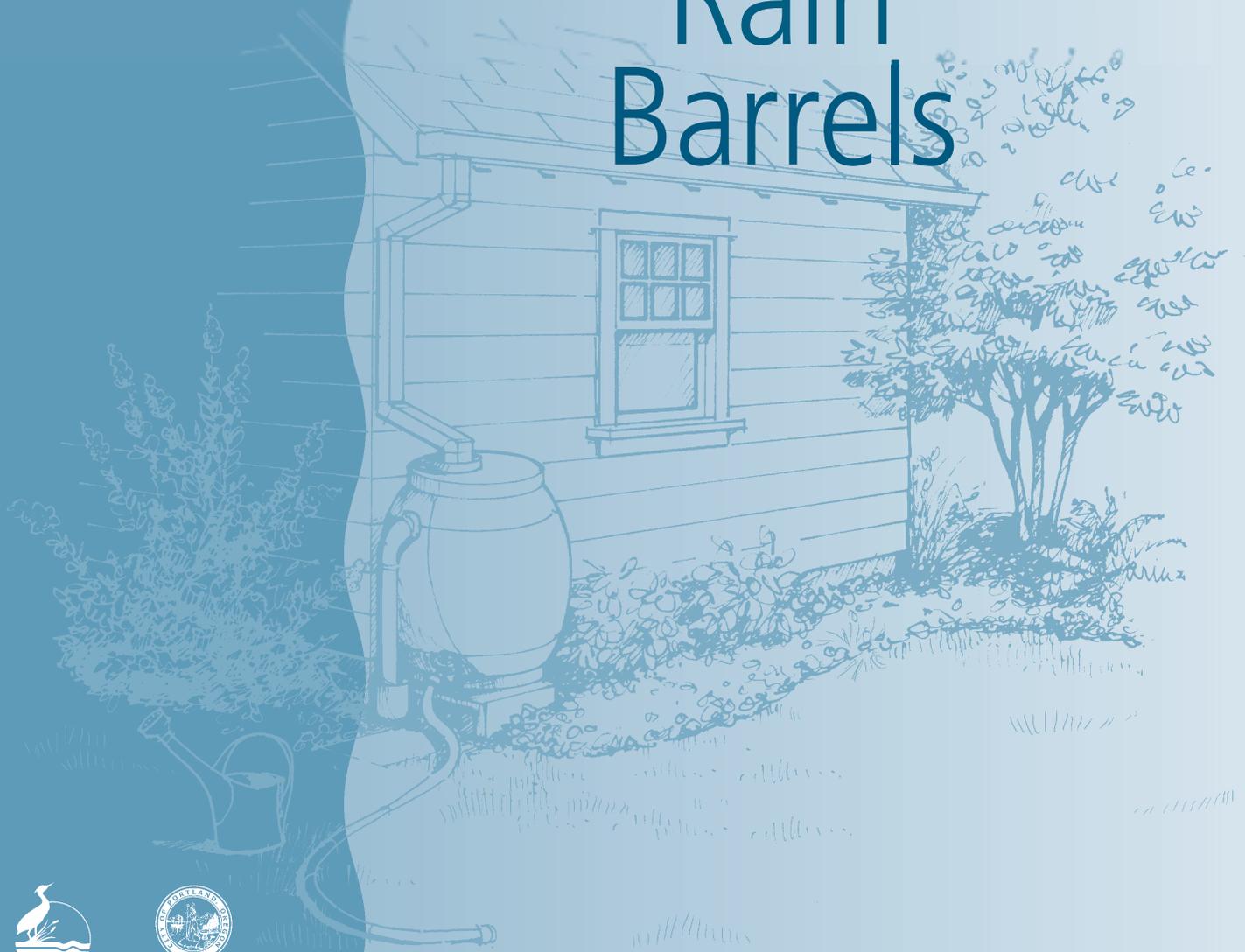


stormwater management for clean rivers

# How to manage stormwater

## Rain Barrels



ENVIRONMENTAL SERVICES  
CITY OF PORTLAND

working for clean rivers

# how to build your rain barrel

Portland gets an average of 37 inches of rain a year. Rain that runs off your roof can flow into a sewer pipe, stream or groundwater. Why not put it to another use? A rain barrel can capture some of that rainfall for later use on your property. Capturing and reusing rainwater from your roof surfaces also reduces demand on the sewer system and protects the quality of streams and groundwater.

## 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. Rain barrels come in a wide variety of materials, designs, and colors. Common sizes for residential use are 55 gallons and 90 gallons. They are usually installed on the ground next to buildings.

A rain barrel is not a stormwater disposal method, but is 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 stormwater discharge location.



## Are there incentives to installing a rain barrel?

Using rain barrels to temporarily store and reuse rainwater can conserve drinking water by providing a water source for gardens. This can also reduce both the water use charge and corresponding sewer charge on your city utility bill.

If used with an approved location where overflow water soaks into the ground, you can qualify for other City of Portland financial incentives. All city ratepayers can qualify for a discount on the on-site stormwater portion of their city utility bill. If you live in

the Downspout Disconnection Program area, you also may be able to earn a one-time incentive of \$53 for each downspout that is safely disconnected. By 2007, over 55,000 homeowners had safely disconnected downspouts to help reduce combined sewer overflows (CSOs) to the Columbia Slough and Willamette River.

See the Resources section of this brochure for more information.

# 1 observe your site



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

## Where does the runoff from your roof area go now?

Sketch a site plan. You can print an aerial view of your property from PortlandMaps.com as a starting point. Mark the locations of downspouts and roof lines, estimate the square footage of your roof and paved areas, and map where all these areas drain.

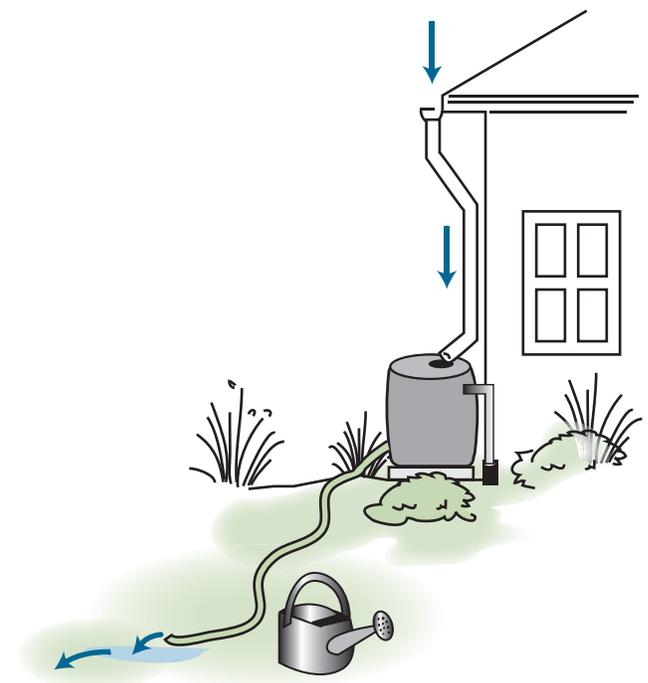
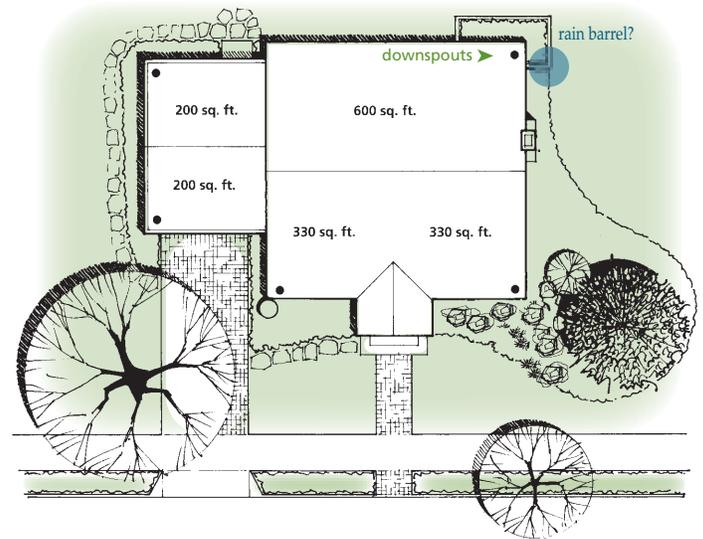
## Where would you like to locate your rain barrel?

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 the gutter and move the downspout to a more desirable location. The rain barrel must be located at the base of one of the downspouts draining your roof gutter. This is the downspout you will work with.

## 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 is the same location where the rain barrel should overflow to.. If you wish to change your stormwater discharge point, please refer to step 2.

example site plan: locate existing downspouts



## 2 plan your rain barrel

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

### Overflow

All rainwater collection systems must have an overflow to a safe disposal location. The average residential roof generates about 30,000 gallons of rainfall runoff every year, and an average 55 gallon rain barrel captures only a fraction of that. Even if you have multiple rain barrels, you must have an overflow to a safe discharge location.

If your rain barrel overflows into the standpipe, be sure the overflow pipe is attached and sealed to the standpipe opening.

If the downspout to be connected to your rain barrel currently drains to a surface infiltration area in your yard, the overflow from your rain barrel should also discharge to that location.

If the downspout currently drains to a standpipe and you wish to change your overflow disposal to surface infiltration in your yard, you must meet the safety guidelines detailed in *How to Manage Stormwater- Downspout Disconnection* or the *How to Manage Stormwater- Rain Gardens* guide (see Resources section of this document).

### Safety Considerations

- Your rain barrel must be secured on a firm, level surface. A full 55-gallon rain barrel weighs over 400 lbs. 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 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.
- Your rain barrel must have an overflow to a safe discharge point.
- If you use a moss-control product on your roof, be sure to use a product that is garden-safe.

### Larger or more complex systems

More complex rainwater collection systems have a much larger storage container (a cistern), and/or use pumps to move water to desired locations. Some use their captured rain water indoors for toilet flushing. These projects involve factors not applicable to simple rain barrels, such as plumbing and electrical work, soil excavation, or concrete foundations and other structural components. For rainwater collection projects of this scale, you should consult a professional to review design, construction, and safety considerations.

For more information about residential or commercial rainwater re-use and potential permit requirements, see the *Portland Rainwater Harvesting Code Guide* or contact the Bureau of Development Services at 503-823-7300.

# 3 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. Assemble your tools and supplies then follow the construction steps illustrated on the following page.



## Tools

### *If you build your own rain barrel:*

- drill
- inch hole saw for overflow pipe
- one-inch spade bit for spigot
- tin snips or heavy-duty scissors for cutting screen
- adjustable wrench
- utility knife
- safety glasses

### *To disconnect your downspout to your rain barrel:*

- hacksaw
- drill
- tape measure
- screwdriver or nut driver
- pliers or crimpers

## Materials

- One 55 to 90-gallon food grade plastic barrel (can be found online or at local restaurant suppliers, nurseries, or gardening supply stores)

### *Find the following items at most plumbing or hardware stores:*

- hose spigot with 3/4 inch threaded inlet and 3/4 inch male hose end
- two 3/4 inch galvanized locknuts to secure spigot from the inside of the barrel
- four 1-inch (opening) washers to provide rigid surface to fasten hose bib
- Teflon tape
- silicon adhesive or outdoor caulking
- two 8"x 8" x 12" concrete or wooden blocks
- window screen mesh (enough to cover the barrel opening)
- downspout elbow to route the downspout to the barrel
- clincher strap (attaches downspout and barrel to house)
- small pieces of wood blocking to use behind clincher strap (if necessary)
- any additional materials necessary for the overflow location
- 1/4" #6 sheet metal screws for downspout
- 3/4" screws for clincher strap
- 2" overflow pipe fittings



## Construction in 6 Easy Steps



- 1 Inlet:** Create an opening with fine screening through which the rain barrel will collect water from the downspout elbow. This can be a single screened opening large enough to accommodate the downspout elbow (as shown in the photo), or a series of smaller screened openings directly in the top of the 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. If the overflow pipe elbow seals and seats securely, it can be threaded directly into the barrel opening. If not, it should be secured with washers on both sides of the barrel and a nut on the inside. Use Teflon tape around the 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. You might want to test stability by filling the rain barrel with water before attaching to your structure. A full rain barrel is very heavy and tipping is a risk if it's unsecured or on an uneven surface.



- 4 Downspout:** Cut the downspout with a hacksaw so that the elbow will sit just above the rain barrel inlet. Attach the elbow over the downspout with a screw and secure the downspout to the house with the strap.

**Attach 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 elbow and direct to the existing discharge location.



- 5 Outlet:** Drill a hole near the bottom of the empty barrel to attach the drain spigot. If the spigot seals and seats securely, it can be threaded directly into the barrel opening. If not, it should be secured with washers on both sides of the barrel and a nut on the inside. Use Teflon tape around the threads and a bead of silicon caulking around the opening to ensure a tight seal.



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

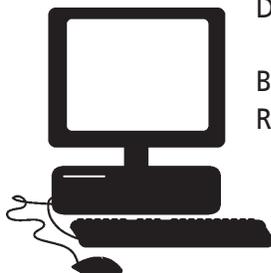
# 4 maintenance

## Simple maintenance of your stormwater system can prevent problems.

- Clean gutters at least twice a year, more often if you have trees.
- 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 all parts are securely fastened together and the rain barrel is securely fastened to the building.
- Clean out the rain barrel and check for leaks at least once a year. Check and clear downspout elbows, rain barrel screening, and overflow to prevent clogging. Caulk any gutter, downspout, barrel, and overflow leaks and holes.
- Make sure the rain barrel remains securely screened to prevent mosquito entry.
- If overflow is to a surface infiltration area, monitor the overflow area and regrade soil if necessary to make sure water drains away from structures and does not flow onto pavement, sidewalks, or neighboring properties.



See the back cover for other 'How to' brochures in this series



# resources

## Clean River Rewards

Clean River Rewards is Portland's stormwater discount program. When you contain the rain safely on your property, you can save money with an ongoing discount on your city utility bill. Go to [www.CleanRiverRewards.com](http://www.CleanRiverRewards.com) to register or to download publications to help you plan, build and maintain your stormwater management options. You can also find other technical assistance information and useful links. For more information, call 503-823-1371.

## Downspout Disconnection Program

The city offers free disconnection for homes in the Downspout Disconnection Program target area. Homeowners in the target area who do the work themselves can earn a one-time incentive of \$53 for each downspout safely disconnected. Call 503-823-5858 or go to [www.portlandonline.com/downspoutdisconnect](http://www.portlandonline.com/downspoutdisconnect) for more information.

## Additional Information

City of Portland Stormwater Management Manual

[www.portlandonline.com/bes/index.cfm?c=35117](http://www.portlandonline.com/bes/index.cfm?c=35117)

City of Portland Stormwater Solutions Handbook

[www.portlandonline.com/bes/index.cfm?c=43110](http://www.portlandonline.com/bes/index.cfm?c=43110)

Portland Residential Rainwater Harvesting Code Guide

[www.opdr.ci.portland.or.us/pubs/CodeGuides/Cabo/RES34%201.pdf](http://www.opdr.ci.portland.or.us/pubs/CodeGuides/Cabo/RES34%201.pdf)

City of Portland Office of Sustainable

Development [www.portlandonline.com/osd](http://www.portlandonline.com/osd)

Bureau of Development Services Records and Research 503-823-7660

Environmental Services  
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[www.cleanriverspdx.org](http://www.cleanriverspdx.org)

Other publications in this series:

How to manage stormwater - Soakage Trenches  
How to manage stormwater - Rain Gardens  
How to manage stormwater - Downspout Disconnection

To help ensure equal access to city programs,  
services and activities, the city will reasonably  
accommodate persons with disabilities.  
Call 503-823-7740 or 1-800-735-2900 with  
such requests. TDD 503-823-6868.