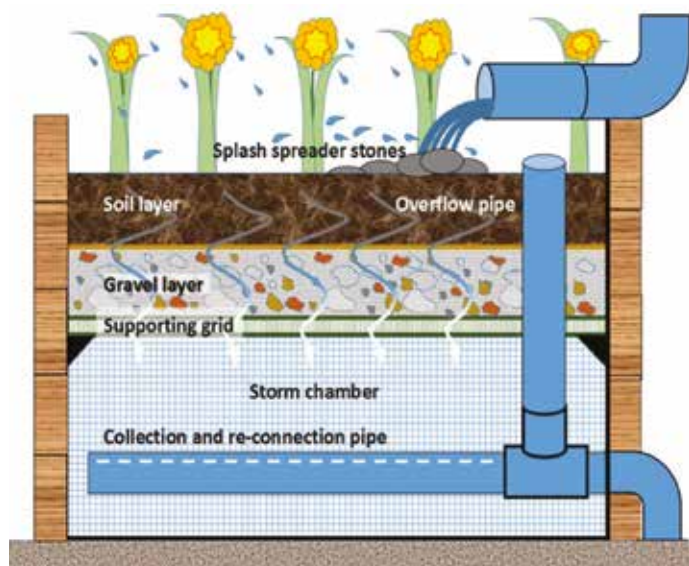


Raingardens - make your own

A basic box Raingarden

A simple way to build a rain garden is to install an above ground box next to the down-pipe from a building's roof. The downpipe is disconnected and flows directly into the box. Water then slowly filters through the plants, soil and gravel within the box, before re-entering the drainage system.

There are many options, but think of something like a garden planter. The box can be something that you have made using strong wooden boards (strong enough to withstand the weight of soil, gravel and water pressing against the sides) or a pre-fabricated box bought from the local DIY shop or on-line. If it is made from wood or has joints in it, the box should be sealed to avoid leakages. This will not be necessary for a single-moulded plastic box/planter.



Example of a down-pipe rain garden layout

Connecting the box

With the box in position but not filled (it's easier to move when empty!) install the plumbing. Disconnect down-pipe at the top of the box, and then re-connect the base of the box to the drainage system, with a pipe. This re-connection will need a neat and accurate hole cut in the box to place the connecting pipe through. This hole can then be sealed using appropriate plumbing components.

A Raingarden is a vegetated area designed to attenuate rainfall. Benefits include:

1. Help reduce flooding by holding rain water and slowly releasing it. This helps decrease the likelihood or severity of flooding.
2. They help to reduce pollution by catching contaminants collected by rainwater and surface run off, before it enters rivers and streams.
3. Raingardens are easy to look after and are pleasant to look at.
4. Cleaner air for you, your family and your friends to breathe.
5. They can provide new homes and food for wildlife that already live in towns, gardens and parks.

When connecting the down-pipe to the rain garden and then re-connecting to the drainage system, consider or not you will need a plumber to do this. If you are doing the plumbing yourself this will still need to be checked by a suitable professional. Remember to obtain any permissions.

Creating the Raingarden

Starting from the bottom, install a slotted, collecting pipe along the bottom of the chamber. This should also be connected to a high level overflow which can receive flows during very heavy rainfall or if a blockage occurs.

Once the plumbing is completed and checked, carefully begin to construct the storm chamber. This can be filled with stone which will support the layers above or can be an open chamber. If open you will need to think about supporting the layers above with a strong metal or plastic grid.

The layers above this will then need to be placed but make sure that the soil and finer gravels are not able to settle into the storm chamber which will cause the whole system to collapse. The use of fabric material is usually recommended to stop this from happening but this can also cause blockage over time. A natural fabric that will slowly rot is best. By the time the fabric rots there will be enough support from the roots of plants to stop collapse from occurring. Place the gravel and soils accordingly.

On top, think about placing stones to scatter splashes from the down-pipe and to have an even distribution of flow across the rain garden. This will also protect the soil from erosion.

Plant choice

The types of plant to use will be down to the specific location and personal preference, but choose plants that are robust and able to tolerate dry periods and very wet soils. Yellow flag (Iris), Ragged robin and Cuckoo flower do well, as do Cranesbill, Geraniums and herbs like Rosemary and Thyme.



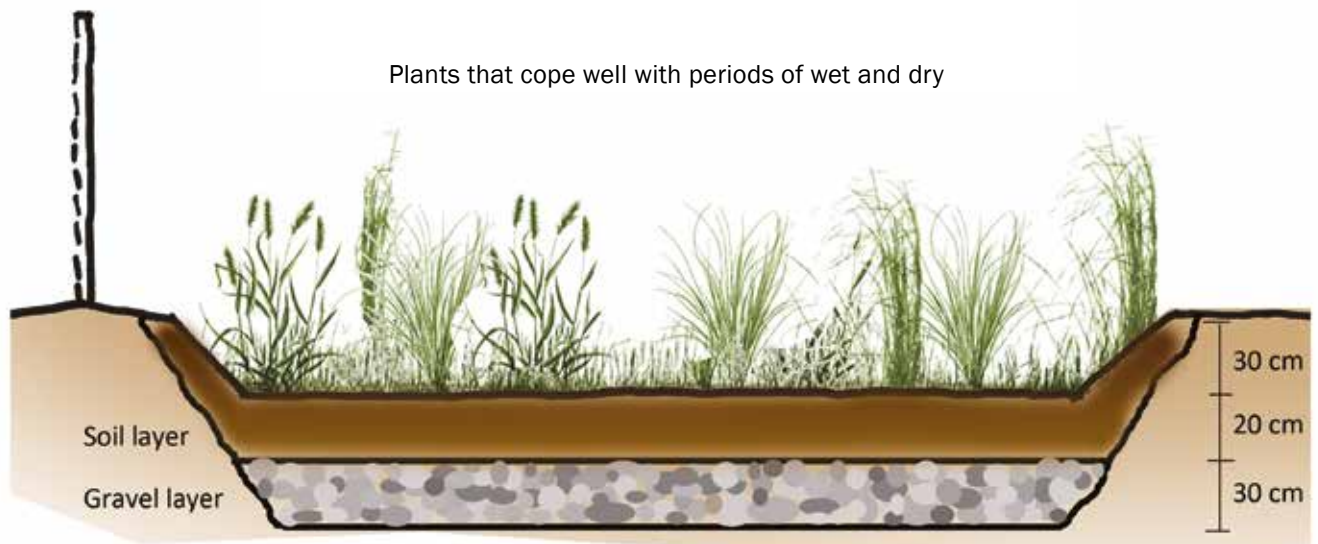
Hybrid Raingarden



Professionally installed down-pipe rain garden

Using Raingardens to help wet gardens

If you have a wet garden, or one with patches of ground where the water doesn't drain away quickly, there are several ways you can deal with it. You could create a "Bog Garden", install a pond, or build a seasonal swale. Bog gardens and ponds are best in areas of a garden which are wet most of the time, potentially with clay soil, as their storage capacity is all on the surface. A swale (a shallow depression in the ground) is ideal for areas which are very wet after periods of heavy rainfall, but can dry out. They tend to be more suited to looser soil than clay ones.



Profile of a swale

Bog garden

The bog garden should be at the lowest part of the garden. Any excavated soil can be distributed elsewhere in the back garden to help create an even slope for water to run into in to the bog garden, and improve soil quality elsewhere.

Planting should feature attractive, tall, vertical plants such as rushes and reeds like *Phragmites* or *Typha*, that remain upright overwinter even as dry stems. Iris will provide colour and shape during early summer. Cuckoo flower (*Cardamine pratensis*) and Marsh Marigold (*Caltha palustris*) provide spring colour in the grass margins and wetter areas, and plant Ragged robin (*Lychnis flos cuculi*), Meadowsweet (*Filipendula ulmaria*) and Buttercups (*Ranunculus* spp.) for colour later on in the year. Make sure you plant grasses and evergreen foliage plant to maximise year round evaporation of water.

Other wildlife friendly water loving plants include Forget-me-not (*Myosotis scorpioides*), Water mint (*Mentha aquatic*), and Water Avens (*Geum rivale*). Prune Forget-me-not and Water mint regularly to prevent them taking over and cut back grasses each year to encourage growth.

Seasonal swale or wetland

Essentially this is an under-drained bog garden that periodically dries out. Make sure you are working at the lowest part of the garden and use excavated soil to create an even slope towards the swale.

Dig a wide hole, about 70 cm deep. Place a layer of gravel in the base and then a layer of top soil or compost. Put in plants that are able to cope with varying levels of moisture.

A support structure for climbing plants can be integrated into the feature at construction stage. Again ensure you include evergreens such as Ivy, to maximise evaporation of water.

Pond

If you're interested in attracting a wide wider range of biodiversity to your garden, you could look at expanding your bog garden to include a pond. This is also a solution if you have a very wet area of ground which struggles to drain at all. Start by digging the bog garden, then make a central area slightly deeper and allowing the water to pool there (you may wish to consider putting down some pond liner). Plant the edges of the pond with the bog species, keeping the water clear. The pond can be as big or small as you like, as the surrounding bog garden will also help to retain water.



Profile of a bog garden

Green roofs

Green roofs, or vegetated roofs, or living roofs are systems that are essentially roofs with vegetation placed upon them in a way to provide benefits.

Roofs can take many different forms. They are generally categorised as Intensive, Extensive or a combination of both. Intensive roofs have a deeper growing medium and can support a range of plants, whilst extensive roofs have a thin layer of growing medium and can support more specialised plants. The categorisation also refers to the amount of maintenance needed. Roofs can also include different habitat types, for example logs, rubble and gravel to provide additional support to wildlife.



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Sedum Roof, Kinnaird Primary School, Falkirk



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Intensive Roof in Edinburgh

Green roof benefits

The installation of a green roof may be for various reasons and will almost always provide a suite of additional benefits including;

- Climate change adaptation & mitigation
- Flood mitigation and water quality improvements
- Health and well being
- Biodiversity and wildlife
- Air quality improvements
- Urban heat island effect reduction
- Building thermal efficiency
- Reduced whole life cost
- Noise reduction

Scottish Green Infrastructure Forum

W: www.sgif.org.uk **E:** info@sgif.org.uk **T:** @ScottishGIF

The Forum is a group of organisations, businesses and individuals interested in promoting and encouraging the building of Green Infrastructure. This guidance was prepared by Buglife - The Invertebrate Conservation Trust for the Scottish Green Infrastructure Forum.

