Building and Installing a Simple Rain Barrel

Florida Keys Aqueduct Authority

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Components of a Rainwater Collection System

The following basic components are involved in every rain water collection system whether it's a concrete cistern or a rain barrel.

1. Catchment area
2. Conveyance system
3. Storage
4. Filtering
5. Distribution of water

Catchment Area

Any area that collects or sheds rainwater is a catchment area. The most common and adaptable area for rainwater collection is a roof. The slope and height of a roof makes it a great catchment area because it uses gravity to direct the water. Homes that are equipped with a guttering system can easily be adapted to funnel water into tanks. Run off from your air conditioner is another source of water collection.

Conveyance system

Once you have identified the catchment area the next step is transporting that water into a storage tank. The easiest way is through a guttering system. This just may require you modify your existing guttering system to divert the downspouts into your storage tanks.

Storage

Storage tanks can be made of various materials and may be located below or above the ground. Fiberglass, concrete and plastics are some of the more common materials used for storage tanks. The material on these tanks should be smooth and nonporous so the water doesn't leak out. Simple plastic containers such as barrels, garbage cans or oak barrels are normally the materials used.

To take advantage of the force of gravity storage tanks are generally placed above ground. The higher the tank is placed the stronger the gravity flow.

Filtration

Rainwater does not need to be filtered for outdoor use. As water runs off of a catchment area, it could pick up debris such as leaves, bird droppings or chemical agents from your roofing materials, but these are not harmful to plants. A simple screening wire-mesh, or a gutter guard, can be used to keep out leaf debris or insects. That is all the filtration necessary. The screen mesh can be located where the water enters the conveyance system (gutter) or at the tank opening.

A small amount of debris will get into to the storage tank so it is a good idea from time to time to clean the tank to avoid a large buildup of debris on the bottom.

Water Distribution

The final step of the rainwater collection system is to get water to your plants. Water distribution will be limited to watering cans, soaker hoses or garden hoses due to the low pressure from most rain barrel applications.

Height level of the tank and the level of the water in the tank determine the water pressure. The higher the water level in the tank the greater the water pressure will be. Your rain barrel should be placed at least 15" from the ground. Remember to keep plumbing attachments to your rain barrel independent from your existing house piping. This will prevent a cross connection to your potable water.

How Much Rainwater Can Be Collected?

You can collect approximately a half gallon of water per square foot of roof area during a 1-inch rainfall. In order to collect all of this water you would need a cistern. Your rain barrel can be filled within a matter of minutes during a good rainfall.

Multiple rain barrels can be linked together to store even more rainwater.

How Much Will a Rain Barrel Cost to Build?

The prices listed below are approximate and do not include any guttering or painting.

Used 55 gallon food grade barrel	$20.00
2 ¾" spigots	8.00
PVC cement/caulking	6.00
4 concrete cinder blocks	8.00
Total	$42.00

The below identifies the components used in the making of a simple rain barrel

Steps to Make a Rain Barrel

Determine Area for Rain Barrel

Before you begin construction decide where the rain barrel is going to be placed. How the water is going to get from the catchment area to the storage tank should be the determining factor. Generally, you will want to place the rain barrel adjacent to the home to tie into existing downspouts. Placing your storage tank closer to the area to be watered may provide easier access but at the same time be impractical if long lengths of pipe are needed to get the water to the storage tank.

Assembly and Installation

Materials List

- 55 gallon food grade plastic drum
- 2 hose spigots (3/4") (1 for your overflow)
- PVC cement
- Gutter outlet geared to your system
- Screen mesh, gutter guard or strainer
- Misc. screws to connect gutter outlet
- Caulking compound
- Plastic primer (optional)
- Plastic Paint (optional)

55 gallon food grade drum

Tools List

- Drill
- 15/16 hole saw
- Measuring tape
- Jig saw or coping saw

Step 1. Clean the Rain Barrel

Clean the rain barrel. Use a mixture of 1/8 cup of bleach and 5 gallons of water as a cleaning solution. Be sure to have selected a food-quality container and **not one that contained harsh chemicals.** Be sure to rinse well.

Step 2. Install the Outlet

- Using a measuring tape, measure about 4" from the bottom of the barrel.
- Using a 15/16" hole saw drill a hole.

Step 2. Install the Outlet Continued…

- Thread the spigot into the hole. When the spigot is about halfway, apply a liberal amount of PVC cement to the exposed area and continue to screw in the spigot until it is snug and pointing toward the bottom of the barrel.
- Caulk around the hose spigot to insure there is no leakage.

Step 3. Install the Overflow Outlet

Locate your overflow at the top of the barrel (about 2" from the top). This will divert excess water that would back up into your gutters. Follow the above directions for the outlet (hose spigot). It can be very beneficial to divert water into another part of your yard; it can reduce the amount of water around the foundation of your house during a rainstorm. You can connect a hose to your overflow and position it to where you want the water to flow.

Step 4. Set up the Rain Barrel Base

Choose a clear level area under a gutter and away from foot traffic. Place cinder blocks (2 high and 2 wide for stability), or build a sturdy wooden crate or a platform. Be sure that the base is up **at least 15"** from the ground. The higher the base the better the pressure will be.

Water weighs a little over 8 pounds per gallon, so a 55-gallon rain barrel will weigh about 440 pounds when full. It is a good idea to attach the barrel to a nearby stable structure if you have pets or children and there is a concern that it might tip over. You can also strap your rain barrel and attach it to a wall. If you set your rain barrel on a level and sturdy structure this shouldn't be an issue.

Step 5. Fit and Install the Downspout Connection

Temporarily set your barrel in place on top of your concrete blocks or your sturdy wooden structure.

- Determine what type of gutter inlet (gutter connector) or flex hose you are going to be using and where it's going to be placed.
- Start by tracing the outline of the gutter inlet or flex hose that will be entering the barrel.
- Drill holes in each corner to provide easy access for the saw blade.
- Cut the out the hole you just traced. Cut exactly along your trace lines using a jig saw.

Step 5. Fit and Install the Downspout Connection Continued…

Once the hole is cut caulk around your gutter inlet and set the inlet in place. If you are using flex hose do not caulk until the rain barrel is completely set up, just set it in place.

A gutter connector (shown above) works well as an inlet

Flex hose used as an inlet

Step 6. Painting your Rain Barrel

If you would like your rain barrel to reflect you personal taste, or blend into the architecture or landscape try painting your barrel. You're limited only by your imagination when it comes to being creative. Painting a rain barrel is a great family activity and will also help protect the surface of the barrel from breaking down due to the harsh effects of the sun.

There are special paints you can use that are compatible with plastic barrels. Rust-Oleum and Krylon are a few of the companies that put out a line of plastic paint products.

Before you start painting thoroughly clean the exterior surface of your barrel. You may want to rough up the

Step 6. Painting your Rain Barrel Continued…

surface of your barrel with a fine to medium grade sandpaper; this will help the paint to adhere.

With a dry cloth wipe the barrel to get rid of any fine plastic shavings caused by sanding.

Apply a coat of plastic primer. Allow the primer to dry then cover with a base coat.

Once the base coat dries your creative juices can kick in and you can paint the barrel any way you like using outdoor acrylics. Stencils can be used, a pattern, freehand, etc. Allow the paint to dry completely before applying one to two coats of polyurethane. Allow the polyurethane to dry between coats (follow the manufacturer's instructions).

Step 7. Modify the Downspout to Divert Water into the Barrel

Place and position the barrel on the base so you can make the transition from the gutter to your rain barrel opening. A traditional gutter will slip into the gutter connector shown above (Step 5 Install the Downspout Connection) quite easily.

Make appropriate adjustments with additional gutter downspouts and or elbows. Flexible downspout extenders eliminate the need for exact measurements because they bend and stretch to the length you need. If you are using an extender make sure it fits the size of your downspout. In either case you may want to secure the transition assembly with a few small screws and re-caulk if necessary. See some of the samples below.

Samples of gutter transition assemblies with traditional gutters

Step 7. Modify the Downspout to Divert Water into the Barrel Continued…

The above photos demonstrate the transition assembly using a flex hose. The flex hose should not be caulked at the barrel opening until the barrel is in place on its platform and secured at the top.

Examples of some Painted Rain Barrels

Frequently Asked Questions

What about water quality?

The quality of the water coming from your roof is great for plants because of the lack of chlorine and a lower pH level than utility provided water but it is not fit for human consumption.

How difficult is it to maintain my rain barrel?

Your rain barrel should require very little maintenance if it is properly installed. You should check it periodically for debris build-up on the bottom or cracks. Some barrels may become brittle over time especially if they are in direct sunlight, painting them will make them last longer.

What about mosquitoes?

Standing water attracts mosquitoes and other insects. If you have a tight fit where the downspout enters the barrel you should have no problems. If you have small gaps or holes fill them with caulk or window screen. There are products (such as mosquito donuts) available at pond supple stores that will prevent mosquitoes from breeding.

Can the rain barrel tip over?

Remember that water weighs a bit over 8 pounds per gallon which means that a 55 gallon rain barrel at full capacity will weigh about 440 pounds. If there are pets or children around and you don't have your rain barrel on a sturdy level surface it may tip over. If you want to take extra precautions you can strap the barrel to a wall or other stable structure (tree, fence, etc.).

References

Rain Barrels A Homeowners Guide (Southwest Florida Water Management District)
http://www.swfwmd.state.fl.us/conservation/rainbarrel/make-a-rain-barrel.html

Maryland Environmental Design Program Natural Solutions for the Built Environment
http://www.dnr.state.md.us/ed/rainbarrel.html

Rain Barrels (Home and Garden Television)
http://www.hgtv.com/ghtv/gardening/article/0,,HGTV_3546_2165903,00.html

Lake Superior Duluth storm-water management
(http://duluthstreams.org/stormwater/toolkit/rainbarrels.html

Used Rain Barrel Resources

Cudjoe Sales next to E-Fish Company in Cudjoe Key

Glander Boat Sales in Key Largo

Local Car Wash Establishments