

Cisterns



Image from rainbanks-nc.com

Cisterns are tanks designed to collect and store water. They can be used to collect rainwater for irrigation. The term 'cistern' encompasses items such as rain barrels, but is usually used to describe larger tanks with a capacity greater than 1000L.

Many organizations such as nurseries, ornamental gardens, towns with public gardens and farms use potable water for irrigation, which can be very expensive and wasteful of this limited and precious resource. Rainwater harvesting using cisterns can help alleviate some of these costs. Cisterns can be set up to collect runoff from impermeable surfaces such as roofs and parking lots, which can in turn be used for irrigation. It cannot be used for drinking unless it has been properly treated.

Cisterns can be constructed from a variety of materials, including:

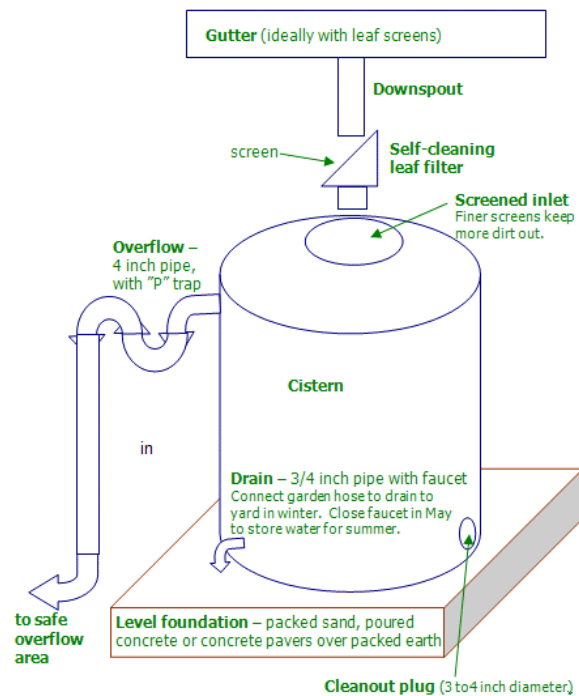
- Brick
- Concrete
- Ferrocement
- Wood
- Stone
- Polypropylene
- Fibreglass
- Metal

Cisterns made of materials such as wood, concrete and stone will require a plastic lining.

They can be designed to be completely utilitarian or they can be adapted to fit in with landscaping. Cisterns can be designed and built custom, or a ready-made model can be purchased. Models are available from many retailers such as hardware stores or specialty stores, although tanks of many different designs can be adapted for this purpose. The design and installation of a large and/or buried cistern will likely require the services of a contractor and in some cases an engineer. When designing the system, it must be taken into consideration that the cistern will eventually be filled with water, which greatly increases its weight.

There are several parts to a cistern system:

- A drainage system to collect rainwater
 - o This may involve diverting of downspouts or the construction of French drains
 - o This should include a mechanism for keeping dirt, insects and debris out of the cistern, such as screening or a first-flush diverter, which keeps the initial (and dirtiest) runoff from entering the cistern
- The cistern itself
 - o The cistern must have a mechanism for controlling overflow
 - o The tank can be placed above or below ground
- A delivery system
 - o This will depend on the design. Could consist of a faucet and hose or a pump and plumbing



Sample cistern design. Diagram taken from City of Seattle website (rainwise.seattle.gov/systems/water)

Cisterns can be installed above or below ground. There are advantages and disadvantages to using either method:

Position	Advantages	Disadvantages
Above Ground	<ul style="list-style-type: none"> - Possibility of a gravity-fed delivery system - Simpler and less expensive to install; does not require excavation - Problems such as leaks or rusting are easier to identify and repair 	<ul style="list-style-type: none"> - Possibility of freezing in the winter - Subject to high winds and extreme weather - Problems with aesthetics. Cisterns tend to be large and may not fit in with the landscape - Limits drainage surfaces to those above the ground, such as roofs - More likely to have algae growth, especially if it is not completely opaque - If at an elevated level, the cistern will become very top heavy, posing a risk of falling over
Below Ground	<ul style="list-style-type: none"> - Not exposed to the sun, whose ultraviolet rays can harm some types of containers - Less subject to extreme weather; less likely to freeze in winter - Can be larger and more elaborate - Out of sight - Surfaces like roads and parking lots can be drained into the cistern 	<ul style="list-style-type: none"> - More expensive to install; generally requires an excavator - More difficult to perform maintenance if necessary - Must be conscious of surrounding soil composition, rocks and nearby rooting systems - Must be conscious of how the weight of the cistern will compact the soil - A pump is required to move water



Installation of an underground cistern for a newly constructed house. Image taken from buildingwithawareness.com

Clean Annapolis River Project

“To restore and protect the ecological health of the Annapolis River watershed through science, leadership and community engagement.”

For more information on cisterns, visit http://www.gov.ns.ca/nse/water/docs/droponwaterFAQ_Cisterns.pdf



Clean Annapolis River Project
Box 395, 151 Victoria Street
Annapolis Royal, Nova Scotia
B0S 1A0

Toll Free: 1.888.547.4344
Tel: 902.532.7533
Fax: 902.532.3038
Website: annapolisriver.ca
Email: carp@annapolisriver.ca

Prepared by the Clean Annapolis River Project as part of the Managing Resources in a Climate Changed World: An Annapolis Pilot Project. This project was funded by Environment Canada’s EcoAction Community Fund.



ecoACTION
using less · living better