

CITY OF OCEANSIDE

WATER UTILITIES DEPARTMENT

WATER, SEWER, AND RECYCLED WATER DESIGN & CONSTRUCTION MANUAL

SECTION 4

RECYCLED WATER SYSTEMS – DESIGN GUIDELINES

TABLE OF CONTENTS

<u>PARAGRAPH</u>	<u>TITLE</u>	<u>PAGE</u>
4.1	INTRODUCTION.....	4-1
4.1.1	PURPOSE AND APPROVED USES OF RECYCLED WATER	
4.1.2	DEFINITION OF TERMS	
4.1.3	PROCEDURES FOR OBTAINING RECYCLED WATER SERVICE	
4.1.4	OVERALL REQUIREMENTS	
4.1.5	REFERNCES STANDARDS	
4.2	OFFSITE & ONSITE DESIGN GUIDELINES.....	4-8
4.2.1	NO CROSS CONNECTIONS & OTHER PROHIBITIONS	
4.2.2	FLOW & SIZING DETERMINATION	
4.2.3	OFFSITE DESIGN CRITERIA	
4.2.4	DEPTH OF COVER AND TRENCH REQUIREMENTS	
4.2.5	SEPARATION DISTANCES FROM OTHER UTILITIES	
4.2.6	PROTECTION FROM OVERSPRAY	
4.2.7	MAINLINE LOCATION	
4.2.8	RECYCLED WATER SITE SUPERVISOR	
4.2.9	CONTROLLER MAP	
4.2.10	PIPELINE MATERIALS	
4.2.11	RECYCLED VALVES AND BLOW-OFF AND AIR AND VACUUM ASSEMBLIES	
4.2.12	MISCELLANEOUS APPURTENANCES	
4.2.13	VALVE BOXES, FRAME AND COVER	
4.2.14	IDENIFICATION GUIDEINES FOR RECYCLED PIPELINES	
4.2.15	IDENIFICATION GUIDEINES FOR RECYCLED APPURTENANCES	
4.2.16	SWIVEL ELL CONNECTIONS	
4.2.17	INFORMATION REQUIRED ON PLANS	
4.3	OFFSITE & ONSITE INSTALLATION & TESTING GUIDELINES.....	4-24
4.3.1	INSTALLATION GUIDELINES	
4.3.1.1	INSTALLATION OF RECYCLED PIPELINES	
4.3.1.2	INSTALLATION OF RECYCLED APPURTENANCES	
4.3.1.3	IDENTIFICATION OF RECYCLED SIGNAGE, TAGS, AND STICKERS	
4.3.2	RECYCLED WATER INSPECTION GUIDELINES	
4.3.2.1	OVERALL GUIDELINES	
4.3.2.2	ONSITE INSPECTION	
4.3.2.3	PRESSURE TEST	

CITY OF OCEANSIDE

WATER UTILITIES DEPARTMENT

WATER, SEWER, AND RECYCLED WATER DESIGN & CONSTRUCTION MANUAL

SECTION 4

RECYCLED WATER SYSTEMS – DESIGN GUIDELINES

TABLE OF CONTENTS (CONTINUED)

4.3.2.4	COVERAGE TEST	
4.3.2.5	RECYCLED WATER CROSS-CONNECTION CONTROL SHUTDOWN TEST	
4.3.2.6	SITE COMPLIANCE	
4.3.2.7	NOTIFICATIONS & CERTIFICATIONS	
4.4	RECYCLED RETROFIT GUIDELINES	4-27
	4.4.1 GUIDELINES AND REGULATIONS	
	4.4.2 PLAN CHECK RETROFIT GUIDELINES	
4.5	LIST OF AUHTORIZED MATERIALS USED IN THE CITY RECYCLED SYSTEM	4-28

APPENDIX A

	SAMPLE RECYCLED WATER USE SITE CERTIFICATION LETTER.....	4-34
--	--	------

SECTION 4- RECYCLED WATER DESIGN GUIDELINES

4.1 INTRODUCTION

- A. All water works construction shall conform to the most recent edition of the City of Oceanside’s Water, Sewer, and Recycled Water Design & Construction Manual.
- B. If a conflict arises between the requirements in this manual, the order of precedence shall take place:
 - a. Sections 1-4, Required Notes, & Appendix
 - b. Standard Drawings
 - c. Standard Specifications
- C. If the standard that is sought does not appear in this manual, then the following standards shall be utilized in the order listed:
 - 1. State Water Resources Control Board – Division of Drinking Water
 - 2. American Water Works Association (AWWA) Standards
 - 3. San Diego County Regional Standard Drawings
 - 4. Standard Specifications for Public Works Construction (SSPWC or “Greenbook”), latest Edition.

Exceptions to this and all other guidelines appearing in this manual may be allowed only upon the written approval of the Water Utilities Director.

4.1.1 Purposes and Approved Uses of Recycled Water

The City of Oceanside is developing a recycled water system. Therefore, during the design process there may be requirements to install a recycled water system for landscape irrigation or other approved use. The Water Utilities Department may set these requirements on developments, as the recycled water becomes available throughout the City of Oceanside. Developers may be required to provide off-site improvements to bring recycled water to their development as necessary.

The purpose of these guidelines is to ensure uniformity in design concepts, format, methodology, procedures, constructions materials, and final work product for the facilities in the City’s recycled water system.

4.1.2 Definitions of Terms

Customer	Individual or Owner that has executed an agreement for use of recycled water.
DEH	San Diego County Department of Environmental Health.
Offsite Facilities	City of Oceanside recycled water system including the recycled water meter.

Onsite Facilities	Customer's recycled water system downstream of the water meter.
Pantone (purple)	A color standard system referenced in the American Water Works Association California-Nevada Section Guidelines for Distribution of Non-Potable Water.
Recycled Water	As defined in California Code of Regulations (CCR), Title 22, Division 4, Chapter 3, Article 1.

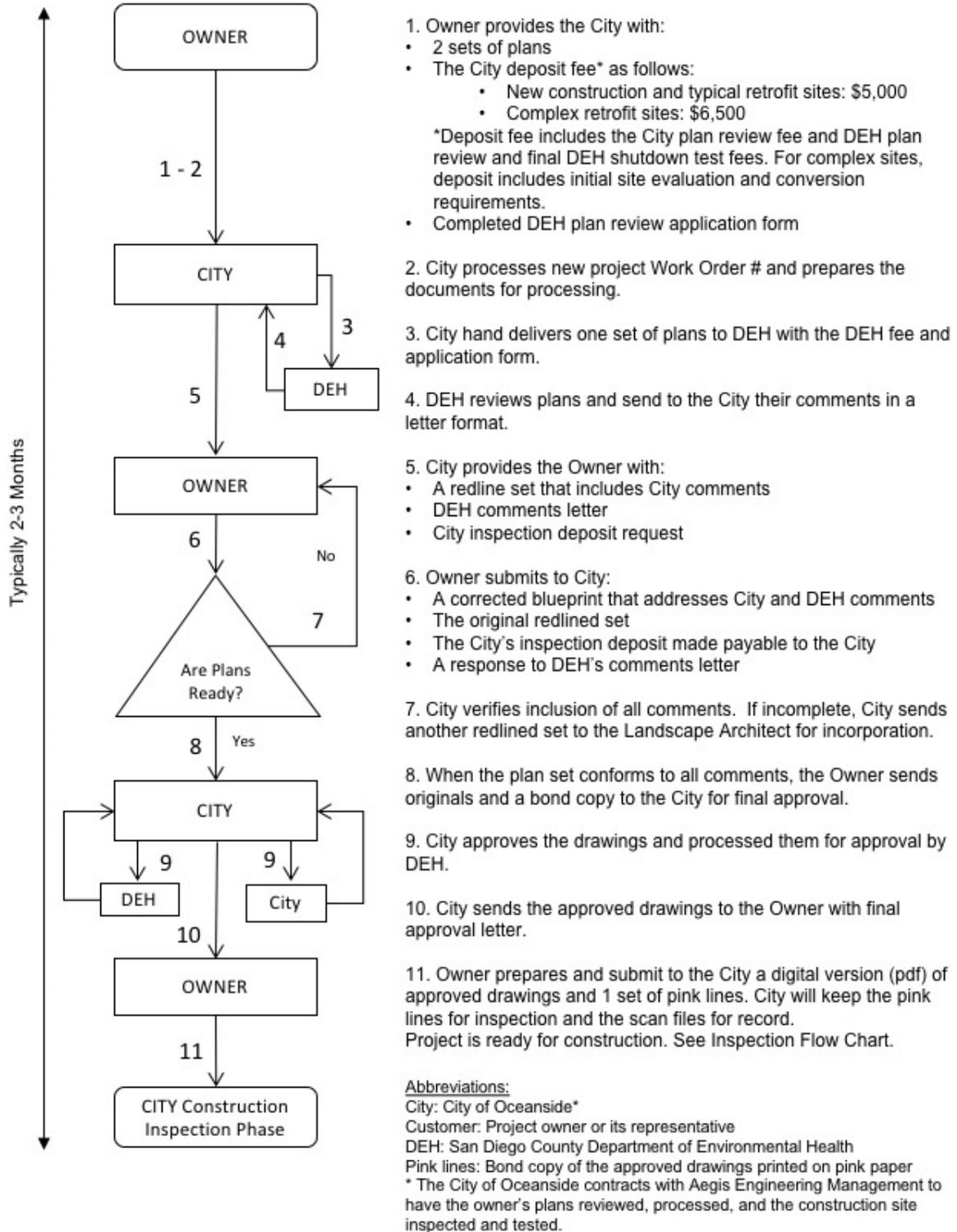
4.1.3 Procedures for Obtaining Recycled Water Service

New Construction and Retrofit Sites — Within the City of Oceanside Only

All projects containing landscaping and proposing to use recycled water are required to submit plans to the City of Oceanside for review and approval.

The overall procedures to obtain recycled water are described in the following pages.

City of Oceanside Recycled Water Plan Review and Approval Process

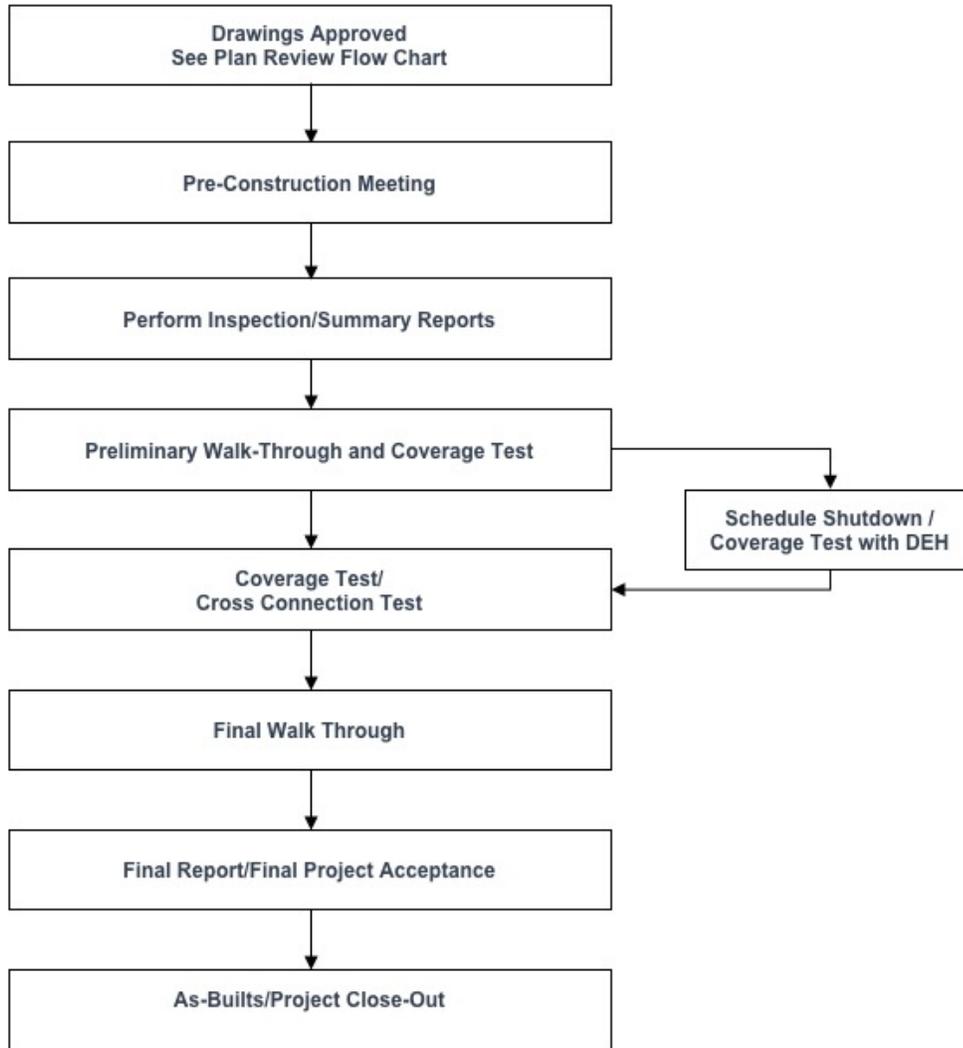


1. Owner provides the City with:
 - 2 sets of plans
 - The City deposit fee* as follows:
 - New construction and typical retrofit sites: \$5,000
 - Complex retrofit sites: \$6,500

*Deposit fee includes the City plan review fee and DEH plan review and final DEH shutdown test fees. For complex sites, deposit includes initial site evaluation and conversion requirements.
- Completed DEH plan review application form
2. City processes new project Work Order # and prepares the documents for processing.
3. City hand delivers one set of plans to DEH with the DEH fee and application form.
4. DEH reviews plans and send to the City their comments in a letter format.
5. City provides the Owner with:
 - A redline set that includes City comments
 - DEH comments letter
 - City inspection deposit request
6. Owner submits to City:
 - A corrected blueprint that addresses City and DEH comments
 - The original redlined set
 - The City's inspection deposit made payable to the City
 - A response to DEH's comments letter
7. City verifies inclusion of all comments. If incomplete, City sends another redlined set to the Landscape Architect for incorporation.
8. When the plan set conforms to all comments, the Owner sends originals and a bond copy to the City for final approval.
9. City approves the drawings and processed them for approval by DEH.
10. City sends the approved drawings to the Owner with final approval letter.
11. Owner prepares and submit to the City a digital version (pdf) of approved drawings and 1 set of pink lines. City will keep the pink lines for inspection and the scan files for record. Project is ready for construction. See Inspection Flow Chart.

Abbreviations:
 City: City of Oceanside*
 Customer: Project owner or its representative
 DEH: San Diego County Department of Environmental Health
 Pink lines: Bond copy of the approved drawings printed on pink paper
 * The City of Oceanside contracts with Aegis Engineering Management to have the owner's plans reviewed, processed, and the construction site inspected and tested.

City of Oceanside Construction Inspection Approval Process



4.1.4 Overall Requirements

The design of offsite facilities, including the preparation of Contract Documents, is to be prepared under the supervision 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 plans shall be prepared under the direct supervision of a responsible registered landscape architect or civil engineer in the State of California. The recycled water system, including offsite and onsite facilities, is separate and independent of any potable water system.

When required, a Title 22 Engineering Report which addresses all of the design criteria pertaining to the use of recycled water shall be submitted to the State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW) and to the San Diego County Department of Environmental Health (DEH) for review and approval before a recycled water project is implemented. Specific requirements associated with the preparation of a Title 22 Engineering report can be found at:

<http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Recharge/ERGUIDE2001.PDF>

In those areas where recycled water is not immediately available, and the City has determined that recycled water will be supplied in the future, the onsite facilities shall be designed to use recycled water. This includes submittal of plans and site inspection as set forth in these guidelines. In the interim, potable water shall be supplied to the site through a temporary potable water connection using a master reduced pressure principal backflow device installed per the City's Water Design & Construction Manual.

Prior to acceptance, the following checklist shall be successfully completed:

City of Oceanside Recycled Water Checklist for New Construction

Project Name: _____ Site Address: _____

Customer No. - _____ Meter Register No. _____

Note: One checklist for each recycled water meter connection.

Date:	Inspector Initials	Item
_____	_____	1. No jumpers providing recycled water on-site; use potable as temporary supply
_____	_____	2. Recycled water curb stop locked off
_____	_____	3. Vertical and horizontal clearances per plan
_____	_____	4. On-site piping (purple), vertical/horizontal clear, depth of cover.
_____	_____	5. All onsite piping pressure test passed.
_____	_____	6. Signage installed.
_____	_____	7. Tagging of on-site valves etc. (both potable and recycled) installed.
_____	_____	8. Successful Cross-connection test conducted by the City and DEH.
_____	_____	9. Coverage Test
_____	_____	10. Additional DEH requirements from letter or coverage test (fill in below and attach as needed)
		a. _____
		b. _____
_____	_____	11. Final punch list.
_____	_____	12. Accepted Record Drawings "as-builts" (3 sets), red-line OK. (Attached)
_____	_____	

		13. Site Supervisor
		a. Name _____
		b. Phone# _____
		14. Backflow certification received.
		15. Disconnect temporary potable highline. Inspector must both witness the disconnect and provide photographic documentation of the disconnect prior to proceeding to the next step.
		16. OK to set recycled water meter, when above items are completed. City
		17. Water Utilities Inspection complete
		Inspector signature: _____ Date: _____

4.1.5 Reference Standards

The following references shall be adhered to in addition to the guidelines set forth in this document.

1. California Code of Regulations (CCR), Title 22, Division 4, Chapter 3, “Water Recycling Criteria”—These regulations are written by the State DHS and specify the approved uses and use area requirements, such as hose bib restrictions, prohibition of irrigation near wells, etc. The regulations govern both the City of Oceanside’s distribution system as well as the customer’s on-site system.
2. California Code of Regulations (CCR), Title 17, “Drinking Water Supply - Backflow Prevention”—Title 17 specifies requirements intended to protect the public drinking water supply from contamination. Some requirements specified in Title 17 include backflow prevention devices, designation of a customer Site Supervisor, and cross-connection testing requirements.
3. American Water Works Association (AWWA), California-Nevada Section, Guidelines For Distribution of Nonpotable Water —This document provides recommended guidelines for planning, designing, constructing, and operating nonpotable water systems, including recycled water systems. The guidelines themselves are not regulations but many agencies have adopted them as general requirements. This document covers both installations of the City of Oceanside’s distribution systems and on-site use systems.
4. Regional Water Quality Control Board—The San Diego Regional Water Quality Control Board (SDRWQCB) is the agency responsible for preserving the quality of California’s water resources. The SDRWQCB is responsible for issuing National Pollutant Discharge Elimination System (NPDES) permits, which contains regulations concerning discharge of water into any watercourse within the County of San Diego.

5. County of San Diego, Department of Environmental Health, Land and Water Quality Division (DEH) – Recycled Water Plan Check and Inspection Manual, latest edition. These guidelines are the reference material for plan check processes and testing required to gain approval from the DEH for onsite recycled water services installed within San Diego County. At a minimum, all guidelines must be strictly adhered to, unless otherwise mentioned in this document.
6. State Water Resources Control Board (SWRCB), Division of Drinking Water (DDW), Field Office Branch (FOB) of District 08, Santa Ana is the agency responsible for protecting and promoting the safety of California's drinking water. They are responsible for developing the criteria and regulations for recycled water use, evaluating and approving offsite recycled water systems, and for making recommendations to the RWQCB regarding the public health implications of recycled water use.
7. State of California Department of Drinking Water and Environmental Management – Guidance Memo No. 2003-02: Guidance Criteria for the Separation of Water Mains and Non-potable pipelines (latest edition October 16, 2003) - The Waterworks standards (Title 22, Chapter 16, Section 64572) provide separation criteria for new construction. However, when these criteria cannot be met, the risk of contamination can be reduced by increasing the structural integrity of pipe materials and joints, and ensuring minimum separation requirements are met.

4.2 OFFSITE & ONSITE DESIGN GUIDELINES

4.2.1 No Cross Connections & Other Prohibitions

The recycled water system shall be COMPLETELY SEPARATE AND INDEPENDENT from the potable water system. Cross connections between potable water and recycled water facilities are completely prohibited. In addition, the following items are also prohibited:

1. Hose bibs on recycled water facilities are prohibited.
2. Drinking fountains will be protected from the spray of recycled water in a manner approved the City’s Water Utilities Department prior to construction.
3. Overspray and runoff will be prevented using BMP’s as approved by the City’s Water Utilities Department prior to construction.
4. Potable and recycled lines will never be installed in the same trench.
5. Recycled water will not be used for any other purpose except as specifically stated in 4.1.1.
6. On-site looped meters are prohibited.
7. No Fire hydrants or fire connections are allowed off of recycled water lines.

4.2.2 Flow & Sizing Determination

Flow and facility sizing for offsite facilities shall be done under the direction of City’s Water Utilities Department.

Substantiating engineering calculations for demands and pressures shall be prepared on a project-by-project basis. Application of recycled water on landscape areas shall be limited to a period of 10 p.m. to 6 a.m.

If recycled water will be used during 6 a.m. to 10 p.m. then the site supervisor must be present at all times during the recycled water use and must be certified through the San Diego County Water Authority (SDCWA) certification workshop.

4.2.3 Offsite Design Criteria

Table 4.1 – Design Criteria for Recycled Water Pipelines and Appurtenances

Design Criteria	Requirements	Comments
Maximum Velocity	7.5 feet per second	
Flow Rate for Sizing	Peak Day	
Minimum Residual Pressure	20 psi	
Hazen Williams Coefficient of Friction	110	
Pipeline Alignment	All lines are to be looped.	Variations shall only be approved by the Water Utilities Director.

Whenever possible, the City of Oceanside operates the recycled water system at a lower pressure than the adjacent potable water system. This convention helps prevent the contamination of the potable water system through cross connection.

4.2.4 Depth of Cover and Trench Requirements

The top of pipe for offsite recycled water pipelines must be a minimum of 4 feet below the finished grade, unless otherwise approved by the City. The depth of cover for service lines will be considered on a case by case basis and in accordance with the City's Landscaping Manual and direction from the Water Utilities Department.

The minimum top of pipe for onsite recycled water mainlines must be as follows:

- A. Intermittent pressure lines 2" in diameter and smaller: 12" deep
- B. Constant pressure lines less than 6": 18" deep
- C. Constant pressure lines 6" in diameter and larger: 30" deep

4.2.5 Separation Distances from other Utilities

Horizontal Separation

A minimum horizontal separation distance of ten feet between parallel, buried, recycled, and potable water pipelines should be maintained. If a ten-foot horizontal separation is not feasible then the special construction requirements will be in effect and shall follow all of the requirements listed in RW-1 and RW-1a.

Vertical Separation at Crossings

Where buried recycled pipelines cross a buried potable water pipeline, it must be located a minimum of 12 inches below the potable water pipeline. Recycled pipelines are allowed over potable water pipelines with a minimum of 12 inches vertical separation if a full standard pipe length is centered over the crossing, or the recycled water pipeline is installed in a pipe sleeve which extends a minimum of 10 feet on either side of the potable water piping.

Location Within Easement

- A. All recycled water mains not located within the public right-of-way shall be provided with a minimum of a 20-foot wide recycled water easement. In some cases a wider easement maybe required, size shall be determined by the Water Utilities Director.
- B. Where recycled water and sewer mains are located within the same easement, the minimum easement size shall be 30 feet wide.
- C. Where potable water, sewer, and recycled water mains are located within the same easement, the minimum easement size shall be 40 feet wide.
- D. Easements shall be easily accessible to City maintenance equipment. Access shall be unobstructed with all weather driveways.
- E. No trees, plantings, structures or building overhang shall be located within the City easement.
- F. Homeowners who purchase property containing a City easement will be responsible for the maintenance of that easement property.

4.2.6 Protection from Overspray

Irrigation systems must be designed and operated to minimize overspray, runoff and ponding. Designers must specify appropriate irrigation devices to prevent overspray in narrow areas. In the event that, during the coverage test, noticeable overspray, runoff and/or ponding are observed, facilities will be adjusted or removed and relocated as needed as directed by the City or DEH. This requirement does not apply to landscape impoundments such as ponds or lakes.

Drinking fountains, outdoor eating areas and other similar facilities (e.g. snack bars) located within the approved use area must be protected from overspray or contact with

recycled water. Protection may be accomplished by relocating the irrigation system or relocating or modifying the protected facilities.

Runoff into storm drains and directly into waters of the state must be absolutely minimized through best management practices and as dictated through the City's NPDES permit.

4.2.7 Mainline Location

Offsite recycled waterlines shall be situated 10 feet north or 10 feet west of the centerline of the street. A 10-foot minimum separation shall be maintained from waterlines unless otherwise approved by the Water Utilities Director and the Department of Health Services.

4.2.8 Recycled Water Site Supervisor

A trained certified recycled water on-site user/supervisor shall be designated in writing. This individual shall be familiar with plumbing systems within the property, with the basic concepts of backflow/cross connection protection, the City's rules and regulations, and the specific requirements of a recycled water system. Said person is required to provide a 24-hour contact phone number and attend approved site supervisor class. Copies of the designation, with current contact phone numbers shall be provided to the City of Oceanside Water Utility Department.

4.2.9 Controller Map

A controller recycled irrigation map shall be prepared and submitted to the City prior to commencing service. The map shall be prepared as follows:

- A. Provide one map for each automatic controller showing the area covered. The map shall be 11" x 17" in size.
- B. The map is to be a reduced drawing of the actual system.
- C. The map shall be a blackline print with a different color used to show area of coverage for each station and subsystem.
- D. The map shall be hermetically sealed between two pieces of clear, colorless plastic, each piece being a minimum 0.010" or 10 mils thick.

4.2.10 Pipeline Materials

Offsite Recycled Piping Materials

Recycled Ductile Iron Pipe (D.I.P.) Water Mains:

1. Per AWWA C-151 and shall conform to Section 207.9 of the Standard Specifications for Water Utilities Construction, as last revised and the City of Oceanside Design and Construction Manual.
2. All D.I.P. shall be double lined inside with cement mortar, per AWWA C-104.
3. All D.I.P. shall be encased in two (2) layers of purple 8-mil polyethylene, per AWWA C-105.
4. Pipe class shall be shown on the plans and is subject to the approval of Water Utilities Department.
5. The maximum deflection for D.I.P. shall be 2-½ degrees per joint (4 inch through 12 inch).
6. 3-inch minimum width purple color coded detector tape marked "RECYCLED WATER" in 1-½ inch black letters shall be placed on the compacted and

graded sand bedding one foot above and centered over the recycled water main prior to backfilling the trench.

Recycled Polyvinyl Chloride Pipe (PVC) Water Mains:

1. Shall conform to AWWA C-900 and C-905 pipe with rubber ring bell end, or plain end with rubber ring coupling. Solvent welded joints are not permitted.
2. Provide pipe with ductile iron equivalent outside diameter (OD) and class 150, minimum, or pressure rating as required.
3. Pipe shall be purple in color and installed with the “Recycled Water” and manufacturer’s data stenciling orientated toward the top of the trench.
4. For 4 inch through 12 inch PVC, deflections at the joints shall not be permitted. Curves and deflections shall be made only with the use of high deflection C-900 PVC couplings or the approved ductile iron fittings. A maximum of 5 degrees per coupling shall be permitted. The improvement plans shall clearly indicate the location of the couplings and the pipe lengths.
5. Minimum allowable radius for PVC pipe, using deflector couplings shall be as follows: (Less than 10-foot pipe length shall not be permitted):

<u>Pipe Length</u>	<u>Minimum Allowable Radius</u>
20 Feet	250 Feet
10 Feet	125 Feet

6. 3-inch minimum width color coded detector tape marked “RECYCLED WATER” in 1-½ inch black letters shall be placed on the compacted and graded sand bedding one foot above and centered over the recycled water main prior to backfilling the trench.

Onsite Recycled Water Irrigation Services:

1. ¾ inch and 1 inch: Type “K” seamless soft copper tubing with no joints from corporation stop to curb stop per Oceanside Standard Drawing RW-4. ¾ inch is the minimum size for recycled irrigation service.
2. 1½ inch through 2 inch: Type “K” rigid copper pipe with all joints silver soldered per Oceanside Standard Drawing RW-5.
2. 3 inch and larger per Oceanside Standard Drawing RW-6.
3. Silver solder shall be type 1/8 inch x 36 inches, Engle Hard Silver “O”.
4. All buried copper pipes shall be encased in an 8-mil purple polyethylene (PE) sleeve.
5. All recycled water services will be encased in 6” of neutral sand.
6. One separate recycled irrigation service shall be installed to each approved lot and a “RW” will be stamped on the curb face at the service location.
7. No service shall be installed in a driveway and no meter boxes shall be set in concrete.
8. Where site improvements or building pad orientation for a lot are not known at the time of street construction, a service shall be installed to the back of the curb for a meter connection. Location of the service should be located 5 feet off the lot line to preclude conflict with future driveways.
9. Minimum separation between potable water services and recycled services shall be 10 feet and shall be located below the invert elevation of a potable water service, unless otherwise approved by the Water Utilities Director.
10. Unless otherwise approved, all services shall be perpendicular to the main.

Onsite Pipe for new irrigation system shall be solid purple-colored PVC material conforming to the following:

1. 3" or smaller pipe shall conform to ASTM-D1784, Type 1, Grade 1, PVC-1120 for schedule 40 or 80, or ASTM-D2241, Type 1, Grade 1, PVC-1120 for SDR rated pipe. Ends shall be solvent welded joints conforming to ASTM-D2672.
2. 4" and larger pipe shall conform to either AWWA C900 or C905 with elastomeric ring bell-type pipe ends, conforming to ASTM-D3139. Where purple pipe is unavailable, 0.008" or 8 mils purple plastic sleeve material may be used.
3. Identification markings shall be continuous on two sides of the pipe. Markings shall include the nominal pipe size, PVC type, ASTM or AWWA designation, pressure rating and the words "CAUTION-RECYCLED WATER".

Fittings for onsite PVC pipe shall conform to the following:

1. 3" and smaller pipe shall use solvent weld joint type fittings, minimum Schedule 40, with a working pressure rating no lower than that of the pipe. Schedule 40 fittings shall conform to ASTM-D2466 and Schedule 80 fittings to ASTM-D2464 and D-2467. PVC solvent cement shall conform to ASTM-D2564.
2. 4" and larger pipe shall use either mechanical joint ductile-iron Class 350 fittings conforming to AWWA C153; or grip tite fittings conforming to AWWA C110 and C111.

4.2.11 Recycled Valves and Blow-off and Air and Vacuum Assemblies

Recycled Valves - General

- A. Maximum valve spacing in street:
 1. 500 feet in residential areas and high valve areas.
 2. 1,000 feet on arteries and secondary feeders, supply lines, and combination arteries and supply lines.
- B. Valve locations: as required and directed by the Water Utilities Representative.
- C. Butterfly Valves shall conform to the "Standard for Rubber Seated Butterfly Valves", per AWWA C-504, as last revised and shall be tested and certified with the valve actuator installed on the valve. All valves over 12 inches in diameter are to be butterfly valves.
- D. Gate Valves sizes 3 inches through 12 inches shall conform to the "Standard for Resilient Wedge Gate Valves for Water and Sewerage Systems", per AWWA C-500, C-550 Epoxy, C-515 Ductile Iron 250 PSI, as last revised.
- E. All tee intersections and cross intersections shall have a valve at each branch.
- F. Valve locations shall be designed so that no more than three valves have to be operated to shut down a line.

Blow-off Assemblies

All offsite dead ends and stub outs shall be equipped with blow-off assembly 4 inches in diameter (Per Oceanside Standard Drawing RW-2). The blow-off assembly shall be located as practicable to a sanitary sewer collection manhole.

Protection of Public Potable Water Systems— Backflow Prevention

Although not normally a part of onsite recycled water irrigation systems, it must be noted that backflow prevention devices are a required and important part of potable water service connections to sites where recycled water is used. At premises where both recycled water and potable water are present in separate piping systems with no

interconnection, a reduced pressure (RP) principal backflow prevention device must be located as close as practicable to the downstream side of every potable water meter. All RP devices must be inspected quarterly and tested at least annually. The customer is responsible for coordinating the testing. An AWWA-certified backflow prevention device tester must do the device testing. Test reports must be provided to the City of Oceanside. The customer, DEH, and the City of Oceanside's Water Utilities Department must maintain records for a minimum of three (3) years.

4.2.12 Miscellaneous Appurtenances

Required Wye Strainer and Pressure Regulator

Unless otherwise directed by the City, all recycled water services must be equipped with a wye-strainer (20-mesh or finer screen) installed as close as practicable to the meter box, and a pressure regulating valve installed immediately downstream of the strainer. Strainer shall be the same size as the meter size. Both of these devices must be installed in an underground box or boxes. Prior to determining available pressure, designers should take into account the pressure losses incurred by these facilities. Refer to Standard Drawing RW-18 for the facilities required as part of the recycled water point of connection (POC).

Quick Coupling Valves

New quick coupling valves must be acme thread and made specifically for recycled water use. New quick coupling valves must be 3/4-inch or one-inch nominal size and of brass construction with a maximum working pressure of 150 psi. The covers on all new quick coupling valves must be permanently attached and made of purple rubber or vinyl with the words "RECYCLED WATER" imprinted on the locking cover. To prevent unauthorized use, the valve must only be operated by a special coupler key for opening and closing the valve. New quick coupling valves must be installed approximately 12 inches from walks, curbs, header boards or paved areas. Quick coupling valves used in the recycled water system must be installed in a valve box, where applicable, and a recycled water identification tag must be permanently attached to the quick coupling valve or the inside of the box so that it is clearly visible when the box lid is removed.

Any wands, sprinkler heads, fittings, or other attachments used in conjunction with the quick coupling valves must be labeled with the words, "RECYCLED WATER—DO NOT DRINK." Attachments used in a recycled water system must not be used in a potable water system.

The installation of quick coupling valves on a potable water system in the vicinity of a recycled water irrigation system must be of a different type to prevent accidental cross-connection or contamination by accidentally interconnecting or interchanging attachments. Keys and attachments must not be interchangeable. Retrofitted potable water system quick coupling valves must be modified to meet standards for new recycled water quick coupling valves.

Check Valves

Check valves shall be in-line, spring-loaded, bronze-body construction. Check valves shall be globe, wafer, or dual check type valves with stainless steel springs. Check valves shall be the same size as the service meter.

Storage Tanks

Recycled water storage tanks are a specialized design and must have the facility, design, and construction approved by the Water Utilities Department.

Booster Pump Stations

Recycled water booster pump stations are a specialized design and must have the facility, design, and construction approved by the Water Utilities Department.

Telemetry and Control

Telemetry and control equipment must be designed for the following installations, pressure regulating stations, booster pump stations, recycled reservoirs, etc.

4.2.13 Valve Boxes, Frame and Cover

All remote control valves, isolation valves, pressure reducing valves, etc. for on-site recycled water systems must be installed below grade in a valve box. The box must be labeled with the recycled identification and warning language permanently stamped or molded into the label. The valve box and cover must also be purple and be tagged as described in Section 4.2.15.

4.2.14 Identification Guidelines for Recycled Pipelines

Identification of Existing Buried Recycled Water Lines Existing buried piping which will be converted to recycled water use need not be marked unless the piping becomes exposed, such as during installation of new pipeline or maintenance of existing pipe. The exposed section must be marked as indicated above for new piping.

Identification of Above Grade Recycled Water Lines All above grade recycled water pipelines, whether new or existing, must be labeled with the words "RECYCLED WATER—DO NOT DRINK" and color coded purple to differentiate recycled water pipelines from potable water pipelines. If purple identification tape is used to label the pipe and/or color code the pipe, the tape must be adhesive, permanent, and resistant to environmental conditions. Purple bands may also be painted around the circumference of the pipe at ten-foot intervals for color-coding. Purple PVC pipe is not an acceptable alternative for color-coding because the purple color will fade when exposed to sunlight.

4.2.15 Identification Guidelines for Recycled Appurtenances

Identification tags and stickers must be weatherproof and durable, such as plastic or plastic coated. Recycled water identification tags and stickers must have a purple background with permanent black lettering stating "RECYCLED WATER—DO NOT DRINK" and "AVISO, AGUA IMPURA—NO TOMAR". Potable water identification tags and labels must have a blue background with "POTABLE WATER" and "AGUA PARA TOMAR" in permanent black lettering.

Valve Tags

All recycled water sprinkler control valves, strainers, pressure regulator, quick couplers, isolation valves shall be tagged with identification tags.

(1) Tags shall be made of weatherproof plastic, be a minimum of 4" tall, be purple in color and have the words "WARNING - RECYCLED WATER - DO NOT DRINK" imprinted on one side, and "AVISA - AGUA IMPURA - NO TOMAR" on the other side. Imprinting shall be permanent and black in color. Use tags as manufactured by T. Christy Enterprises or approved equal.

(2) One tag shall be attached to each appurtenance as follows:

- a) Attach to valve stem directly or with plastic tie wrap or
- b) Attach to solenoid wire directly or with plastic tie wrap or
- c) Attach to valve cover with existing valve cover bolt.
- d) Attach to the body of the relative appurtenance with a plastic tie-wrap.

Isolation Valves New and existing isolation valves must be installed in a marked valve box with a recycled water identification tag on the valve operator or, if the valve operator is too deep to reach, at the top of the valve box extension. Valves shall be painted purple.

Remote Control Valves New and existing remote control valves must be installed in a marked valve box with a recycled water identification tag on the valve.

Pressure Regulating Valves and Strainers New and existing pressure regulating valves and strainers must be installed in a marked valve box with a recycled water identification tag on the valve/strainer.

Water Meters, Pumps, Pump Control Valves, Air/Vacuum Relief Valves All of these recycled water devices must be tagged with a recycled water identification tag.

Recycled Water Backflow Prevention Devices If applicable, these devices must be tagged with a recycled water identification tag.

Potable Water System Devices At recycled water use sites where potable water is used, all potable water meters and above grade water devices, such as backflow prevention devices and hose bibs, must be tagged or labeled as potable water

Warning Labels

Warning labels for pumping equipment shall be on purple field, and shall have the words: "Recycled Water - Do No Drink No Tome El Agua" printed on the field in black letters. Warning labels for controllers shall be prepared on a purple field, and shall have the words: "Attention Controller Unit for Recycled Water - Atencion Unidad Controladora del Agua Recuperada" printed on the field in black letters.

4.2.16 Swivel Ell Connections

Swivel ell connections are a specialized design and must have the facility, design, and construction approved by the Water Utilities Director, DDW, and the DEH.

4.2.17 Information Required on Plans

The Plans must include the City's Required Recycled General Notes that is included as a part of this manual. The drawings shall also include whether there are or not any drinking fountains and/or designated outdoor eating areas on this site. Any outdoor drinking fountains, eating areas, etc. must be protected from spray and/or misting by recycled water. In addition, any other guidelines, references, or notations as requested by the City Water Utilities Department and the DEH.

The following notes shall be clearly shown on the plans:

Declaration of Responsible Charge (on title sheet)

I hereby declare that I am the landscape architect/engineer of work for this project and that I have exercised responsible charges over the design of this project.

I understand that the check of the project drawings and specifications by the City of Oceanside and the San Diego County Department of Environmental Health (DEH) 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:

By: _____ Date: _____
Name

Registration No. _____

Expiration Date: _____

INSPECTION NOTE (All Sheets)

THE CITY OF OCEANSIDE WATER UTILITIES DEPARMENT SHALL BE NOTIFIED FIVE (5) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION AT (760) 435-5800. ALL WORK PERFORMED WITHOUT BENEFIT OF INSPECTION SHALL BE SUBJECT TO REJECTION AND REMOVAL.

OMISSION STATEMENT (title sheet only)

There are no drinking fountains, decorative fountains, comfort stations, outdoor eating areas, swimming pools, playground equipment, or wells on the site.

*If **one** of the listed items does exist, each must be clearly identified on the plans. Note shall read, "drinking water fountains, designated outdoor eating areas pools, etc. shall be protected against contact with recycled water spray, mist, or run-off".*

METER INFORMATION TABLE (title sheet only)

POC ID	Number of Remote Control Valves	IRRIGATED AREA (SF)	DEMAND (GPM)	ANNUAL USAGE (ACRE-FT)	LATERAL SIZE (IN)	METER SIZE (IN)
TOTAL						

COLOR CODING (add to legend table, irrigation legend and details sheet)

Sprinklers, rotor heads and other types of dispersion heads shall have the exposed surface colored purple. The exposed surface shall be colored through the use of integrally molded purple plastic or permanently attached purple plastic ring or disc. All shrub heads shall have purple caps. Decal on risers will not be accepted.

CITY OF OCEANSIDE RECYCLED WATER NOTES

1. ALL ON-SITE IRRIGATION IMPROVEMENTS SHOWN ON THESE PLANS ARE PART OF A RECYCLED WATER DISTRIBUTION SYSTEM. NO CONSTRUCTION WILL BE ALLOWED UNTIL ALL APPROVALS HAVE BEEN OBTAINED.
2. CROSS CONNECTIONS BETWEEN RECYCLED WATER LINES AND POTABLE WATER LINES ARE STRICTLY PROHIBITED.
3. USE OF RECYCLED WATER SHALL ADHERE TO TITLE 22, DIVISION 4, CHAPTER 3 OF THE CALIFORNIA CODE OF REGULATIONS AND THE CURRENT RULES, REGULATIONS AND SPECIFICATIONS OF THE CITY.
4. UNLESS OTHERWISE DIRECTED BY THE CITY, A 10-FOOT HORIZONTAL AND 1-FOOT VERTICAL SEPARATION BETWEEN POTABLE WATER AND CONSTANT PRESSURE RECYCLED WATER LINES SHALL BE MAINTAINED AT ALL TIMES. THE POTABLE LINES SHALL BE INSTALLED ABOVE THE RECYCLED LINES.
5. WHERE POTABLE LINES AND CONSTANT PRESSURE RECYCLED WATER LINES CROSS, THE RECYCLED WATER LINE SHALL BE INSTALLED BELOW THE POTABLE WATER LINE IN A CLASS 200 PURPLE COLORED PVC SLEEVE. THE SLEEVE SHALL EXTEND 10-FEET ON EITHER SIDE OF THE POTABLE LINE, FOR A TOTAL OF 20-FEET.
6. A MINIMUM VERTICAL SEPARATION OF 12 INCHES SHALL BE MAINTAINED BETWEEN UTILITIES AT ALL TIMES.
7. HOSE BIBS ARE STRICTLY PROHIBITED ON RECYCLED WATER SYSTEMS.
8. ALL SPRAY HEADS, VALVE BOXES, AND QUICK COUPLER VALVES SHALL BE CLEARLY COLOR CODED (PURPLE) TO INDICATE THE USE OF RECYCLED WATER.

9. RECYCLED WATER LINES SHALL NOT CROSS ROADS, STREETS, OR EASEMENTS UNLESS SPECIFICALLY SHOWN ON THESE PLANS.

10. ALL PRESSURE LINES SHALL BE TESTED WITH HYDROSTATIC PRESSURE AS REQUIRED IN THE CITY STANDARD SPECIFICATIONS, AND ALL NON-PRESSURE LINES SHALL BE TESTED WITH THE EXISTING STATIC LINE PRESSURE. NO LEAKS SHALL BE ALLOWED. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT FOR HYDROSTATIC TESTS. THESE TESTS SHALL BE WITNESSED BY A REPRESENTATIVE OF THE CITY.

11. PRIOR TO SITE ACCEPTANCE, A CROSS-CONNECTION SHUTDOWN TEST WILL BE CONDUCTED BY THE CITY AND SAN DIEGO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH.

12. PRIOR TO ENERGIZING THE ON-SITE SYSTEM WITH WATER, ONE (1) COMPLETE SET OF LAMINATED CONTROLLER CHARTS SHALL BE PROVIDED TO THE CITY.

13. EACH AUTOMATIC CONTROLLER AND ITS ASSOCIATED EQUIPMENT SHALL BE IDENTIFIED WITH A SIGN BEARING THE WORDS "RECYCLED WATER USED FOR IRRIGATION" IN ENGLISH AND SPANISH, WITH WHITE LETTERS AT LEAST 1 INCH HIGH ON A PURPLE, PANTONE 512, BACKGROUND. THE SIGN SHALL BE PLACED AS TO BE READILY SEEN BY ANY OPERATIONS PERSONNEL UTILIZING THE EQUIPMENT.

14. THE CONTRACTOR SHALL ADJUST ALL SPRINKLER HEADS FOR OPTIMUM PERFORMANCE. THIS SHALL INCLUDE THROTTLING THE FLOW CONTROL AT EACH VALVE TO OBTAIN THE OPTIMUM OPERATING PRESSURE FOR EACH SYSTEM. CONDITIONS THAT CAUSE OVERSPRAYS, PONDING, OR RUNOFF SHALL BE ELIMINATED. ADJUST SYSTEM TO AVOID THESE CONDITIONS.

15. FAILURE TO COMPLY WITH THE CITY'S RULES AND REGULATIONS IS A VIOLATION AND COULD RESULT IN SUSPENSION OF SERVICE UNTIL THE APPROPRIATE CORRECTIVE STEPS HAVE BEEN TAKEN.

16. WHEN RECYCLED WATER BECOMES AVAILABLE, AN ON-SITE USER/SUPERVISOR SHALL BE DESIGNATED IN WRITING. THIS INDIVIDUAL SHALL BE FAMILIAR WITH PLUMBING SYSTEMS WITHIN THE PROPERTY, WITH THE BASIC CONCEPTS OF BACKFLOW/CROSS CONNECTION PROTECTION, THE RECYCLED PURVEYOR'S RULES AND REGULATIONS, AND THE SPECIFIC REQUIREMENTS OF A RECYCLED WATER SYSTEM.

IN CASE OF EMERGENCY, CONTACT _____ AT _____
PHONE NO. NAME

OR AFTER HOURS,
CONTACT _____ AT _____ PHONE NO..
NAME

17. BEST MANAGEMENT PRACTICES SHALL BE USED TO ELIMINATE OR CONTROL TO THE BEST EXTENT POSSIBLE PONDING, RUN-OFF, OVER-SPRAY AND MISTING.

18. RECYCLED WATER QUICK COUPLING VALVES SHALL BE OF A TYPE DESIGNED FOR USE ON RECYCLED WATER DISTRIBUTION SYSTEMS (SPIKES NOT INTERCHANGEABLE WITH POTABLE WATER QUICK COUPLER SPIKES).

19. UPON FINAL ACCEPTANCE, ANY FUTURE MODIFICATIONS TO THE IRRIGATION SYSTEM MUST BE APPROVED BY THE CITY PRIOR TO THE START OF CONSTRUCTION.

DEH RECYCLED WATER NOTES

http://www.sandiegocounty.gov/content/sdc/deh/lwqd/lu_recycled_water.html

4.2.18 Plan Review Checklist

The following checklist is provided as a tool to help the landscape architect in designing the irrigation plans. The list below can be modified at any time to reflect changes in either DEH requirements or in the City policy for recycled water use.

	1 ST Check	2 nd Check	3 rd Check	Comments
I. DESIGN				
A. Show potable water and recycled water lines				
B. Show point of connection				
C. Connections of hose bibs and hydrant not allowed				
D. Cross connection between recycled and potable water is prohibited				
E. Potable & recycled not in same trench				
F. Drinking fountains and outdoor eating facilities are to be protected from spray of irrigation systems.				
G. Recycled water system does not discharge on to areas not under the owner's control				
H. Swimming pools (No QCV within 50', drip or bubbler only, no potable QCV within 75', plants must be 4 feet away from the pool or spa)				
I. Minimum separation with recycled water and potable water is 4'.				
J. Vertical separation is 12" OD-OD with recycled below potable main				

	1 ST Check	2 nd Check	3 rd Check	Comments
K. Recycled may be above if is intermittent pressure				
L. Recycled may be above if constant pressure line is sleeved				
M. Depth of pipe				
1. Intermittent pressure (2" or less) 12" min. TOP				
2. Constant pressure (less than 6") 18" min. TOP				
3. Constant pressure (6" or more) 30" min. TOP				
N. Fertigation system or pump system requires RP device.				
O. Quick coupler valve shall be of a type approved for recycled water use.				
P. Installation and materials for recycled water irrigation system shall conform the City of Oceanside Standards and Specifications and DEH requirements.				
Q. All shrub heads shall have purple caps. Decal on risers will not be accepted.				
II. ALL SHEETS				
A. Medium				
4. 24"x36" size Mylar conforming to City format				
5. No "sticky back", glued or taped on sections				
6. Retrofit site: 11" x 17 " color paper ok.				
B. Signed and date of expiration of registration adjacent to signature				
C. Marked with the name, address and telephone number of the firm preparing the plans and date of preparation				
D. Consecutively numbered with total number of sheets				
E. Lettered in a neat and legible style, no hand lettering smaller than 1/8" and no machine letter smaller than 1/10"				
F. City of Oceanside WO# shown on right margin				

	1 ST Check	2 nd Check	3 rd Check	Comments
III. TITLE SHEET				
A. City Signature Block				
B. DEH Signature Block				
C. Declaration of Responsible Charge				
D. Responsibility Disclaimer				
E. Meter Information Table				
F. DEH RW# shown vertically on top right margin				
G. Marked with the name, address and telephone number of the owner and developer				
H. Name and phase of development (if applicable)				
I. Inspection note				
J. Omission Statement				
K. Vicinity Map				
L. APN Number and Site Address				
M. M. Sheet coverage shown				
IV. LEGEND, DETAILS & SPECS				
A. Non-standard symbols and abbreviations used are listed and				
B. New site: For sprinklers, show radius & pattern, flow pressure, material, manufacturer & model number				
C. Materials list or Specs when applicable				
D. Show symbols of potable water meter and potable mains.				
E. Show quick coupler detail with note: Quick Coupler shall be of a type approved for recycled water.				
F. Show POC detail				
G. Show Do Not Drink Sign detail				
H. Recycled water tags shall be shown within all valve boxes.				
I. Show potable/recycled crossing and trench details				

	1 ST Check	2 nd Check	3 rd Check	Comments
V. IRRIGATION PLANS				
A. Show:				
1. Meters				
2. Verify w/ City & Civil that lateral stubout exists				
3. Lateral size (2" min.)				
4. Meter size & location				
5. Fire hydrants located with the proposed RW use area.				
6. Gate valves				
7. Control Valves				
8. Quick coupling Valves				
9. Control stations				
10. Signage				
11. Cross connection test station				
12. Adjacent parcels				
13. Backflow prevention device				
14. Potable water line to buildings and drinking fountains.				
15. Buildings				
16. Decorative fountains				
17. Exterior drinking fountains				
18. Routing of all irrigation pipes				
19. Separation of irrigation system used (fence, mow curbs, walls, etc)				
20. Playgrounds				
21. Eating areas				
22. North arrow				
23. Street names				
24. Location of all irrigation meters				
25. Existing & proposed utilities in street (type & size)				
26. Sign locations				
27. Arterial streets				
28. Project boundary				

	1 ST Check	2 nd Check	3 rd Check	Comments
B. Note: If items A18-20 are not present, include an omission paragraph on the plans specifically stating none exist.				
C. City Notes provided				
D. Additional notes are designated as "Special Notes"				
E. DEH Notes provided				
F. Inspection note shown on each sheet of irrigation plans.				
G. Reference to other drawings if applicable				
H. Warning/identification tape				
I. Cross connection test station is directly downstream of meter and/or pressure reducing valve				

4.3 OFFSITE & ONSITE INSTALLATION AND TESTING GUIDELINES

4.3.1 Installation Guidelines

4.3.1.1 Installation of Recycled Pipelines

All connections to existing lines by hot tapping shall be made by a City approved contractor. A list is available from the Water Utilities Department. All tapping machines and auxiliary equipment shall be certified to be used on recycled systems; and, shall not be used on potable water systems (Per Oceanside Standard Drawing RW-17).

4.3.1.2 Installation of Recycled Appurtenances

All appurtenances installed on recycled lines must be installed under the direction of the Water Utilities Department and must be tested with the mainline.

4.3.1.3 Identification of Recycled Signage, Tags, and Stickers

All pipes installed above or below ground and above ground appurtenances on new and retrofitted recycled water facilities shall be consistently color-coded with a safety purple color to differentiate the facilities from potable water facilities. This includes but is not limited to valve and meter boxes and/or covers, air vacuum release valve and blow-off assembly valve covers, all related recycled water signage and tags, irrigation heads, and backflow prevention assemblies.

4.3.2 Recycled Water Inspection Guidelines

4.3.2.1 Overall Guidelines

DEH requires that the City of Oceanside, or designated representatives, conduct on-site inspections during the construction phase to ensure that materials, installation and procedures are in accordance with the approved plans, specifications, and all applicable regulations. Accordingly, the customer must notify City of Oceanside of the schedule for all phases of planning, construction and start up so that inspections can be scheduled. The constant-pressure mainline piping portion of all systems must conform to the requirements of the UPC Sections 103.5.1 through 103.5.4.2.

The tests described below are all required for final acceptance of the recycled system by the City. More detailed information is contained in the *Recycled Water Plan Check and Inspection Manual* published by DEH, latest edition. An example of the "Sample Recycled Water Use Site Certification Letter" is attached as Appendix A. This letter must be submitted to the City of Oceanside Water Utilities Department before recycled water will be delivered to the site.

4.3.2.2 Onsite inspection

- A. The City shall conduct onsite inspections during the construction phase to ensure the materials, installation and procedures are in accordance with the approved Irrigation Plans, specifications, and all applicable regulations.
- B. All work performed without inspection shall be subject to, but is not limited to, rejection and removal.
- C. Any changes to the site or irrigation system as determined by the City or as notified by the landscape contractor must receive written approval by the City

prior to construction. Major changes will need to be documented via a construction change submittal.

- D. The recycled water irrigation system shall be inspected for, but is not limited to the following; POC equipment, irrigation, material, installation depth, valves, sleeves, mainline, lateral line, emission devices (rotors, spray, drip, bubbler, etc.), recycled water identification, recycled water and potable water clearances, separation, irrigation controller, system operation and safety components, coverage tests, backflow prevention, cross connection shutdown inspection, etc.

4.3.2.3 Pressure Test

Hydrotesting shall be performed on all constant pressure lines in the presence of the City. The test pressure shall be a minimum of 50 psi above the rating of the pipe, and shall be maintained for a minimum duration of 2 hours. No leakage (drop in pressure) shall be allowed. If leakage exceeds this rate, the leak points shall be located and repaired, and the hydrotest repeated until there is zero leakage.

4.3.2.4 Coverage Test

The owner, applicant, or customer is responsible for controlling overspray and runoff on new systems or systems requesting conversion. To ensure that any overspray and runoff is in accordance with the City of Oceanside's Rules and Regulations, an inspection of the on-site system by the City of Oceanside is required. When the sprinkler system is completed and the planting installed, the owner or owner's representative shall contact the City of Oceanside's Water Utilities Department at (760) 435-5800 and arrange for a coverage test walk through. The owner or owner's representative must be in attendance and have persons capable of making system adjustments. If modifications to the system are required, other than minor adjustments, the owner will be notified in writing of the changes required. To avoid termination of service, the modifications must be made in a timely manner. All modifications to the system are the responsibility of the owner, applicant, or customer and said owner, applicant, or customer shall pay all costs associated with such modifications.

4.3.2.5 Recycled Water Cross-Connection Control Shutdown Test

There are numerous methods for performing the shutdown test as required by the DEH. The standard test that the City will conduct is "Method 1". Other testing procedures required for unique sites will be reviewed by the City and DEH. The initial cross connection test and inspection of both the entire potable and off-site recycled piping system will be conducted under the supervision of an AWWA Certified Cross-Connection Specialist employed by the City of Oceanside. The initial activation and subsequent shutdown tests will be under the direct supervision of an agent of the City and a DEH representative.

4.3.2.6 Site Compliance

- A. The City will conduct inspections of the recycled water use site and the recycled water irrigation system annually, or on a more frequent basis at EMWD's discretion due to the project size, type, complexity and/or regulatory requirements.
- B. The City inspector shall conduct the compliance management inspection with the Designated Site Supervisor, complete an inspection form, and

transmit any deficiencies observed to the Site Supervisor for correction and follow up inspection.

- C. The City will conduct a cross-connection control shutdown with the presence of the Designated Site Supervisor every four years to verify that no new connections have been made between the potable and recycled water systems.
- D. At City's discretion based on the project conditions, the type of user, and to maintain compliance with DEH and DDW, the City may elect to conduct annual or more frequent cross-connection control shutdown tests.

4.3.2.7 Notifications & Certifications

Recycled water shall not be delivered to a use site until the Recycled Water Use Site Certifications Letter has been signed by DEH and a copy is sent to DDW. The site cannot use recycled water without the receipt of this certification letter. The date of the certification letter will be the start date for calculating the next recycled water cross-connection shutdown test. An example of an acceptable certification letter is shown in Appendix A to these guidelines.

4.4 RECYCLED RETROFIT GUIDELINES

4.4.1 Guidelines and Regulations

In general, as provided for in Section 5.4 of the CITY OF OCEANSIDE Rules and Regulations, all irrigation facilities converting from a potable to a recycled water supply shall conform to the City of Oceanside's construction specifications as contained herein. **CITY OF OCEANSIDE will notify county health agencies of the intent to convert and solicit their involvement throughout the process.** The facilities to be converted shall be investigated in detail including review of any record drawings, preparation of required reports, and determinations by the City of Oceanside of measures necessary to bring the system into full compliance with these standard specifications. The applicant, owner, or customer shall pay all costs to convert the system.

4.4.2 Plan Check Retrofit Guidelines

No piping system used for conveying recycled water shall be converted to potable without the written approval from the DDW, DEH, and the City of Oceanside Water Utilities Department.

The following recycled water plan check-off list is an excerpt from the County of San Diego Department of Environmental Health's manual titled "Recycled Water Plan Check and Inspection Manual. Attachment 35: Recycled Water Plan Check Retrofit Guidelines." All the requirements as stated in Attachment 35 must be strictly adhered to in addition to the guidelines stated below.

1. A preliminary site inspection should be conducted to address problem areas before beginning design of site plans. On complex or questionable sites, DEH should participate. This notification will be up to the City.
2. Before a potable service will be converted to recycled water, a site plan must be submitted to the DEH for approval as described in Section 4.2.
3. Before a potable water service is actually converted to recycled water, a cross connection test shall take place. The test must be conducted as closely as possible to the time of actual recycled water service delivery. If service can not be delivered within the business week, the City and/or DEH representative has the option to retake the cross connection test at the Contractor's/landscaper's cost.

4.5 LIST OF APPROVED MATERIALS FOR USE IN THE CITY'S RECYCLED SYSTEM

A. Combination and Air Release Valves:

1. All air release valves are to be 2 inch (2") and shall be constructed per Oceanside Standard Drawing RW-3.
2. Approved 2" models: A.R.I. combination air-vac model D 040 with a non-slam, discharge throttling attachment and screen.
3. All air release valves shall be housed in an air-vacuum valve enclosure.
4. Approved air-vacuum valve enclosure models: Pipeline Products model VCAS-1830-PR or Armorcast model P6002002 (purple)

B. Blow-off Valves:

1. 4 inch shall be the standard size per Oceanside Standard Drawing RW-2.
2. The head will be a James Jones J-344 HP with a 2-1/2 inch brass fire nozzle with cap and chain.
3. All non-buried metallic pipe and appurtenances (e.g. above ground, in vaults, meter boxes, enclosures, etc.) shall have a factory-applied exterior coating of a universal phenolic primer and two field coats of an alkyd enamel (2 mils DFT per coat), safety purple in color, as approved by the Water Utilities Director.
4. Primer shall be compatible with field finish; acceptable coating manufacturers are Tnemec Co., Inc., Sherwin-Williams Co., 3M, or approved equal.

C. Pipe, Fitting, Valve, and Nut and Bolt Material and Protection:

1. Flange Nuts and Bolts:

- a. Bolts and nuts for above ground installation shall be cadmium-plated carbon steel ASTM A307, Grade "B" or equal.
- b. All Nuts, Bolts, Screws & Washers for buried services shall be Type 316 Stainless Steel.
- c. All Nuts and Bolts will be installed to the proper torque requirements of the manufacturer.
- d. Apply non-oxide grease to the threads of the plated nuts and bolts and anti-seize to the Stainless Steel nuts and bolts prior to installation in the flange.

2. Valve and Flange Coatings:

- a. Primer: All buried service fittings, valve flanges, and bolt and nut surfaces shall be prime-coated with a paste-like consistency. Primer shall be Trenton Wax-Tape Primer or equal.
- b. Wax-Tape: Cover flange, all irregular surfaces, and metallic pipe to 6-inches from backside of flange. Wax-Tape shall be Trenton #1 Wax-Tape or equal.
- c. Outer covering: After applying the primer and wax-tape cover the flange with Trenton Poly-Ply or equal.

3. Polyethylene Encasement:

- a. All Ductile Iron Pipe, fittings and valves are to be encased with two (2) layers of 8-mil thick purple polyethylene (PE) in accordance with AWWA C-105 and SSPWC (Greenbook) Section 207-9.2.6.

4. All valves and fittings shall be encased with 6 inches of neutral sand.

D. Ductile Iron Pipe (DIP) Water Mains:

1. Conform to AWWA C-151 and shall conform to Section 207.9 of the Standard Specifications for Public Works Construction (Greenbook), latest revision.
2. All ductile iron pipe shall be double lined inside with cement mortar, per AWWA C-104.
3. All ductile iron pipe shall be encased in two (2) layers of 8-mil polyethylene, purple in color, and conform to AWWA C-105.
4. Pipe class shall be shown on the plans and is subject to the approval of the Water Utilities Director.
5. The maximum deflection for DIP shall be 2-½ degrees per joint (4 inch through 12 inch).
6. 3-inch minimum width color coded detector tape marked "RECYCLED WATER" in 1 ½ inch black letters shall be placed on the compacted and graded sand bedding one foot above and centered over the DIP water main prior to backfilling the trench.
7. Above-ground ductile iron pipe, such as on bridges or separate pipe supports, or contained within vaults, boxes, or other housings, shall have a factory-applied exterior coating of a universal phenolic primer and two field coats of an alkyd enamel (2 mils DFT per coat), safety purple in color, as approved by the Water Utilities Director.
8. Primer shall be compatible with field finish; acceptable coating manufacturers are Tnemec Co., Inc., Sherwin-Williams Co., or approved equal.

E. Polyvinyl Chloride pipe (PVC) Recycled Water Mains:

1. Shall conform to AWWA C-900 and C-905 pipe with rubber ring bell end, or plain end with rubber ring coupling. PVC pipe for recycled water system applications shall be manufactured in a solid purple color. Solvent welded joints are not permitted.
2. Provide pipe with ductile iron equivalent outside diameter (OD) and class 150 minimum, or pressure rating as required.
3. For 4 inch through 12 inch PVC, deflections at the joints shall not be permitted. Curves and deflections shall be made only with the use of high deflection C-900 PVC couplings or the approved ductile iron fittings. A maximum of 5 degrees per coupling shall be permitted. The improvement plans shall clearly indicate the location of the couplings and the pipe lengths.
4. Minimum allowable radius for PVC pipe, using deflector couplings shall be as follows: (Less than 10-foot pipe length shall not be permitted):

<u>Pipe Length</u>	<u>Minimum Allowable Radius</u>
20 Feet	250 Feet
10 Feet	125 Feet

5. 3-inch minimum width color coded detector tape marked "RECYCLED WATER" in 1 ½ inch black letters shall be placed on the compacted and graded sand bedding one foot above and centered over the PVC recycled water main prior to backfilling the trench.
- F. Hydraulic Valves: Cla-Val with factory fuse coated epoxy coating inside and outside of the body with stainless steel trim. Exterior epoxy coatings shall be safety purple:
1. Standard Check Valve per Oceanside Standard Drawing RW-9.
 2. Standard Relief Valve per Oceanside Standard Drawing RW-10.
 3. Standard Pressure Reducing Valve per Oceanside Standard Drawing RW-11.
- G. Irrigation Service Saddles:
1. All 1-inch saddles are to have NPT iron pipe (IP) threaded taps.
 2. All 1-1/2 inch and 2 inch saddles are to have IP threaded taps.
 3. For PVC C-900 or C-905 use Ford S-912 (4"-8"), Ford 202-BS (10"-30") or A.Y. McDonald 3846 (4"-16").
 4. For DIP use Ford 202-B (4"-30") or A.Y. McDonald 3826 (4"-16").
 5. Threads on bolts and nuts must be coated with non-oxide grease or anti-seize before installation per Section 4.5 of this Manual.
 6. Service saddles shall be wrapped with one layer of purple Polywrap-C (8 mils thick) as manufactured by Northtown Company products, or approved equal; and, shall be encased with six (6) inches of SE 30 sand or equivalent material approved by the Water Utilities Department.
- H. Valves under 14 inch:
1. 1-inch Corporation Stops for irrigation meter service saddles will be NPT iron pipe (IP) thread by flare: Ford FB700-4-NL or A.Y. McDonald 74704B per Oceanside Standard Drawing RW-4.
 2. 1-inch Irrigation Meter Angle Stops (street side of meter): Ford 1-inch BA23-444W-NL or A.Y. McDonald 74602. The center flow line is to be 10 inches below the finished grade per Oceanside Standard Drawing RW-4.
 3. 1-inch Irrigation Meter Service Valve (property side of meter): Ford B-13-332W-HB-34S-L or B-13-444W-HB-34S-NL or A.Y. McDonald 76101MW/SHDLB. This will be furnished and installed by City forces when meter is set at contractor's expense.
 4. 1½-inch and 2-inch Ball Valves for irrigation meter service saddles and 2-inch Ball Valves for 2-inch combination air valve saddles will be male iron pipe (MIP) thread inlet by female iron pipe (FIP) thread outlet with 2-inch gate valve operating nut adapter: Ford B-81-777-NL with QT67 or A.Y. McDonald 76107 with 6122.
 5. 1½-inch and 2-inch Irrigation Meter Service Valves (street side of meter): Ford BFA-13-666W-NL (1-1/2"), BFA-13-777W-NL (2") or A.Y. McDonald 74604B. The center of the flow line shall be 10 inches below finished grade per Oceanside Standard Drawing RW-5. The use of threaded bushings and reducers on irrigation service lines is not allowed.
 6. 1½-inch and 2-inch Irrigation Meter Service Valves (property side of meter): Ford BF-13-666W-NL (1-1/2"), BF13-777W-NL (2") or A.Y. McDonald 74604B. This will be furnished and installed by City forces when meter is set at contractor's expense.

7. 2-inch Ball Valve just under combination air valve inside the valve cover: Ford B11-777-NL or A.Y. McDonald 76101 per Oceanside Standard Drawing RW-3.
8. 3-inch to 12-inch Gate Valves will be Clow, Mueller, or American Flow Control Series 2500 resilient wedge gate valve per AWWA C509 with a fully encapsulated gate, low zinc stem, and factory-fused epoxy coating inside and outside. All nuts and bolts shall be Type 316 Stainless Steel.
9. Coat, wrap, and encase all buried gate valves and appurtenances per Section 4.5 of this Manual.
10. All above-ground valves, such as on bridges or separate pipe supports, or contained within vaults, boxes, or other housings, shall have a factory fuse applied epoxy coating inside and outside the body. The exterior epoxy coating shall be safety purple in color.
11. All epoxy coatings shall be approved and applied by the valve manufacturer.

I. Butterfly Valves (BFV):

1. Valves 14 inch or larger will be Butterfly Valves. The only acceptable butterfly valve shall be a Pratt Groundhog Valve, which has been tested and certified with the valve actuator installed.
2. Butterfly Valves, including operators, shall be protectively coated. Exterior surfaces shall be coated for buried service in accordance with Section 4.2 of AWWA C-504.
3. All interior ferrous surfaces of butterfly valves, including contiguous flange faces, shall be protectively coated with Keysite No. 750, a product of the Soc-Co Plastic Coating Company of Rancho Cucamonga, California, 3-M Company No. 302, or equal. Said coating shall be applied in not less than three (3) coats to a dry-film thickness of not less than ten (10) or more than twelve (12) mils and shall be "holiday" free.
4. All surfaces to receive epoxy coating shall be thoroughly cleaned of all contaminants, i.e., oil, grease, wax, etc., by solvent washing or steam cleaning. Surface projections shall be removed and sharp edges rounded to assure proper application of the epoxy coatings. Immediately prior to applying epoxy coating, surfaces to receive this coating shall be blast cleaned to white metal in accordance with Steel Structures Painting Council Surface Preparation Specifications, No. 5 White Metal Blast Cleaning (SSPC – SP5-63).
5. To assure a thorough "Keysite" or "3-M" coating, an epoxy paste-type filler shall be used to fill any crevices and to modify any sharp inside corners. Said epoxy filler shall be "Keysite No. 742, A and B Epoxy Filler No. 2098", as manufactured by Wyndham Chemical, Inc., Santa Fe Springs, California; or an approved equal.
6. During application of "Keysite" coating the seating surfaces shall be masked. However, the coating shall cover all junctions between dissimilar metals.
7. If any epoxy coating material, other than Keysite No. 750, or 3-M Company 320 is proposed to be used to coat the valves furnished here under, the epoxy coating material be submitted to the Water Utilities Department for review and approval.
8. The valve manufacturer shall apply all epoxy lining and coating.
9. Coat, wrap, and encase all buried butterfly valves and appurtenances per Section 4.5 of this Manual.
10. The exterior epoxy coating shall be safety purple in color for all above-ground valves, such as on bridges or separate pipe supports, or contained within vaults, boxes, or other housings.

- J. Valve Box, Cover and Can per Oceanside Standard Drawing RW-15:
1. Valve Covers: Recycled water Model SBF 1208 N Frame and Lid as manufactured by South Bay Foundry with "OCEANSIDE RECYCLED WATER" Stamped on the cover.
 2. Valve Can: 6 Inch PVC SDR-35 in solid purple, one-piece recycled water pipe centered over valve operating nut and set plumb.
 3. Each assembly shall include a recycled water identification tag as manufactured by Christy's model ID MAX P2 RC007.
- K. Valve Stem Extension:
1. Provide a stainless steel valve stem extension where the depth from the finish surface to the top of valve operating nut exceeds nine (9) feet per Oceanside Standard Drawing RW-16.
- L. Standard Pre-cast Concrete Vault (per Oceanside Standard Drawing RW-13)
1. All vaults, manholes, pits, etc. shall be designed per all current applicable codes and regulations: Title 8, CALIFORNIA CODE OF REGULATIONS, Cal/OSHA, ANSI, etc., for "Confined Space" and "Fall Protection".
 2. All vaults, manholes, pits, etc., shall be certified by the Design Engineer at the time of construction that they meet all current applicable codes and regulations for "Confined space" and "Fall Protection" at the time of construction.
- M. Vault Lids (per Oceanside Standard Drawing RW-14):
1. Aluminum Bilco lid appropriately sized for each vault and shall be rate for H-20 loading.
 2. Each vault lid shall include a recycled water identification nameplate as manufactured by Christy's model 3800.
- N. Fittings – Ductile Iron Only – Cast Iron Not Permitted:
1. Use ductile iron Tyler Grip-Tite or Nappco push-on fittings conforming to AWWA C-110 or C-153 with a minimum rated working pressure of 250 PSI.
 2. Provide fittings with bells and rubber O-ring gaskets specifically designed for ductile iron equivalent outside diameter PVC pipe.
 3. Mechanical joint fittings not permitted. Use of flex couplings is not allowed.
 4. Wrap all ductile iron pipe fittings with double 8 mil in purple polyethylene and encase in 6 inches of neutral sand per Section 4.5 of the City of Oceanside Water, Sewer, and Recycled Water Design & Construction Manual.
- O. Flanges:
1. Flanges on ductile iron pipe and fittings shall conform to AWWA C-100 or ANSI B16.1 Class-250.
- P. Flange Gaskets:
1. Full face, cloth-inserted rubber, 1/8-inch thick, conforming to AWWA Standard C-500.
- Q. Bedding and Backfill:
1. Pipe bedding and trench backfill shall conform to San Diego Regional Standard Drawing WP-02, except that compaction in the pipe zone, trench zone, and upper zone shall be 95%.

2. Where neutral materials, sand or native materials are specified, they shall meet the testing specification requirements of the “Construction Guidelines and Requirements” section of the City of Oceanside Water, Sewer, and Recycled Design & Construction Manual.

**APPENDIX A – SAMPLE RECYCLED WATER
USE SITE CERTIFICATION LETTER**

[Date]

City of Oceanside
Water Utilities Department
300 N. Coast Highway
Oceanside, CA 92054

RE: RECYCLED WATER USE SITE CERTIFICATION FOR [Insert site address]

The recycled water cross connection shutdown test and/or use site inspection for the use site located at the address in the subject line has been successfully completed. No discoverable cross-connections between the use site potable water system(s) and the use site recycled water system(s) were discovered at the time and date of the shutdown test. The overspray, ponding, and signage inspection was successfully completed.

This use site is approved for the use of recycled water.

If you have any questions, please feel free to contact [Insert DEH Representative Name].

Sincerely,

RC:

Cc: State Water Resources Control Board, Division of Drinking Water

END OF RECYCLED WATER SYSTEMS DESIGN GUIDELINES