



City of Sunnyvale  
**Recycled Water Systems**

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**Design and Construction  
Guidelines**

Published by Sunnyvale Department of Public Works  
and  
Sunnyvale Environmental Services Department

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# RECYCLED WATER SYSTEMS - DESIGN GUIDELINES

## 1. PURPOSE AND INTENT

The purpose of this document is to ensure the health, safety, and general welfare of the citizens of the City of Sunnyvale when using recycled water, consistent with the laws and regulations of the State of California and County of Santa Clara applicable to the use of recycled water. The Design Guidelines are to ensure uniformity in design concepts, format, methodology, procedures, construction materials, and quality of work products on recycled water improvements projects.

These Guidelines are intended as a stand-alone document to assist DESIGN CONSULTANTS, Customers, and Users to plan, design, and construct recycled water systems. These Guidelines do not limit the responsibility of the DESIGN CONSULTANT, Customer, or User, but assist in providing professionally sound, efficient, uniform, and workable criteria and requirements for recycled water improvements. These Guidelines do not address all aspects of a complete design. For areas not addressed in these Guidelines, the DESIGN CONSULTANT, Customer, and User must use good engineering judgment and practices.

### A. GENERAL REQUIREMENTS

The design of the offsite facilities, including the preparation of Contract Documents, is conducted under the direction of a responsible professional engineer registered in the state of California. The design of onsite facilities that will use recycled water and the preparation of Contract Documents must be under the direction of a responsible professional landscape architect, civil engineer, or mechanical engineer registered in the state of California. The recycled water system, including offsite and onsite facilities, is separate and independent of any potable water system.

### B. CURRENT STANDARDS

1. American Water Works Association (AWWA). Guideline for Distribution of Non-Potable Water and Guidelines for the On-Site Retrofit of Facilities Using Tertiary Recycled Water.
2. City of Sunnyvale Reclaimed Water Program Manual.
3. City of Sunnyvale Standard Details and Standard Specifications.
4. City of Sunnyvale Municipal Code (SMC).
5. Laws and Standards of the State of California Department of Public Health (CDPH) relating to Recycled Water.
6. California Building Code (CBC) as amended by SMC.
7. California Plumbing Code (CPC) as amended by SMC.
8. Title 17, Code of Regulations, regulations relating to cross-connections.
9. Title 22, Code of Regulations, Division 4 Wastewater Recycling Criteria.
10. USC University of Southern California Foundation for Cross-Connection Control and Hydraulic Research.
11. San Francisco Bay Regional Water Quality Control Board, Region 2. City of Sunnyvale Water Reclamation Permit.

### **C. REFERENCES**

All offsite and onsite recycled water facilities must conform to the requirements of the Design Guidelines for Distribution of Nonpotable Water developed by the AWWA California-Nevada Section, and the DHS' Guidelines for Use of Recycled Water. Any recycled-water improvements must also comply with the requirements, conditions, and standards set forth in the current edition of the Standard Specifications for the City of Sunnyvale Public Works Construction, the Standard Drawings for the City of Sunnyvale, and the Rules and Regulations for the Reclaimed Water Use and Distribution within the City of Sunnyvale, and the latest edition of Recycled Water Plan Check and Inspection Manual and other related design standards and construction specification guidelines.

### **D. SERVICE LATERAL AND METER**

The City will perform the tap at the main, and the City will furnish and install the meter and meter box. Meters shall be installed by the City Water Division and in accordance with City Standard Details.

All meters and meter boxes are the sole property of the City, and may be repaired, replaced or removed by the City. The customer shall exercise reasonable care to prevent the meters and appliances installed upon the premises from being damaged or destroyed. If any defects are noted, the Water Division should be notified. Any damage occurring to a meter or other appliance or pipes owned by the City, shall be paid for by the customer. The customer shall maintain and repair all service piping downstream from the meter.

No person or persons shall open or in any way tamper with or make any addition or modification to any portion of the recycled water main, service connection, meter, curb stop, valve or corporation stop that are connected to the recycled water main.

### **E. FACILITIES DESIGN AND CONSTRUCTION STANDARDS**

The design and construction of off-site recycled water facilities that will be owned and operated by the City, including service connections and any required appurtenances at the point of connection, shall be as required by the City of Sunnyvale Environmental Services Department, in accordance with its Standard Specifications and Details.

The design and construction of on-site facilities, including new facilities required to retrofit existing systems, shall be in accordance with the requirements and standards of the City's Reclaimed Water Program Manual.

### **F. PROTECTIVE MEASURES FOR CROSS-CONNECTION CONTROL**

The following provisions are to protect the City potable water supplies against actual, undiscovered, unauthorized, or potential cross-connections to the customer's recycled water system. These provisions are in accordance with the California Code of Regulations Title 17 (Public Health), and are in addition to, not in lieu of, the controls and requirements of other regulatory agencies, such as the California Department of Public Health (CDPH).

## **G. IDENTIFICATION OF RECYCLED WATER FACILITIES**

Components of a recycled water system shall be identified with appropriate signage, tags, tape, color, or other means to differentiate them from the potable system as outlined in the Permit to Use Recycled Water.

## **H. CROSS-CONNECTION TESTING**

Prior to activating a recycled water service, a cross-connection test shall be conducted to verify the absence of cross-connections between the potable and recycled water systems. Tests shall be performed by an AWWA-certified Cross-Connection Control Specialist. A test procedure for sites using recycled water for irrigation or related uses is described in Appendix E of the City's Rules and Regulations. For cases involving use of recycled water inside buildings, (i.e. dual-plumbed systems) the test procedure described in the current edition of the Uniform Plumbing Code shall be followed. The cross-connection test shall be conducted by the City. At least once every four years, a complete cross-connection shutdown test shall be conducted at all "dual-plumbed" and cooling tower sites to verify the non-existence of cross-connection between the recycled water system and any other piping system.

## **I. RECYCLED WATER PERMIT**

Prior to activating a recycled water service, an Application for a Permit to Use Recycled Water must be submitted to the City for each site or service connection. After determining that the application is complete and the site meets all design requirements, the City will conduct a cross-connection test and issue a permit. Refer to the attached Site Assessment and Permitting Process Flow sheet, in accordance with the Reclaimed Water Program Manual Rules and Regulations Administrative Requirements, Permits.

## **J. OTHER MEASURES**

Each time there is a change of customer (either owner or tenant) on any commercial or industrial premises, the owner or customer shall notify the City immediately. The City will then reassess the adequacy of the protection. Also, any alterations to existing onsite facilities that may affect the required protection level must be reported immediately to the City. At its discretion, the City may conduct surveys of any property where water service is provided by the City. These surveys are to determine if any actual or potential cross-connections exist. The applicant, owner, or customer shall provide their full cooperation in facilitating these surveys.

## **2. OFFSITE RECYCLED WATER FACILITIES**

### **A. BOOSTER PUMPS**

Customers that provide booster pumps to increase the operating pressure must identify the pumping systems as recycled water, avoid the release of recycled water in an uncontrolled manner, and provide proper drainage of the packing seal water. The signage must be readily seen by all operations personnel that are in the working area. A backflow prevention assembly is required to protect the recycled water distribution system from back pressure that may be caused by using booster pumps.

### **B. SEALING WATER**

Any potable water used as seal water for recycled water pump seals must be adequately protected against backflow.

### **C. DEPTH OF PIPELINE COVER**

The top of recycled water transmission pipelines must be a minimum of 4-feet below the finished grade, unless otherwise approved. The depth of cover on service lines must be no less than 30-inches from top of grade, in accordance with the Standard Details Drawings.

### **D. SEPARATION FROM OTHER CITY UTILITY PIPELINES**

#### **1. Horizontal**

A 4-foot horizontal separation outside of pipe to outside of pipe should be maintained when a new recycled water pipeline is built parallel to an existing potable water pipeline, an existing sanitary sewer, an existing sewage force main, an existing recycled water pipeline.

#### **2. Vertical**

At crossings of potable water, recycled water, and/or sewer pipelines, pipelines should be located from the ground surface in the order of descending quality, with potable water above recycled water and recycled water above sewer. The minimum vertical separation should be 1-foot between outside top and bottom surfaces of pipes.

### **E. ALTERNATIVE CRITERIA FOR CONSTRUCTION OF RECYCLED WATER PIPELINES**

When new recycled water mains are being installed in existing developed areas, local conditions (e.g., available space, limited slope, existing structures) may create a situation in which there is no alternative but to install recycled water mains at a distance less than that required by the regulations. In such cases, the DESIGN CONSULTANT must obtain approval from the California Department of Public Health (CDPH). The alternative approach is allowed under Title 22 California Code of Regulations, Section 64551(c).

### **F. SIGNAGE AND PUBLIC NOTIFICATION**

Adequate means of notification must be provided to inform the public, employees and others that recycled water is being used, as outlined in the Water Reclamation Program Rules and Regulations.

## **G. COLOR IDENTIFICATION OF RECYCLED WATER PIPES**

All new transmission/distribution pipelines in the recycled water system, including service pipelines, valves, and other appurtenances, are colored purple and embossed or integrally stamped and/or marked:

“CAUTION: RECYCLED WATER – DO NOT DRINK,” and “PELIGRO: AGUA IMPURA – NO BEBER,” or Installed with a purple pipeline identification tape or a purple polyethylene or vinyl wrap.

Color-coded identification (caution) tape differentiating the recycled water piping from other utility lines must be consistent throughout the service area. Use Pantone 522 for the purple color.

When converting an existing potable water pipeline to recycled water usage, the water pipeline must be accurately located and tested in coordination with the Public Works Department and CDPH, and the necessary actions must be taken to bring the water pipeline and appurtenances into compliance with all applicable rules and regulations. If the existing pipeline is approved by the Public Works Department and the CDPH, except for pipe identification, the pipeline can be considered approved for recycled water service. If the use of the existing pipeline cannot be verified, the pipeline must be uncovered, inspected, and its use identified before it can be converted to another use. All replacements of an offsite distribution and/or delivery system connected to a recycled water irrigation system must be color coded for identification in accordance with these Guidelines.

## **H. PIPELINE IDENTIFICATION TAPES**

Identification tapes for protection and identification of the pipeline are prepared with black printing on a purple field having the words: “CAUTION – RECYCLED WATER – DO NOT DRINK” and “PELIGRO: AGUA IMPURA – NO BEBER” alternately on the tape. The overall tape width must be at least 3-inches and cover the width of the pipe and non-metallic.

Identification tapes must be installed 1-foot over the pipe longitudinally, and the identification tape must be continuous in its coverage.

## **I. SITE SIGNAGE**

Noticeable signs with wording that can be clearly read must be posted all site entrances, and if required by the City, at adequate intervals around the authorized use area. The Signs shall be a minimum of 9” x 12” and shall include words such as "Irrigated with Recycled Water" or "Using Recycled Water" and "Do Not Drink" in minimum 1” lettering. Signs shall also display a universal symbol identifying non-potable water. Languages in addition to English should be used on signs where appropriate. The City will provide examples of suitable signage.

## **J. EQUIPMENT IDENTIFICATION**

The recycled water system shall be identified with appropriate signage, tags, tape, or other means to differentiate them from the potable system as indicated below. The City will provide examples of identification devices and approved wording for such devices. Customers shall maintain all signage and identification devices, and replace, repair or refurbish all devices as needed.

All above-ground equipment, including pumps, storage reservoirs, piping, valves, strainers, controllers, quick-couplers, etc., which may contain recycled water shall be clearly and adequately identified by purple color-coding, tags, stickers, and/or signage.

#### **K. WATER METERS**

Water meters that are used for recycled water service shall be tagged and/or painted purple. These meters shall not be interchanged or used for potable water service after repairs and/or meter testing has been performed.

#### **L. METER AND VALVE BOXES**

Valve G-5 lids are standard steel castings with a special heavy-duty cover. All valve covers on offsite recycled water transmission pipelines are non-interchangeable with potable water covers. Covers must be painted purple by using Pantone 522.

Meter boxes shall be purple with a purple lid, or shall have a 2" x 3" minimum tag securely affixed to the outside of lid. The tag shall have the following bilingual wording: "WARNING Recycled Water Do Not Drink / AVISO Auga Reciclada No Beber."

#### **M. VALVE BOX IDENTIFICATION**

All valve covers on offsite recycled water transmission pipelines are non-interchangeable with potable water pipeline covers and must have a recognizable inscription cast on the top surface. As illustrated on the Standard Detail Drawing, all recycled water valve covers must be painted purple by using Pantone 522.

#### **N. COLOR-CODING EXPOSED RECYCLED WATER APPURTENANCES**

All aboveground, exposed pipeline facilities must be consistently color-coded purple by using Pantone 522 and marked accordingly to differentiate recycled water facilities from potable water and wastewater facilities.

#### **O. BLOW-OFF AND AIR AND VACUUM ASSEMBLIES**

Either an in-line or end-of-line blow-off drain assembly must be installed to remove water or sediment from the recycled water pipeline. Blow-off assemblies must be installed in a low point of the pipeline. The pipeline tap for the assembly must be no closer than 18-inches from a valve, coupling, joint, or fitting unless it is at the end of the pipeline. Discharge of recycled water to storm drains is restricted.

Air and vacuum valves must be provided in high points and air and vacuum valves must be sized appropriately. All below ground appurtenances for blow-off and air and vacuum valve assemblies must be consistently color-coded purple by using Pantone 522 and marked to differentiate recycled water facilities from potable water and/or wastewater facilities, in accordance with Standard Details Drawings.

**P. IRRIGATION CONTROLLERS**

Irrigation controllers shall have the same tag as specified for meter and valve boxes, located on the inside and outside of the box.

**Q. NEW RECYLED WATER PIPING**

Recycled water piping shall be purple color coded with an approved warning notice embossed or integrally stamped/marked on the pipe. As an alternative, standard pipe may be wrapped with purple plastic and tape containing the warning notice. The tape shall cover the circumference of the pipe and be securely fastened. Purple warning tape shall be placed 1-foot above pipe in the trench, be non-metallic tape, and the tape must be installed continuously. The piping must be exothermic welded for cathodic protection.

**R. STORAGE TANKS**

Recycled water storage tanks may have potable water connections for makeup from potable water sources. In all cases and under all circumstances, an approved air gap separation must be provided between the storage tank and the potable water discharge point. A copy of the proposed air gap assembly plans shall be submitted to the City of Sunnyvale Environmental Services Department and CDPH review and approval.

Where potable water is to be used for make-up to a storage tank, the flow must be controlled from the remote supervisory control and data acquisition (SCADA) system. Flow and pump run, stop, and/or fail status information, where applicable, must be available at the remote SCADA system.

The water level in each tank must be determined and electrical conductivity must be determined in tanks that receive potable water for makeup. Water level and conductivity status must be available at the remote SCADA system.

**S. TRACER WIRE**

Tracer wire must be installed as specified in the City Standard Detail Drawings.

**T. QUICK-COUPLING VALVES**

Quick-coupling valves on recycled water systems shall be visibly different from those used on the potable system. The use of Acme threaded couplings for recycled water is preferred, and shall be required for sites where both recycled water and potable water quick coupling valves are present. *The use of garden hose bibs is strictly prohibited.*

**U. OTHER EQUIPMENT**

Other equipment such as backflow prevention devices, pumps, tanks, etc., shall be painted purple and have an approved purple identification tag.

### **3. ONSITE RECYCLED WATER FACILITIES**

#### **A. GENERAL**

All onsite recycled water facilities that benefit specifically from the use of recycled water are provided by the User or Customer at its own expense. The Customer, at its own expense, makes any modification to the potable water system on the premises required by the City, to permit the use of recycled water service, including the installation by the Customer of approved backflow preventers (BP). Onsite recycled water facilities are designed to accommodate the use of recycled water in areas where the City determines that recycled water will be supplied in the future, even though recycled water service is not immediately available when the design area is ready for construction. Provision must be made for connecting to the recycled water system, when it becomes available.

#### **B. IDENTIFICATION OF ONSITE PIPES AND FITTINGS**

New onsite pipelines must be identified as recycled water pipelines by using a purple color-code that differentiates them from potable water pipelines.

All piping and valves must also be appropriately labeled or continuously taped with appropriate identification.

Approved use areas for recycled water service must also be posted with precautionary notices to warn the public.

When converting an existing potable water pipeline to recycled water usage, the potable water pipeline must be accurately located and tested in coordination with the Water Division and regulatory agencies, and the necessary actions taken to bring the water line and appurtenances into compliance with these Guidelines. If the existing pipeline is approved by the City and the regulatory agencies, except for pipe identification, the line can be considered approved for recycled water service. If the acceptability of the existing line cannot be verified, the line must be uncovered and inspected, and deficiencies identified before use. However, all replacements of an existing recycled water irrigation system must be color-coded for identification in accordance with these Guidelines.

#### **C. PIPELINE IDENTIFICATION TAPES**

Non-metallic identification or warning tape must be installed on all recycled water pressure and/or non-pressure service pipelines. A purple tape with black lettering stating: –Caution: RECYCLED WATER – DO NOT DRINK– and – PELIGRO: AGUA IMPURA – NO BEBER–must be fastened to the top of the pipe.

The tape must run continuously the entire length of the pipe, the tape must cover the entire width of pipe, and must be at least 3-inches wide tape samples and colors.

#### **D. COLOR-CODE FOR RECYCLED WATER PIPES**

The use of purple (Pantone 522) colored pipe, with the words – CAUTION: RECYCLED WATER – DO NOT DRINK –and – PELIGRO: AGUA IMPURA – NO BEBER – embossed or integrally

stamped and/or marked on the pipe is an acceptable alternative to the warning tape fastened to the top of the pipe.

The lettering should be stamped on opposite sides of the pipe, repeated every 3-feet.

All temporary and permanent connections to a recycled water system must be identified in the manner described above to differentiate them from connections to a potable water system.

When potable water is being supplied to an area also being supplied with recycled water, the potable water main must also be identified. A color-coded tape prescribed by the Water Division with the words – CAUTION – DRINKING WATER LINE – and – CUIDADA: TUBERIA DE AG UA POTABLE – must be fastened to the top of the potable water pipe and run continuously the entire length of the pipe. This tape must be at least 3-inches wide. The City determines the color code for potable water to differentiate it from recycled water.

#### **E. SEPARATION**

Refer to Chapter 2 for horizontal and vertical separations. Exceptions to the general rule of a 1-foot minimum vertical separation between potable and recycled water for onsite facilities follow.

1. On irrigation systems where intermittently pressurized recycled water lines (service lines) serve sprinkler heads, the potable water line(s) may be placed under the recycled water service lines. No special construction requirements are necessary provided that the 1-foot vertical separation is maintained.
2. On sites that use pressurized irrigation service lines with valve-in-head sprinklers, the potable water line(s) may be placed under the recycled water service lines, if additional protection is provided for the potable line. Common practices include sleeving or automatic flow control and/or shutoff devices that are installed and function properly on each lateral that cross a potable line.

#### **F. RESTRICTIONS AND REQUIRED SEPARATIONS**

1. Areas irrigated with recycled water must be kept completely separated from domestic water wells and reservoirs. Recycled water shall not be applied or allowed to migrate to within 500-feet of any well used for domestic supply or within 100-feet of any irrigation well, unless it can be demonstrated that special circumstances justify lesser distances to be acceptable.
2. Connections to supplement the recycled water system with potable water may be made only through an air-gap separation.
3. Irrigation systems at parks, golf courses, and landscape areas must be designed to strictly prohibit exposure to golfers, picnickers or others who may be exposed to recycled water or water spray.
4. No spray or mist shall be allowed to contact drinking fountains, enter dwellings, food handling facilities, or where the public may be present.
5. Cooling towers shall employ drift eliminators and/or biocides if the public or employees can be exposed to the mist.
6. Where practical, a separation of 10 horizontal feet should be maintained where potable and recycled water lines run parallel. Where potable and recycled lines cross, the potable service

should be no less than one foot above the recycled service. The City may approve reduced separation distances if these preferred separations distances cannot be achieved.

7. Garden hose bibs are not to be installed on any recycled water system for any purpose. The use of quick couplers are permitted, subject to the identification requirements described above.
8. Recycled water shall not be used as a domestic or animal water supply.
9. No reclaimed water for irrigation shall be used during periods of rainfall or when soils are saturated such that runoff can occur.
10. No reclaimed water used for irrigation shall be allowed to escape to areas outside of the designated use areas by surface flow or airborne spray.

## **G. HUNDRED YEAR FLOOD CLAUSE**

### **1. RUNOFF AND EROSION**

All recycled water storage facilities, booster pumping stations, and pipelines owned and/or operated by recycled water users must be protected against erosion, overland runoff, and other impacts resulting from storms with 100-year frequency and 24-hour duration.

### **2. PEAK FLOOD LEVELS**

All recycled water storage facilities, booster pumping stations, and pipelines owned and/or operated by recycled water users must be protected against 100-year frequency peak stream flows.

## **H. CUSTOMER'S PLANS AND SPECIFICATIONS**

Construction Drawings prepared by a professional civil engineer, a mechanical engineer, or landscape architect registered in the state of California for the construction of onsite recycled water facilities are submitted to the City Public Works Department for review and approval. The Contract Documents must delineate the proposed recycled water service area, the proposed facility location, the sizes and types of all recycled water pipelines and service connections, and other onsite facilities. The Contract Documents must include the layout of existing potable water pipelines and facilities, including any areas from which recycled water must be specifically excluded.

## **I. INFORMATION ON CUSTOMER'S CONTRACT DOCUMENTS**

The following information is provided on the Contract Documents by every customer applying for a permit to use recycled water:

1. Application information specified in the City of Sunnyvale Reclaimed Water Program Manual Rules and Regulations for Recycled Water Use and Distribution within City of Sunnyvale
2. Meter size (inch diameter)
3. Irrigated area to be served through the recycled water meter (square feet or acres)
4. Peak flow required through the meter CCF (gpm)
5. Estimate of the yearly recycled water requirement (acre-feet or hundreds of cubic feet).
6. Service pressure required at the meter as provided by the City pounds per square inch (psi).
7. Topographic contours of the served by the zone served by the meter, or if not available, sufficient information to determine elevation differences in the area served by the meter.

8. Direction of overland drainage pattern.
9. Location of existing wells (if applicable).
10. Boundary location of 100-Year Flood Plan (if applicable).
11. Location of potable water pipelines and sanitary sewers within metered service area.
12. Location of storm drains within metered service area.

**J. INFORMATION TO BE CALLED OUT ON CUSTOMER'S DRAWINGS**

The drawings shall indicate whether there are or are not any drinking fountains and/or designated outdoor eating areas on this site. All public facilities such as comfort stations, drinking fountains, outdoor eating areas, etc., shall be protected from spray and/or misting by recycled water.

**K. INFORMATION REQUIRED FOR RECYCLED WATER IRRIGATION SYSTEMS**

If onsite facilities include a landscape irrigation system, the following data for the materials used in the irrigation system is included on the plans:

1. A pipe schedule listing pipe sizes and materials of construction.
2. Valve types and/or sizes.
3. The following information for each type of sprinkler head:
  - a. Sprinkler radius (feet).
  - b. Operating pressure (psi).
  - c. Flow [gpm or gallons per hour (gph)] Sprinkler pattern.
  - d. Manufacturer, model number, and all pertinent information.
4. Drip irrigation information and all pertinent information.
5. Estimates of application rate, acres to be irrigated, soil texture and soil infiltration rate, and information on pressure requirement, hourly delivery rate, and the wetting pattern of sprinklers.

**L. STANDARD NOTES FOR INCLUSION ON CUSTOMER'S DRAWINGS**

Provide the following standard notes as applicable, on the recycled water improvement and irrigation drawings under the heading Recycled Water Notes – City of Sunnyvale.

1. Forty-eight (48) hours before starting any excavation for onsite improvements, the CONTRACTOR must notify the City of Sunnyvale, Environmental Services Department, Reclaimed Water Use Section at telephone number (408) 730-7900.
2. All work is done in accordance with City of Sunnyvale Rules and Regulations for Reclaimed Water Use and Distribution within the City of Sunnyvale.
3. All public facilities such as comfort stations, drinking fountains, outdoor eating areas, etc., must be prevented or shielded from spray and/or misting by recycled water.
4. No ponding, runoff, misting or overspray is permitted. Relocate or adjust all irrigation heads to prevent overspraying onto sidewalks, streets, private lots, and nondesignated use areas.
5. Non-designated use areas shall be protected from contact with recycled water, whether by windblown spray or by direct application through irrigation or other use. Lack of prevention, whether by design, construction practice, or system operation, is strictly prohibited.
6. Hose bibs are prohibited on recycled water systems.

7. Onsite cross-connection between recycled water pipelines and potable water pipelines is strictly prohibited.
8. Quick coupling valves used in recycled water systems conform to the following:
  - a. Quick coupling valves can be 1-inch or 3/4-inch nominal size Nelson #7645 with brass construction and a normal working pressure of 150 psi or equal.
  - b. The valve cover must be permanently attached to the quick coupling valves. The valve cover is rubber or vinyl colored purple.
  - c. Locking covers are required.
9. No substitution of pipe materials from those specified is allowed without prior approval by the City of Sunnyvale Public Works Department.
10. Install approved, non-metallic backed and stenciled warning tape over all pressure recycled water pipelines. Stencil and color code (purple Pantone 522) all irrigation pipe. Orient the stenciling to the top of the trench.
11. Provide a minimum cover of all pipe and wire in accordance with City of Sunnyvale Standard Detail Drawings.
12. When potable water pipelines and recycled water pipelines cross, the recycled water pipeline is installed within a protective sleeve. The sleeve extends 10-feet from each side, from the centerline of the potable line, for a total of 20-feet.
13. Maintain separation between potable water, recycled water, and/or sewer pipelines according to Standard Detail Drawings. Install a sewer pipeline below a recycled water pipeline and a recycled water pipeline below a potable water pipeline.
14. Provide a minimum of 12-inches of vertical separation between potable water, recycled water, and sewer pipeline so that the potable water is on top of recycled and sewer pipelines and sewer pipelines are the bottom utility pipeline, in accordance Standard Detail Drawings.
15. All public and private potable water mains, including fire mains and any water wells and water courses within the recycled water project, are shown on the plans.
16. The site irrigation systems shown on these documents use potable water until the City of Sunnyvale makes recycled water available to the site.
17. Install purple-colored Pantone 522 material for all aboveground irrigation facilities per American Water Works Association (AWWA) Guidelines and Section 116815 of the California Health and Safety Code.
  - a. Valve and other on-grade boxes – integral color
  - b. Sprinkler heads – integral color plastic
18. Tag all valves and other below-grade facilities in boxes with permanent recycled water labels that identify the facility as —RECYCLED WATER — DO NOT DRINK— in English and —AVISO: AQUA IMPURA — NO TOMAR— in Spanish. Attach the label with either stainless steel wire or self-locking plastic ties.
19. The Customer or Contractor shall conduct a successful cross-connection control shutdown test and coverage test as directed by the City of Sunnyvale Water Division before the site shall be approved for the use of any recycled water.
20. The design and location for RECYCLED WATER – DO NOT DRINK signs must be called out on the drawings.
21. An annual cross-connection inspection is conducted by the City of Sunnyvale subject to approval.
22. Before a pipeline is converted to recycled water, an onsite supervisor shall be designated in writing. This individual shall be familiar with plumbing systems on the property, the basic concepts

of backflow and/or cross-connection protection, and the specific requirements of recycled water systems. The designated site supervisor shall attend the county water authority class for recycled water site supervisors. Copies of the site supervisor's certificate with 24-hour contact telephone numbers in the form shown below must be provided to the City of Sunnyvale.

In case of emergency, contact \_\_\_\_\_ at \_\_\_\_\_

After hours, contact \_\_\_\_\_ at \_\_\_\_\_

24. Educate all maintenance personnel continuously of the presence of recycled water. Personnel must be informed that recycled water is meant for irrigation purposes or any CDPH-approved nonpotable use only, and is not approved for drinking purposes, hand washing, cleaning of tools, etc. Given the high turnover rate of employees in the landscape industry, it is important this information be disseminated almost daily.
25. A physical separation shall be provided between adjacent areas of irrigation with recycled water and potable water. Separation is provided by concrete mow strips, chain fences, or other means approved by the City of Sunnyvale.

#### M. DECLARATION OF RESPONSIBLE CHARGE

The following declaration of responsible charge must appear on the cover sheet of the drawings.

##### **Declaration of Responsible Charge**

I hereby declare that I am the landscape architect of work for this project, and that I have exercised responsible charges over the design of this project as defined in Section 6703 of the Business and Professions Code and design is consistent with current standards.

I understand that the check of project drawings and specifications by the City of Sunnyvale and the California Department of Public Health is confined to a review only and does not relieve me, as the landscape architect of work, of my responsibilities for project design.

Firm Name and Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone No. \_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Name

Registration No. \_\_\_\_\_

Expiration Date: \_\_\_\_\_

## **N. RECYCLED WATER INSPECTION PROCEDURES**

This paragraph summarizes the inspection procedures for recycled water.

### **1. Coverage Test**

- a. Upon completion of the construction of any irrigation system, the system is inspected to determine its adequacy to meet health and safety concerns. The coverage test looks at overspray, misting, ponding, runoff, color coding, and signage. The City's Cross-Connection Specialist schedules the coverage test with the customer site supervisor. Any punchlist items are finalized by the Cross-Connection Specialist. Changes from the approved design are marked on as-built drawings.

### **2. Backflow Prevention**

- a. The provision of recycled water to a premises constitutes an auxiliary water supply not approved for potable use as described in Sunnyvale Municipal Code 12.28.190. All premises served by both potable water and recycled water shall have but not limited to air gaps or reduced pressure principle devices (RP) on the potable and recycled water system. Pressure regulating devices may be required as to further protect the potable water system, as the Water Division deems necessary.
- b. In certain cases, the City may require RPs or other backflow prevention devices to be installed on the recycled water service. Such protection might be deemed necessary in cases where backflow from onsite uses has the potential to impact the quality or safety of the recycled water supply. The City will evaluate the need for such protection on a case-by-case basis.
- c. Approved RPs on potable water services, as required in these provisions, shall be provided, installed, tested, and maintained by the customer at the customer's expense. Test reports shall be submitted to the Water Division as directed. RPs shall be located on the property served immediately downstream of the meter and shall not be on the City's facilities. All devices shall be readily accessible for testing and maintenance and no device shall be submerged at any time.
- d. All backflow prevention devices are to meet the City Standard Detail Drawings, and Cross-Connection Control Program Rules and Regulations.
- e. Requirements governing backflow prevention are intended to protect the City's potable and recycled water supplies, and are not intended to protect customers from potential hazards of cross-connections within their own property.

### **3. CUSTOMERS' DESIGNATED RECYCLED WATER SUPERVISOR**

The customer shall designate a "Recycled Water Supervisor" as the person responsible for the customer's recycled water system at each premise where recycled water is used. This supervisor shall be responsible for:

- a. The operation and maintenance of all components of the recycled water system;

- b. Provide, install, and maintain signs, tags, markers, paint, and other devices identifying recycled water distribution hardware and appurtenances onsite in accordance with permit requirements;
- c. Prevention of cross-connections with the potable system;
- d. Notifying the City of any problems, changes or proposed changes to method of operation of the recycled water system or violations of any permit conditions;
- e. Notifying the City of any updates, changes or proposed changes, modifications or additions to the on-site recycled water system;
- f. Coordinate and work collaboratively with the City Cross-Connection Specialist on performing cross-connection inspections and tests;
- g. Following each year of operation, submit a self-survey monitoring report to the Environmental Services. The self-survey shall be conducted by the site supervisor and/or a certified AWWA CA-NV Cross-Connection Control Specialist.

#### **O. SHUTDOWN TEST (CROSS-CONNECTION CONTROL TEST)**

The cross-connection control shutdown 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 116800 and 116805 of the California Health and Safety Code.

Cross-connection control tests are conducted on all sites containing potable and recycled water systems. The individual responsible for overseeing the cross-connection control test must hold a current state of California recognized certification as a Cross-Connection Control Specialist. A complete cross-connection control test must be scheduled before the initial activation of the site's recycled water system and be retested at least once every four years thereafter for dual plumbed sites. Also, based on Section 60316 of proposed Title 22, a site walkthrough and record check must be scheduled annually for dual plumbed sites. Article 5 of Title 22 details the report requirements for dual plumbed sites. Section 7604 of Title 17 CCR refers to nondual plumbed sites. The frequency of the cross-connection control shutdown test and inspection of nondual plumbed sites is determined by the regulatory agency. A dual plumbed schedule for cross-connection control shutdown tests and inspections should be followed. These tests may be conducted by the water purveyor's cross-connection control specialist or a contract specialist with oversight by local or state health departments.

##### **1. Shutdown Test Purpose**

The purpose or reason for the test is to demonstrate that at the time of the test, there were no discoverable cross-connections between the use site potable water systems and the use site recycled water systems.

##### **2. General Test Procedure**

Shut off the recycled water meter(s), depressurize the recycled distribution system, and maintain a pressurized potable water system. Attach 24-hour pressure recorders to points in the recycled water system. If the recycled system repressurizes, it could be cross-connected to the potable water system.

Due to the possibility of check valves, the procedure is reversed. Pressurize the recycled distribution system and depressurize the potable water system. The test may take up to 48- hours to complete. If cross-connections are discovered during the test, the cross-connections must be

eliminated before the recycled water distribution system is activated (for new systems) or reactivated (for existing systems).

### **3. Overspray and Runoff Testing**

A recycled water overspray, ponding, runoff inspection, and a signage review are part of the cross-connection control test. The inspection relates to the possibility of the inhalation of recycled water irrigation spray and overspray and misting into nonuse areas, and excessive runoff into area storm drains. The inspection must also include the possibility of cross-connecting the irrigation system and other private potable water systems. The overspray, ponding, and runoff inspection is not necessary on sites that use only drip irrigation.

### **4. New and Retrofit Site Considerations**

Cross-connection control tests and use site inspections are conducted on two types of recycled water use sites. The first type is new construction with complete sets of planning and inspection documents. The second is the retrofit with minimal or no planning and inspection documents. Although the basis for the test is the same for each type, the retrofit can pose additional challenges because of the lack of knowledge of the site and the existing plumbing layout. When dealing with retrofits, the site must be carefully inspected by the City's Cross-Connection Specialist. Minimal plans should be available, either as existing as-builts or as developed by the purveyor. The site must be surveyed by the City Cross-Connection Specialist before final submission of the site retrofit plans for review and approval by the City. The shutdown testing will be conducted only after final site plan approval.

### **5. Dual-Plumbing Systems**

The results of the cross-connection control test for dual-plumbed systems are compiled in a standard engineering report and distributed to all concerned parties. The specific requirements of the engineering report are contained in Section 60314 of proposed Title 22, CCR.

## **P. PROCEDURES**

Notification should occur at least two weeks before the actual cross-connection control test to allow adequate time for scheduling. The recycled water customer or contractor contacts and coordinates the test with all parties concerned.

Because a complete cross-connection control test directly impacts the site and any ongoing operations at that site, the owner or customer at the site must be notified well in advance of the test. The City should make the owner or customer aware of its responsibilities and obligations well in advance of the cross-connection control test. Test notification should consist of a letter explaining the purpose and general methodology of the test and the date, time, and duration of the test.

In an emergency, the City may perform testing at a site with 24-hours of notice given to the Owner.

## **Q. Shutdown (Cross-Connection Control) Test General Considerations**

Concerning the actual cross-connection control test, any devices that could repressurize the potable or recycled water systems during testing should be deactivated. Examples of these devices are water

heaters, pump systems on cooling towers, heating systems, etc.; overhead plumbing that may become air locked during the depressurization and break free during the test; and any water uses during the test such as opening of hose bibs or the use of hand basins that may contribute to pressure changes in the system. There may be water cooled systems that cannot be shut down during the test. If so, cooling system water must be highlined from another available source, such as a fire hydrant.

A suggested list of equipment to have available for testing includes site plans, flashlight, notebook, tape measure, needle-nose pliers (to activate hose-bib vacuum breakers), paper cups, regulatory and guidance documents such as Title 22, and the CDPH recommended policies relating to recycled water use.

The customer or contractor should provide 24-hour pressure recorders and shovels for potholing, if necessary.

The customer or contractor should ensure that someone is on site during testing who is familiar with the existing plumbing and/or irrigation systems. The Site Supervisor should be present during the testing. The customer or contractor must know how to operate the irrigation master control panel at the site.

Normally, the cross-connection control test is the last element to be completed before the site is converted to recycled water use. This approach minimizes the chance for construction personnel to create a cross-connection after the test is completed and before the system is converted to recycled water.

To minimize the impact of the test on the public, cross-connection control tests should be scheduled during periods of minimal water use. For example, tests can be scheduled during school vacation periods or from 11:00 p.m. to 7:00 a.m. at shopping centers. Similarly, residential and apartment complex potable water cross-connection control tests can be scheduled on weekend nights. If there is a threshold valve, it should be secured to isolate the building from the rest of the potable water system during the shutdown test.

Frequently at commercial and industrial sites, potable water meters are secured (shutoff) when buildings are empty. Before securing the water meter, check the meter tattle tail for signs of water flow. If there is flow into the building, it must be stopped before securing the meter. The reason for this action is that after the test, when the meter is reactivated, flow may lead to flooding for unknown reasons. A frequent cause of flow, after reactivation of the meter, is a stuck toilet tank fill float. If any water is flowing through the meter, the reason for the flow must be determined.

## **4. RECYCLED WATER FOR CONSTRUCTION USE**

### **A. Permits**

The use of recycled water for construction purposes must be approved by the City of Sunnyvale Public Works Department. The permit must be obtained from the Water Division before construction begins. Recycled water is obtained from a permanent water tanker filling station. The permit instructions and form are attached at the end of this chapter.

### **B. Construction Uses**

Recycled water for construction may only be used for soil compaction during grading operations, dust control, and consolidation and compaction of backfill in trenches for nonpotable water, sanitary sewer, storm drain, gas and electric pipelines. Recycled water may not be used for water jetting and consolidation or compaction of backfill in trenches for potable water pipelines.

### **C. Equipment**

Equipment operators must be instructed about the requirements stated here and the potential health hazards involved with the use of recycled water. Water trucks, hoses, drop tanks, etc., must be identified as containing recycled water not suitable for use as drinking water.

Recycled water may not be introduced into any potable water piping system. No unprotected connection may be made between equipment containing recycled water and any part of a potable water system.

### **D. Equipment and Facilities Cleaning**

Any equipment or facilities such as storage ponds, tanks, temporary piping or valves, and portable pumps used with recycled water must be cleaned and disinfected before being removed from the approved use area for use at another jobsite. Disinfection and cleaning ensure the protection of public health. The disinfection process must be performed in the representative's presence.

**City of Sunnyvale**  
**Environmental Services Department**  
**Water Division**  
**Permanent Water Tanker Filling Station**  
**Recycled Water Service Guidelines**

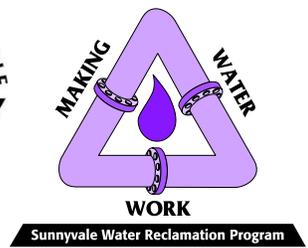
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1. Notify and/or call the City of Sunnyvale Recycled Water Program Coordinator for information when applying for the Recycled Water Service Construction Permit at telephone number (408) 730-7663 or (408) 730-7561.
  
2. A Recycled Water Filling Station is located at the:  
  
Donald M. Somers Water Pollution Control Plant  
1444 Borregas Avenue  
Sunnyvale, CA 94089
  
3. A Contractor and/or customer interested in using recycled water must complete an application for recycled water use according to the City of Sunnyvale Department Rules and Regulations for Reclaimed Water, a copy of which is attached.
  
4. All vehicles used in transporting recycled water must be clearly marked with typical signage that reads: "CAUTION: RECYCLED WATER – DO NOT DRINK" in English and Spanish, and are required to undergo disinfection before potable water can be used.
  
5. The Contractor and/or customer must have a person knowledgeable in the safe and proper use of recycled water. Before the use of recycled water begins, the Contractor and/or customer and the City of Sunnyvale representative must hold tailgate safety meeting, prior to issuing the permit.
  
6. Prior to filling operations, the Contractor and/or customer is required to check in at the Sunnyvale Water Pollution Plant Administrative Office and sign in for every load taken.
  
7. The City of Sunnyvale may make periodic site inspections to ensure that state guidelines are being applied in a manner that does not jeopardize the safety of workers or the general public.

# City of Sunnyvale

## RECYCLED WATER FOR CONSTRUCTION USE PERMIT

Environmental Services Division  
221 Commercial Street, Sunnyvale, CA 94088  
(408) 730-7633



### APPLICANT INFORMATION

CONTRACTOR: \_\_\_\_\_

CONTRACTOR'S DESIGNATED RECYLED WATER REPRESENTATIVE'S NAME: \_\_\_\_\_

PHONE NUMBER: \_\_\_\_\_

EMAIL: \_\_\_\_\_

DATE: \_\_\_\_\_

PROPOSED START: \_\_\_\_\_ PROPOSED FINISH: \_\_\_\_\_

JOB SITE LOCATION/ADDRESS: \_\_\_\_\_

PROJECT NUMBER: \_\_\_\_\_ CITY PROJECT?  ENCROACHMENT PERMIT?

SIGNATURE: \_\_\_\_\_

### TERMS & CONDITIONS

The above named applicant is hereby authorized to use recycled water subject to compliance with a) the City of Sunnyvale's *Rules and Regulations for Recycled Water*, b) applicable state regulations related to the use of recycled water, and c) the attached additional terms and conditions.

The applicant shall report any changes (permanent or temporary) to the premises or operation that significantly change the volume or uses of reclaimed water, or any change in ownership of the facility.

This permit may be revoked prior to the expiration date if found to have been obtained through submittal of false information or if there is unapproved deviation from the terms and conditions under which it has been granted. This permit is issued solely to the user named above for the operation and ownership in effect at the time of the application and is not transferable.

Recycled water for construction use may only be used for soil compaction during grading operations, dust control, mixing concrete, cleaning roads, sidewalks, and streets and the consolidation and compaction of backfill in trenches for non-potable water, sanitary sewer, storm drain, gas and electric pipelines.

Recycled water may not be used for water jetting and consolidation or compaction of backfill in trenches for potable water pipelines.

Recycled water is only available from the hours of 7am to 4pm, Monday through Friday, excepting City Holidays.

### CITY USE ONLY

**Approved for Recycled Water Use per Terms and Conditions listed above.**

\_\_\_\_\_  
City of Sunnyvale – Cross Connection Specialist

\_\_\_\_\_  
John Ramirez, Water Operations Manager

- cc:  John Lunetta, Land Development  
 Kim Pineda, Project Administration

