THE DO-IT-YOURSELF ECO ROOF

A do-it-yourself guide to installing a lightweight, simple sedum ecoroof on a shed-sized structure.

The information in this guide is meant as an example only. When in doubt, contact a professional.
Before starting, answer this question: **Can the structure hold the additional weight of the ecoroof?** If you are unable to determine if your structure can hold the additional load, consult a contractor, architect or structural engineer. You may need to add structural support. Generally, a square foot of lightweight soil approximately four inches deep weighs about 20 pounds when saturated.

**TYPICAL ECOROOF COMPONENTS:**
1. Perimeter frame and drainage
2. Waterproof membrane
3. Soil
4. Sedum

Rain chains were added to this ecoroof. Natural materials added to the top of this ecoroof increase microclimate niches for habitat value.

Ecoroofs under 200 square feet may not need a permit. Call the Bureau of Development Services (503-823-7300) for information about permit requirements.
Step 1: Perimeter frame and drainage
Create a frame to hold your ecoroof materials in place. Typical framing materials are metal or wood. For a roof with a less than 4 in 12 slope, you can build a simple 2x4 or 2x6 frame. If your roof has a greater than 4 in 12 slope, include an interior lattice to prevent materials from sliding. The interior lattice should have two to four inch wide by ½ inch tall drainage holes every 24 inches to ensure drainage between sections.

Do not fasten the lattice to the roof through the membrane. Design it to fit free float and snug, or hang it from a ridge beam. To allow water to drain off the roof, cut holes in the eaves at low points to receive the roof drain. As an alternative to cutting holes in the eaves, cut two to four inch wide holes along the bottom edge of the frame to allow water to drain to the ground or a gutter and downspout. If you choose this option, make sure that holes or scuppers maintain a waterproof basin for the ecoroof.

Step 2: Waterproof membrane
After you have installed the perimeter frame, place a waterproof membrane over the roof to prevent leaks. There are many types of waterproof membranes, such as EPDM and TPO. For an existing structure, it is best to remove existing roofing, such as asphalt shingles, along with all exposed fasteners, and replace it with the membrane.

It is possible to place the frame and membrane directly on top of existing roofing if the shingles are in good condition. When the surface of the roof is rough or sharp, add a layer of felt or a slip sheet to your roof deck to protect the membrane from punctures, then place the membrane on top. Use a single sheet of membrane material to avoid seams.

After you have placed the membrane over the roof, cut a small “X” at each bar sink strainer location. Install the strainers, tightly clamping the membrane between the gaskets. Attach a rain chain to the bottom of the strainer if you’d like. Install the top cap of your perimeter frame and cut off excess membrane.

Step 3: Soil
After installing the membrane, add drainage rock behind the bottom edge of the perimeter frame. Install a filter material (such as a piece of window screen) on top of the strainer before placing the drainage rock to help keep it free of debris.

Next add soil. Soil depth of about four inches is ideal. You could use a depth as shallow as two inches if your structure can’t hold much weight. There are many types of ecoroof soils. Typical ecoroof soil weighs about five pounds per square foot per one inch depth when saturated.
Another option is to mix your own soil: 75% inorganic (such as pumice) and 25% organic (such as compost). You could also use soil from your backyard, but keep in mind that it will be heavier, closer to ten pounds per square foot per one inch depth when saturated. If you are mixing your own soil, make sure you know its saturated weight. If you purchase soil from a vendor, confirm saturated weight with the manufacturer.

**Step 4: Sedum**
The final step is to plant the sedum. Sedum is a large genus of flowering plants that thrive on ecoroofs. Sedum can survive in a few inches of low-fertility soil, with little to no irrigation, and little maintenance.

If you select evergreen varieties, the roof can provide year-round interest. You can plant your ecoroof with sedum of any size, from potted plant or plug to a sprinkling of sedum cuttings. Consider using native varieties of sedum, varying the depth of your substrate, or including natural materials such as branches and small rocks to the top of the ecoroof to add microclimate niches for habitat value. Take sun exposure into account when choosing varieties.

**Find More Resources at**
[www.portlandoregon.gov/bes/ecoroof](http://www.portlandoregon.gov/bes/ecoroof)

- **General information** about the City of Portland Ecoroof Program
- **Ecoroof Handbook** – How ecoroofs work, how they keep rivers clean, elements of ecoroof design, and where to find additional resources
- **Ecoroof Guide** – Six steps to move you through a project, whether you’re a do-it-yourselfer (DIY), project manager or a client
- **Ecoroof Resource List** – Local ecoroof professionals and ecoroof product vendors

If using cuttings, a typical application is 10 pounds per 100 square feet. To ensure good plant cover over time, choose at least three varieties of sedum.

- Sedum acre (se) ☉
- Sedum album (e), many varieties ☉
- Sedum divergens (e), native ☉
- Sedum oreganum (e), native ☉
- Sedum sexangulare (e) ☉
- Sedum spurium (d), many varieties ☉
- Sedum spathulifolium (e), native, many varieties ☉
- Sedum kamtschaticum (d), many varieties ☉

plant type: (e)=evergreen (d)=deciduous (se)=semi-evergreen

**Maintaining Your Ecoroof**
For the first couple of summers, irrigate as needed. After the plants are established, the only maintenance should be light weeding to remove unwanted plants (such as tree saplings) and an occasional watering during the dry season. It is not necessary to use pesticides or other chemicals to maintain your ecoroof.

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