



Rainwater Harvesting from Residential Roof

Background

The homeowner had been collecting rainwater in five, 55-gallon rain barrels to supplement summer outdoor watering needs, until she decided to upgrade to a larger capacity cistern system. The two-cistern system, with a storage capacity of 610 gallons, collects water to distribute to a duck pond and to an underground irrigation system.

About the System

- **Catchment:** Rainwater falling on the 15' X 30' roof section is collected in two cisterns, each with a capacity of 305 gallons. One-inch of rain falling on this roof area yields approximately 240 gallons of water. Bellingham receives an average 35 inches of rain per year.
- **Conveyance:** Uncovered gutters collect rain from roof area and direct water to a downspout.
- **Filter:** A first-flush device is installed to prevent initial roof runoff from entering the tank, while filtering out leaf and twig debris. Once the first-flush rainwater with debris is diverted away, the rest of the rain water enters the tanks.
- **Storage:** The two plastic (HDPE - high density polyethylene) cisterns are certified for collecting water that could (with proper treatment) be used for drinking water and a duck pond.
- **Distribution:** Water is gravity fed from tanks to duck pond to underground irrigation system.
- **Use:** Harvested rainwater is used for outside irrigation and duck recreation.
- **Overflow:** When the first tank reaches capacity, the overflow is directed to the second tank through a pipe connection. When the second tank reaches capacity, water is directed through an overflow pipe from tank to a duck pond and to an irrigation system. When necessary, overflow water moves from irrigation system to additional infiltration area.

Project Hints and Lessons Learned

- Glue the plumbing together or leaks will eventually occur.
- Despite the dark green color of the tanks, ultraviolet light can still penetrate to encourage biological (algae) growth inside the tank. To limit biological growth inside the tanks, apply a primer to the tanks and spray the tanks with additional paint. A trellis screen and new plant cover will help minimize amount of sunlight reaching the tanks.
- It is challenging to get even flow through the irrigation system.
- The first flush system was redesigned – is it needed?



Before ...



After...

