



Water  
collected  
in a  
cistern  
can be  
reused  
in the  
landscape

# CISTERNS

A cistern is a structure that captures and stores roof runoff. The collected water can be used for landscape irrigation and some interior uses, such as toilets and washing machines. It is possible to use a cistern system for household drinking water if it has proper filtration, inspection and permitting. Cisterns are constructed of durable material, such as concrete, plastic, polyethylene, or metal. They are larger and usually more permanent than rain barrels, ranging in size from 100 gallons to 10,000 gallons. They can be placed above-ground, underground or on a rooftop.

A roof washer or filter removes contaminants and debris before the runoff enters the cistern. A pipe from the cistern conveys the stored water, either by gravity or pump, to the designated interior or exterior use. In some instances, an overflow system conveys excess runoff to a destination location. At sites with soils that drain well, the overflow can be conveyed to onsite landscaped areas or into perforated underground pipes if permitting requirements are met.

## Benefits

Using a cistern to store and reuse rainwater reduces or eliminates stormwater runoff from the site. It conserves potable water and reduces water charges with an installed meter. Cisterns are available from many sources, and are relatively easy and inexpensive to install and maintain, especially if they are above ground. Rainwater can be used for potable applications if the water is treated and meets state and federal safe drinking water standards, and the system meets permitting requirements.

## Maintenance

Inspect the cistern periodically to ensure debris does not clog the system. Check for leaks at connection points. Clean the cistern interior annually with a brush and vinegar or other non-toxic cleaner that will not degrade water quality or harm the cistern. The

washout from cleaning can be disposed of onsite to vegetated areas if disinfecting agents are adequately diluted so they do not harm plants. Schedule cleaning during dry weather. A cistern and its components have a lifespan of 20 to 50 years, depending on location and material.

## Cost

Costs for a cistern, not including installation, range from about \$250 for a 200-gallon cistern to \$5,000 for a 10,000-gallon cistern.

## Safety and Siting Requirements

- Only collect roof water for reuse. Do not reuse water from parking or pedestrian areas, surface water runoff, or bodies of standing water.
- With the proper permitting, underground cisterns in areas with soils that drain well may be approved to overflow into underground perforated pipes.



- In areas where soils do not drain well, overflow to a city system is required.
- Refer to Portland's Stormwater Management Manual for detailed sizing, placement, and design information.

### Permits

- Installing a cistern requires a plumbing permit from the City's Bureau of Development Services (BDS) because installation usually involves altering or adding plumbing components.
- Any pumps or other electrical controls require an electrical permit from BDS.
- Any cistern footings, foundations, enclosures, and roof structures require a building permit from BDS.

- Rooftop cisterns require a building permit for structural review and approval by BDS.
- Underground tanks require a grading and erosion control permit.

### Examples

DaVinci Middle School (aboveground)  
2508 NE Everett Street

Portland State University-Stephen Epler Hall  
(underground)  
SW 12th and Montgomery

Oregon Natural Resources Council (ONRC)  
(underground)  
5825 N Greeley Avenue

*aboveground*



*underground*

