



SEEDS FOR ECO COMMUNITIES  
PRESENTS...

# RAINWATER CISTERNS

## What are they?

Cisterns are a form of rainwater harvesting, whereby rainfall or snowmelt runoff is collected, stored and used in your home. Runoff is collected from your roof through eavestroughs, gutters and downspouts directing it into a storage tank or cistern which can be above or below ground, but most people opt to put them underground. A cistern is much larger than a rain barrel and can sometimes hold thousands of gallons of water, depending on your water needs and space available.

## Why a cistern?

There are many great reasons to use a cistern, such as limiting your water

use and its impacts on the natural environment, reducing your water bills and to help balance water needs in areas with a lack of or limited quality water sources. Rainwater harvesting in cisterns also aids in managing your stormwater runoff, which can help with flooding and erosion of the surrounding natural environment.

## How do they work?

All cistern setups have the same major components: a water collection system (your roof, eavestroughs, gutters, and downspouts), filter mechanisms to keep out debris, algae and small animals, and a storage device.





Any precipitation that falls onto your roof will be directed via your eavestroughs or gutters into a downspout and through the inlet into your cistern. There are usually screens and filters placed throughout the eavestroughs and in the downspout pipes to remove debris as it travels.

If your cistern is underground, it will also require a pump to deliver the water into your home where it is needed. If it is above ground, a pump may not be required - in some cases, the flow of gravity can be used to deliver your water. Another important component is an overflow mechanism, where during heavy rain events or snow melts, excess water can flow either to another storage vessel, safely into the surrounding environment or out into a sewer system if there are municipal storm sewers near you. The overflow should also have a protective filter or cover to prevent debris or small animals from entering.

Any filters in your cistern need to be checked and cleaned periodically to ensure proper operation of your cistern and to prevent any unsafe buildup of sediment, bacteria or algal growth.

Your cisterns must also have an access point for inspection and maintenance, which is simple for an above ground cistern, but requires an access hatch or manhole for an underground one.

### **Important things to consider on cisterns**

Consider the pros and cons of above or below ground cisterns to determine which is right for you, which will include considerations of the climate you live in and the amount of building and maintenance required. An above-ground cistern in Ontario for example, is typically only used seasonally, as the water will freeze in winter, however, this system has the added benefit of not requiring a pump. If you live in a warmer climate or plan to use a cistern for a summer home or cottage, this may be acceptable; but, for year-round water supply in cold climates, this may not be the best route for you.



For an underground cistern, you must install it below the frost line. This is where frost does not penetrate the soil - which varies depending on where you live, so you should do some research to find out how deep that is! This will help to keep water from freezing in cold seasons. You will have the added benefit that your water will also remain cooler in summer when it is kept underground.

Material choice for the roof is important - a material that is not porous, does not corrode and does not leach chemical contaminants into your water is advised. This means some wood and metals or synthetic materials are not ideal to capture runoff for a cistern. A great eco-friendly option is to build one out of local natural stone!



You must consider your household water usage and the amount of rain your area gets to decide if a cistern is suitable for you. Can you rely solely on your cistern, or will it be a supplement to another water source?

Oversight and rules for cistern construction vary geographically, as such the building code should be consulted to determine building considerations and the local authority should be contacted to determine if you require any permits.

You should avoid being close to a source of pollution, such as a highway, a farm that sprays harmful chemicals or smokestacks from a nearby factory, as your roof runoff may be contaminated, and your cistern water may be compromised and/or need additional treatment.



The size of your cistern must meet your needs, whether you are solely relying on it or as a supplement to other water sources, and consideration should be given to your budget and space constraints. Track your water usage over a year and build appropriately!