

From rain barrels to cisterns

The homeowner had been collecting rainwater in five, 55-gallon rain barrels (275 gallons) to supplement summer outdoor watering needs, until she decided to upgrade to a larger capacity cistern system (610 gallons). The system collects water to distribute to a duck pond and underground irrigation.

System details

Catchment area: 15' x 30' asphalt shingle roof section, 450 square feet
This could potentially yield over 8,000 gallons of water per year.

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.

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.

Conveyance: Uncovered gutters collect rain from the roof area and direct water to a downspout.

Storage: The two plastic (HDPE - high density polyethylene) cisterns are each 305 gallons and NSF certified (could be used to collect rainwater to be used for drinking water with proper filtration and disinfection). Total storage is 610 gallons.

Distribution: Water is gravity fed from tanks to duck pond to underground irrigation system.

Permits

No permits were needed at time of construction.

Lessons learned

- Glue the plumbing together or leaks will eventually occur.
- Despite the dark green color of the tanks, ultraviolet light can still penetrate inside to encourage algae growth. To limit this, apply a primer to the tanks and spray 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?



Water conservation and water quality protection

The homeowners participated in the City's Homeowner Incentive Program (HIP) for Lake Whatcom Watershed residents. With the assistance of printed and online materials and Public Works staff, they designed and constructed a rainwater harvesting system consisting of seven 275-gallon water tanks to supplement watering needs and provide additional stormwater management.

System details

Catchment area: 1,792 square feet of collection area; metal roof on house, asphalt shingle on garage. This could potentially yield over 38,700 gallons of rainwater per year.

Filter: Each tank has a two-stage screen filter. These devices serve to filter out year-round deciduous and conifer tree debris from entering the tanks.

Overflow: Each single, stand-alone tank has its own overflow pipe. When a tank reaches capacity, the overflow pipe diverts water into the yard and rain gardens, all located downslope from the tanks. The three-tank system is interconnected with overflow pipes between the tanks. When all three tanks have reached capacity, the last tank in the series has an overflow pipe that diverts water to the yard and rain gardens. Each overflow pipe is fitted with screened tank flap valve that prevents rodents and debris from entering.

Conveyance: Gutters fitted with debris screens, collect rain from the roof areas and direct water to downspouts.

Storage: Seven recycled 275-gallon plastic (HDPE - high density polyethylene, food grade) tanks. Total potential storage capacity is 1,925 gallons.

Distribution: Water is gravity fed from tanks to hoses, buckets and watering cans.

Permits

No permits were needed for this system.

Lessons learned

- To facilitate future system modifications and interior tank cleaning, do not glue all intake and overflow pipe components. Outflow (hose bib) and associated pipes must be glued to prevent leakage.
- Prime and paint multiple layers of a dark colored latex paint to reduce UV light penetration and algae growth. Additional coverage of tanks with screening, etc. also helps minimize these issues.

Cost

\$2,249 (\$321 average cost per rainwater tank)

