CITY OF OCEANSIDE

WATER UTILITIES DEPARTMENT

WATER, SEWER, AND RECLAIMED WATER DESIGN & CONSTRUCTION MANUAL

SECTION 4

RECLAIMED WATER SYSTEMS – DESIGN GUIDELINES

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SECTION 4- RECLAIMED WATER DESIGN GUIDELINES

4.1 INTRODUCTION

4.1.1 Purposes and Approved Uses of Reclaimed Water

The City of Oceanside is developing a water reclamation system in accordance with Ordinance 91-15. Therefore, during the design process there shall be requirements to install a dual reclaimed water system for landscape irrigation. The Water Utilities Department shall set these requirements on developments, as the reclaimed water becomes available throughout the City of Oceanside. Developers will be required to provide off-site improvements to bring reclaimed 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 reclaimed water system.

4.1.2 Definitions of Terms

Customer	Individual or Owner that has executed an agreement for use of reclaimed water
Offsite Facilities	City of Oceanside reclaimed water system including the reclaimed water meter
Onsite Facilities	Customer's reclaimed 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
Reclaimed Water & Recycled Water	The terms are identical and any reference to reclaimed water refers to recycled water and vice versa

4.1.3 Procedures for Obtaining Reclaimed Water Service on New Construction and Existing Sites

1. All projects containing landscaping and use of reclaimed water will submit plans to City of Oceanside for review and approval.

2. City's Project Engineer enters the project on the master reclaimed water database. This database will be updated as necessary throughout the design, construction and completion of each project.
3. City's Project Engineer performs plan check with respect to requirements.
4. Applicant/customer makes necessary corrections and resubmits plan to City
5. City's Project Engineer reviews resubmitted plans, attaches "At Owner's Risk Letter" to plans and, when deemed ready, will recommend for approval to Land Development Engineer.
6. City's Project Engineer forwards City approved plans to:
    - One set to DEH
    - One set to City's Water Utilities Department
7. City's Project Engineer signs off/issues permit subject to DEH changes (obtains at owner's risk letter).
8. Applicant installs landscaping improvements at their own risk
9. DEH sends to City letter of approval, not approved or approved with comments.
10. DEH letter is distributed to: Developer's Landscape Architect/representative, Water Utilities Department (2 copies).
11. Developer's Landscape Architect makes necessary changes based on any comments from DEH.
12. When work is completed and inspected by the City, Developer's Landscape Architect/ Contractor submits (4) sets of record drawings "as-built", together with required checklist (Appendix B) and certificates, to the City's Water Utilities Inspection Department. The City's Water Utilities Inspection Department will then forward the completed package to the City's Project Engineer.
13. Record Drawings must be prepared by the Landscape Architect or installing Landscape Contractor and include all field changes.
14. Water Utilities Department's Project Engineer distributes record drawings and certificates as follows:
    - One set to the DEH
    - One set to City's Water Utilities Department
15. City's Signature Block Must use Reclaimed Water Standard Title Block

4.1.4 Overall Requirements

The design of off-site 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 on-site facilities that will use reclaimed water and the preparation of such facilities shall be prepared under the direct supervision of a responsible registered landscape architect or civil engineer in the State of California. The reclaimed water system, including offsite and onsite facilities is separate and independent of any potable water system.

A Title 22 Engineering Report which addresses all of the design criteria pertaining to the use of reclaimed water shall be submitted to the Department of Health Services (DHS) of the State of California and/or to the San Diego County Department of Environmental Health (DEH) for review and approval before a reclaimed water project is implemented.

If there are any plans for future use of reclaimed water but not immediate use the plans must complete the full review process for reclaimed water service as set forth in these guidelines. Otherwise the plans must go through the rigorous retrofit process.

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 Non-potable Water —This document provides recommended guidelines for planning, designing, constructing, and operating non-potable water systems, including reclaimed 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 – Recycled Water Plan Check and Inspection Manual, latest edition. These guidelines are the reference material for plan check processes and testing required for approval from the DEH for reclaimed services installed within the County. At a minimum all guidelines must be strictly adhered to unless otherwise mentioned in this document.

6. State of California Department of Health Services, Drinking Water Field Operations Branch, San Diego District—The State Department of Health Services Drinking Water Field Operations Branch (DHS) 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 reclaimed water use, evaluating and approving reclaimed water systems, and for making recommendations to the RWQCB regarding the public health implications of reclaimed 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 reclaimed water system shall be COMPLETELY SEPARATE AND INDEPENDENT from the potable water system. Cross connections between potable water and reclaimed water facilities are completely prohibited. In addition, the following items are also prohibited:

1. Hose bibs on reclaimed water facilities are prohibited.
2. Drinking fountains will be protected from the spray of reclaimed water in a manner approved by 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 reclaimed lines will never be installed in the same trench.
5. Reclaimed 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 reclaimed 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 reclaimed water on landscape areas shall be limited to a period of 10 p.m. to 6 a.m.

If reclaimed water will be used during 6 a.m. to 10 p.m. then the site supervisor must be on-site at all times during the reclaimed water use and must be certified through the San Diego County Water Authority (SDCWA) class titled, "Recycled Water Certification Workshop".

4.2.3 Design Criteria

Table 4.1 – Design Criteria for Reclaimed 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 reclaimed 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 reclaimed 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.

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 listed in RW-1 and RW-1a will be in effect.

Vertical Separation at Crossings

Where buried reclaimed pipelines cross a buried potable water pipeline, it must be located a minimum of 12 inches below the potable water pipeline. Reclaimed 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 reclaimed 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 reclaimed water mains not located within the public right-of-way shall be provided with a minimum of a 20-foot wide reclaimed water easement. In some cases a wider easement maybe required, size shall be determined by the Water Utilities Director.

B. Where reclaimed 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 reclaimed 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. 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 reclaimed 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 Point of Connection Location

Reclaimed 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 Pipeline Materials

Off-site Reclaimed Piping Materials

A. Reclaimed 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.
   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 “RECLAIMED WATER” in 1-½ inch black letters shall be placed on the compacted and graded sand bedding one foot above and centered over the reclaimed water main prior to backfilling the trench.

B. Reclaimed 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 Pantone purple in color and installed with the “Reclaimed 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):

Pipe Length	Minimum Allowable Radius
20 Feet	250 Feet
10 Feet	125 Feet

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

On-site Reclaimed 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 reclaimed 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 reclaimed water services will be encased in 6" of neutral sand.
6. One separate reclaimed 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 reclaimed 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.

4.2.9 Reclaimed Valves, Blow-off, Air and Vacuum Assemblies

Reclaimed Valves - General

A. Maximum valve spacing:
   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 dead ends and stub outs shall be equipped with blow-off assembly 4 inches in diameter (Per Oceanside Standard Drawing RW-2).

Protection of Public Potable Water Systems— Backflow Prevention

Although not normally a part of onsite reclaimed 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 reclaimed water is used. At premises where both reclaimed 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 Program and 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.

4.2.10 Miscellaneous Appurtenances

Required Wye Strainer and Pressure Regulator

Unless otherwise directed by the Program, all reclaimed 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. 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.

Quick Coupling Valves

New quick coupling valves must be made specifically for reclaimed 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 “RECLAIMED 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 reclaimed water system must be installed in a valve box, where applicable, and a reclaimed 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, “RECLAIMED WATER—DO NOT DRINK.” Attachments used in a reclaimed 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 reclaimed 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 reclaimed water quick coupling valves.

Storage Tanks

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

Booster Pump Stations

Reclaimed 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, reclaimed reservoirs, etc.

4.2.11 Valve Boxes, Frame and Cover

All remote control valves, isolation valves, pressure reducing valves, etc. for on-site reclaimed water systems must be installed below grade in a valve box. The box must be labeled with the reclaimed 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 4.2.12.

4.2.12 Identification Guidelines for Reclaimed Pipelines

Identification of Existing Buried Reclaimed Water Lines Existing buried piping which will be converted to reclaimed 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 Reclaimed Water Lines All above grade reclaimed water pipelines, whether new or existing, must be labeled with the words “RECLAIMED WATER—DO NOT DRINK” and color coded purple to differentiate reclaimed 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 b e 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.

4.2.13 Identification Guidelines for Reclaimed Appurtenances

Identification tags and stickers must be weatherproof and durable, such as plastic or plastic coated. Reclaimed water identification tags and stickers must have a purple background with permanent black lettering stating “RECLAIMED 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 reclaimed water sprinkler control valves, strainers, pressure regulator, quick couplers, isolation valves shall be tagged with identification tags.

(1) Tags shall be weatherproof plastic, 3" x 4", purple in color with the words "WARNING - RECLAIMED 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 reclaimed 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.

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

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

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

Potable Water System Devices At reclaimed 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

4.2.14 Swivel Ell Connections

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

4.2.15 Information Required on Plans

The Plans must include the City's Required Reclaimed 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 declaration of responsible charge must also appear on the cover sheet of the plans:

Declaration of Responsible Charge

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:

_____

_____

_____

Telephone No. _____

By: _____ Date: _____
Name

Registration No. _____

Expiration Date: _____

4.3 OFFSITE & ONSITE INSTALLATION AND TESTING GUIDELINES

4.3.1 Installation Guidelines

4.3.1.1 Installation of Reclaimed Pipelines

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

4.3.1.2 Installation of Reclaimed Appurtenances

All appurtenances installed on reclaimed 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 Reclaimed Signage, Tags, and Stickers

All pipes installed above or below ground and above ground appurtenances on new and retrofitted reclaimed water facilities shall be consistently color-coded with the Pantone (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 reclaimed water signage and tags, irrigation heads, and backflow prevention assemblies.

4.3.2 Reclaimed 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 reclaimed 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 reclaimed water will be delivered to the site.

4.3.2.2 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.

4.3.2.3 Recycled Water Cross-Connection Control Shutdown Test

There are numerous methods for performing the shutdown test as required by the DEH. The proper method for each site must be reviewed and accepted by both the DEH and the City of Oceanside's Water Utilities Department prior to start of test. The initial cross connection test and inspection of both the entire potable and off-site reclaimed 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.

4.3.2.4 Notifications & Certifications

Reclaimed 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 the State Health, Office of Drinking Water. The site cannot use reclaimed water without the receipt of this certification letter. The date of the certification letter will be the start date for calculating the next reclaimed water cross-connection shutdown test. An example of an acceptable certification letter is shown in Appendix A to these guidelines.

4.4 RECLAIMED 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 reclaimed 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 through out 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 reclaimed water shall be converted to potable without the written approval from the California State Health Department, DEH, and the City of Oceanside Water Utilities Department.

The following reclaimed water plan check-off list is an excerpt from the County of San Diego Department of Environmental Health's manual titled "Reclaimed Water Plan Check and Inspection Manual. Attachment 35: Reclaimed 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 reclaimed water a site plan must be submitted to the DEH for approval. The title sheet must include the following information at a minimum:

a. Project Name
b. Vicinity/location map with North arrow shown
c. Engineer's/architect's professional stamp (current and signed)
d. DEH signature block
e. Property boundary
f. Date plans were prepared and revisions, if any were made
g. Declaration of responsibility signed and dated
h. Index of Sheets
i. DEH RW number, in one-inch letters, vertically on the right hand corner
j. Address and telephone number of the engineer/architect of record
k. Reclaimed water standard notes in their entirety as included in these guidelines

Other items must be included within the plan set, preferably on the site plan sheet (which is required) and shall include at a minimum the following items:

a. Recycled water mains and laterals
b. Potable water mains and laterals
c. Locations of "Do Not Drink" signage
d. "Do Not Drink" sign diagrams
e. Point of connection(s)
f. Location of meters (reclaimed and potable)
g. Location of wells (if applicable)
h. Fire laterals and fire hydrants
i. Location of water courses and major catch basins (if applicable)
j. Indicate on the plans any designated outdoor eating areas or drinking fountains. Verify these areas are protected against contact with reclaimed water over spray, mist, or run-off
k. Typical cross section of reclaimed water and potable line crossings
l. Quick coupler detail with quick coupler valves shall be of a type approved for reclaimed water use

m. Irrigation legend

n. Reclaimed water note on separation. A physical separation shall be provided between adjacent areas irrigated with recycled water and potable water. Separation shall be provided by distance, concrete mow strips or other approved methods

o. If biotech or research site, note that the building has the proper wall/turf located air intakes

Once approval is granted, plans shall be submitted to the DEH for signature. If a large number of sites will be retrofitted at one time then the sites can be packaged under one title page for signature.

3. Before a potable water service is actually converted to reclaimed water, a cross connection test shall take place. The test must be conducted as closely as possible to the time of actual reclaimed 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 RECLAIMED SYSTEM

A. 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" model is Vent-O-Mat Model 050RBX2521CS4.

3. Valves are to have stainless steel trim.

4. Valves shall be epoxy-coated inside and outside. Epoxy Coating shall be purple and shall be approved and applied by the valve manufacturer.

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 aboveground pipe and appurtenances shall be primed and painted Pantone purple.

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, per 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 “RECLAIMED 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.

E. 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. 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):

Pipe Length	Minimum Allowable Radius
20 Feet	250 Feet
10 Feet	125 Feet

5. 3-inch minimum width color coded detector tape marked “RECLAIMED 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 water main prior to backfilling the trench.

F. Hydraulic Valves: Cal-Val with factory fuse coated epoxy coating inside and outside of the body with stainless steel trim:

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 ¾ inch and 1 inch saddles are to have AWWA Tapered Thread taps (CC Thread).

2. All 1-1/2 inch and 2 inch saddles are to have Iron Pipe taps (IP Thread).

3. For PVC C-900 or C-905 use James Jones J-996 (4”-12”), James Jones J969 (14”-16”), or Ford S-912 (4”-8”), Ford 202-BS (10”-30”).

4. For DIP use James Jones J-979 (4”-16”), Ford 202-B (4”-30”), or Apac Products No. 113 (14”-30”).

5. Saddle must be completely encased in neutral sand before backfilling.

6. Threads on bolts and nuts must be coated with non-oxide grease or anti-seize before installation per Section 4.5 of this Manual.

H. Valves under 14 inch:

1. ¾ inch and 1 inch corporation stop for irrigation meter services will be AWWA taper thread (CC thread) by flare: James Jones E-1930, or Ford FB-600-3-NL, FB600-4-NL per Oceanside Standard Drawing RW-4.

2. ¾ inch and 1 inch irrigation meter angle stops (street side of meter): James Jones E-1964W or Ford BA23-332W-NL, BA23-444W-NL. The center flow line is to be 10 inches below the finished grade per Oceanside Standard Drawing RW-4.

3. ¾ inch and 1 inch irrigation meter service valve (house side of meter): James Jones E-1908W or Ford B13-332W-HB-34S-NL, B13-444W-HB-34S-NL. The valve will be furnished and installed by City forces when meter is set at contractor's expense.

4. 1-½ inch and 2 inch ball valves for irrigation meter service saddles and 2 inch Ball Valves for 2 inch air release saddles will be male iron pipe (MIP) thread inlet by female iron pipe (FIP) thread outlet with 2 inch gate valve operating nut adapter: James Jones E-1945 with 281-NB, or Ford B81-777-NL with QT67.

5. 1-½ inch and 2 inch irrigation meter service valves (street side of meter): James Jones E-1912W or Ford BF-13-666W-NL, BF13-777W-NL. The center of the flow line shall be 10 inches below finished grade per Oceanside Standard Drawing RW-5.

6. 1-½ inch and 2 inch irrigation meter service valves (property side of meter): James Jones E-1912W or BF-13-666W-NL, BF13-777W-NL. The valve will be furnished and installed by City forces when meter is set at contractor's expense.

7. 3 inch to 12 inch gate valves will be: Clow 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.

8. Coat, wrap, and encase all buried gate valves and appurtenances per Section 4.5 of this Manual.

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, or 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.

J. Valve Box, Cover and Can per Oceanside Standard Drawing RW-15:

1. Valve Covers: Reclaimed water Model SBTT Frame and Lid as manufactured by South Bay Foundry with "RECLAIMED" or "RW" Stamped on the cover.
2. Valve Can: 6 Inch SDR-35 PVC, one-piece gravity sewer pipe centered over valve operating nut and set plumb.

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.

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 Oceanside Water, Sewer, and Reclaimed 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 W-21, 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 Oceanside Water, Sewer, and Reclaimed 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 Health Department

Appendix B- Reclaimed Water Checklist

City of Oceanside Reclaimed Water Checklist for New Construction

Project Name: _____Site Address: _____

Customer No. -_____ Meter Register No. _____

Note: One checklist for each reclaimed water meter connection.

A. Water Utilities Department Inspection Permit # _____

_____

Date	Inspector	Item
_____	_____	1. Reclaimed Water Curb Stop locked off
_____	_____	2. Reclaimed Water Vertical and horizontal clearances per plan
_____	_____	3. No jumpers providing reclaimed water on-site; use potable as temporary supply
_____	_____	4. Upon obtaining clearance for Item A3, set potable water meter
_____	_____	a. Backflow certification obtained
_____	_____	b. Meter Box OK
_____	_____	5. On-site piping (purple), vert/horiz clear, depth of cover
_____	_____	6. On-site piping pressure test passed
_____	_____	7. Cross-connection test certificate from AWWA Cross-Connection Specialist is attached (must use potable water for testing).
_____	_____	8. Signage installed
_____	_____	9. Tagging of on-site valves etc. (both potable and recycled) installed.
		10. Disconnect temporary potable highline. Inspector must both witness the disconnect and provide photographic documentation of the disconnect prior to proceeding to the next step.
_____	_____	11. OK to set reclaimed water meter, when above items are completed
_____	_____	12. Coverage Test
_____	_____	13. Additional DEH requirements from letter (fill in below and attach as needed)
_____	_____	a. _____

_____ _____ b. _____

_____ _____ 14. Record Drawings "as-builts" (3 sets), red-line OK. (Attached)

_____ _____ a. Record drawings reviewed for changes, signage and completeness

_____ _____ b. _____

_____ _____ c. _____

_____ _____ 15. Interim Site Supervisor

_____ _____ a. Name _____,
b.Phone#_____

_____ _____ 16. Water Utilities Inspection complete

_____

Water Utilities Dept.
Inspector signature Date

END OF RECLAIMED WATER SYSTEMS DESIGN GUIDELINES