Water

2.05 RECYCLED WATER NOTES

Use only those notes determined appropriate by the Design Engineer, with appropriate standards to be selected by him/her.

A. Detailed Requirements

(List on recycled waterline layout for subdivision improvements and on front sheet of the construction plans where they are not the same).

1. Recycled water pipeline and appurtenant construction shall be in accordance with EMWD Standards and Specifications.
2. Prior to construction of pipeline, contractor shall expose existing recycled water system and verifying its existing elevation and location.
3. All service connections shall be 2-inch services, unless otherwise noted, and shall be located as shown on the plans and adjusted as necessary to miss

driveways. Irrigation Services shall be installed in accordance with Std. Dwg. PB-10A or PB-1.

4. Blow-offs shall be installed in accordance with Std. Dwg. PA-1.
5. Fire hydrants assemblies or hose bib connections are not allowed on a recycled water system.

2.06 EXECUTION

- A. In general, public recycled water facilities shall be installed in accordance with the requirements for potable water materials and facilities as detailed in the current District's Standards and Specifications for Developer Projects.
- B. Field Identification – Recycled water piping and appurtenances shall be identified with purple-colored coding and identification labels and signs as specified herein.
 1. PVC pipe and related gate well casings shall be colored purple as manufactured. If purple-colored PVC in the specified size or class is not readily available from suppliers, standard colored PVC pipe may be used and sleeved with an 8 mils purple-colored, high-density polyethylene encasement sleeve that totally encloses the pipe.
 2. Buried items including service laterals that are not available from the manufacturer in the purple color shall be identified in the field by means of utility identification tape applied to the surface of the items. Valves, ductile iron fittings and similar items shall receive a band of the tape applied circumferentially at the ends of the fittings adjacent to connections to the adjoining piping sections, and to the operator portions of gate and butterfly valves. The identification tape shall also be used to secure the polyethylene wrap specified for the various piping materials and appurtenances. Copper tubing and appurtenant bronze fittings shall be identified by means of utility identification tape applied continuously along the upper surface of the entire length of the line. The identification tape shall visibly extend into the meter box.
 3. Meter and blow-off boxes shall be colored purple as manufactured.
 4. Accessible items that are not available from the manufacturer in the purple color, such as those located at grade, above ground and within meter boxes and vaults shall be identified in the field by means of a paint coating in the purple color. Meters, blow-off piping and blow-off box covers or blow-off manhole covers, valve box lids, air valves and enclosures, piping, valves, backflow devices and all other items either accessible or exposed to view, shall be identified by means of the purple coating or integral purple color. The coating system shall be suitable for the substrate material and the degree of protection required for the various items, in accordance with these specifications.
 5. Locator wire shall be installed in accordance with Section 02718 of these Standards and Specifications.

6. Identification tape shall be installed over the pipe longitudinally 2 feet below the finished surface and centered over the pipeline. The identification tape must be continuous in its coverage of the pipeline and fastened to each pipe section. Taping attached to sections of pipe before they are placed in the trench must have overlaps sufficient for continuous coverage. During trench backfill other means of securing identification tape may be used (if suitable for the work) as determined by the District.

C. Labels and Signage

1. Labels shall be installed on recycled facilities exposed to view including above ground piping and appurtenances, meter and blow-off box covers, and where indicated on the Approved Plans. Signs shall be installed where necessary and as indicated on the Approved Plans or by the District's Representative.
2. In a fenced area (e.g. pump station area), at least one sign shall be posted on the fence that can be readily seen by all operations personnel utilizing the facility.

D. Disinfection and Bacteriological Testing

In the event the recycled water mains are installed with provisions for future use for transporting recycled water, but will initially transport potable water, disinfection, flushing, and bacteriological testing shall be performed in accordance with Section 02718 of these Standards and Specifications.

E. Hydrostatic Testing

Potable water shall be used for filling, flushing, and hydrostatic testing. Field hydrostatic testing shall be performed in accordance with Section 02718 of these Standards and Specifications.

F. Backflow Prevention

During the course of flushing, disinfection, and hydrostatic testing of the recycled water mains, an appropriate reduced pressure backflow prevention device shall be installed on the potable source piping to isolate the potable from the non-potable system. All backflow devices shall be on the current University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCC&HR) list of "Approved Backflow Prevention Assemblies".

2.07 FUTURE USE OF RECYCLED WATER

In those areas where the District has determined that recycled water will be supplied in the future but is not currently available, recycled facilities shall be installed as detailed in this Section. Only landscape service laterals as identified on the RWUE shall be allowed unless authorized by the District and CDPH. Provisions for future connection to the permanent recycled water system shall be included in the initial installation of the system as directed by the District. In the interim, the new recycled system will be supplied with potable water via a temporary connection performed by the contractor as directed by the District. This temporary service connection shall be

provided in accordance with the Standard Drawings and shall incorporate a master RP backflow prevention device located and installed in accordance with Standard Drawing B-597. Connections between public recycled water mains and potable water mains shall only be permitted when the recycled water main is to temporarily convey potable water. No connection of any other kind shall be permitted between the potable water and recycled water mains. In the future, the owner shall be responsible to remove the temporary service and transfer the main to a permanent connection to the recycled system when it becomes available.

2.08 EMERGENCY POTABLE WATER SUPPLY

Potable water may be used by the District as an emergency source of supply to serve recycled customers. All potable water connections must be approved by the District, be properly air-gapped, inspected, and meet the requirements as described in DOHS policy Memo 95-004, dated August 11, 2001. The potable system shall never be directly connected to the recycled system.

3.01 GENERAL

- A. The following design criteria applies to all on-site recycled constant pressure lines 6" or smaller. For recycled mains larger than 6", the user shall refer to Section 2 "RECYCLED WATER PUBLIC FACILITIES".
- B. In accordance with the goals of the District, the uses of recycled water include only those uses approved by the State of California Department of Public Health (CDPH) and for which Title 22 of the California Code of Regulations provides treatment requirements. Prior to approving recycled water use, the District at its discretion, set forth specific requirements as condition to provide such services and/or require specific approval from the appropriate Regulatory Agencies.
- C. Design of all on-site facilities including, but not limited to, landscape irrigation systems, agricultural irrigation systems, systems used for industrial process or construction purposes, cooling towers, or recreational impoundment systems shall conform to the provisions set forth herein and to any conditions, standards, and requirements set forth by the District in addition to these standard specifications. The project owner should contact the District prior to system design and assure that the intended use of the recycled water is an approved use. Final determination as to whether or not the intended use of the recycled water is appropriate (uses as approved by the Regional Board, Health Department or EMWD Board of Directors) is the responsibility of the District Chief Engineer.

3.02 PROHIBITIONS AND LIMITATIONS

The design, installation, and use of recycled water shall conform to the following:

- A. Cross connections between potable and recycled water facilities is strictly prohibited.
- B. Hose Bibs: Use or installation of permanent hose bibs on any customer water system that presently operates or is designed to operate with recycled water, regardless of the hose bib construction or identification, is prohibited.
- C. A recycled water user is not allowed to give or sell recycled water to another party.
- D. Drinking fountains shall be protected at all times from recycled water mist and overspray in a manner approved by the District.
- E. Swimming pools: Recycled water shall not be used within the immediate fenced perimeter of swimming pools, spas or other recreational uses unless specifically authorized by the District.
- F. Baseball fields: There shall be no recycled water quick couplers located within the infield.

- G. Runoff conditions: The system shall be designed, constructed, and operated to minimize runoff conditions outside of the Approved Use Area.
- H. Ponding Conditions: The system shall be designed, constructed, and operated to minimize ponding conditions within or outside of the Approved Use Area.
- I. Windblown Spray Conditions: The system shall be designed, constructed, and operated to minimize windblown spray conditions outside of the Approved Use Area.
- J. Overspray: Recycled Water shall not be sprayed on people, food handling facilities, drinking fountains, or picnic areas.
- K. There shall be no recycled water quick couplers located within 25 feet of drinking fountains or picnic areas.
- L. Food preparation, outdoor eating and designated children play areas must not be subject to recycled water overspray by selection of landscape material, irrigation design or other method as specifically approved by the District.
- M. Disposal in Unapproved Areas: Disposal of recycled water for any purposes, including approved uses, in areas other than those specifically approved by the District and without the prior knowledge and approval of the governing regulatory agencies, is prohibited.
- N. Unapproved Uses: Use of recycled water for any purposes other than those specifically approved by the District, is prohibited.
- O. The recycled system shall be designed to irrigate the approved area within the allowable time period as set forth in these specifications.
- P. Interconnection of irrigation pressure supply lines originating from more than one landscape water meter is strictly prohibited.

3.03 DESIGN CRITERIA

- A. The design of on-site recycled water facilities, including the preparation of plans and specifications, shall be under the responsibility of a licensed Landscape Architect or Civil Engineer registered in the State of California. A Declaration of Responsible Charge shall appear on the title sheet of the plans.
- B. The design of on-site recycled facilities shall conform to the most current provisions set forth herein, and to any other conditions, standards, and requirements set forth by the District. Landscape irrigation systems shall be designed and approved in accordance with the Districts "Guidelines for the Submittal of Onsite Recycled Water Irrigation Plans".
- C. Validity of Signed Plans

Plans will be valid for six (6) months from the date of District approval. If construction has not started within six (6) months from date of approval, plans shall become "null and void". After that date the District will require re-submittal and re-checking of the

plans for conformance to the then current standards. The District reserves the right to charge plan check fees for the re-submittal.

- D. On-site recycled water systems shall be installed to operate during periods of minimal public use of the area. The total time required to irrigate the design area shall not exceed nine (9) hours in any 24-hour period. The system shall be installed to operate between the hours of 9 PM and 6 AM.

- E. Horizontal Separation

The horizontal clearance between on-site recycled and potable lines shall be a minimum of 48 inches, measured between outside diameters.

- F. Vertical Separation

In general, on-site recycled water lines shall be installed below potable water lines, with a minimum vertical separation of 12 inches, measured between outside diameters. Exceptions to this general requirement are as follows:

1. Recycled water lines may be installed above potable water lines where the recycled lines (laterals) are intermittently pressurized. No special construction requirements are necessary, provided the 12-inch vertical separation is maintained.
2. Constantly pressurized recycled water lines may be installed above potable water lines provided that recycled line is sleeved. Sleeving shall extend ten (10) feet each side from the centerline of the potable line, for a total length of twenty (20) feet. The sleeve shall be purple PVC minimum CL-200. A 4-inch minimum clearance must be maintained at all times.

- G. In those areas where recycled water is not immediately available, and the District has determined that recycled water will be supplied in the future, the on-site facilities shall be designed to use recycled water. Provisions shall be made, as directed by the District, to allow for connection to the recycled distribution main when it becomes available. In the interim, potable water shall be supplied through a temporary potable water connection using a reduced pressure principal backflow device installed per Std. Dwg. B-597. The on-site system will be connected to the recycled water distribution main per the requirements of the District's Standards & Specifications at the time the connection is made. Water rates for interim supplies shall be based upon the interim source, as set forth in the Schedule of Rates and Charges, Exhibit "B" to Ordinance No. 68. Any connection(s) to a potable system shall be completely removed prior to connecting the system to recycled water.

- H. On premises using both recycled water and potable water, the potable water supply must be protected against any accidental cross connections by the use of a reduced pressure backflow prevention assembly. All backflow devices shall be on the current University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCC&HR) list of "Approved Backflow Prevention Assemblies," and shall be tested and certified prior to final approval. The backflow prevention device shall be installed per B-597. When recycled water becomes available the District will remove and return the backflow prevention device to the

owner, if appropriate, and make the connection to the on-site facility at the owner's expense. Should the on-site system require any modification prior to conversion, it shall be completed by the owner at the owner's expense. All work is to be completed in a timely manner as directed and approved by the District.

- I. Permanent on-grade pipe shall utilize PVC SCH 40 (or approved equal) UVR Resistant Purple Pipe. Irrigation heads and nozzles may be plastic but shall be identified with purple integral plastic or purple attachments made specifically for the product being used. All on-grade lines shall be secured to slopes every 10 feet. The ends of all laterals shall also be staked. Stakes shall be installed so as to not create a safety hazard.
- J. Backflow prevention devices will be required on recycled water services on an as needed basis. However, in accordance with the District's Backflow and Cross-Connection Prevention Program, Ordinance No. 69, backflow prevention devices will be required on potable water services where an alternate water source (i.e. wells or recycled water) is also supplied to the property.
- K. An approved RP backflow prevention assembly will be required to be shown on the irrigation plans and installed when chemical injection system is used at any time.
- L. Depth of Cover:

For on-site recycled water piping, the minimum depth from finished grade to top of pipe (minimum cover) shall be as follows:

- 1. Constant pressure lines 6 inches: 36"
- 2. Constant pressure lines 3 inches and 4 inches: 24"
- 3. Constant pressure lines 2 ½ inches and smaller: 18"
- 4. Intermittent pressure lines: 12"

Where piping is under paved areas, these dimensions shall be considered below sub-grade.

- M. Fire hydrants wharf heads, or other appurtenances shall only be included in the design when these appurtenances are expressly approved by the District and CDPH.
- N. On-site recycled irrigation systems shall be designed to provide a physical separation between adjacent areas irrigated with potable water. The means of separation shall be provided by either distance, concrete mow strips, approved fence or other approved means. Where concrete mow strips or other means are used, they shall be shown on the plans.
- O. On-site recycled water system designs shall include automatic system control devices which can be easily adjusted to minimize ponding and runoff.

3.04 ON-SITE POTABLE FACILITIES

- A. Potable mains shall be white or blue -colored PVC mains conforming to the District's Standards and Specifications.
- B. Quick-coupling valves shall **not** be acme threaded, shall have a cover made of brass, yellow rubber, or vinyl, and shall not be located in areas where they can be submerged with recycled water.
- C. On-site potable system shall have no purple markings.

3.05 CONTROL OF RUNOFF FROM ON-SITE IRRIGATION SYSTEMS

- A. The District encourages new and innovative methods of irrigation. The use of drip or subsurface irrigation may prove effective in the reduction of total water consumption and control of unnecessary over spray and runoff by containment of the water to the use area.
- B. In accordance with the requirements of the District's Ordinance No. 68 for control of runoff and the areas to which recycled water is applied, the design of irrigation systems shall conform to the following:
 - 1. The on-site recycled water irrigation system shall be designed to meet the peak moisture demand (plant water requirement) of all plant materials used within the use area. The use of moisture sensors is encouraged.
 - 2. On-site recycled water facilities shall be designed to prevent discharge onto areas not under control of the customer. Part-circle sprinklers shall be used adjacent to roadways and property lines to confine the discharge from sprinklers to the use area.
 - 3. The total time required to irrigate the use area shall be approved by the District. Irrigation systems shall be designed to operate within this time requirement.
 - 4. Recycled water shall be applied at a rate that does not exceed the infiltration rate of the soil. Where varying soil types are present, the design of the recycled water facilities shall be compatible with the lowest infiltration rate present. Copies of the Developer's soils test reports shall be made available to the District upon request.

3.06 PRODUCTS

- A. On-site recycled water pipe shall be solid purple PVC conforming to the following:
 - 1. 2-inch and 3-inch pipes shall be CL 315. 2-inch and smaller pipe shall be Schedule 40. Pipe shall conform to ASTM-D1784, Type 1, Grade 1, PVC-1120 for Schedule 40, or ASTM-D2241, Type 1, Grade 1, PVC-1120 for SDR rated pipe. Ends shall be solvent welded joints conforming to ASTM-D2672.
 - 2. 4-inch and 6-inch pipes shall conform to AWWA C900 (Class 150 DR 18) with elastomeric ring bell-type ends, conforming to ASTM-D3139. See Section

15064. Where purple pipe is unavailable, 0.008-inch (8 mils) purple plastic sleeve material may be used.

3. PVC pipe for recycled water system applications and related gate well casings shall be manufactured in the purple color (Pantone 522). The PVC pipe shall be integrally stamped and/or marked on both sides of the pipe with the wording "CAUTION: RECYCLED WATER – DO NOT DRINK." The lettering shall be minimum 1-inch-high black letters and be repeated every 30 inches. The purple coloring shall be achieved by adding pigment to the PVC material as the pipe is being manufactured.
- B. Fittings for PVC pipe shall conform to the following:
1. 3-inch and smaller pipe shall use solvent weld joint type fittings, minimum Schedule 40, with a working pressure rating no lower than that of the pipe. Schedule 40 fittings shall conform to ASTM-D2466 and Schedule 80 fittings to ASTM-D2464 and D-2467. PVC solvent cement shall conform to ASTM-2564.
 2. 4-inch and 6-inch pipe shall use either mechanical joint ductile-iron Class 350 fittings conforming to AWWA C153; or grip tite fittings conforming to AWWA C110 and C111.
- C. Plastic warning tape shall be an inert plastic film specially formulated for prolonged underground use and shall be prepared with black printing on a purple field (Pantone 522), having the words "CAUTION: RECYCLED WATER" at approximately 12-inch intervals. Lettering shall be a minimum of 2 inches high. The minimum thickness of tape shall be 4 mils. The overall tape width must be at least 3 inches.
- D. Quick-coupling valves shall be acme thread type for operation with a special coupler key. They shall be constructed of brass with a solid purple-colored locking rubber or vinyl cover. The locking cover shall have the warning "NON-POTABLE- DO NOT DRINK" in English and Spanish, and the International "DO NOT DRINK" symbol. The warnings shall be permanently molded into the cover.
- E. Sprinklers, rotor heads and other types of dispersion heads shall have the exposed surface colored purple. The exposed surface shall be colored through the use of integrally molded purple plastic or permanently attached purple plastic ring or disc.
- F. Valve boxes shall be purple per industry standards with solid purple-colored lids. The lids shall have the warning "NON-POTABLE- DO NOT DRINK" in English and Spanish and the International "DO NOT DRINK" symbol. The warnings shall be permanently molded into the lid.
- G. Valves shall have their exterior surface painted purple and be tagged with identification tags. The purple paint shall be as listed on the District's Approved Materials List. Identification tags shall be 3 inches by 4 inches weatherproof purple plastic. The plastic tags shall be imprinted in black permanent markings with the words "WARNING RECYCLED WATER - DO NOT DRINK" on one side and "AVISO, AGUA IMPURA – NO TOMAR" on the opposite side.

- H. Identification tags shall be plastic film, WEATHERPROOF, with the words “WARNING RECYCLED WATER - DO NOT DRINK” imprinted on one side, and “AVISO, AGUA IMPURA – NO TOMAR” on the other side. Imprinting shall be permanent. One tag shall be attached to each valve (control valve, strainers, pressure regulator, quick couplers, and isolation valves) as follows:
 - 1. Attach to valve stem directly or with plastic tie-wrap, or
 - 2. Attach to solenoid wire directly or with plastic tie-wrap, or
 - 3. Attach to valve cover with existing valve cover bolt.
- I. Warning labels and signs shall be required and installed per the approved plans or as directed by the District’s Representative. As a minimum, signs shall be installed at impoundments, ingress and egress points, and on the exterior front panel of irrigation controllers. Labels and signs shall be submitted to the District Engineer for approval prior to installation. The labels and signs shall notify that the system contains recycled water that is unsafe to drink. Labels shall be inert plastic film, WEATHERPROOF, with black printing on a purple field having the words: “WARNING RECYCLED WATER - DO NOT DRINK” and “AVISO, AGUA IMPURA – NO TOMAR.” Imprinting shall be permanent. The minimum thickness shall be 4 mils. They shall be in English and Spanish with the International “DO NOT DRINK” symbol.
- J. Strainers shall be located above grade, have a 30-mesh or finer screen, and shall be inline flushable. Strainers shall at least be the same nominal size as the service meter and shall have a ball valve on the strainer leg for flushing. Strainers shall be designed and installed in a manner to prevent public access. If designed as “auto-flush”, the flush line must be hard-piped to a gravel leach pit sized to handle the entire flush cycle. Hard piping must maintain an approved “air gap” from the leach pit equivalent to twice the pipe diameter. The flush flow rate must be regulated to maintain constant flow. The basis of design for the sizing of gravel leach pit may be required to be submitted to EMWD. Manufacture cut sheets of all strainers shall be submitted for review and approval at the EMWD preconstruction conference and prior to any construction activities.

3.07 EXECUTION

- A. The District, the Regional Water Quality Control Board, and CDPH shall have the right to enter upon the customer’s premises during reasonable hours, from time to time, to verify that the customer’s irrigation practices conform to these Standards and Specifications. Where necessary, keys and/or combination locks shall be used upon request by the District to provide such access.
- B. On-site recycled water facilities shall not be installed until the irrigation plans have been approved by the District and a pre-construction meeting has been held with the Field Engineering Department. If any portion of the on-site recycled system is installed prior to plan approval and/or inspection, all or any portion of the system shall be exposed and corrected as directed by the District or by the District’s Representative.

- C. On-site recycled water facilities shall be installed as shown on the approved plans by a qualified licensed Contractor with a Class “A” General Engineering or Class “C-27” Landscape Specialty License. Deviations from those plans by the installer shall not be permitted until the revised plans have been submitted to, and approved by, the District.
- D. On-site recycled water systems shall be installed to prevent discharge onto areas not under control of the owner. Appropriate irrigation components shall be employed in the installation to confine the discharge to the approved use area. The installation shall avoid spray patterns which discharge onto obstructions that tend to concentrate water to produce ponding and/or runoff.
- E. Booster Pumps. The pumping system shall be clearly identified as recycled water and designed to avoid the release of recycled water in an uncontrolled manner.
- F. Warning/Identification Tape shall be installed as required on all on-site potable and recycled lines.
- G. Signs or labels must be posted on pump cabinets and controller stations. Recycled water sprinklers and spray heads must have purple cap, purple collars, or the risers must have a recycled water decal. Large throw heads must have purple inserts. Purple caps and collars must be firmly affixed to the sprinkler head. All other above ground equipments must be colored purple or have a “recycled water do not drink” decal or sign.
- H. Hydrotesting shall be performed on all constant pressure lines in the presence of the District Representative. All joints shall remain open for inspection during the test. The test pressure shall be at either 150 psi or 50 psi above the pressure rating of the pipe, whichever is greater, and shall be maintained for a minimum duration of 2.5 hours. No leakage (drop in pressure) shall be allowed. If leakage exceeds this rate, the leak points shall be located and repaired, and the hydrotest repeated until there is zero leakage.
- I. Only potable water shall be used for hydrotesting, flushing, the operational test and the cross connection test (if required). Potable water shall be supplied through a separate temporary water meter obtained from the District and located at a District-approved potable water source. A reduced pressure principal backflow device shall be installed at ground level immediately downstream of the temporary potable water meter and tested before service. A temporary high line shall be installed to supply the proposed recycled irrigation system during the construction and testing period. Contractor to provide all necessary equipment to accomplish the work.
- J. A recycled water irrigation controller map shall be prepared and submitted to the District prior to commencing service. The map shall be prepared as follows:
 - 1. Provide one map for each automatic controller showing the area covered. The map shall be 11” x 17” in size.
 - 2. The controller map is to be a reduced drawing of the actual system. The line weights and lettering on the original controller map drawing shall be so drawn that, when reduced, it is clearly legible.

3. The controller map shall be a blackline print with a different color used to show area of coverage for each station and subsystem.
4. When completed and approved, the maps shall be hermetically sealed between two pieces of clear, colorless plastic, each being a minimum of 0.010 inch or 10 mils thick.

3.08 INSPECTION AND TESTING REQUIREMENTS

A. Pre-construction Conference

1. A pre-construction conference will be held at Eastern Municipal Water District prior to any construction. The owner or owner's representative and contractor shall be in attendance.
2. To schedule a pre-construction conference, call the Eastern Municipal Water District Field Engineering Department at (951) 928-3777 ext. 4830.

B. Construction Inspection

1. CDPH requires that the District or designated representatives conduct on-site inspections during the construction phase to ensure that materials, installation and procedures are in accordance with the approved plans, specifications, and all applicable regulations.
2. The Eastern Municipal Water District Water Operation Department shall be notified two working days prior to the start of construction at (951) 679-3222. All work performed without benefit of inspection shall be subject to rejection and removal.
3. The District inspector shall be immediately notified if construction work is anticipated to stop for a duration of two or more weeks.

C. Cross-Connection Control Shutdown Test

1. At sites where both recycled water and potable water systems are present, a cross connection shutdown test will be performed before final approval is given to energize the two systems. This test is to ensure that there is absolute separation between the two systems. The cross-connection control test is based in law on Section 13521 and 13523 of the California Water Code, Sections 60314 and 60316 of the proposed Title 22 and Section 7604 of Title 17 of the California Code of Regulations (CCR) and Chapter 7, Sections 11680 and 16805 of the California Health and Safety Code.
2. The cross-connection test will be performed by an AWWA Cross-Connection Control Specialist (Specialist) in the presence of the Site Supervisor and contractor. Representatives from the CDPH may be present as well. A written report will document the test results.
3. The initial cross-connection test procedure is as follows:

a. Site Survey

- (1) The Specialist shall conduct a survey of the site to be tested based on USCFCCC&HR's most current edition of the manual.
- (2) Prior to the initial survey both potable and recycled systems must be completed. If changes are required, they must be inspected or retested. The Specialist shall note any actual/potential cross-connections. Any actual cross-connections must be brought to the attention of the Site Supervisor to be eliminated immediately. Potential cross-connections must be brought to the attention of the Site Supervisor to be corrected within a reasonable time period.
- (3) Baring any obvious cross-connections being found during the survey, the Specialist shall determine the appropriate type of cross-connection control test to conduct. A shutdown test or food grade dye test shall be performed.

b. Shutdown Test Procedure (Recycled Water System)

- (1) The shutdown test must meet the CDPH approval and be a minimum of four (4) hours in duration.
- (2) Only one system (recycled water or potable) may be tested at a time.
- (3) Install a water pressure recorder on the recycled water system to be tested. More than one pressure recorder may be required due to the size of the system.
- (4) Reduce the static pressure in the recycled water system to 50 % of the static potable water pressure or to 15 psi as directed by the District.
- (5) Ensure that there will be no use of the system being tested for the entire test period.
- (6) At the end of the test period, note any increases or decreases in pressure as indicated on the recycled water pressure recorder.

If an increase is noted, either the isolation valve is leaking or a cross-connection exists. The isolation valve shall be checked to eliminate the possibility of any increase in pressure due to a leaking valve. If the isolation valve is found to be tight, it must be assumed that the system pressure increase is due to a cross-connection and the test must fail. The cross-connection must be found and eliminated by the customer. The test shall be repeated after corrections have been made.

If a decrease in pressure is noted, it is most likely due to a leak in the system. If the leak is small and the system pressure

maintained above 0 during the test, the system is not tight (leak resistant), but the Specialist may continue the shutdown test. If the system pressure dropped to 0, there is a leak in the system that must be found and corrected by the customer, unless irrigation lateral lines are being tested as part of the test sequence. (A large system leak may not show a cross-connection on the pressure recorder). Unless approved in writing by the District, the system shutdown test must be repeated once repairs have been made.

If the pressure remains the same during the test period, then the system is tight (leak resistant) and the Specialist may continue the shutdown test. All control valves on the recycled water system should be run at this point (2-minute test mode) during the 4-hour period

- (7) Reinstate the recycled water service and note the results of the recycled water system and remove the test equipment.

c. Shutdown Test Procedure (Potable System):

- (1) The shutdown test must meet the CDPH approval and be a minimum of four (4) hours in duration.
- (2) Only one system (recycled water or potable) may be tested at a time.
- (3) Install a water pressure recorder on the potable water system to be tested. More than one pressure recorder may be required due to the size of the system.
- (4) Isolate the potable system at the service.
- (5) Reduce the static pressure in the potable system to approximately 15 psi or no more than $\frac{1}{2}$ of the recycled water system.
- (6) Ensure that there will be no use of the system being tested for the entire test period. This may require turning off and/or locking public drinking fountains and restrooms.
- (7) At the end of the test period, note any increases or decreases in pressure as indicated on the potable water pressure recorder.

If an increase is noted, either the isolation valve is leaking or a cross-connection exists. The isolation valve shall be checked to eliminate the possibility of any increase in pressure due to a leaking valve. If the isolation valve is found to be tight, it must be assumed that the system pressure increase is due to a cross-connection and the test must fail. The cross-connection must be found and eliminated by the customer. The test must be repeated after corrections have been made.

If a decrease in pressure is noted, it is most likely due to a leak in the system. If the leak is small and the system pressure maintained above 0 during the test, the system is not tight (leak resistant), but the Specialist may continue the shutdown test. If the system pressure dropped to 0, there is a leak in the system that must be found and corrected by the customer. (A large system leak may not show a cross-connection on the pressure recorder). Unless approved in writing by the District, the system shutdown test must be repeated once repairs have been made.

If the pressure remains the same during the test period, then the system is tight (leak resistant) and the Specialist may continue the shutdown test. All control valves on the recycled water system should be run at this point (2-minute test mode) during the 4-hour period.

- (8) Reinstate the potable service noting the pressure increase after recharging the system on the pressure recorder.
- (9) Continue testing each potable system following the steps above. The fire system may be connected to a low pressure/flow alarm. Notify the customer to contact the appropriate agency/company responding to any alarms.
- (10) If the recycled water system is fed by the fire system, notify the District Water Operations Manager. The potable fire hydrant connection must be disconnected and the recycled water system connected to the recycled water service prior to completing the fire system shutdown test.

d. Conventional Dye Test Procedure

- (1) This procedure may be required where it is not possible to isolate the system to be tested, specifically for sewage treatment plants, and must only be used under strictly controlled conditions.
- (2) Under conditions where high concentrations of chlorine are used for disinfection, higher concentrations of dye must be used.
- (3) Obtain the overall system capacity for the systems to be tested in order to determine the amount of dye required.
- (4) Inject the dye into the recycled water system either into the wet well (if the utility water system is separate from the recycled water system) or into the utility water system. This may require a pump to overcome the system pressure.
- (5) Start flowing each of the outlets on the recycled water system, working away from the dye injection point.

- (6) Test the potable discharge points (eyewash stations, hand sinks, hose bibs, etc.) on the potable system once the dye has reached the area being tested. The potable connection may be gated down to achieve lower potable system pressure than recycled water during the flow test.
- (7) Continue the process of verifying the presence of dye in the utility water system and checking to make sure there are no cross-connections (presence of dye) into the potable system until the entire system has been checked.

4. Notification Procedure

- a. After completing each of the potable system tests, a report shall be completed by the Cross-Connection Control Specialist and sent to CDPH, with a copy being sent to the District Source Control Division.
 - b. For cross-connections detected during the test, a written report shall be submitted within 30 days to the State CDPH, the District Water Operations Department, and the District Environmental and Regulatory Compliance Director.
5. If cross connections are discovered during the test, the cross connections must be eliminated before the recycled water system is activated (for new systems) or reactivated (for existing systems).
 6. Cross connection tests will be conducted periodically, at a minimum frequency of once every four years. The District may, at its discretion, specify more frequent testing for large or complex sites, following modifications to the site's potable or recycled water systems, or when there is any concern regarding a possible cross connection at the site.

D. Final Inspection

1. A final inspection of the recycled water facilities will be performed at the time of the cross-connection test. The following items must be completed to the satisfaction of the District Representative before permanent service will be established:
2. Application for recycled service has been made to the District.
3. Warning signs and labels are installed.
4. Quick coupling valves, valve boxes, controllers and other system components are clearly identified with the proper markings indicating distribution of either recycled or potable water.
5. Windblown spray, runoff and ponding have been limited or prevented.
6. Controller clocks are set to operate during the approved hours.

7. Controller maps have been submitted to the District.
8. Site Supervisor is identified and contact information has been provided to the District.

E. Coverage Test

1. The applicant or the customer is responsible for controlling overspray and runoff from recycled water systems. An initial coverage test will be conducted while the site is on the potable system. A final coverage test will be performed after the recycled water meter has been set. The owner or owner's representative shall contact the District Inspection Department at (951) 679-3222 and arrange for a coverage test inspection. The owner or owner's representative must be in attendance along with the Site Supervisor.
2. If modifications to the system are required, other than minor adjustments, the owner will be notified in writing of the changes required. To avoid suspension of service, the modifications must be made in a timely manner. All modifications to the system are the responsibility of the applicant or customer and said applicant or customer shall pay all costs associated with such modifications.

F. As-Builts Drawings

All conceptual or major design changes shall be approved before implementing the change in the construction contract. Record drawings shall be prepared to show the recycled system as constructed and shall include all changes in work constituting departures from the original contract drawings including those involving both constant pressure and intermittent-pressure lines and appurtenances.

G. Final Approval

The District must grant final approval before recycled water will be supplied to the site. Final approval will be granted when construction has been completed in accordance with approved plans and specifications, all cross-connection tests have been performed, a final on-site inspection has been conducted, the as-builts drawings and controller chart(s) have been submitted and approved, and all requirements have been met satisfactorily. After the District has approved the applicant's Permit to Use Recycled Water and Water Service Agreement, and all applicable fees have been paid, the District will authorize the installation of the recycled water meter.

3.09 OPERATION AND MAINTENANCE REQUIREMENTS

- A. The operation, surveillance, maintenance, and repair of all on-site recycled water facilities are the responsibility of the customer. The customer's designated Site Supervisor shall bear the responsibility for the distribution of recycled water in accordance with the District's Standards and Specifications.
- B. The customer shall have the following responsibilities pertaining to operation of on-site facilities:

1. To ensure that all operation and maintenance personnel are trained and familiarized with the use of recycled water.
 2. To ensure precautionary measures be taken to minimize direct contact with recycled water. For work involving more than a casual contact with recycled water, employees must be provided with proper protective equipment. Adequate first aid supplies should be available on the premises. All cuts and abrasions should be promptly treated to prevent infection.
 3. To furnish their operations and maintenance personnel with maintenance instructions, irrigation schedules, controller maps, and record drawings to ensure proper operation in accordance with these Standards and Specifications.
 4. To ensure all recycled water facilities are operated and maintained in accordance with these Standards and Specifications and other documents governing recycled water systems within the District.
- C. The customer shall be responsible for any and all subsequent uses of the recycled water. Operations, maintenance and control measures to be utilized in this regard, where appropriate, shall include but are not limited to the following:
1. Operation of on-site recycled water facilities shall prevent or minimize discharge onto areas not under control of the customer so as to minimize public contact.
 2. Operation of on-site recycled water facilities shall be during periods of minimal human use of the service area as defined in Section 3.03-D. Consideration shall be given to allow a maximum dry-out time before the irrigated area will be used by the public.
 3. Utilization of automatic controller systems to minimize ponding and runoff of recycled water. Total sprinkler run times shall not be greater than the time needed to supply the landscape's water requirement. If runoff occurs before the landscape's water requirements are met, the automatic controllers shall be reprogrammed with a greater number of water cycles of shorter duration to meet the requirements. This method of operation is intended to minimize ponding and runoff.
 4. Reporting to the District any and all failures in the recycled water system that cause an unauthorized discharge of recycled water within or outside of the approved use site.
 5. Protection of all drinking fountains located within the approved use area from contact with windblown recycled water spray, direct application through irrigation or other approved uses by location and/or a protecting structure. Protection shall be by design, construction practice and system operation.
 6. Protection of facilities that may be used by the public. They include but are not limited to, eating surfaces and playground equipment located within the approved use areas. These shall be protected by placement and/or shelter from contact with recycled water to the maximum extent possible. Windblown

spray, direct contact through wash down or by irrigation application, or other approved uses are considered sources of recycled water. Protection shall be by design, construction practice and system operation.

7. Notification of the District of all updates and proposed changes. Approval by the District and CDPH shall be obtained prior to construction in accordance with District procedures. All updates and proposed changes shall comply with these Standards and Specifications and the governing documents of all other regulatory agencies.

- D. The customer shall enforce the limitations and prohibitions detailed in Section 3.02.

3.10 MONITORING AND INSPECTIONS

- A. The District will inspect each recycled water system annually, or on a more frequent basis if warranted by the size and complexity of the site or other considerations. For these purposes, the District shall have the right to enter upon the customer's premises during reasonable hours to inspect on-site recycled water facilities and approved use areas. Reasonable hours shall include hours when irrigation is occurring. The site supervisor shall be available during those inspection.
- B. The inspections will include, at a minimum, a visual inspection of all backflow prevention assemblies, exposed piping, valves, pressure reducing valves, sprinklers, controllers, signs, labels, tags, and all points of connection. The inspection will also check for proper use of recycled water, e.g. minimization of runoff, overspray, ponding, etc. Each controller valve will be operated to verify proper irrigation use. The Site Supervisor's records will be inspected to review the maintenance and education conducted since the last inspection. The District Inspector will complete an inspection form and transmit any deficiencies observed to the Site Supervisor for correction.
- C. The District will conduct a cross-connection shutdown test as described in Section 3.08-C.

3.11 MAINTENANCE GUARANTEES

As set forth in the Application Agreement and applicable Ordinances, the Applicant shall be responsible for any and all repairs and replacements without expense whatsoever to the District.. In the event of failure to comply with the aforementioned conditions, the District is authorized to proceed to have the defects repaired and made good at the expense of the Applicant who will be responsible for all costs incurred. The District maintains the option of suspending recycled water service until all repairs are made to the satisfaction of the District.

3.12 INFORMATION REQUIRED ON PLANS - ON-SITE IRRIGATION FACILITIES

- A. Plans shall be submitted to the District for review and approval in accordance with the Districts "Guidelines for the Submittal of Onsite Recycled Water Irrigation Plans" and shall include at a minimum a title sheet, an index map sheet, and irrigation plans describing the proposed facilities. Plans shall be full size drawings (24"x36") and shall be signed by a licensed landscape architect.

- B. It is the responsibility of the Applicant to obtain a copy of the latest edition of the District “Guidelines for the Submittal of Onsite Recycled Water Irrigation Plans” prior to the submittal of irrigation plans for review and approval by the District.

SECTION 4 REQUIREMENTS FOR THE CONVERSIONS OF ON-SITE SYSTEMS

4.01 CONVERSION FROM POTABLE TO RECYCLED WATER SUPPLY

- A. In general, and as provided for in Section 3.4.1 of the District's Ordinance No. 68.2 or latest edition, all irrigation facilities converting from a potable to a recycled water supply shall conform to the District's Standards and Specifications.
 - B. The facilities to be converted shall be investigated in detail including review of any record drawings, preparation of required reports, and determinations by the District of measures necessary to bring the system into full compliance with the Standard Specifications. The Applicant shall pay all costs to convert the system.
 - C. Existing potable water lines that are being converted to recycled water use should first be accurately located and tested in coordination with regulatory agencies. If required, the necessary actions to bring the water line and appurtenances into compliance with regulatory standards should be taken. If the existing lines meet approval of the water supplier and regulatory agency, except for the pipe identification, the lines should be approved for recycled water distribution. If verification of the existing lines is not possible, the lines should be uncovered, inspected, and identified prior to use.
 - D. The District follows the San Diego County Department of Environmental Health's manual titled "Reclaimed Water Plan Check and Inspection Manual, Attachment 35: Reclaimed Water Plan" for the requirements associated with the approval of a retrofit system. A copy of Attachment 35 can be obtained from the District.
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SECTION 5 RECYCLED WATER FOR OTHER PURPOSES.

5.01 USE OF RECYCLED WATER FOR CONSTRUCTION PURPOSES

The use of recycled water for construction purposes (e.g. soil compaction, dust control, or roadway landscaping) shall be approved in advance by the District. The applicant shall provide the "EASTERN MUNICIPAL WATER DISTRICT APPLICATION FOR TEMPORARY USE OF RECYCLED WATER FOR CONSTRUCTION" form prior to any construction work.

- A. Recycled water for construction purposes cannot be used for the consolidation or compaction of backfills for potable water mains.
- B. Only Air Gap connection may be made between equipment containing recycled water and any part of a potable water system.
- C. Any ponds used for the storage of recycled water for construction must be fenced to limit public access. Warning signs shall be installed as directed by the District's Representative.
- D. Applicant shall instruct equipment operators about the requirements associated with recycled water use. Water trucks, hoses, drop tanks, or other equipment must be clearly identified (e.g. "Do Not Drink" symbol) as containing recycled water not suitable for human consumption.

5.02 ADDITIONAL USES OF RECYCLED WATER

- A. The District reserves the right to authorize recycled water use for purposes other than described hereon. All requests for recycled water must be approved in writing by the District.
 - B. For additional information regarding acceptable uses of recycled water refer to "The Purple Book", Section 60307.
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