CITY OF ANN ARBOR
QUALIFYING FOR A CISTERN CREDIT

A cistern is a receptacle built to catch and store rainwater for irrigation during dryer periods. While they are similar to rain barrels in purpose, cisterns are usually much larger. Cisterns may be located underground, at ground level, or on elevated stands. It is recommended that they be watertight, have smooth interior surfaces, enclosed lids, and be large enough to provide adequate storage. They also should be fabricated from non-reactive materials such as reinforced concrete, galvanized steel, and plastic.

Requirements for Credit:

- At least 50% of your property's roof area should drain to the cistern OR the cistern must capture runoff from impervious area on your property that is equal to 50% of your roof area.
- Size:
  - Cubic feet: 66 cubic feet of capacity OR
  - Gallons: 500 gallons of capacity
- The cistern must be completely drained in no less than 24 hours and no longer than 48 hours after each rainfall event. Rainwater from the cistern must be applied to on-site vegetation and should not discharge from the property. Longer drainage periods may be acceptable if the cistern is larger than the minimum sized required for credit.
- The cistern must be equipped with screens, seals, or other suitable methods to prevent mosquitoes from entering them.
- Cisterns must be equipped with an overflow or bypass device to divert runoff in excess of the cistern capacity to the storm drainage system without causing erosion and/or property damage.

Above Ground Cisterns:

1500 gallon cistern fed from two gable downspouts.
(Source: Experiments in Sustainable Urban Living)

Two above-ground cisterns, shown below, have the capacity to store 300 and 500 gallons of water in plastic tanks. About 1/4 of the roof area drains rainwater into each of the cisterns. They have been designed to allow the first flush of each storm to by-pass the cistern, thus, keeping leaf and other debris out of the cistern. A small bailing pump is placed in each system to pump water to a vegetable garden, the greenhouse, or to fill buckets and water planters.

Below Ground Cisterns:

The photos below show the pipes from the gutter leading to the below-ground storage tank stores up to 1,000 gallons of water. A small bailing pump is used to draw water from the tanks and apply it to landscape plantings.

(Source: Rainwater Recovery, Inc).

A simple sequence for constructing a cistern below ground:

1. Excavate the hole to the required dimensions. This is usually done with a back hoe. For example, 8 ft by 12 ft and 8 ft deep. Make sure the hole is dug to the dimensions you desire or your storage will be seriously compromised.

2. Pour the cistern floor. First form up the floor of the cistern much as you would a sidewalk, driveway or other flat work. Construct a rectangular framework from 2 x 4s and secure it with 2 x 4 stakes driven into the ground at intervals of about 2 feet.

3. Form the cistern walls. The cistern walls should be constructed by first building the outside forms and then installing #6 rebar wired together on an approximate 1 foot grid. Set the grid into the holes bored into the concrete floor of the cistern with a hammer drill. With the reinforcing grid in place build the inside forms. Make sure the walls are adequately braced and then pour the concrete.

4. Let the concrete set for the required time period recommended by the manufacturer and then remove the forms.

5. Seal the inside of the cistern, a Portland-based product with a latex additive is recommended, possibly Damtite, or another acceptable alternative available at your local building supply store.

6. Create the lid and hatches. The lid can be made of any acceptable material but should fit snuggly to keep potential pest from entering.

Source: ***Kessner, K., 2000: How to Build a Rainwater Catchment Cistern. The March Hare, Summer 2000, Issue 25, (http://www.dancingrabbit.org/newsletter/)***