

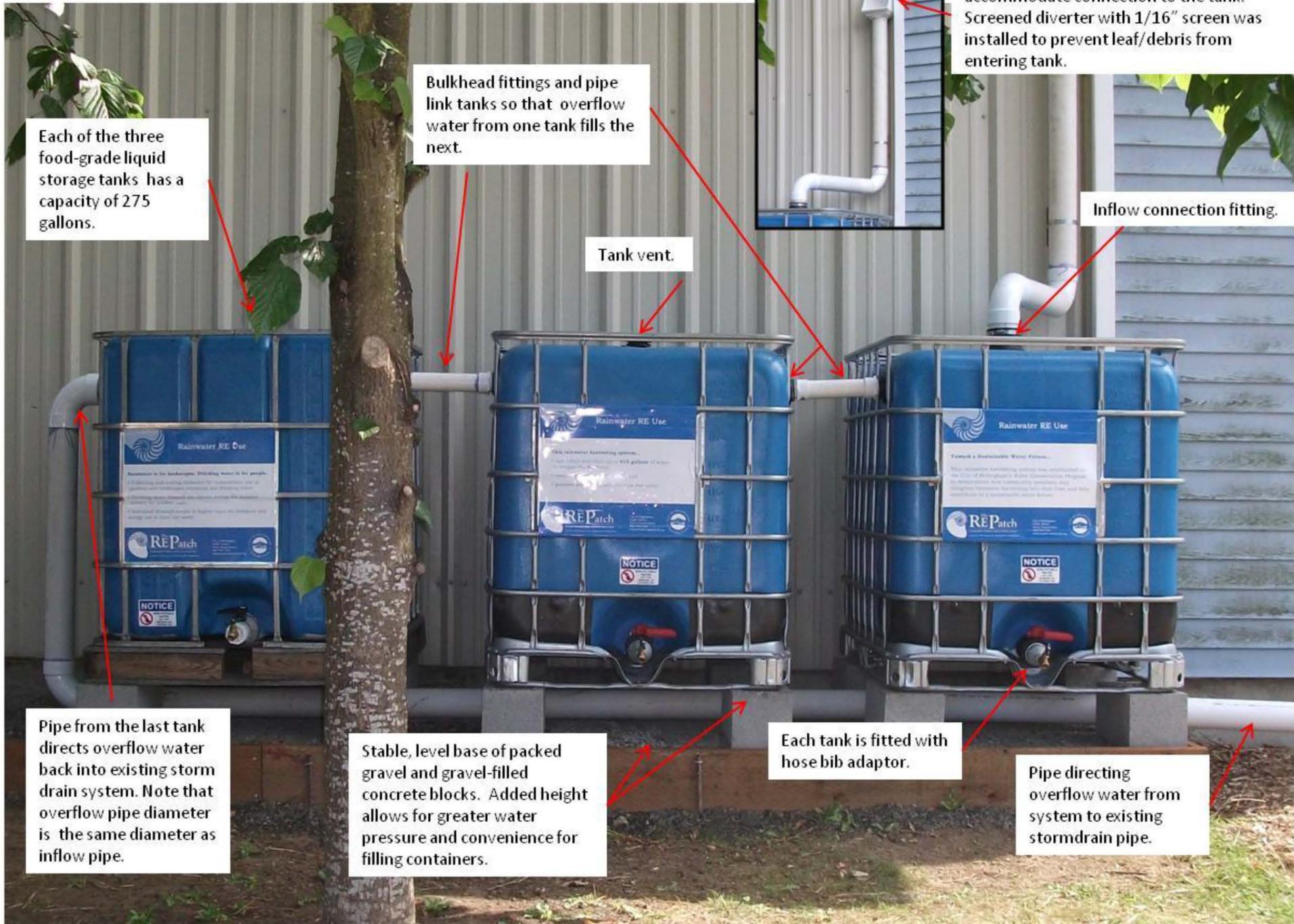


RE Patch Rainwater Harvesting System

City of Bellingham's Water Conservation Program staff installed this system to demonstrate how community members can integrate rainwater harvesting into their lives and help contribute to a sustainable water future.

1. **Determine location of watering needs.** Analyze and plan location for tank placement, taking into consideration factors such as location(s) of downspout(s), dimensions of available space for tank(s), and proximity to where water will be used.
2. **Analyze potential volume of roof runoff.** One inch of rain on this roof area will yield approximately 1,072 gallons of water. Overflow water (i.e. water that flows out of the last tank once the tank has reached its holding capacity) is routed to the existing stormdrain system.
3. **Purchase food-grade liquid storage tanks, hose spigots, valves, vents and connecting pipes and hardware.** Available space along the side of the building allowed for three, 275-gallon capacity food-grade liquid storage tanks. Linked together, the tanks hold up to 825 gallons of rainwater for use in irrigating the RE Patch community garden.
4. **Plan for connections and overflow spacing between tanks** before siting them. If the available space, potential roof runoff collection volume and selected tank size allow for more than one tank to be linked together, plan for adequate spacing between each tank to accommodate connections and to allow for safe and appropriate routing of overflow water.
5. **Paint translucent tanks a dark color.** Sunlight encourages algae growth. Painting the translucent tanks a solid/opaque color reduces the amount of ultra-violet light that can penetrate the tanks, thereby minimizing algae growth inside the tanks. Use a primer made for use on plastic.
6. **Position tanks on prepared, level, stable base.** Consider weight of tanks when filled (i.e. weight of tank + 8.48 pounds per gallon of water); the base must be capable of supporting the entire weight of the filled tanks. Plan for an installation height that will allow you to place a watering container underneath the spigot.
7. **Install bulkhead type fittings and connector pipes.** After positioning the tanks on a level and stable base, holes were drilled in the sides of the tank to accommodate bulkhead type fittings. To install bulkhead type fittings, you must be able to access the inside and outside of tank (i.e. think about if you can reach inside the tank to assemble the bulkhead fitting). Once the fittings were installed, the overflow pipes linking the tanks together were installed along with the overflow pipe directing water from the last tank into the existing stormdrain system. Sizing pipe length for connections involves cutting pipe with a hacksaw.
8. **Install adaptor to transition from tank opening to a threaded hose bib spigot to allow a garden hose to be attached.** Depending on the size of the tank opening, some type of transitional fitting may be necessary in order to allow a standard garden hose bib to be installed on the tank. This project required a fitting on the outlet of each tank to transition from the large diameter tank outflow hole to a standard garden hose fitting. (Note that fittings and adaptors will be easier to install when tanks are empty.)
9. **Install vent for tank ventilation.** A vent cap should be installed to allow for efficient flow and vacuum relief on all tanks.
10. **Install overflow valve and pipe/hose.** When the water level in the third tank reaches its full capacity, overflow from this tank is directed into the existing underground pipe at the building's foundation that connects to the stormdrain system. This underground pipe and stormdrain system are the same ones that the downspout previously flowed into directly.
11. **Cut downspout and install screened diverter.** Cut downspout to the proper height to accommodate connection to the rainwater catchment tank. Consider your plan for winterization (i.e. Will you bypass tanks during the winter time or allow water to flow continuously through tanks and out the overflow to infiltrate or to continue to flow into the existing stormwater system?) and install fixtures accordingly.
12. **Install adaptor on inflow tank to allow for connection to downspout.** Depending on the type of tank, diameter/shape of inflow hole, and whether or not the connection from downspout to tank will be "tight lined", an adaptive fitting may be necessary in order to connect the downspout to the tank. This project required an adaptor to connect the downspout to the existing hole at the top of the inflow tank.
13. **Complete the overflow connection from the last tank to the existing stormdrain system.** Inflow pipe and overflow pipe must be the same diameter.
14. **Use your collected rainwater for your outdoor watering needs!**

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Each of the three food-grade liquid storage tanks has a capacity of 275 gallons.

Bulkhead fittings and pipe link tanks so that overflow water from one tank fills the next.

Tank vent.



Downspout from roof was cut to accommodate connection to the tank. Screened diverter with 1/16" screen was installed to prevent leaf/debris from entering tank.

Inflow connection fitting.

Pipe from the last tank directs overflow water back into existing storm drain system. Note that overflow pipe diameter is the same diameter as inflow pipe.

Stable, level base of packed gravel and gravel-filled concrete blocks. Added height allows for greater water pressure and convenience for filling containers.

Each tank is fitted with hose bib adaptor.

Pipe directing overflow water from system to existing storm drain pipe.