	City of Rancho Cucamonga BUILDING AND SAFETY SERVICES DEPARTMENT 10500 Civic Center Drive Rancho Cucamonga, CA Tel: (909) 477-2710 Fax: (909) 477-2711 www.CityofRC.us To start an account and the application process online Click Accelerate https://aca.accela.com/cityofrc	BUILDING STANDARD S-3	
		Page 1 of 8	
		6/23/2015 EFFECTIVE DATE	6/23/15 REVISION DATE
Guidelines for Residential Graywater & Rainwater Collecting Systems			

INTENT

The intent of the standard is to identify local requirements related to the construction of Residential Graywater and Rain Collecting Systems within the City as adopted in the latest California Plumbing Code. The user of this standard must comply with all code requirements.

AUTHORITY

This standard is in accordance with the adopted 2013 California Code of regulations Title 24, the California Plumbing Code, Chapters 16 and 17 and Rancho Cucamonga Ordinance No. 862, Chapter 15.20.

TABLE OF CONTENTS

I	INTRODUCTION	2
II	DEFINITIONS	2
III	UNDERSTANDING YOUR NEEDS	2
IV	DIFFERENT COLLECTION SYSTEMS	3
	A. RAINWATER COLLECTING SYSTEM: RAIN BARRELS	3
	B. RAINWATER COLLECTING SYSTEMS: CISTERNS	4
	C. RESIDENTIAL GRAYWATER SYSTEMS	4
V	DISTRIBUTION METHODS FOR RESIDENTIAL RAINWATER AND GRAYWATER	7
VI	PERMITTING REQUIREMENTS	8

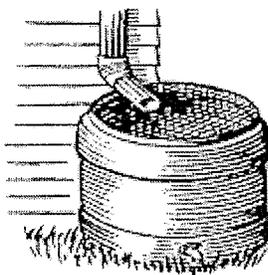
Approved by:	 Signature:	7/1/2015	Trang Huynh P.E. Building & Safety Services Director
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I. INTRODUCTION

The Guidelines to Conserving Water through Rainwater Collecting and Graywater Reuse systems for Outdoor Use is designed to give homeowners an overview of graywater and rainwater irrigation systems including information for systems that do not require permits. Additionally, this guideline gives information on permitting requirements for installing more complicated residential rainwater collecting and graywater system in accordance to Chapters 16 (Graywater systems) and 17 (Rainwater systems) of the latest adopted California Plumbing code.

II. DEFINITIONS

Rainwater and Graywater systems are alternative plumbing systems that help to conserve our limited water supply. Currently, most of us use clean drinking water straight from the tap to water our gardens. Graywater and rainwater systems give you another water choice for irrigating and can save you money on your water bill. Using non potable water to irrigate your garden can also help replenish local aquifers. Graywater and rainwater are different with distinct requirements for system design and permitting.



Rainwater is collected precipitation from rooftops and other above ground impervious surfaces that is stored in catchment tanks for later use. Rainwater collecting systems can range from a simple barrel at the bottom of a downspout to multiple cisterns with pumps and filtration. The harvested rainwater is low in sodium and chloramine and fluoride free. Rainwater is different than potable tap water and requires specific measures for its safe reuse in your garden



Graywater is untreated household wastewater generated from hand washing, laundry and bathing. This wastewater can be diverted from the sewer to irrigate outdoor plants and landscape. Graywater cannot include any wastewater from toilets, kitchen sinks, dishwashers or washing machines laundering soiled diapers or other sources of contamination such as darkrooms. Graywater cannot be stored for more than 24 hours. Graywater is different than potable tap water and requires specific measures for its safe reuse in your garden.

III. UNDERSTANDING YOUR NEEDS

To design your alternative plumbing system you should know:

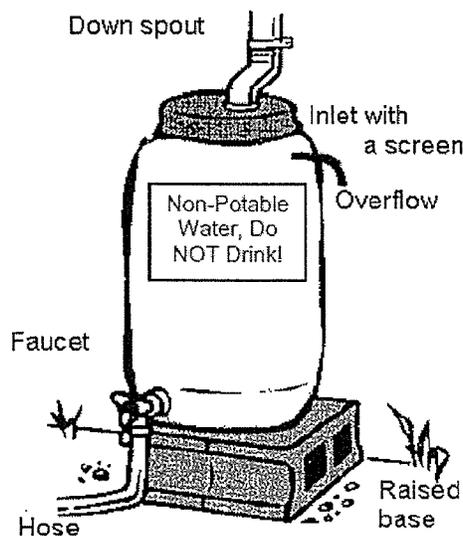
- How much water is needed for your garden?
- How much water will be produced from your graywater or rainwater systems?
- What type of water do the plants need (rainwater is acidic, graywater is basic)?
- When do you need it (daily, monthly, and biannually)?
- Where are you going to get it from (shower, sink, and roof)?
- How are you going to deliver the water to the garden (pump system, gravity flow)?
- Which distribution system do you plan to use (sub-surface, drip, mulch basin)?

IV. DIFFERENT COLLECTION SYSTEMS

A. RAINWATER COLLECTING SYSTEM: RAIN BARRELS

According to the latest adopted version of the California Plumbing Code section 1702.2, allows no permit or city approval is needed for rain barrel systems of 100 gallons or less per container, provided the following requirements and conditions are met:

Rain Barrel (Less than 100 gallons —no permit required) A rain barrel system is a simple rainwater collector that captures and stores a portion of the runoff from a roof down spout. A hose attached to the bottom of the rain barrel can be used to irrigate your garden. A rain barrel will only capture a small fraction of the rainwater that flows off your roof, the rest of the runoff will still need to drain to a safe overflow location.



Drawing Credit: City of Ottawa, Canada

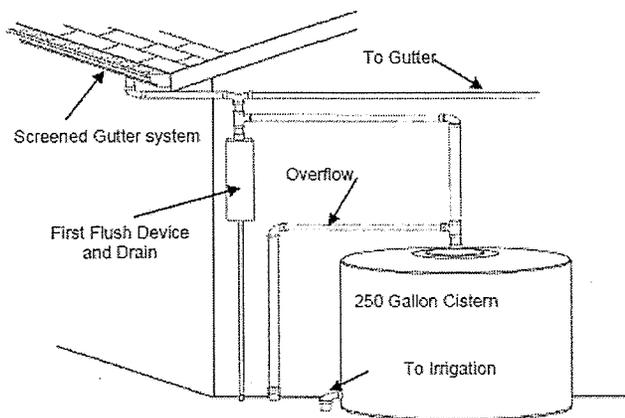
Requirements:

1. Your rain barrel should have a spigot/faucet so that you can access the water, an overflow pipe, a sealed and screened lid with an opening to attach your downspout and screens on all vents.
2. All rainwater collection systems must have an overflow to a safe disposal location (storm water drain or rain garden).
3. If you intend to water edible plants with your rainwater, consider installing a first flush diverter, which disposes of the first inch of rain and ensures that you harvest only the cleanest rainwater.
4. Rain barrel must be secured on a firm, level surface so that it will not tip over. It can be raised slightly to help with gravity flow irrigation.
5. Provide a labeled "Non-Potable Water, Do NOT Drink!" On the barrel.
6. Secured to ensure all child safety precautions are taken to prevent drowning
7. Rain barrels shall be sited at grade on a sound and level surface at or near gutter downspouts.
8. Water collected shall be used for irrigation only.
9. Rain barrel openings shall be screened with a fine mesh (.05 inch x .05 inch) to pre-vent mosquitoes from entering.
10. Gutters serving rain barrels shall be debris screened.
11. Large openings shall be securely fastened to prevent accidental drowning.
12. No pumps, connections to domestic water or interior use are permitted.
13. Rain barrels shall be located a minimum of 3 feet from the property line.
14. Overflow or discharge from rain barrels may not discharge across the public right-of-way or adjacent property, or in any way create a nuisance.
15. Collection vessel(s) for each existing downspout shall not exceed 100 gallons in the aggregate.
16. Rain barrels and gutters shall be cleaned annually with a non-toxic cleaner such as vinegar.
17. Rainwater from rain barrels is not required to be treated.
18. Use of rainwater collected from rain barrels is not limited to subsurface irrigation.

B. RAINWATER COLLECTING SYSTEMS: CISTERNS

Note: Rain catchment systems over 100 gallons or over 100 gallons in aggregate per downspout will be considered cisterns subject to the permitting requirements.

Cisterns (Greater than 100 gallons) Cisterns are larger systems that can hold much more water and may include pumps to move the rainwater to the garden. More complex systems can involve plumbing and electrical work, soil excavation or other structural work. Permits with the reviews and approvals from Building and Planning Departments are required for cistern systems.



- **Note:** The size of your system depends on how big your roof is, how much rain-water storage you have, and how you intend to use the water. A typical standard is that you can collect 600 gallons of water for every 1,000 sq.ft. of roof area for every inch of rain.
- **Requirements:** Some of the requirements for the rain barrel system might be applicable to this Cistern system as described on page 3 of these guidelines. Consult a licensed professional plumber for the design, construction, and safety considerations.

C. RESIDENTIAL GRAYWATER SYSTEMS

1. Types of Graywater Systems:

There are three types of graywater systems that vary in complexity, volume of water produced and permitting requirements. In order to determine which system is right for you, you need to know your irrigation needs, including yard size, soil type, groundwater level and budget. The easiest, most low-tech system uses a washing machine and gravity to move laundry water directly out to the garden. To further ensure safety, graywater cannot be used on the edible portions of vegetables and must be used for sub-surface irrigation in order to reduce human contact or ponding. You cannot store graywater so only divert the amount needed to water your garden. All systems must be installed and maintained according to California Plumbing Code section 1602.

- **Clothes Washer System (no permit required)** Laundry-to-landscape systems divert gray-water from the washing machine to your garden without cutting into existing plumbing. Washing machines have internal pumps which can be used to pump water directly out to the garden. No permit is required as long as no pump (other than the washing machine itself) or surge tank is used.
- **Simple System (Less than 250 gallons a day.)** These systems include reusing water from a bathroom sink or shower. Simple systems require permits and involve altering plumbing and can include surge tanks and pumps. Simple Systems are not covered in these guidelines.

- **Complex System (Greater than 250 gallons a day.)** These systems supply a large volume of water. Complex systems rely on pumps, surge tanks, filtration systems and are expensive to install and require ongoing maintenance. Complex systems must be designed by a qualified professional plumber and meet all the requirements of the California Plumbing Code. Complex Systems are not covered in these guidelines.

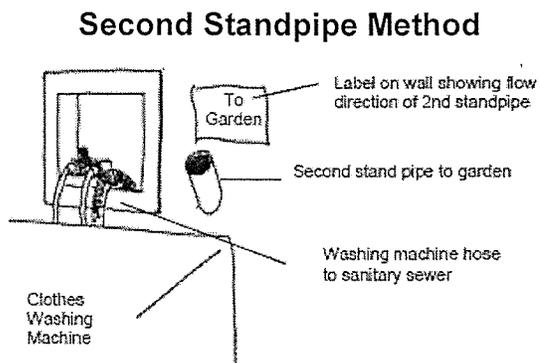
2. Clothes Washer Systems

Washing machine systems are the least complicated type of graywater system. They are great for gardens with minimal irrigation needs, are low cost, easy to install, and require very little maintenance. No permit is required for a clothes washing machine, providing all system design and code requirements according to the latest adopted California Plumbing Code section 1601. Permits are required for systems that include tanks or pumps.

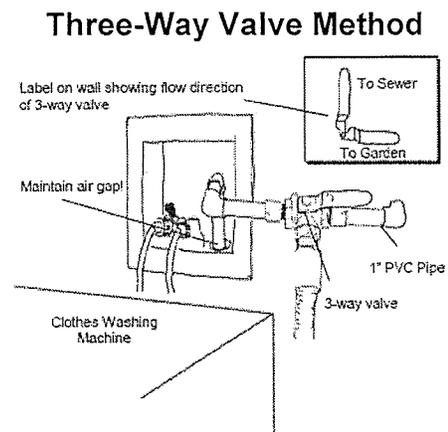
a. Designing a Clothes Washer System:

- Attach washing machine discharge hose to either a 3-way valve to switch between a graywater system and the sewer or a second standpipe. Graywater must be capable of being reconnected to the sewer.
- Graywater then travels out to the garden. A mulch basin with 2" cover is the simplest system for distribution and irrigation.
- Clearly label flow direction to sewer or yard. Once outside the building, the discharge must drain directly to the disposal field by hose or pipe. Piping at five foot increments & at hose connection point is to be permanently labeled: **"CAUTION: NONPOTABLE WATER, DO NOT DRINK"**
- All graywater must be used the same day it was produced.

Two examples of methods to divert washing machine graywater to the garden:



The second standpipe is installed in the wall or through the floor before it goes out to the garden. The clothes washing machine hose is moved by hand from the normal building sewer connection to the irrigation system standpipe.



A three-way valve and piping are assembled to switch between the normal building sewer connection and the irrigation system. A vacuum breaker or backflow device may be required for proper operation depending on site elevations. Consult a plumber.

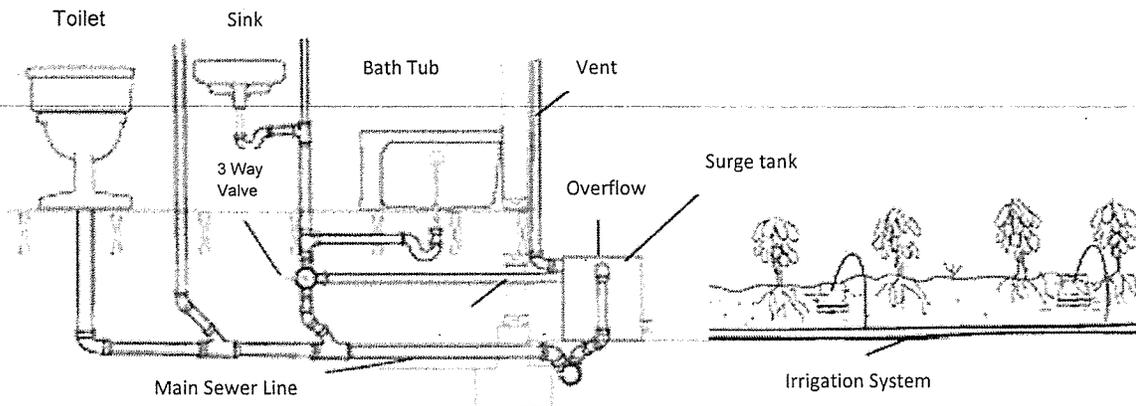
b. Clothes Washer System Requirements:

Permit from the City of Rancho Cucamonga Building and Safety Services Department is not required, but the following requirement shall be used:

1. The design shall allow the user to direct the flow either to the irrigation or disposal field or the building sewer. The direction control of the graywater shall be clearly labeled and readily accessible to the user.
2. The installation, change, alteration or repair of the system does not include a potable water connection or a pump and does not affect other building, plumbing, electrical or mechanical components including structural features, egress, fire-life safety, sanitation, potable water supply piping or accessibility.
Note: The pump in a clothes washer shall not be considered part of the graywater system.
3. The graywater shall be contained on the site where it is generated.
4. Graywater shall be directed to and contained within an irrigation, mulch basin, or disposal field.
5. Ponding or runoff is prohibited, and shall be considered a nuisance.
6. Graywater may be released above the ground surface provided at least two (2) inches (51mm) of mulch, rock or soil or a solid shield covers the release point. Other methods which provide equivalent separation are also acceptable.
7. Graywater systems shall be designed to minimize contact with humans and domestic pets.
8. Water used to wash diapers or similarly soiled or infectious garments shall not be used and shall be diverted to the building sewer.
9. Graywater shall not contain hazardous chemicals derived from activities such as cleaning car parts, washing greasy or oily rags or disposing of waste solution from home photo labs or similar hobbyist or home occupational activities.
10. Exemption from construction permit requirements of this code shall not be deemed to grant authorization for any graywater system to be installed in a manner that violates other provisions of this code or any other laws or ordinances of the City of Rancho Cucamonga.

3. Simple and Complex Graywater Systems:

These systems shall be designed by a licensed professional plumbing contractor. The diagram below can be used as a reference for one of the designs.

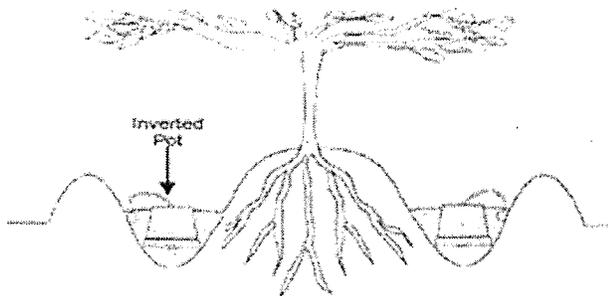


V. DISTRIBUTION METHODS FOR RESIDENTIAL RAINWATER AND GRAYWATER

Although rainwater and graywater systems are different and have distinct characteristics and permitting requirements, they have similar distribution methods and allowable uses. Residential rainwater and graywater may replace drinking water for watering plants and lawn.

A. TYPES OF IRRIGATION SYSTEMS:

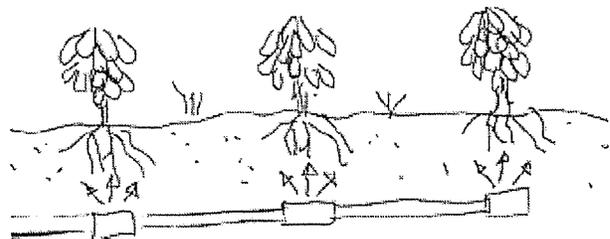
- Mulch Basin– simplest method of irrigation
- Sub-Surface Plant Drip System– more complex system
- Sub-Surface Irrigation for Lawns– more complex design and venting requirements

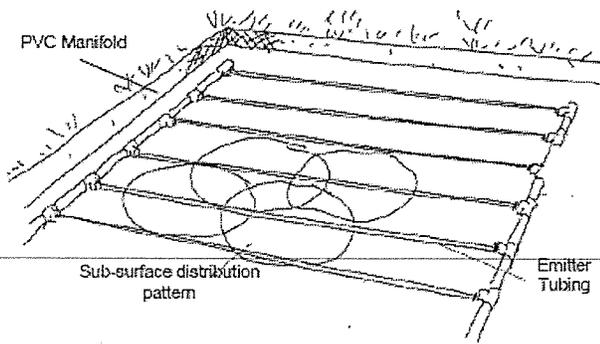


1. Mulch Basins are trenches located between or around plants filled with mulch designed to prevent ponding or surfacing.

The diagram (to the left) illustrates a branched subsurface irrigation system that waters plants without the use of specialized drip emitters, using tubing for controlled saturation at the roots. Pots are located below the surface of the system to provide air pockets around the tubing to prevent root intrusion. This system is less prone to clogging, but requires more volume for even distribution.

2. Sub-Surface Plant Drip System directly irrigates plants at the root system at a regulated low volume. Sub-surface drip emitters must be designed to resist root infiltration and generally require a pump and filter. (See diagram to right)





3. Sub-Surface Irrigation for Lawns Mulch Basins are trenches located between or around plants filled with mulch designed to prevent ponding or surfacing. The diagram (to the left) illustrates a branched subsurface irrigation system that waters plants without the use of specialized drip emitters, using tubing for controlled saturation at the roots. Pots are located below the surface of the system to provide air pockets around the tubing to prevent root intrusion. This system is less prone to clogging, but requires more volume for even distribution.

VI. PERMITTING REQUIREMENTS

A. Rainwater Collecting Systems Permitting Requirements:

System type	Building permit	Planning Review and Approval
Rain Barrel (<100 gallons)	No	No
Cistern (<360 gallons)	Yes	Yes
Cisterns (>360 gallons)*	Yes	Yes
Cisterns >5000 gallons & >2:1 height to width OR Cisterns above grade (raised) OR below grade (underground)*	Yes	Yes
Cisterns within a building	Yes	Yes
Pumps added to any system	Yes	Yes

B. Graywater Systems Permitting Requirements:

System type	Building permit	Planning Review and Approval
Clothes Washer System	No*	No
Simple (<250 gallons)	Yes	Yes
Complex (>250 gallons)	Yes	Yes
* A permit shall not be required for a clothes washer system that does not cut or alter the existing plumbing piping as long as it is in compliance with the Graywater Systems Requirements as specified in the latest adopted California Plumbing Code.		

For additional information and inquiries, please contact:
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