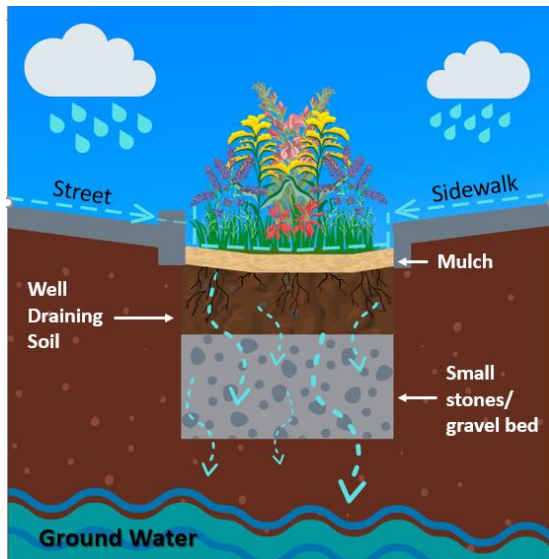


Rain Gardens - Cleaning Rainwater Naturally

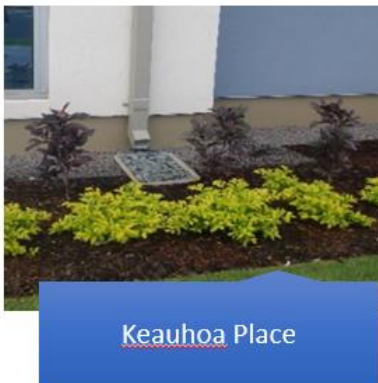


A rain garden is a landscaping feature. What distinguishes a rain garden from other types of landscaping is how it is designed. A rain garden is a shallow recessed area that collects rainwater from a roof, driveway, or street, and allows it to temporarily pond before soaking into the ground. Amended soils (special mixture of sand and compost) are used to aid infiltration, remove pollutants, and support plant growth. Typically, rain gardens are planted with native grasses and shrubs that can tolerate moist to wet soils.

Rain gardens help to alleviate flooding, improve water quality, and assist with groundwater recharge.

When rainwater is allowed to infiltrate into the ground, it reduces the amount of water and pollutants (such as oil and grease, pesticides and fertilizers, bacteria, and sediment) that typically flows into the storm drain system. The rainwater is filtered as it seeps through the soil.

There are several rain gardens to be found in Kakaako: on Auahi Street by 'A'ali'i tower, on South Street by Keauhou Place, and around the Entrepreneurs Sandbox on Ilalo Street. These rain gardens help to keep water off the roads and also filter water before it enters the ocean.



A rain garden can be installed in your property using the steps outlined below. More detailed instructions are available in the *Hawaii Residential Rain Garden Manual* (<https://www.huihawaii.org/rain-gardens.html>)

1. Identify the rain garden location.

A rain garden can be located near a downspout, driveway, sidewalk, or in the yard. The rain garden should not be located too close to any structure, wall, or sidewalk, or over a drain field

for a septic tank or cesspool. Check with the City and County of Honolulu Planning Office at (808) 768-8102 for information on any permits, setbacks, or other regulations relating with rain garden.

Also take into consideration how rainwater will be directed to the rain garden. Typically, water is routed either through a pipe underground or aboveground via surface flow. Where you place the rain garden may dictate how you route rainwater to it.

A rain garden should drain within a few hours to a day after a rain event. If you are unsure if your soil is suitable for a rain garden, you can test it by digging a hole 6 inches deep and filling it with water. If water drains completely within 12 hours, you can build a garden. If it takes longer than 12 hours, you may need design help or could consider installing a rain barrel instead.

2. Design your rain garden.

Plan the shape and size of your garden. A rain garden should not be built any smaller than twenty (20) square feet and should have a minimum width of 4.5 feet. The recommended ponding depth is 9 inches. A rain garden should also be built with an overflow to safely remove water during heavy rain events. Design the overflow to direct excess water to another area that can infiltrate it, such as a lawn, or to an existing storm drain system. The outfall should be located approximately 2 inches below the top of the berm.

Determine the contributing drainage area (i.e., the area of the roof, driveway, or sidewalk), rainfall, and soil infiltration rates. These will be used to determine the size of the rain garden. Definitions, equations, sizing charts, and examples are available in the *Hawaii Residential Rain Garden Manual*.

Determine how water will enter the rain garden. Will it be piped underground, or will it surface flow into the rain garden? If water is piped underground, a pipe will need to be buried at least 4 inches deep. If water is routed aboveground, plan on digging a trench to direct rainwater into the rain garden. In both cases, the slope should be approximately 2% from the source to the rain garden.

When selecting plants for the garden, take into consideration where the plants will be placed. Plants placed in the deepest section of the rain garden must handle wet soils for an extended time. Plants along the sides must thrive in both dry and wet soil conditions. Plants on the very edge of the garden must tolerate extended periods of dry soil.

3. Build your garden.

Before you start digging, call for utility location! The State of Hawaii number is 1-866-423-7287 or on the web at: <http://callbeforeyoudig.org/>.

Use string, rope, or spray paint to outline your garden. Beginning making a shallow depression.

If you are routing rainwater aboveground, dig out the trench and line it with rock. If you are disconnecting the downspout, do not forget to install a converter to redirect rainwater to your garden. If rainwater will be piped underground, install/lay the pipe first. Install a clean out if the pipe length is long.

Slope the sides of the garden and design the deepest part towards the middle of the garden. Use the extra soil you dug out to create a berm. The overflow should be installed 2 inches below the top of the berm. Use rocks approximately 2 to 3 inches large to line the overflow.

Before you start planting, mix compost with the existing soil to promote health plant growth and remove pollutants. Space plants to provide complete coverage when matured. After planting, spread 2 to 3 inches of mulch over the garden to prevent erosion, block weeds, and provide nutrients to the plants.

4. Maintain your Rain Garden

You may need to water your rain garden more often at first. Once the plants are established, watering can be reduced to weekly or only during dry conditions.

Routine maintenance is necessary to maintain healthy plants. Maintenance activities should include weeding, pruning, and replacing mulch and dead, dying, diseased plants as needed.

Survey

Please take a moment to answer the questions in the following survey:

<https://www.surveymonkey.com/r/JTJWT9>

The survey is designed to help us assess the general knowledge of storm water pollutants and awareness in Kakaako. We will review all answers to improve our storm water education and outreach program.