

TABLE OF CONTENTS

**SECTION IV
RECYCLED WATER SYSTEM REQUIREMENTS**

SECTION IV-A - DESIGN CRITERIA 1

IV-A1. GENERAL 1

 IV-A1-1. Review of Potential Uses..... 1

IV-A2. DISTINCTION BETWEEN DISTRICT AND CUSTOMER FACILITIES..... 1

IV-A3. DISTRICT FACILITY REQUIREMENTS 1

 IV-A3-1. Design Water Demand..... 1

 IV-A3-2. Design Water Pressure..... 2

 IV-A3-3. Pipe Size and Maximum Velocity 2

 IV-A3-4. Location of Main 2

 IV-A3-5. Depth and Minimum Cover 2

 IV-A3-6. Horizontal and Vertical Curves 2

 IV-A3-7. Valving 2

 IV-A3-8. Combination Air Release and Vacuum Relief Valves 2

 IV-A3-9. Blowoffs 2

 IV-A3-10. Thrust Blocks..... 3

 IV-A3-11. Pipe and Appurtenance Identification 3

 IV-A3-12. Building Set Back from Mains 3

IV-A4. CUSTOMER FACILITY REQUIREMENTS 3

 IV-A4-1. Pipe Depth and Trenching 3

 IV-A4-2. Service Pressure; Pressure Reducing Valve 3

 IV-A4-3. Backflow Prevention 4

 IV-A4-4. Hose Bibs..... 4

 IV-A4-5. Irrigation Systems..... 4

 IV-A4-5.01. Control of Runoff and Application Areas..... 4

 IV-A4-5.02. Record Drawings..... 5

 IV-A4-6. Restriction of Public Access to Recycled Water 5

 IV-A4-6.01 Limits of Use for Recycled Water 6

 IV-A4-7. Pipe, Appurtenance, and Use Area Identification 6

 IV-A4-8. Temporary Potable Water Service..... 6

 IV-A4-9. Conversion from Potable to Recycled Water Supply 6

 IV-A4-10. Cross Connections 7

 IV-A4-10.01 Potable Water Used to Supplement the Recycled Water System 7

SECTION IV-B - CONSTRUCTION STANDARDS..... 8

IV-B1. MATERIALS OF CONSTRUCTION 8

 IV-B1-1. Pipes and Fittings..... 8

 IV-B1-1.01. Polyvinyl Chloride (PVC) Pipe and Fittings..... 8

 IV-B1-1.02. Other Pipe Materials..... 9

IV-B1-1.03. Pipe Identification	9
IV-B1-2. Appurtenances	10
IV-B1-2.01. General	10
IV-B1-2.02. Above-Ground Equipment	10
IV-B1-2.03. Quick-Coupling Valves.....	10
IV-B1-2.04. Valve and Meter Boxes	10
IV-B1-2.05. Pressure Reducing Valves.....	10
IV-B1-2.06. Sprinklers and Sprinkler Control Valves.....	11
IV-B1-2.07. Identification Tags.....	11
IV-B1-2.08. Recycled Water Sample Stations	11
IV-B1-2.09. Tracer Wire.....	11
IV-B1-3. Thrust Blocks.....	11
IV-B2. INSTALLATION OF RECYCLED WATER PIPE AND APPURTENANCES	12
IV-B3. INSPECTION AND TESTING.....	12
IV-B3-1. Disinfection.....	12
IV-B3-2. Flushing	12
IV-B3-3. Cross-Connection Inspection and Coverage Test.....	13
IV-B3-3.01. Visual Dual System Inspection.....	13
IV-B3-3.02. Cross Connection Test.....	13
IV-B3-3.03. Disconnection of Cross Connections.....	14
IV-B3-3.04. Coverage Test for Irrigation Systems	14

SECTION IV

RECYCLED WATER SYSTEM REQUIREMENTS

SECTION IV-A - DESIGN CRITERIA

IV-A1. GENERAL

Unless otherwise noted, all recycled water design and construction work shall conform to Sections I, II and IV of these Standards, as amended. In addition, all recycled water pipes shall be purple or wrapped in purple polyethylene sleeve conforming to AWWA C105 specifications. Piping or piping wrap shall be permanently labeled “Caution: Recycled Water – Do Not Drink” or similar as approved by the District Engineer.

IV-A1-1. Review of Potential Uses

All potential uses of recycled water shall be reviewed by the District Engineer. If recycled water use is allowed or required, the facilities shall be constructed in accordance with the procedures and requirements set forth in these Standards. All potential uses other than landscape irrigation shall be considered by the District Engineer on a case-by-case basis. Determination of allowed and required uses shall be in accordance with the standards of treatment and water quality regulations of the State of California and the District’s regulations and “Recycled Water Use Guidelines.” The District Engineer may set forth specific requirements as conditions prior to approving any such uses and/or require specific prior approval from the appropriate regulatory agencies.

IV-A2. DISTINCTION BETWEEN DISTRICT AND CUSTOMER FACILITIES

The design criteria for recycled water facilities are separated into two categories – District facilities and Customer facilities. District recycled water facilities typically consist of those recycled water facilities that are, or will be, owned, operated, and maintained by the District. Typically these are facilities that are on the upstream side of and including the water meter, and are within public streets, public rights-of-way, or easements. Customer recycled water facilities typically consist of facilities that will be owner-operated and maintained, and are downstream of the water meter.

IV-A3. DISTRICT FACILITY REQUIREMENTS

IV-A3-1. Design Water Demand

All recycled water systems shall be designed using accepted design procedures and formulas. Unless otherwise approved by the District Engineer, District recycled water facilities that supply irrigation systems shall be designed to deliver peak flows of twenty five (25) gpm per acre irrigated.

IV-A3-2. Design Water Pressure

District recycled water system pressures will vary depending on location. District recycled water system facilities shall be designed to have a minimum static pressure of forty (40) psi.

IV-A3-3. Pipe Size and Maximum Velocity

Minimum size of recycled water mains shall be four (4) inches in diameter. Smaller mains may be individually approved by the District Engineer. The maximum allowable design velocity shall be in conformance with Section II-A1-5.

IV-A3-4. Location of Main

District recycled water facilities shall typically be located in streets a minimum of three (3) feet from the curb face on the opposite side of the street from the potable water mains.

IV-A3-5. Depth and Minimum Cover

The top of recycled water mains shall be a minimum of four (4) feet below the finished street grade unless otherwise approved by the District Engineer.

IV-A3-6. Horizontal and Vertical Curves

Curves for District facility recycled water pipelines shall be in conformance with District specifications for potable water pipelines, Sections II-A5-1, II-A5-2, and II-A5-3.

IV-A3-7. Valving

Valving for recycled water shall conform to District specifications for potable water, Section II-A6.

IV-A3-8. Combination Air Release and Vacuum Relief Valves

Combination air and vacuum valves shall be installed at all high points in mains in conformance with Section II-A8, with the exception that separate above-grade vent boxes are not required for recycled water air release/vacuum relief valves, as shown in Drawings W-15B and W-16B. The use of air release valves should be minimized.

IV-A3-9. Blowoffs

Blowoffs shall be installed in conformance with District specifications for potable water pipelines, Section II-A9, with the exception that recycled water blowoffs shall be designed to discharge to the sewer. Recycled water blowoff drains shall be located within twenty five (25) feet of sewer manholes. Preferably, recycled water blowoff drains shall be aligned in the same traffic lane as the manhole.

IV-A3-10. Thrust Blocks

Thrust blocks for District recycled water facilities shall be used in conformance with District specifications for potable water pipelines, Section II-A13.

IV-A3-11. Pipe and Appurtenance Identification

See Section IV-B1-1.03 for pipe and appurtenance identification requirements.

IV-A3-12. Building Set Back from Mains

To minimize hazards to buildings when pressure mains are repaired, building foundations shall be set back a minimum of 7.5 feet from the outside surface of the potable water or recycled water main.

The installation of mains less than 7.5 feet from the building shall be subject to the approval of the District Engineer. In such cases, polyethylene wrapped ductile iron pipe shall be used. No service connection to the water main is allowed within five (5) feet of the building foundation.

IV-A4. CUSTOMER FACILITY REQUIREMENTS

IV-A4-1. Pipe Depth and Trenching

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

1. Constant pressure lines three (3) inches or larger: twenty four (24) inches
2. Constant pressure lines two and one-half (2-1/2) inches and smaller: eighteen (18) inches
3. Intermittent pressure lines: twelve (12) inches

Where piping is under paved areas, these dimensions shall be increased to include the roadway section and adequately protect the piping from damage from traffic loads.

Recycled water irrigation pipelines shall be installed with the greatest possible horizontal separation from the District's potable water service lines and private potable water pipelines. Recycled water irrigation pipes shall not be installed within or across meter boxes. Recycled water pipelines shall not have physical contact with any potable water pipes or appurtenances. Where recycled water irrigation pipelines and private potable water pipelines cross, the potable water pipe shall be installed a minimum of twelve (12) inches above the recycled water piping. Buried recycled water pipelines intended for indoor use, such as toilet flushing, must conform to the separation requirements outlined in Appendix J of the Uniform Plumbing Code.

IV-A4-2. Service Pressure; Pressure Reducing Valve

Static service pressure shall be as provided by the District. Customer facilities shall include a pressure reducing valve (PRV) to protect the customer facilities from excess pressures during the

daily operations of the District's system. The size of the PRV shall be the same size as the water meter that provides service to the water system. The PRV shall be installed immediately downstream of the water meter, and in accordance with Drawing W-31. Exceptions must be approved by the District Engineer.

IV-A4-3. Backflow Prevention

Backflow prevention devices are not normally required on recycled water systems, but shall be installed as required by the District Engineer on a case-by-case basis if there exists a potential for back-siphonage or backpressure of water into the recycled water main, which could impact the quality of the recycled water.

Backflow prevention devices are required on potable water connections to sites that also use recycled water, as defined in Section II-A10. This includes, but is not limited to, potable water connections for both domestic and fire services.

IV-A4-4. Hose Bibs

No hose bibs shall be installed on recycled water systems.

IV-A4-5. Irrigation Systems

The design of landscape irrigation systems shall comply with these Standards and the District's "Recycled Water Use Guidelines," as well as regulatory requirements by local and state agencies. In the City of Dublin, designs shall also comply with the City of Dublin Water Efficient Landscape Ordinance (Ordinance No. 18-92).

IV-A4-5.01. Control of Runoff and Application Areas

For control of runoff and control of the areas to which recycled water is applied, the design of irrigation systems shall conform to the following:

1. No irrigation with recycled water shall take place within fifty (50) feet of any domestic water supply well unless specific conditions have been met as per Title 22, Section 60310 (a) (1) of the California Code of Regulations.
2. No impoundment of recycled water shall occur within one hundred (100) feet of any domestic water well.
3. In conformance with Title 22 of the California Code of Regulations, all piping and irrigation shall be designed so that spray or runoff shall not enter a dwelling or food handling facility and shall not contact any drinking water fountain. Drinking water fountains shall not be located in landscaped areas irrigated by spray-type irrigation devices. Concrete patios, walls, shrubbery irrigated by drip or bubbler systems, or other barriers shall be used to physically separate drinking fountains from areas irrigated by spray-type irrigation devices.
4. The customer recycled water facilities shall be designed not to exceed the evapotranspiration requirements for the types of plants used, with standard and reasonable

allowances for irrigation inefficiencies and storage of moisture in the soil column. The use of moisture sensors and/or weather stations to automatically adjust the amount of applied irrigation water is encouraged, but not mandatory.

5. Customer recycled water facilities shall be designed to prevent discharge of recycled water outside of the designated use area. Part circle sprinklers shall be used adjacent to roadways and property lines to confine the discharge from sprinklers to the design area.
6. The design of customer recycled water irrigation facilities shall provide for watering periods that minimize human contact. Spray irrigation is prohibited between the hours of 7:00 a.m. and 9:00 p.m. Additional prohibitions shall be as directed by the District Engineer.
7. Recycled water shall not be allowed to escape from the designated use areas as surface flow that would either pond and/or enter waters of the State.
8. The peak rate at which recycled water is applied shall not exceed the infiltration rate of the soil. Where varying soil types are present, the design of the peak rate of application of recycled water 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. No recycled water shall be applied to the irrigation area during periods when soils are saturated.

IV-A4-5.02. Record Drawings

Record drawings of customer facility irrigation systems shall include the following information:

1. Point of connection.
2. The meter location and size (inches), meter address, and civil station number.
3. Location and size of all irrigation lines.
4. Location of isolation and line valves.
5. Location of irrigation control valves.
6. Location of quick-coupling valves.
7. Location of control wires.
8. Location, size, and type of backflow prevention devices.
9. Other related equipment as specified by the District Engineer.

IV-A4-6. Restriction of Public Access to Recycled Water

All customer recycled water facilities shall be installed to restrict public access so that the general public cannot draw water from the system. Facilities such as blowoff hydrants, blowoffs on strainers, and other such facilities, shall be restricted from public access. These facilities, both above and below grade, shall be housed in an approved lockable container colored purple. A sign reading "CAUTION: RECYCLED WATER - DO NOT DRINK," or similar shall be installed in conformance with Section IV-A4-7. An alternative acceptable means of restricting public access is the use of valves that operate by means of a recessed key slot or by means of pentagonal heads (such as those typically found on fire hydrants). Other means of restricting public access may be approved by the District Engineer.

Warning labels, as approved by the District Engineer, shall be installed on designated facilities such as on controller panels and washdown or blowoff hydrants on water trucks and temporary construction services where designated by the District Engineer or Inspector. The labels will notify the public that the system contains recycled water that is unsafe to drink.

IV-A4-6.01 Limits of Use for Recycled Water

Recycled water shall not be used as a domestic or animal water supply.

IV-A4-7. Pipe, Appurtenance, and Use Area Identification

See Section IV-B-1 for pipe and appurtenance identification requirements. All areas where recycled water is used that are accessible to the public shall be posted with conspicuous signs, in a size no less than four (4) inches high by eight (8) inches wide. Signs shall be provided by the District and installed by the Applicant. Signs shall be located as determined by the District, after review and approval of Applicant connection drawings and review and approval by the Department of Health Services.

IV-A4-8. Temporary Potable Water Service

Where recycled water is not immediately available and will be supplied in the future, the customer facilities shall be designated to use recycled water and shall be designed and constructed to the District's Standards as set forth herein. Provisions shall be made as directed by the District and these Standards to allow for connection to the recycled water facilities when they become available. During the interim period, potable water will be supplied to the recycled water facilities through a potable water connection. A backflow prevention device approved by the District will be required on the irrigation service as long as the customer facilities area uses potable water. The backflow prevention device shall be downstream of the meter and a part of the customer facilities.

IV-A4-9. Conversion from Potable to Recycled Water Supply

All non-buried existing irrigation facilities converting from potable to recycled water supply shall conform to the District's Standards as contained herein. 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 these Standards.

When an existing potable water line is converted to recycled water usage, the water line shall be accurately located and tested in accordance with these Standards and the District's "Recycled Water Use Guidelines" in coordination with State regulatory agencies. If required, the Owner shall take action to bring the water line and appurtenances into compliance with regulatory standards. If the existing line meets the approval of the District and regulatory agencies, the line shall be approved for recycled distribution. If verification of the existing line is not possible, the line shall be uncovered, inspected, and approved by the Inspector prior to conversion.

IV-A4-10. Cross Connections

No physical connection shall be made or allowed to exist between any system containing recycled water and any separate system conveying potable water.

IV-A4-10.01 Potable Water Used to Supplement the Recycled Water System

If the potable water system is used to supplement the recycled water system, an air gap separation is required.

SECTION IV-B - CONSTRUCTION STANDARDS

IV-B1. MATERIALS OF CONSTRUCTION

This section covers materials for recycled water pipes, fittings, and appurtenances for both customer and District recycled water facilities. All customer recycled water piping shall be installed in accordance with the Uniform Plumbing Code and all other local governing codes, rules, and regulations.

IV-B1-1. Pipes and Fittings

IV-B1-1.01. Polyvinyl Chloride (PVC) Pipe and Fittings

PVC pipe and fittings for District facilities shall conform to District specifications for potable water, Sections II-B1-1.01. PVC pipe and fittings for customer facilities shall conform to the following:

1. PVC pipe and fittings shall be installed below grade.
2. All PVC pipe shall be made from an NSF-approved Type I, Grade I compound conforming to ASTM D1784.
3. PVC pipe of diameter 4-inch through 12-inch shall conform to District specifications for potable water, Section II-B1-1.01.
4. All PVC Schedule 40 and Schedule 80 pipe shall be manufactured conforming to ASTM D1785 and D2466 and shall meet requirements set forth in Federal Specifications PS21.
5. All PVC Class 160, Class 200, and Class 315 solvent weld and Ring-Tite pipe shall be manufactured conforming to ASTM D2241 and meet requirements set forth in Federal Specifications PS-22, with Standard Dimension Ratio (SDR) for pressure rated pipe. Pipe shall be extruded from approved Class 12454-PVC with resin specifications conforming to ASTM D1784 and rubber rings conforming to ASTM D169.
6. All pipe shall be homogeneous throughout, free from visible cracks, holes, or foreign materials. The pipe shall be free from blisters, dents, wrinkles or ripples, die, and heat marks. All piping shall be manufactured per NSF specifications.
7. All PVC plastic pipe fittings shall be rigid PVC virgin Type I, minimum Schedule 40, with working pressure no lower than that of the pipe. Sockets shall be tapered to conform to the outside diameter of the pipe, as recommended by the pipe manufacturer. All Schedule 40 fittings shall conform to ASTM D2466. Schedule 80 fittings shall conform to ASTM D2464 and D2467.
8. All fittings shall be injection molded of an approved PVC fitting compound featuring high tensile strength, high chemical resistance, and high strength. The compound must meet the requirements described in ASTM D1784 and D2466, cell classification 13454B. Where threads are required for plastic fittings, they shall also be injected molded. All tees and elbows shall be side gated.
9. PVC solvent cement shall conform to ASTM D2564.

10. The minimum class or schedule of customer facility PVC piping and fittings shall be as follows:

- a. PVC constant pressure main line pipe two (2) to three (3) inches diameter: Solvent weld joint, Schedule 40; Rubber-ring joint, PVC Class 160; or Solvent weld joint, PVC Class 315.
- b. PVC constant pressure main line pipe 1-1/2 inches diameter and smaller: Solvent weld joint, Schedule 40.
- c. PVC intermittent pressure lateral line piping: Solvent weld joint, Class 200 or Schedule 40.
- d. PVC fittings: Schedule 40 solvent weld and factory manufactured, or Schedule 40 with rubber-ring joint.

IV-B1-1.02. Other Pipe Materials

Ductile iron or steel pipe and fittings shall conform to District specifications for potable water, Sections II-B1-1.02 and II-B1-1.03. The minimum requirements for customer facility pipe and fittings of other materials shall be as follows:

1. Wrought copper or bronze solder fittings: ANSI B.16.22.
2. Hard drawn copper Type K: ANSI H-26.1 and ASTM B88.
3. Tubing for drip irrigation systems: Manufactured from virgin polyethylene conforming to ASTM D1248, Type II, Class C, or approved equal.
4. HDPE pipe shall conform to the requirements as specified in AWWA C901 or AWWA C906-99, have a PPI material designation of PE 3408, a cell classification of PE 345464C per ASTM D3350, and have an established hydrostatic design basis of 1600 psi at 73 degrees F. HDPE pipe for use in recycled water applications shall also conform to all the HDPE pipe specifications in Section II of District specifications. HDPE pipe for use in recycled water system shall have a co-extruded, purple-colored exterior to facilitate the identification of the pipe as recycled water pipe.

IV-B1-1.03. Pipe Identification

All recycled water piping shall be clearly marked as recycled water pipe by the use of purple-colored and stenciled pipe, permanent recycled water warning tape continuously applied to the pipe, or marked plastic encasement. All marking and coloring shall be durable enough to be easily recognizable and legible for the design life of the piping.

Plastic pipe, permanent warning tape, or encasement shall be purple in color with the words "CAUTION: RECYCLED WATER - DO NOT DRINK," or similar printed on it as approved by the District Engineer. The lettering shall be repeated continuously on two (2) sides of the pipe, warning tape, or encasement for the full length of the pipe, warning tape, or encasement. If purple pipe is used, it shall be PW PurplePlus, or JM Purple Save, or approved equal. If encasement or warning tape is used, it shall be Pantone 512 or equivalent in color with 1" minimum black or white lettering. Encasement or warning tape shall be T.Christy Enterprises, Rencor, or equivalent.

All piping shall be continuously and permanently marked with the manufacturer's name or trademark, nominal size, and schedule or class indicating the pressure rating.

All riser pipes for valves and blowoffs on recycled water lines shall be purple piping.

Recycled water service lines shall conform to Drawings W-7 or W-8. The line shall be purple or purple wrapped.

IV-B1-2. Appurtenances

IV-B1-2.01. General

Unless otherwise specified below, appurtenances for District recycled water facilities shall conform to District specifications for potable water, Section II-B1-2.

IV-B1-2.02. Above-Ground Equipment

Exposed or above-ground equipment, such as blowoffs, valves, pumps, and water meters, shall be labeled with recycled water tags. Tags shall be provided by the District and fastened as specified in Section IV-B1-2.06.

IV-B1-2.03. Quick-Coupling Valves

Quick-coupling valves shall be constructed of brass with a purple rubber or vinyl cover, and shall have a one (1) inch inlet with acme thread body, Nelson Model 7645, or equal, and key, Nelson Model 7640, or equal.

IV-B1-2.04. Valve and Meter Boxes

Valve boxes in paved areas or subject to traffic loads shall conform to Section II-B1-2.06. All recycled water valve boxes shall be Christy G-4, or approved equal with a cast iron triangular cover for heavy traffic areas. All valve covers shall have a recognizable "RW" inscription cast or otherwise permanently marked on the top surface, as shown on Drawing W-1.

All meter boxes and customer facility valve boxes shall be purple in color and have a warning label permanently molded into or affixed onto the lid with rivets, bolts, etc. Warning labels shall be constructed of a purple weatherproof material with the warning "RECYCLED WATER" permanently stamped or molded into the label, T. Christy Enterprises 3800, or equivalent.

IV-B1-2.05. Pressure Reducing Valves

Pressure reducing valves (PRV) shall be Wilkins Model 500HLR or approved equal for irrigation systems served by ¾-inch to 3-inch water meters. District Engineer shall review proposed PRV installations for larger sizes on an individual basis.

IV-B1-2.06. Sprinklers and Sprinkler Control Valves

All sprinklers used in customer recycled water facilities shall have an exposed surface colored purple to associate them with recycled water use. The exposed surface may be colored purple through the use of: (1) dyed plastic or rubber; or (2) weatherproof paint. Where possible, the exposed surface shall have the following warnings molded or hot-stamped on it: (1) “CAUTION: RECYCLED WATER - DO NOT DRINK” in English and Spanish; and (2) an international warning symbol cautioning against drinking the water emitted through the sprinkler. Sprinklers unable to meet these specifications shall be identified with purple bilingual recycled water warning tags in conformance with Section IV-B1-2.06.

IV-B1-2.07. Identification Tags

All meters, valves, blowoffs, and controllers shall be identified using recycled water identification tags, T.Christy Enterprises 3150, or equivalent. Tags shall be weatherproof plastic, 3-inch by 4-inch, purple in color with the words “WARNING - RECYCLED WATER - DO NOT DRINK,” or similar imprinted on one side, and “AVISO - AGUA IMPURA - NO TOMAR” on the other side, or similar as approved by the District Engineer. Imprinting shall be permanent and black in color. One tag shall be attached to each valve 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.

Weatherproof stickers of equivalent color and lettering may be used as an alternative for controller units.

IV-B1-2.08. Recycled Water Sample Stations

Where determined by the District, recycled water quality sampling stations shall be installed. The sampling station shall consist of a 3/4-inch service connection stubbed out at least twelve (12) inches behind the sidewalk, an in-line corporation stop with a valve box and cover, and an above-grade lockable sampling station. The above-grade lockable sampling station shall be as shown on Drawing W-26. Station shall be purple in color and shall be center mounted on a four (4) inch thick concrete slab, two (2) feet square in area.

IV-B1-2.09. Tracer Wire

Underground tracer wire shall be insulated #10 AWG THWN copper wire. A continuity test in accordance with II-B3-2.06.01 shall be performed.

IV-B1-3. Thrust Blocks

Thrust blocks for recycled water systems shall conform to District specifications for potable water, Section II-B1-3.

IV-B2. INSTALLATION OF RECYCLED WATER PIPE AND APPURTENANCES

Recycled water pipe and appurtenances shall be installed in conformance with Section II-B2 of District specifications, the same as for the installation of potable water pipe and appurtenances, with the following exceptions:

1. At the point where a service line crosses beneath a curb, the point shall be permanently marked with an “R” to signify recycled water, rather than a “W,” which is used for potable water.
2. Plastic warning tape specified in Section II-B2-8 used for recycled water lines shall be purple in color, a minimum of three (3) inches wide and printed continuously with the words “CAUTION: RECYCLED WATER LINE BELOW,” or similar as approved by the District Engineer. Plastic warning tape shall be installed above all recycled water mains as shown on Drawing G-1.
3. During construction, above ground risers for recycled water pipe and appurtenances shall be purple in color.

IV-B3. INSPECTION AND TESTING

Recycled water piping shall be tested using potable water with an approved backflow prevention device. The testing shall be performed in accordance with District specifications, Section II-B3-1 to Section II-B3-2.04. Disinfection is not required on recycled water main unless the pipelines will be temporarily used as a potable water main.

After completion of testing, the Contractor shall thoroughly flush all recycled water from the line with recycled water from the existing system to remove debris from the pipeline. The Contractor is responsible for proper disposal of the flush water in a manner that will not cause damage and/or nuisance to the environment and in compliance with state and local regulations.

Where both potable and recycled water customer facilities exist at a site (dual system), a cross connection inspection, test, and coverage test shall be performed on both the potable and recycled water systems as follows:

IV-B3-1. Disinfection

After completion of the hydrostatic pressure and leakage test, the mains shall be chlorinated in accordance with the latest revision of AWWA C651, Standards for Disinfecting Water Mains. A minimum of 50 ppm chlorine shall be initially applied. At the end of the contact period, the mains shall be thoroughly flushed. Bacteriological samples are not required.

IV-B3-2. Flushing

After completion of testing and disinfection, the Contractor shall thoroughly flush all recycled water from the line with recycled water from the existing system to remove debris from the pipeline. The Contractor is responsible for proper disposal of the flush water in a manner that will not cause damage and/or nuisance to the environment and in compliance with state and local

regulations.

IV-B3-3. Cross-Connection Inspection and Coverage Test

Where both potable and recycled water customer facilities exist at a site (dual system), a cross connection inspection, test, and coverage test shall be performed on both the potable and recycled water systems as described in the following subsections.

IV-B3-3.01. Visual Dual System Inspection

Prior to commencing the cross connection testing, a dual system inspection shall be conducted by the Inspector.

1. Meter locations of the recycled water and potable water lines shall be checked to verify that no modifications were made, nor cross connections visible.
2. All pumps and equipment, equipment room signs, and exposed piping in equipment room shall be checked visually for cross connections.

IV-B3-3.02. Cross Connection Test

The following procedure shall be performed by the Inspector to determine if a cross connection exists.

1. For purposes of this test, the on-site recycled water system shall be tested using potable water wherever possible to minimize any subsequent disinfection requirements in the event that a cross connection is identified.
2. The potable water system shall be activated and pressurized. The recycled water system shall be shut down and completely drained. All line valves for both the potable and irrigation system shall be checked to verify they are in full open position.
3. The potable water system shall remain pressurized for a minimum period of time specified by the Inspector while the recycled water system is empty. The minimum period the recycled water system is to remain depressurized shall be determined on a case-by-case basis taking into account the size and complexity of the potable and recycled water distribution systems, but in no case shall that period be less than one (1) hour.
4. All fixtures, potable and recycled, shall be tested and inspected for flow. Flow from any recycled water system outlet shall indicate a cross connection. No flow from a potable water outlet would indicate that it may be connected to the recycled water system.
5. The drain on the recycled water system shall be checked for flow during the test and at the end of the period.
6. The potable water system shall then be completely drained.
7. The recycled water system shall then be activated and pressurized.
8. The recycled water system shall remain pressurized for a minimum period of time specified by the Inspector while the potable water system is depressurized. The minimum period the potable water system is to remain depressurized shall be determined on a case-by-case basis, but in no case shall that period be less than one (1) hour.

9. All fixtures, potable and recycled, shall be tested and inspected for flow. Flow from any potable water system outlet shall indicate a cross connection. No flow from a recycled water outlet would indicate that it may be connected to the potable water system.
10. The drain on the potable water system shall be checked for flow during the test and at the end of the period.
11. If there is no flow detected in any of the fixtures, which would indicate a cross connection, the potable water system shall be re-pressurized.

IV-B3-3.03. Disconnection of Cross Connections

In the event that a cross connection is discovered, both systems shall be shut down and the recycled water system drained immediately and the following procedure shall be carried out in the presence of the Inspector:

1. The cross connection shall be uncovered and disconnected.
2. The dual system shall be retested following procedure - in Section IV-B3-2.
3. The potable water system shall be chlorinated with 50 ppm Cl₂ for 24 hours.
4. The potable water system shall be flushed after 24 hours, and standard bacteriological tests shall be performed by Inspector. If test results are acceptable the potable water system may be recharged.

IV-B3-3.04. Coverage Test for Irrigation Systems

The Owner of the customer recycled water system shall be responsible for controlling overspray and runoff from recycled water irrigation systems. To ensure that overspray or runoff is in accordance with the California Department of Health Services' regulations, inspection by DSRSD staff prior to connection of recycled water is required.

The Site Supervisor shall attend the coverage test and shall have someone attend that is capable of making minor adjustments to the irrigation system. All modifications and costs are the responsibility of the Owner.

The Owner will be notified in writing of required modifications to the system that could not be made during the coverage test. Failure to make timely modifications will result in termination of service.