

SECTION 14

RECYCLED WATER INFRASTRUCTURE DESIGN

- 14-1 DETERMINATION OF USE** - The City shall determine whether a given parcel or site will be furnished with recycled water or potable water for non-potable use. The determination shall be in accordance with the standards of treatment and water quality requirements for the proposed use. Guidelines are set in Title 22, Chapter 4 of the California Administrative Code, with the intent of the City to protect the public health, and with the availability and/or feasibility of making recycled water available.
- 14-2 DESIGN INFORMATION** - Before design, the Developer, or his representative, should obtain the following from the City of Roseville Environmental Utilities Department:
- A.** Approval to use recycled water for the proposed system, as stated in the previous section.
 - B.** Determination of on-site storage of recycled water will be required for peak demand use.
 - C.** Verification of locations and size of proposed points of connection.
 - D.** Design pressures and available flow to the proposed facilities.
- 14-3 CURRENT STANDARDS** - Pertinent and current requirements of the following agencies or standards shall be complied with. In case of conflicting design criteria, standards set forth by the City of Roseville, as established herein, shall govern:
- A.** City of Roseville Rules and Regulations for use of recycled water.
 - B.** City of Roseville Design and Construction Standards
 - C.** Title 22, Chapter 4 of the California Administrative Code regarding recycled water use.
 - D.** Title 17, Chapter 5, Subchapter 1 of the California Administrative Code regarding cross-connections and backflow prevention.
 - E.** Guidelines for Use of Recycled Water, State of California Department of Health Services.
 - F.** Guidelines for Distribution of Non-potable Water, California – Nevada Section, American Water Works Association (AWWA).

- G.** Manual of Cross Connection Control, State of California Department of Health Services.
- H.** Placer County Department of Environmental Health – regulations pertaining to recycled water.
- 14-4 RECYCLED WATER SUPPLY QUALITY** - The City of Roseville produces disinfected, tertiary-treated recycled water consistent with Title 22, Chapter 4 of the California Administrative Code.
- 14-5 OFF-SITE RECYCLED WATER FACILITIES** - Normally consists of those facilities which are or will be owned, operated, and maintained by the City of Roseville.
- 14-6 PRIVATE ON-SITE RECYCLED WATER FACILITIES** - Facilities downstream of a recycled water meter owned, operated, and maintained by the property owner. The on-site recycled water facilities shall be subject to rules and regulations set forth by the City for recycled water.
- 14-7 WATER SUPPLY PRESSURE** - Minimum operating pressure of 50 PSI shall be maintained at service connections to the distribution system.
- 14-8 TRANSMISSION SYSTEM DESIGN** - Sizing and layout of transmission mains shall conform to the Recycled Water Master Plan of the City of Roseville and as outlined herein.
- A. Hydraulic Analysis** – A Hardy-Cross network hydraulic analysis shall be provided to the Environmental Utilities Department upon request.
- 1.** The hydraulic analysis submitted shall include two copies of the following items:
 - a.** The data input files, as well as the analysis results on electronic format.
 - b.** Information on the development (e.g. type of development, number of acres, number of units, etc.).
 - c.** Data sheets outlining all assumptions including, but not limited to, method used to assign demands to corresponding junction nodes, proposed irrigation demands, and source HGLs used.
 - d.** Map identifying pipe and node numbers and their locations.
 - e.** The name and version of software used for the analysis.
 - f.** Elevations of junction and source nodes. (The elevations used in the network hydraulic analysis shall be based on a project grading

plan or the anticipated final elevations. If the final grading plan deviates significantly from the elevations used in the analysis, a revised analysis will be required.)

g. Staging or phasing of the development.

h. Appropriate off-site demands.

2. The Hazen-Williams formula shall be used in the analysis of the system. The roughness factor shall be as follows:

a. C=130 for all new cement-line, PVC C-900, and ductile iron pipes.

b. C=130 for all existing pipes greater or equal to 16 inches in diameter.

c. C=120 for all existing pipes less than or equal to 12 inches in diameter.

B. Specifications - Technical specifications for transmission mains shall be submitted with improvement plans.

C. Transmission Main Size - All transmission mains shall be sized to provide total peak demand of all customers served. Peak demand flow is determined as follows:

1. Peak day demand for irrigation customers shall be determined as a July day demand.

2. Peak demand flow for customers with on-site storage shall be peak day as a constant flow rate over a 24-hour period

3. Peak demand flow for customers without on-site storage shall be no less than peak day as a constant flow rate over a 9-hour period. Maximum design velocity in the transmission and distribution systems shall not exceed 5 feet per second. Standard acceptable pipe sizes are 6, 8, 12, 24, 30, 36, 42, 48, and 54 inches.

D. Transmission Main Location - All transmission mains shall be installed within public rights-of-way and easements. In every instance where a recycled water main is to be installed in a public right-of-way or easement, the Environmental Utilities Department Director shall be contacted for preferred location.

1. Mains shall be located 3 feet from the curb and gutter on the southerly and easterly side of the street. If conflicts exist at this location, then the main may be installed within an easement immediately adjacent to and behind the property line fronting the

public right-of-way, subject to approval of the Environmental Utilities Department Director.

- 2.** If it necessary to install a recycled water main outside of the public right-of-way, an easement dedication to the City shall be required. Recycled water mains shall be centered within their easement. Easements shall be located completely on one side of a property line or fence. Dedicated easements shall be clear of all permanent structures, building eaves, roof lines and the future trucks of large tree species. Temporary construction easements of adequate size shall also be provided. The easement width shall be the greater of the following:
 - a.** Minimum width of easement shall be 15 feet.
 - b.** All easements shall have a minimum width equal to the required trench width according to the standard detail for trench backfill plus 2 additional feet of width for every 1 foot of depth of the pipe as measured from bottom of the pipe to finish grade. All recycled water lines shall be centered within their easement.
- 3.** Recycled water mains located between lots shall require an access easement or pedestrian walkway as determined by the Environmental Utilities Department Director.
- 4.** Recycled water mains shall maintain a minimum horizontal separation of 10 feet between sanitary sewer lines and potable water mains. Recycled water mains shall be higher than sewer mains and below water mains. On crossings, the recycled water line shall be a minimum of 1 foot above the sewer line and 1 foot below water mains. In cases where the recycled water main must cross under the sewer main or service, or over water mains, the recycled water line shall be ductile iron to a point 5 feet each side of crossing and be concrete-encased.
- 5.** When crossing a sanitary sewer force main, the recycled water main shall be installed a minimum of 1 foot above the sewer line, and be of ductile iron a minimum of 5 feet on each side of the force main.
- 6.** No parallel utilities shall be placed within 5 feet of each side of a recycled water line.
- 7.** Mains shall maintain a minimum cover of 48 inches and a maximum depth of 60 inches as measured from gutter flowline, unless otherwise specified by the Environmental Utilities Department Director.

8. Recycled water mains shall maintain vertical separation of 12 inches between storm drains and other dry utilities. The vertical clearance may be reduced to 6 inches with the approval of the Environmental Utilities Director.
9. Recycled water mains under large structures such as culverts and large diameter storm drains shall be ductile iron and installed within a casing per these standard. The casing shall extend beyond the structure a minimum of 5 feet or the depth of the water main on each side.

E. Main Line Fittings and Connections - Recycled water transmission and distribution systems shall be designed with mechanical restraint systems to prevent thrusting forces. All fittings shall maintain a minimum of 18 feet of restrained pipe into the fitting in all directions. Thrust blocks shall only be used in special cases where approved by the Environmental Utilities Department Director. All restrained joint systems shall be shown in plan and profile and on the master recycled water plan. Design of restrained systems shall follow standard engineering practice. The Environmental Utilities Department Director shall approve the design prior to installation. Any deviation from these requirements will not be permitted without approval of the Environmental Utilities Director.

F. Recycled Water Transmission Main and Appurtenances

1. **Valves** - The distribution system shall be equipped with a sufficient number of valves so that no single shutdown will result in isolating a transmission main. Valves shall also be spaced at intervals no greater than 2,500 feet for pipe 16" and larger. Valves shall be spaced no greater than 500' for pipe sizes of 12" or less. Valves shall be located such that any section of main can be shut down without going to more than three locations to close valves. All tees shall have three valves and all crosses shall have four valves. A valve shall be installed on services immediately off the main and on the transmission main immediately downstream of the service.
2. **Inspection Manholes** - Inspection manholes shall be placed every 2,000 feet. A minimum of one inspection manhole shall be located between two valves unless otherwise approved by the Environmental Utilities Director. Inspection manholes on Ductile Iron Mains are not required.

G. Booster Pump Stations - All booster pumps stations shall be subject to criteria established and approved by the Environmental Utilities Department Director.

- H. Air and Vacuum Valves and Blow-Offs** - Air and vacuum valves shall be installed at all localized high points in the transmission main per standard drawings. A blow-off assembly, conforming to the Standard Drawings, shall be installed on all permanent and temporary dead-end runs, as well as each local low point on the transmission main. Wherever possible, the blow-off shall be installed in the street right-of-way a minimum of 5 feet from the curb and gutter. In no case shall the location be such that there is a possibility of back-siphon into the distribution system. A 2-inch blow-off shall be used on mains 12 inches and smaller. A 4-inch blow-off shall be used on lines 16 inches and larger. Blow-offs shall be located within 100 feet of a sewer manhole for discharging during servicing.
- I. Corrosion Protection** – A corrosion protection study shall be included with improvement plan submittals. Corrosion protection facilities shall be identified from the roadway with the curb stamp “CP-RW”
- J. Insulating Flange Test Station** - An insulating flange test station shall be used between dissimilar metals per the standard details.
- K. Warranty Inspection of Recycled Water Stubs:** As a requirement, recycled water stubs are provided to subdivision, existing lots, or parcels, as a courtesy by developers during the construction of backbone infrastructures in streets to prevent cutting up the newly paved streets when the subdivisions are ready to develop. These stubs become an integral part of the recycled water system of the subdivisions, existing lots, or parcels, and subsequently the responsibility of the developers of the subdivisions, existing lots, or parcels, and are therefore imperiled to both construction and warranty inspections. This practice saves future developers construction time and cost that would have otherwise been spent on tie-ins and street repairs and in some instances prevents delays in the event a street has a moratorium. Since these stubs are provided at no cost to future developers, it is our position, hence our policy, that it is the responsibility of contractors to test and repair these stubs, if found damage, prior to tie-ins. A note to this effect shall be placed on the improvement plans.
- 14-9 SERVICE LINES** - Service lines from the recycled water main to the property line or edge of easement shall normally be installed at the time the main is constructed. Services from mains installed in private roads shall extend 2 feet beyond the edge of the pavement. Service line criteria shall be as follows:
- A.** For customers with on-site storage, service lines shall be sized to provide peak day demand as a constant flow rate over a 24-hour period. Service size subject to approval of the Environmental Utilities Department Director.

For customers where no on-site storage is required (as determined by the Environmental Utilities Department Director), larger service lines shall be provided subject to approval of the Environmental Utilities Department Director.

Maximum design velocity in service lines larger than 4 inches shall not exceed 5 feet per second.

- B.** All services shall be installed with a corporation stop at the main and a curb stop at the property line. A gate valve shall be used when the service is larger than 2 inches.
- C.** The Environmental Utilities Department reserves the right to make all recycled water service taps into existing mains upon application for a permit and payment of the required fees. A note to this effect shall be placed on the plan sheet, which details the area that requires such tapping. Application shall be made to the Environmental Utilities Department at least two weeks in advance of the time the tap is desired. All fees shall be paid prior to application. The Contractor shall do all excavation, backfill and the installation of the remainder of the recycled water service.
- D.** Location of each service line will be determined on a case-by-case basis by the Environmental Utilities Director.
- E.** Separation of recycled water services, sanitary sewer lines, and potable water lines are described in these standards.
- F.** Meters shall be installed on all recycled water services. City staff shall install meters after permits are processed, testing has been completed per the construction standards, and fees are paid.
- G.** The curb shall be stamped with a “RW” at service locations.

14-10 ON-SITE RECYCLED WATER FACILITIES DESIGN - On-site recycled water facilities are defined as those facilities which are owned and operated by private entities. All potential on-site uses of recycled water shall be reviewed by the City of Roseville Environmental Utilities Department. If recycled water is to be used, the facilities shall be designed and constructed in accordance with the provisions set forth herein (Sections 14-10 through 14-23) for on-site recycled water facilities. Where a unique situation exists on-site that is not covered by on-site specifications, off-site specifications may apply as determined by the Environmental Utilities Department Director. In addition, all state and county regulations regarding recycled water use shall be incorporated. Potential uses of recycled water are outlined in Title 22, Chapter 4 of the California Administrative Code. The

following notes shall be placed on the improvement plans, and landscape design plans:

City of Roseville Recycled Water Special On-Site Irrigation Notes

- 1.** The installation of the recycled water system shall conform to the regulations for the construction of recycled water systems within the City of Roseville and the accompanying plans and specifications.
- 2.** All on-site recycled and potable water piping installed on this project shall be identified in accordance with the City of Roseville Construction Standards for recycled water infrastructure and the irrigation specifications.
- 3.** City of Roseville Environmental Utilities Department shall be notified two days prior to the start of construction at (916) 774-5750 and each workday thereafter until completion of project for commercial irrigation systems. City of Roseville Parks Department shall be notified two days prior to the start of construction at (916) 746-1758 for landscape corridors and parks. A pre-construction materials inspection must be arranged prior to the start of construction.
- 4.** No facility is to be backfilled until inspected by the City of Roseville Environmental Utilities Department and /or Parks Department Inspector.
- 5.** All recycled water infrastructure, both on-site and off-site, shall be inspected by City of Roseville ~~Development Services Environmental Utilities and/or Parks~~ Department. For inspection of recycled water system contact Development Services ~~Environmental Utilities at 774-5750~~ forty-eight (48) hours in advance. Points of inspection are:
 - a.** Pre-construction materials inspection.
 - b.** Irrigation system installation before lines are covered.
 - c.** Pressure testing.
 - d.** System cross connection control test.
 - e.** System coverage test.
 - f.** Signage.
- 6.** All recycled water piping shall be purple colored PVC unless otherwise specified. Where purple PVC is not used, pipe shall be identified

(marked) in accordance with the City of Roseville Construction Standards.

7. Marking on the purple colored PVC pipe shall include the following:

“RECYCLED WATER- DO NOT DRINK”. Nominal pipe size. PVC-1120. Pressure rating in pounds per square inch at 73 degrees. ASTM designations such as 1785, 2241, 1672, 3139. Printing shall be placed continuously on two sides of the pipe.

8. All recycled water sprinkler control valves, valve risers, sprinkler risers, and swing joints shall be tagged with identification tags or adhesive labels.

a. Tags shall be weatherproof plastic, 3” x 4”, purple color with the words “RECYCLED WATER - DO NOT DRINK” imprinted on one side, and “AGUA Reciclada on the other side. Imprinting shall be permanent and black in color. Use tags as manufactured by T. Christy Enterprises or approved equal.

b. 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.

c. Recycled water warning labels or stickers that are consistent with City of Roseville Construction Standards for recycled water infrastructure and the irrigation specifications must be attached to all piping not in compliance.

d. All sprinkler heads must be designed for recycled water usage, with purple recycled water warning caps.

e. Sprinkler risers and swing joints shall be identified with purple adhesive 3” x 3” labels. Each label shall state “Recycled Water – Do Not Drink” in English and Spanish.

9. All recycled water control valve boxes shall be purple 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 permanently stamped or molded into the label. The warning shall contain the following information:

a. “RECYCLED WATER”.

b. “DO NOT DRINK” in English and Spanish.

- 10.** Recycled water quick coupling valves shall have a purple rubber or vinyl cover. The cover shall be of a locking type and have a warning permanently stamped or molded as follows: “RECYCLED WATER – DO NOT DRINK” in English and Spanish.
- 11.** Plastic warning tape shall be used on all potable water piping; potable water warning tape shall be a minimum of 3 inches wide and shall run continuously for the entire length of each line. The tape shall be attached to the top of the pipe with nylon tie-wrap banded around the warning tape and the pipe every five feet on center. Warning tape for the potable water piping shall be blue in color with words “CAUTION: POTABLE WATER LINE BURIED BELOW” imprinted in minimum 1-inch high letters, black in color. Imprinting shall be continuous and permanent.
- 12.** All pressure main line piping from the recycled water system shall be installed to maintain 10 feet minimum horizontal separation from all potable water piping. Where recycled and potable water pressure main line piping cross, the recycled water piping shall be installed 12” below the potable water piping OD to OD. Where the recycled water pressure main line must pass above potable water piping, the recycled water piping shall be installed in a class 200 purple colored PVC sleeve which extends a minimum of five feet on either side of the potable water piping. A 12” vertical separation OD to OD must be maintained. Conventional (white) PVC pipe may be used for sleeving material if it is taped with three-inch wide purple warning tape, which reads “RECYCLED WATER-DO NOT DRINK”.
- 13.** All pressure main line piping from the recycled water system shall be installed to maintain a ten foot minimum horizontal separation from all sanitary sewer lines. Where recycled and sewer cross, the recycled water piping shall be installed a minimum of one foot above sewer.
- 14.** For on-site recycled water piping, the minimum depth from finish grade to top of pipe shall be as follows:
 - a.** Intermittent pressure lines (All sizes) 12”
 - b.** Constant pressure lines 2.5” and smaller..... 18”
 - c.** Constant pressure lines 3” and larger24”
- 15.** Pressure and cross connection testing for On-Site Recycled water systems:
 - a.** All testing of recycled water systems must be performed utilizing a potable water source via a construction water connection per City of Roseville Construction Standards. No recycled water may connect to a recycled water system until all testing is successfully complete.

- b.** The source of potable water used for testing must have a meter and an approved back flow prevention device. These can be obtained through the City of Roseville.
- c.** The contractor shall provide a means to plumb in pressure and cross connection testing apparatus at the point of highest elevation, for both potable and constant pressure recycled water systems.
- d.** The constant pressure recycled water system including all appurtenances shall be tested at 125 PSI at highest point of elevation for 1 hour with no detectable leakage.
- e.** Pressure testing must be successfully completed prior to cross connection testing.
- f.** The recycled water system shall be tested for cross-connection in accordance with Uniform Plumbing Code Appendix J prior to use.
- g.** For projects being performed in phases, a cross connection test shall be performed on each phase independently before it is put into service. The potable water source used for testing each phase must be independent of other previously completed phases.
- h.** At the time a cross connection test is to be performed, construction on both the potable and the recycled water systems being tested must be complete, and both systems fully operational and functioning as designed.
- i.** Cross connection testing shall be performed on the system by City forces with the assistance of the Contractor. The test will be coordinated through the Environmental Utilities or Parks Department inspector. Forty-eight (48) hours notice is required before the test. Depending on the complexity of the site, a preliminary field meeting may also be required.

16. Coverage test

- a.** Adjust spray heads to eliminate overspray onto native oak areas and into areas not under the control of the customer such as pool decks, private patios, streets, sidewalks, and other similar facilities.

17. Meter Installation

Once the on-site recycled water system has been properly inspected and passed pressure and cross connection testing, a meter may be installed. The meter must be purchased from the City of Roseville and installed by

city forces. Coordinate meter purchase and installation with the Environmental Utilities or Parks Department inspector.

18. No connection shall be made to the City's existing recycled water system until the new facilities have been successfully pressure and cross connection tested. Taps to the existing recycled system will be made by City forces only.

19. Failure to comply with the above guidelines violates the City of Roseville design and construction standards for recycled water infrastructure and will result in termination of service until the appropriate corrective steps have been taken.

14-11 DETERMINATION TO USE RECYCLED WATER OR POTABLE WATER - The City shall determine whether a given parcel or site will be furnished with recycled water or potable water for non-potable use. The determination shall be in accordance with the standards of treatment and water quality requirements for the proposed use. Guidelines are set in Title 22, Chapter 4 of the California Administrative Code, with the intent of the City to protect the public health, and with the availability and/or feasibility of making recycled water available. Additionally, a determination will be made whether the proposed use falls within the guidelines of the City's Master Reclamation Permit.

14-12 DESIGN OF RECYCLED WATER FACILITIES WITH TEMPORARY POTABLE WATER SERVICE - Where recycled water is not immediately available for use when the design area is ready for construction, and if the City of Roseville Environmental Utilities Department has determined that recycled water will be supplied in the future, the on-site facilities shall be designed to use recycled water. The on-site system shall be designed and constructed to the Environmental Utilities Department construction specifications as set forth herein. Provisions shall be made as directed by the Environmental Utilities Department and these specifications followed to allow for connection to the recycled water facilities when they become available. In the interim, potable water will be supplied to the recycled water facilities through a temporary potable water connection. Until recycled water is available, potable water rates will be charged as set forth in Section 14 of the Roseville Municipal Code. A backflow prevention device acceptable to the local Health Department and the Environmental Utilities Department will be required as long as the on-site facilities area uses potable water. The backflow prevention device shall be downstream of the meter and a part of the on-site facilities. When recycled water becomes available, the backflow prevention device will be removed and the recycled water connection to the on-site facility made.

14-13 BACKFLOW PREVENTION DEVICES - Single check valve backflow preventors shall be required on all recycled water services 1-1/2 inches in diameter and larger. The backflow preventor shall be installed per City

standards downstream of the meter. Backflows are not required on recycled water services utilizing booster pumps which incorporate a backflow preventor.

14-14 PROHIBITION AND LIMITATIONS - Design of on-site recycled water facilities shall conform to the following:

- A.** The recycled water systems shall be separate and independent of any potable water system. Cross-connections between potable water facilities and on-site recycled water facilities are forbidden.
- B.** Hose bibs on recycled water facilities are forbidden.
- C.** Drinking fountains shall be protected from the spray of recycled water in a manner approved by the Environmental Utilities Department Director prior to installation.
- D.** Overspray and run-off shall be limited or prevented.
- E.** Potable and recycled lines are not to be installed in the same trench.
- F.** Recycled water shall not be used for any purpose other than the approved uses as set forth herein.
- G.** The system shall be designed to irrigate the design area within the allowable time periods as set forth herein.

14-15 CONTROL OF RUN-OFF AND APPLICATION AREAS - The City 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 run-off by containment of the water to the design area. In accordance with these requirements for control of run-off and for control of the areas to which recycled water is applied, the design of irrigation systems shall conform to following:

- A.** The on-site recycled water facilities shall be designed to meet the peak moisture demand of all plant materials used within the design area. The use of moisture sensors is encouraged.
- B.** On-site recycled water facilities shall be designed to prevent discharge onto areas not under control of the customer. Semi-circular sprinklers shall be used adjacent to roadways and property lines to confine the discharge from sprinklers to the design area.
- C.** The design of the on-site recycled water irrigation facilities shall provide for watering during periods of minimal use of the service area. All on-site recycled water irrigation systems shall be designed to operate

between the hours of 9:00 PM and 6:00 AM unless otherwise directed by the Environmental Utilities Department Director.

- D.** The total time required to irrigate the design area shall not exceed nine hours in any 24-hour period. Irrigation systems shall be designed to operate within this time requirement.
- E.** Recycled water shall be applied at a rate that does not exceed the percolation 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 Environmental Utilities Department upon request.

14-16 MINIMUM DEPTH TO TOP OF ON-SITE RECYCLED WATER PIPING - For on-site recycled water piping, the minimum depth from finished grade to top of pipe (minimum cover) shall be as follows:

- A.** Constant pressure lines 3 inches and larger: 24 inches
- B.** Constant pressure lines 2-1/2 inches and smaller: 18 inches
- C.** Intermittent pressure lines excluding drip tube: 12 inches

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

14-17 DATA REQUIRED ON PLANS - The following information shall be included on all improvement plan sets for projects with recycled water facilities:

- A. Meter Data** - All recycled water services shall be metered. The following information shall be supplied for each recycled water meter desired; information is to be provided and shown at each meter location.
 - 1.** The meter location (distance from property lines) and size (inches); meter address.
 - 2.** The peak flow through the meter (gpm).
 - 3.** The (static) design pressure at the meter (PSI).
 - 4.** The total area served through the irrigation meter in square feet or acres.
 - 5.** An estimate of the yearly water requirement through the meter (acre-feet).

B. Drinking Fountains - Exterior drinking fountains must be shown and called out on the recycled water system plans. If no exterior drinking fountains are present in the design area, it must be specifically stated on the plans that none exist. The potable water lines supplying the drinking fountain must have an identification tape installed as provided in the Construction Standards. All existing and proposed potable water lines within the area of recycled water lines must be shown on the recycled water system plans calling out all required separations. Drinking fountains must be protected from the direct spray of recycled water either by proper placement of the drinking fountain within the design area or the use of a covered fountain approved for this purpose.

C. Irrigation Equipment Legend - For irrigation systems, a legend showing the pertinent data for the materials used in the system shall be recorded on the plans. The legend shall include a pipe schedule listing pipe sizes, a listing of valve types including quick-coupling valves, and the following information for each type of sprinkler head:

1. Sprinkler radius (feet).
2. Operating pressure (PSI).
3. Flow (gpm).
4. Sprinkler pattern.

D. Recycled Water Warning/Information Sign - Recycled water warning/information signage locations shall be shown on the recycled water system plan. Signs shall be located at all access points to the area of recycled water use. Signs shall also be placed along frontage roads at intervals of every 500 feet or less. The signs shall be installed in accordance with the Construction Standards herein and as required by the Environmental Utilities Director.

14-18 LOCATION - All pressure main line piping from the recycled water system shall be installed to maintain a 10-foot minimum horizontal separation from all potable water piping. Where recycled and potable water pressure main line piping cross, the recycled water piping shall be installed below the potable water piping in a Class 200, purple-colored PVC sleeve which extends a minimum of 5 feet on each side of the potable water piping. Provide a minimum vertical clearance of 12 inches.

All pressure main line piping from the recycled water system shall be installed to maintain a 10-foot minimum horizontal separation from all sanitary sewer lines. Where recycled and sewer lines cross, the recycled water piping shall be installed a minimum of 1 foot above the sewer.

14-19 PLAN SUBMITTAL AND APPROVAL - Plans with recycled water systems, public and private, shall be submitted to the Environmental Utilities Department for review and approval prior to construction. ~~A signature block shall be placed on the cover sheet for Environmental Utilities Department signature.~~

14-20 INSPECTION - The Environmental Utilities Department shall inspect the construction of on-site facilities per the Construction Standards for recycled water. Notification shall be made two working days in advance of construction by the applicant, owner, or customer. The Environmental Utilities Department shall be called for inspection at (916) 774-5750.

14-21 RECORD DRAWINGS - Record or "As Built" drawings shall be prepared and shall show all changes in the work constituting departures from the original contract drawings including those involving both constant-pressure and intermittent-pressure lines and appurtenances. All conceptual or major design changes including any changes that may be affected by the requirements of these standard specifications shall be approved by the Environmental Utilities Department before implementing the change in the construction contract. Failure to receive prior approval may result in termination of service.

Upon completion of each increment of work, all required information and dimensions shall be transferred to their record drawings. Facilities and items to be located and verified on the record drawings will include, but are not limited to the following:

- A. Point of connection.
- B. Routing of sprinkler pressure lines.
- C. Routing of all potable water lines both existing and proposed.
- D. Gate valves.
- E. Sprinkler control valves.
- F. Quick-coupling valves.
- G. Routing of control wires.
- H. Other related equipment as specified by the Environmental Utilities Department or the owner.
- I. Sprinkler head manufacturer and model number.

Changes and dimensions shall be recorded in a legible and workman-like manner. Record construction drawings shall be maintained at the job site

during construction. The applicant, owner, or customer shall provide a complete set of as-built ~~mylar~~ drawings to the Environmental Utilities Department upon completion of construction. The applicant will also provide as-builts ~~on diskette~~ in .DWF or .DWG electronic format upon request.

Prior arrangements must be made with the Environmental Utilities Department if water service is to be provided prior to as-built blue line submittal. Failure to provide record drawings will result in termination of service.

14-22 CONTROLLER ACCESS - The City of Roseville Environmental Utilities Department reserves the right to have complete access to the controller clocks, for reasons of monitoring and controlling system failures. The applicant, owner, or customer shall provide the Environmental Utilities Department with two sets of all keys necessary for access to the controller clocks within the design area. The keys will then become the property of the Environmental Utilities Department. The Environmental Utilities Department is not responsible for loss or damage to any controller.

14-23 BLOW-OFF HYDRANTS AND OTHER POINTS OF PUBLIC ACCESS – All on-site recycled water facilities shall be restricted from public access so that the general public cannot draw water from the system. Facilities, blow-offs 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” shall be installed in accordance with the Construction Standards herein. The Environmental Utilities Department shall approve its size. 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 hexagonal heads (such as those typically found on fire hydrants). Other means of restricting public access must be approved by the Environmental Utilities Department.

14-24 Detail Drawings – Details not covered by the Construction Standard Detail sheets shall be shown on the plans.