

A Guide to Building a Graywater and/or Cistern System in Santa Monica

(residential projects using collected water
in sub-surface drip irrigation systems)



Step 1	Research graywater or cistern systems that will work for your site and water needs
Step 2	Design your graywater or cistern system
Step 3	Apply for Plan Check from City
Step 4	Get Plan Check approval and permit from City
Step 5	Begin building the system according to the approved plans
Step 6	Call City Building & Safety (310) 458-2202 for plumbing and electrical rough-in inspections
Step 7	Call City Water Resources (310) 458-8535 for cross-connection inspection for a system
Step 8	Final inspections by City Building & Safety and Water Resources

Step 1 – Research Graywater and Cistern Systems

- The rules for building a graywater system in Santa Monica are described in the 2007 California Plumbing Code: Title 24, Part 5 California Administrative Code, Appendix G Graywater Systems. You can find this document at:
http://www.owue.water.ca.gov/docs/Revised_Graywater_Standards.pdf
- Title 17, Chapter 22 also has information regarding graywater systems
<http://www.cdph.ca.gov/certlic/drinkingwater/Documents/Recharge/Purplebookupdate6-01.PDF>
(NOTE: Graywater is considered an “unapproved auxiliary water supply” NOT recycled water.)
- **Graywater** is defined in Appendix G, “Graywater includes waste water from bathtubs, showers, bathroom wash basins, clothes washing machines, and laundry tubs, or an equivalent discharge as approved by the Administrative Authority. It does not include waste water from kitchen sinks, photo lab sinks, dishwashers, or laundry water from soiled diapers.”
- Because there is so much misinformation available, a great place to start your exploration of graywater is with its recognized guru, Art Ludwig. After reading this page of his web site:
<http://www.oasisdesign.net/greywater/index.htm>, you will have a good understanding of the suitability of a graywater system for your property.
- Another good resource is *Graywater Guidelines* available from WaterCASA at:
<http://www.watercasa.org/graywaterguidelines.php>. This document is based on Arizona State law but includes a lot of helpful information including system diagrams.
- A **cistern** is a catchment device to capture rain water from a roof or other surface before it reaches the ground. In Santa Monica, cistern water can only be used for non-potable purposes.
- The American Rainwater Catchment Systems Association is a great place to learn about cisterns:
<http://www.arcsa-usa.org>

A few rules of thumb:

- ~ For minimum hassle, the things you want to water should be downhill from the lowest point in your graywater/cistern system. Simple systems cost less and will be cost-effective in a shorter period of time.
- ~ No matter how much graywater/cistern water you produce (**up to 30,000 gallons per year** for a house that has water-efficient showers, faucets and clothes washers), you will probably still need a conventional potable irrigation system on at least part of your property.
- ~ Getting a code-approved graywater/cistern system built is a time-intensive process. You do not need a permit for a simple cistern system that consists of a rain barrel and typical garden hose.

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- ~ Putting in a graywater/cistern system is not something that is going to save you a lot of money. But it is one of the most effective things you can do to cut your exterior water use and reduce sewer waste and charges. After installation, ask the Water Resources billing office at (310) 458-8224 to adjust your sewer bill.
- ~ Besides the cost of the graywater/cistern system, irrigation system, and cross-connection devices, it will also cost you ~\$530 for a permit; \$40 for your cross-connection protection device fee from the Water Resources Division plus yearly testing by a certified cross-connection tester.

Step 2 – Design Your Graywater/Cistern System

- Design your graywater system according to the 2007 California Plumbing Code – Appendix “G”.
- See Attachment A: Plan Submittal Requirements for a list of all the details you’ll need to show on your plan.
- Changes to the plan require a plan check revision from the City’s Building & Safety Division (fee required for changes).

Step 3 & 4 – Plan Review and Permit

Submit plans to the City.

- Submit 2 sets of plans (or 6 sets if part of a remodel/new construction) to:

City of Santa Monica Building & Safety Counter

Santa Monica City Hall

1685 Main Street, Room 111, Santa Monica CA, 90401

(310) 458-8355

www.ePermits.smgov.net for on-line permit services

Call Dan Macey at (310) 458-2201 x 5603 for plan check/technical questions.

- Permit Fee is ~\$533 plan check, plumbing review and 3 inspections. Additional inspections require additional fees.
- Approval time is approximately 30 days. Upon approval you will be notified by the plan check project coordinator and receive an approval letter.
- If the proposed system is a stand alone project (no other building project at the site) a Single Trade Permit will be issued. Plans and other related construction related documents shall be submitted for plan check before a permit is issued. If the proposed graywater and/or cistern system is included as part of a larger building construction/alteration for a single family home, a Combination Permit will be issued. In such cases applicants should clearly indicate to the staff that a proposed graywater/cistern system is included to ensure that plans are properly routed and reviewed for compliance with applicable codes. This is critical since most single family homes are normally exempt from plan review for mechanical, electrical and plumbing (MEP) provisions.
Note: this may trigger additional plumbing upgrades, such as meter size upgrade, as approved by the City’s Water Resource’s Manager.
- If your project is valued at \$1,000 or more, you will be required to have appropriate smoke detectors and water heater straps. If your project is valued at \$10,000 or more, you will also be required have an appropriate gas shut-off valve.

Following the plan check approval, inspections are scheduled with the contractor during the construction phase, for both conversions and new construction projects.

Step 5 – Build Your System

- Begin building your system according to the 2007 California Plumbing Code – Appendix G and the approved design plans. Inspections are required throughout the building process (see Steps 6, 7, 8)
- Changes to the plan require a plan check revision from the City’s Building & Safety Division (fee required for changes).

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Step 6 – City Installation Inspection

Call the City's Building and Safety Division to schedule these inspections. Inspections may incur additional costs ranging from \$44 to \$89 depending on the type of inspection.

Inspector Request Lines: (310) 458-2202 or (310) 458-8358

- A. Underground plumbing inspection as pipes and system are being installed.
- B. Plumbing rough-in inspection once pipes are installed but before they are covered.
- C. Electrical inspection as system is installed.

Step 7 – City Cross-Connection Installation Inspections

Step 7 is required if a system has a pump and/or is pressurized. The inspector will make sure the appropriate RP (back flow device) is installed properly on the water line after the main water meter. The inspector will also inspect the air gap, if one is required for your system.

Call the **City of Santa Monica Water Resources Division** for proper cross-connection inspection.
Stuart Jose or Chris Camacho (310) 458-8535

Step 8 – Final Inspections

These inspections by the City will determine if the system meets all code requirements and is ready for approval. Inspections may incur additional costs ranging from \$44 to \$89 depending on the type of inspection.

- A. **Call the City of Santa Monica Building & Safety Division** for an inspection when the system is complete. Upon approval a report will be generated.

John Guerrero (310) 458-2201 x 5222

Inspector Request Lines: (310) 458-2202 or (310) 458-8358

www.ePermits.smgov.net for on-line permit services

- B. Call the **City of Santa Monica Water Resources Division** for a final shutdown inspection.
Stuart Jose or Chris Camacho (310) 458-8535

Questions?

Call the Water Efficiency Section staff at (310) 458-8972

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Attachment A: Graywater/Cistern System Plan Submittal Requirements

(The following information, if applicable, must be shown on your plans)

- All water meters
- All irrigation connections, i.e. quick couplers, valve boxes, controllers, sub-surface drip irrigation, backflow devices, etc.
- Connection of the potable water to the building.
- Cross-Connection Devices:
Graywater and/or cistern systems with a pump and/or pressurization, without potable make-up water does require a, Reduced Pressure Backflow Device (RP) after the main water meter. (See the attached list of approved RP devices).

Graywater and/or cistern system with a pump and/or pressurization, with potable make-up water require RP and air gap protection. The RP must be installed on the domestic water supply line (water main going into the house) as close to the main water supply meter as possible. The air gap must be installed between the potable make-up water and the graywater/cistern tank. The air gap must be at least two times the diameter of the effective pipe opening (see 2007 Uniform Plumbing Code Chapter 6; Table 6-3).

- Internal backflow devices, i.e. non-potable uses.
- All water lines must be identified (UPC, 601.2, Appendix G)

Potable (blue or green background):

“Caution – Potable Water Line”

Non-potable (Irrigation, from a potable source, yellow background):

“Caution – Non-potable Water Line”

Cistern Water:

“Caution – Cistern Water Irrigation System Sub-surface only, Danger – Unsafe Water”

Gray Water:

“Graywater Irrigation System Sub-surface only, Danger – Unsafe Water”