City of Brisbane Department of Public Works

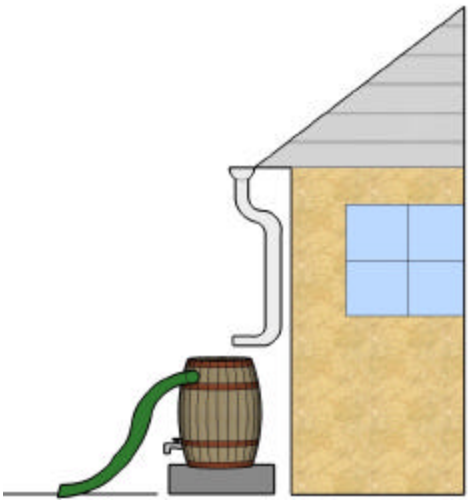
Guidance on Installing Rain Barrels on Residential Properties

WHY INSTALL A RAIN BARREL ON YOUR PROPERTY

A rain barrel can capture a portion of the rainfall that normally runs off your roof, flows into your roof gutters, and empties directly into a storm drain. The captured water can be saved and used to supplement the water required for your outside landscaping. Capturing and reusing some of the rainwater from your roof surfaces also reduces demand on the stormdrain system and helps protect the quality of the water discharging out to the bay. Captured rainwater is untreated water that is not considered drinkable (potable) water, must be kept separate from the potable water system, and shall only be allowed for external landscaping use in the City of Brisbane.

WHAT IS A RAIN BARREL

A rain barrel is a simple rainwater collector that captures and stores a portion of the runoff from a roof downspout for non-potable, exterior uses, such as irrigation. Using rain barrels to temporarily store and reuse rainwater can conserve drinking water by providing a supplemental water source for outside landscaping. Rain barrels come in a wide variety of materials, designs, and colors. Common sizes for residential use are 55 and 90 gallons. They are typically installed on firm, level ground next to buildings.



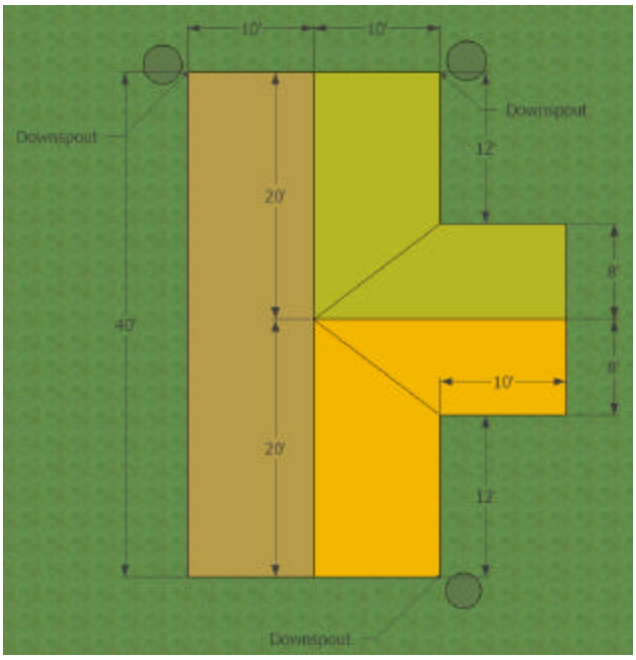
A rain barrel is not a stormwater disposal method, but a way to capture a small fraction of the rainwater that flows off your roof. The rest of the runoff will still need to go to an approved drain and/or other stormwater discharge location.

HOW TO DETERMINE IF YOUR PROPERTY IS RIGHT FOR A RAIN BARREL

To determine if a rain barrel is right for your property, the first step is to identify your site's drainage conditions. Answer the questions below as you walk around your property:

- **Where does the runoff from your roof go now?**
  Sketch a site plan or use an aerial view of your property from online programs such as Google maps. Mark the locations of downspouts and roof lines, estimate the square footage of the roof sections draining to each downspout, and map where all these areas currently drain.

- **How much water runs off your roof and how much can you expect to collect?**
  Once you determine your roof drainage areas, you can calculate how much runoff you can expect. A rough rule of thumb is that you can expect 600 gallons of runoff for every 1,000 square feet of roof area for every inch of rain. Rainfall rates in Brisbane are approximately 20 inches per year. This means a 1,000 square foot roof would produce about 12,000 gallons of rainwater each year. Actual rainwater collection is dependent upon wind, evaporation, leaky gutters, etc. How much you collect will depend on your roof size and how many rain barrels you install, and will only be a fraction of the overall roof runoff due to the small size of rain barrels (50 to 100 gallons each) and the timing and frequency of storms. Once your barrel fills up, you have to drain it in order to capture more runoff, and your external irrigation needs are much less during the rainy season when rainfall is being collected, so it may be difficult to empty the barrel prior to every rain event.



- **Where should you locate your rain barrel?**
  Install your rain barrel based on where you will use the water in your yard. Keep in mind that it may be possible to rehang gutters and move downspouts to more desirable locations. The rain barrel must be located at the base of one of the downspouts draining your roof gutter. However, rain barrels must have overflow piping to proper discharge locations, so this is an important consideration in determining where to place your rain barrels.

- **Where does that downspout currently drain?**
  The downspout you will divert to your rain barrel probably drains into a standpipe or to your yard. This is the stormwater discharge point and the same location to which the rain barrel should overflow.

RAIN BARREL DESIGN

Rainwater collection for residential, external, non-potable uses such as irrigation, do not require a city permit, but there are still important design considerations to follow.

Allowable Uses

Water collected in a rain barrel may be used for **external irrigation only**.

Restrictions

There shall be **absolutely no** direct connection of any rain barrel and/or rainwater collection piping system to any domestic potable water pipe system. Collected rainwater cannot be used for any purpose other than outside irrigation and the system shall be completely separate from any domestic potable water piping system.

Label your rain barrel with the following: **NON-POTABLE WATER – DO NOT DRINK**

Proper system design, maintenance, and use are the responsibility of the system owner.

Overflow

All rain barrels must have an overflow to a safe location. Average residential roofs can generate thousands of gallons of runoff each year, and a typical rain barrel will only capture a fraction of that volume. Even if you have multiple rain barrels, they must all have a proper overflow to a safe discharge location.

If the downspout to which you are connecting a rain barrel currently connects to a standpipe that carries the flow to the street or the City's storm drain system, your rain barrel should also be connected to the standpipe. You need to be sure the rain barrel overflow pipe is attached and sealed to the standpipe opening.

If the downspout to which you are connecting a rain barrel currently drains to a surface infiltration or landscaped area in your yard, then the overflow from your rain barrel should also discharge to that location. You should not change an overflow discharge location from a standpipe to surface infiltration in your yard without consulting with staff in the City's Public Works Department. Changing overflow discharge locations could cause erosion, localized flooding, or even damage to your or your neighbor's properties.

Required components for rain barrels

- Storage container (rain barrel) – typically 50 to 100 gallons in size.
- Sealed lid (removable) – prevent children and animals from entering storage container.
- Screened openings – prevent mosquito breeding and reduce particulate matter. To prevent mosquitoes, screening should be a fine mesh like window screening.

- Spigot and/or hose bib – located near the bottom for water access.
- Overflow pipe – located near the top and connected to a stormwater facility
- Downspout connection– flexible connection between downspout and storage container.
- Expanded storage volume – possible by connecting multiple rain barrels with hard PVC or flexible hose.

Siting and design

- Your rain barrel must be secured on a firm, level surface. A full 55-gallon rain barrel weighs over 400 pounds and tipping is a risk if it's unsecured or on uneven ground.

- The barrel must be structurally sound and should be a food-grade container made to hold liquid. Containers such as trash cans are not designed to withstand the pressure of the water.

- The barrel must have a lid and a sturdy fine mesh (window screen-sized openings) covering all openings to prevent mosquitoes and debris from getting inside.

- The water from the rain barrel should **never** be used for drinking, cooking or other potable uses. It is important to identify the rain barrel and any associated piping as carrying non-potable/not drinkable water.

- All rainwater collection systems must have an overflow to a safe disposal location. If your rain barrel overflows into the standpipe, be sure the overflow pipe is attached and sealed to the standpipe opening.

- Rain barrel overflow locations must be designed to prevent nuisance flows to adjacent properties and may not discharge water across a public right-of-way. Appropriate overflow discharge locations are:

    - Approved drain (may require an inspection and a permit if no approved drain is available on the property)
    - Rain garden or other stormwater management facility

- If you use a moss-control product on your roof, be sure to use a product that is garden-safe.

CONSTRUCTION

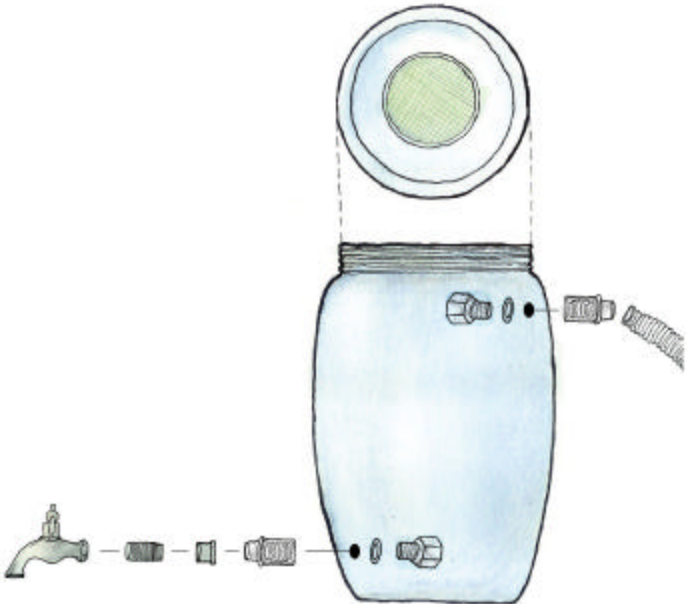
Many nurseries and yard supply stores sell fully-assembled rain barrels, but you can get an unmodified barrel and convert it into a rain barrel yourself with parts found at a typical hardware store. Because you can use different types of barrels to capture rainwater, the parts necessary for constructing a rain barrel will vary, so be sure to consult with your local hardware store if you need assistance. Some basic steps for construction are listed below.

1. Inlet: Create an opening with fine screening (screening must be fine enough to prevent mosquito entry, such as window screening) through which the rain barrel will collect water from the roof downspout. A plastic flex hose can be used to direct the downspout to the top of the rain barrel.

2. Overflow: Drill a hole near the top of the barrel to accommodate an overflow pipe that is at least 2 inches in diameter. Using standard plumbing fittings, install an overflow connection to which you can connect your overflow discharge line. Use Teflon tape on all fitting threads and a bead of silicon caulking around the opening to ensure a tight seal.

3. Foundation: Create a raised, stable, level base (like concrete blocks) for the rain barrel to sit on (this must be less than 30 inches in height). You might want to test stability by filling the rain barrel with water before attaching to your structure. A rain barrel is very heavy and tipping is a risk if it's unsecured or on an uneven surface.

4. Downspout: Once you know the height of the barrel's inlet, cut your downspout with a hacksaw and attach a plastic flex hose. Adjust this flex hose so the rainwater flows out of the flex hose just above the rain barrel inlet. Make sure you keep the downspout secured to the house with standard downspout straps.



Graphic courtesy of the San Francisco Public Utilities Commission

5. Set Barrel: Set up the barrel beneath the elbow and secure the barrel to the house with a strap. Cut and attach the overflow pipe to the overflow connection you created in step two and direct it to the existing discharge location.

6. Outlet: Drill a hole near the bottom of the empty barrel to attach the drain spigot. You may be able to thread a spigot directly into the barrel opening if it seals and seats securely. Otherwise, it should be secured with standard plumbing fittings on both sides of the barrel. Use Teflon tape around any pipe threads and a bead of silicon caulking around the opening to ensure a tight seal.

7. Use: After a rainfall, fill a watering can using the bottom spigot or attach a hose to use the water where it's needed.

MAINTENANCE

Simple maintenance of your stormwater system can help prevent problems.

- Clean the gutters at least twice a year, more often if you have trees. Consider installing gutter screens to keep debris out of your gutter. Certain companies offer "first flush diverters" that can be installed in your downspout piping that will collect the initial runoff from your roof before sending flow to the rain barrel. These systems may need to be manually drained between storms. Make sure gutters are tilted to direct water to downspouts and fix low spots or sagging areas along the gutter line with spikes or place new hangers as needed. Make sure roof flashing directs water into the gutter.

- Make sure the rain barrel remains securely screened to prevent mosquito entry. Make sure all parts are securely fastened together and the rain barrel is securely fastened to the building.

- Clean out your rain barrel and check for leaks at least once a year. Clean your rain barrel annually with a non-toxic cleaner such as vinegar. Check and clear downspout elbows, rain barrel screening, and overflow to prevent clogging. Caulk any gutter, downspout, barrel, and overflow leaks and holes.

USES FOR COLLECTED WATER

Water collected in a rain barrel may be used for external irrigation only.

- If you currently have a standard irrigation system, you may be able to turn off sprinkler zones that are in planter beds or gardens and use stored rainwater instead.

- The low water pressure generated from a small rain barrel is not adequate to operate any type of in-ground sprinkler or low-volume devices. However, a soaker hose or a length of PVC pipe or garden hose with holes punched in it may work with these low pressures.

- If using a soaker hose, take out the pressure-reducing washer to allow more water to flow through the hose.

- Filling a watering can to water plants around the yard is always an option. You can also use the water to keep your compost bin moist or to rinse off gardening tools.