rainwater harvesting in san francisco

A Partnership between San Francisco's Public Utilities Commission, Department of Public Health, & Department of Building Inspection

WHAT IS RAINWATER HARVESTING?

Rainwater harvesting is the practice of collecting and using rainwater from hard surfaces such as roofs. It is an age-old technology; communities in ancient Rome were designed with individual cisterns and paved courtyards, which captured rainwater to augment supply from the city's aqueducts. Today, rainwater harvesting is growing in popularity as people look for ways to use water resources more wisely.

Many rural areas around the world rely on rainwater as their primary water source, but areas served by municipal water have tended to overlook rainwater as a water resource. San Francisco would like to change that by promoting rainwater harvesting in our urban setting.

Assembling a rainwater harvesting system at Cesar Chavez Elementary School, San Francisco, CA.

WHY HARVEST RAINWATER?

When you install a rainwater harvesting system at home, you are helping to maintain the health and beauty of San Francisco's urban watershed in many ways. By harvesting rainwater you:

- Keep relatively clean water out of the sewer system and make it available for use;
- Reduce the energy and chemicals needed to treat stormwater in San Francisco's wastewater plants, and the energy expended transporting water from far away;
- Reduce the volume and peak flows of stormwater entering the sewer, thereby helping to reduce flooding and combined sewer discharges; and
- Reduce the volume of potable water used for non-potable applications such as irrigation and toilet flushing.

MAKING IT HAPPEN

Contrary to popular belief, it is now legal to divert stormwater from San Francisco's combined sewer system. In 2005, city staff amended the plumbing code via Ordinance 137-05, making it possible to direct rainwater to alternative locations such as rain gardens, rain barrels, and cisterns.

The relevant Plumbing Code is Section 306.2., which reads: "Roofs, inner courts, vent shafts, light wells or similar areas having rainwater drains, shall discharge directly into a building drain or building sewer, or to an approved alternate location based on approved geotechnical and engineering designs."

The Public Utilities Commission, the Department of Public Health, and the Department of Building Inspection have partnered to encourage the safe use of rainwater for irrigation and toilet flushing without requiring treatment to potable standards. Systems designed to collect and treat rainwater for potable uses will be inspected and permitted on a case-by-case basis.

This new approach allows any San Francisco homeowner to easily install a rainwater harvesting system. This brochure can help you get started.

A disconnected downspout and rain barrel.
Photo: Clean Air Gardening

GETTING STARTED

Rainwater can be harvested from most types of rooftops. The first steps are to clean your roof, disconnect your downspout from the sewer, and connect it to a storage container. Rainwater harvesting can retain up to 100% of roof runoff on site during small rain storms. In larger storms, water in excess of the system's storage capacity is discharged to the combined sewer or stormwater facility.

RAIN BARRELS

Rain barrels are containers designed to capture rainwater runoff from your roof so that you can use it for irrigation or other non-potable applications. Rain barrels are inexpensive, easy to install and maintain, and well suited to small-scale residential sites. They typically range from 50 to 100 gallons, and the water they collect is most often used to water plants.

System components

Your rain barrel should have a spigot and/or hose bibb 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.

Permits

You do not need a permit to install a rain barrel as long as the barrel does not connect to your plumbing.

Installation of a cistern in Sausalito, CA. Photo: Sherwood Engineers

CISTERNS

Cisterns are larger than rain barrels, ranging from 100 gallons on a small residential site to millions of gallons beneath schools and parks. They can be installed above or below ground, or even on the roof, depending upon site conditions. Water from cisterns can be stored until needed and used for irrigation and toilet flushing.

System components

Cistern systems vary in size and complexity depending on the end use of the rainwater and the site constraints.

Cisterns not connected to indoor plumbing

A basic system used for irrigation typically includes fully screened gutters, downspouts, and piping; a fully closed storage tank; a spigot and/or hose bibb for access; and an overflow pipe.

Cisterns connected to indoor plumbing for toilet flushing

A system designed to provide water for toilet flushing has more detailed specifications. It should have non-toxic, fully screened gutters, downspouts, and yellow piping; an automatic self-draining first flush diverter; a fully closed storage tank approved for use with potable water (even if water is used for irrigation and toilet flushing only); an approved backflow prevention device and an air gap; a spigot and/or hose bibb for access; and an overflow pipe.

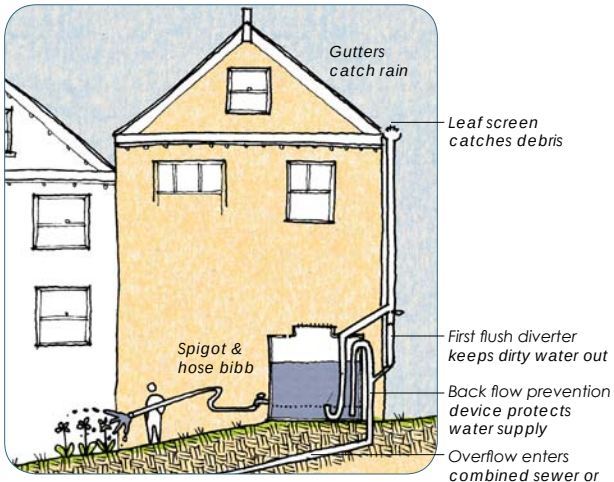
Permits

To install a cistern for irrigation or toilet flushing, you will need a plumbing permit and a building permit from the Department of Building Inspection. If your system includes a pump or will be installed on the roof or underground, you will need additional permits. Explore DBI's website at:
http://www.sfgov.org/site/dbi_index.asp
or call 415.558.6088.

SAFETY AND MAINTENANCE

Be sure that your rain barrel or cistern is sited on a stable, flat area near your downspout. Keep your system clear of debris and maintain all screens to prevent mosquito breeding. Clean your rain barrel or cistern annually with a non-toxic cleaner such as vinegar.

Pipes conveying rainwater to indoor fixtures must be yellow. Label all rainwater harvesting system pipes and fixtures, including toilet tanks: NON-POTABLE WATER, DO NOT DRINK. Label your rain barrel or cistern with safety stickers provided by the SFPUC at: 1155 Market St.



Basic rainwater harvesting system.

QUESTIONS? CONTACT US

Rainwater harvesting can help you manage stormwater at your home or business and offset potable water use. If you are interested in learning more about rainwater harvesting, please contact us:

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