



Greener Gardens

An Introduction to Raingardens for Developers | **green infrastructure, design and placemaking**



Supported by

improving living in scotland



In 2011, the Scottish Government published their Green Infrastructure: Design and Placemaking guide. This guide was produced to complement previous policy documents and to give practical tips on incorporating green infrastructure into development.

Gardens are an integral part of the Green Infrastructure resource of a housing development. They can contribute to many of the qualities of successful places identified throughout the Scottish Government's design policy. Unfortunately, they are also often the last consideration within a development with a comparatively small amount of budget and resources committed to them.

Gardens can also contribute positively to the environmental impact of a development, assisting towards the Sewers for Scotland 3 policy on sustainable urban drainage, and add value to planning applications.

This Greener Gardens guide demonstrates how gardens can become an economical selling point within a development, and how they can contribute towards the measures within the Scottish Government's guide.



Why install small scale green infrastructure features?

- Raingardens offer a way to **create attractive, sustainable places**, which deliver on the Scottish Government's qualities of successful places.
- They could help **deal with many issues** gardens in new developments can face such as poor **drainage**.
- A raingarden could be presented as a **selling point** if also installed in show gardens.
- Raingardens **could be installed cheaply**, with readily available building materials.

Help and support is available. CSGNT and other organisations such as the Scottish Green Infrastructure Forum can work with you to develop bespoke raingardens for your development, and produce an information leaflet for your new homes pack which explains the feature to the home owner. All the features below are designed specifically to be low maintenance, but will need a small amount of work annually to maintain their function.



Houseplot raingardens. (photos: Centre for Neighbourhood Technology and La Citta Vita)

Installing small scale green infrastructure features in each plot within a development will help give it the qualities of a successful place. It is also a way of demonstrating that account has been taken of the green infrastructure considerations highlighted in the Scottish Government's Green Infrastructure: Design and Placemaking guide when creating a master plan.

Distinctive	Reinforcing the landscape character and identity	Garden green infrastructure, particularly in-ground raingardens, swales and raingardens can contribute to the character and quality of your development adding to retained landscape character features and new planting schemes linking to surrounding habitats.
	Using unique design features	
	Creating a sense of place	
Welcoming	Creating spaces with a positive image	Green infrastructure features, particularly green roof and walls, along with rain butts, composters etc, provide a very positive image through a demonstration of environmental awareness, people and wildlife friendly developments, and a willingness to mitigate.
Safe and pleasant	Addressing risks through design	Risks associated with poor quality gardens could be reduced through the use of garden green infrastructure features.
	Delivering quality through design and maintenance	A little attention to a garden could reduce complaints on the quality of the soil or drainage. A green infrastructure feature is a potential way to do this.
Easy to move around	Green networks	Including green infrastructure features in gardens automatically provides increased green network opportunities and the linking of the wider green network across gardens along with other measures such as street trees.
	Connections for wildlife	Using native, local and pollinator-friendly species where possible within these features contributes to green corridors and provides small areas of habitat suited to biodiversity. These are often of more use to wildlife than larger, spaced out features.
Resource efficient	SUDs and water resource management	The green infrastructure features described here all provide water resource management solutions, essentially creating SUDs for individual house plots.
	Sustainable use of materials	All the features can be built using materials already found on site, reducing waste from other areas of the development. Top soil can be retained and used in the features to save sourcing an appropriate growing medium at a later stage.
	Microclimate and saving energy	All green infrastructure features, but particularly green walls and roofs, provide options for improved microclimate and energy saving through insulation, cooling, shelter, water collection and evapotranspiration.
Adaptable	Multi-functional spaces	Whilst only small scale, these features can contribute to the provision of multi-functional spaces for the home buyers. By addressing potential drainage problems, they could help make other parts of the garden more useable.

What are the Green Infrastructure options for gardens?

There are various ways of creating greener gardens. All these options slow down water flow and can contribute to development wide water management, delivering on Scottish Water's aims for managing more water at source and limiting new connections to the sewer network. They can also contribute to the SUDs network for whole development, potentiality freeing up space for more housing.

Natural raingardens

Potential drainage issues can be addressed with the installation of raingardens within gardens. They can be installed in a low part of the garden, and can take many forms from a natural raingarden to a seasonal wetland or swale.

They can act as household SUDs and could be a vegetated pond, linear feature, or sometimes draining water from a disconnected downpipe (in appropriate situations). Permeable paving and rainwater harvesting also helps with surface water management.

Planter box raingardens

These are often associated with a disconnected downpipe and are an above or below ground contained unit designed to attenuate and slow down water flow from gutters and roofs.

Green roofs and/or green walls

Installing even small scale green roofs or green walls on or around buildings can make a huge contribution to the green infrastructure of a development. Options include a green roof on a shed or garage with the potential for associated gutters and rainwater butt, or a green wall along the back wall of the house, porch or garage.

Smaller scale garden options

There are many options for smaller scale green infrastructure in gardens, which increase the biodiversity and green network contributions of your development and make it more attractive to potential buyers for a small cost.

Options include rainwater harvesting; building small (1x1m) raised beds for fruit and vegetable growing; building compost areas or wood sheds (with green roof and rain butt); trailing climbing plants such as Ivy or Honeysuckle along fences; or planting a wildlife hedge along boundaries between properties.

[More advice on how to design, locate and construct each of these forms of green infrastructure](#)



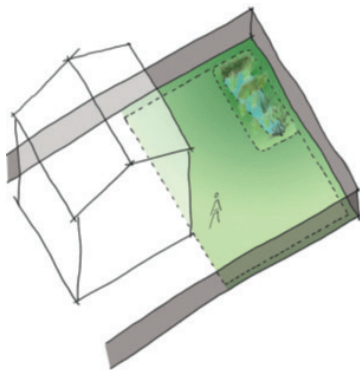
How to design, locate and construct greener gardens

Natural raingardens

Siting

Natural raingardens should be located at the lowest part of the garden to encourage drainage away from the house.

Any excavated soil can be distributed around the garden to help create a fall into the natural raingarden. Free draining subsoil should be used in the base of the raingarden, with any topsoil saved and used on top for planting.



Natural Raingarden. (photo: Taylor Wimpey)

Planting

Natural raingardens should feature attractive plants with vertical dimensions such as Phragmites and Typha that remain vertical over winter even as dry stems, plus Iris which will give colour and shape during early summer.

Grasses and other foliage plants are important to provide evapotranspiration activity during mild periods over the winter months helping with the drying out process.



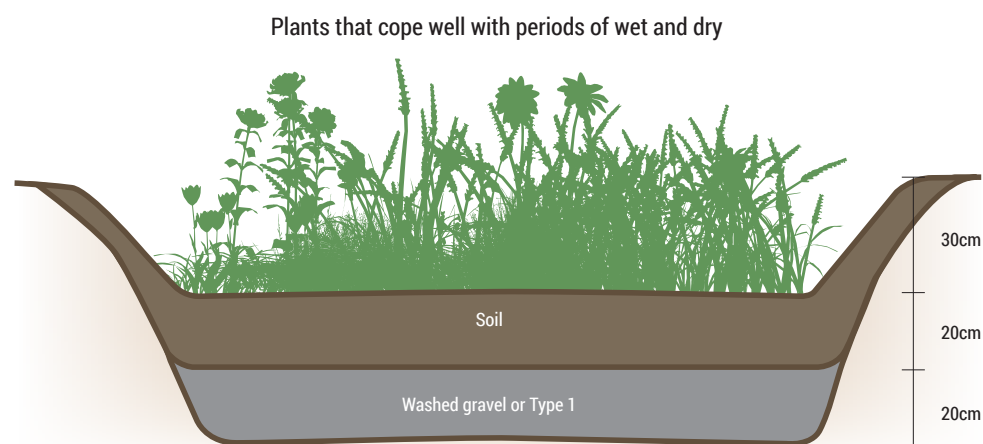
Seasonal swale/wetland

Siting

A seasonal swale or wetland is, in effect, a raingarden with added underground drainage meaning it can periodically dry out. As with natural raingardens, this feature should be at the lowest part of the garden, and any excavated soil can be distributed around the garden to help create an even fall into the raingarden.

A washed gravel or Type 1 filled soakaway should be laid beneath the raingarden, topped with porous sub-soil and finally top soil or compost and plants that can cope with variations in moisture.

It could also be a linear feature, running from a diverted downpipe, down a garden to the lowest point at the bottom.



Planting

A support structure for climbing plants can be integrated into the feature at construction stage.

If evergreens such as Ivy are used, the periods of evapotranspiration will be maximised by comparison with deciduous shrubs.



*Seasonal wetland in Northumberland.
(photo: Glen Bowman)*



*Swale in housing estate.
(photo: Karen Roe)*

Further information on linear natural raingardens can be found in the UK raingarden guide signposted later in this leaflet.

Planter box raingardens

Siting and construction

Planter box raingardens are contained units, either above or below the ground, which are positioned below a disconnected downpipe in order to collect, filter and slow down the infiltration of water. The units include layers of soil for filtration, gravel for drainage and plants which tolerate variations in water supply.

A pipe beneath the soil layer takes the water away from the building and gradually releases it safely into a water course, pond, or free draining area of the garden.

Planter box raingardens can be constructed from any material that is strong enough to hold the soil, but will need a PVC liner to ensure all the water is contained within the unit and prevent deterioration of the material over time, especially if it is wooden.

Modular units can be made with any building materials which will hold and slow down water. Wooden units are likely to need waterproof linings to help reduce rot. They are therefore cheap to install at the time of building the house.



Planter box raingardens. (photos: Taylor Wimpey and Brian D'Arcy)

For more information on how to create different kinds of raingardens, see the UK Rain Garden Guide: www.raingardens.info

Green roofs and green walls

Green roofs and green walls offer many benefits to a housing development. As well as the stormwater management benefits, they can help with energy savings to the building that they are installed on through insulation, increase the life of the structure through protection and provide shelter for wildlife.

Green roofs and green walls are more expensive than other green features to install, though this depends very much on the type, size and location.

Siting

Green wall systems can be integral to a building, or be entirely separate using “trellis” systems attached to walls to grow plants up. Where possible, green walls should be on south or east facing walls to encourage plant growth. If not possible, shade tolerant plants can be used.

Green roofs can be sited on almost any type of roof (structural advice is recommended), but are best on flat or slightly sloping roofs. The plants used can be suited to the aspect and weather conditions, but structural integrity of the building is important, so some planning is required to make sure the building can support this type of roof



Green wall on an office block. (photo: Buglife)



Green wall using the trellis system. (photo: Karen Roe)



Shed roof with raised bed style planters supported by an external frame. (photo: Wildroof Landscapes)

Construction

Integral green wall systems can be designed for a house or development by specialised contractors, trellis systems simply involve attaching climbing structures to the wall of a building and planting climbing plants such as Ivy, Honeysuckle, Climbing Roses and Winter Jasmine in the ground at the base of the wall. The structures could be free standing metal or wooden trellis, trellis attached directly to the wall, or espalier style wires stretched horizontally at 0.5m intervals up the wall.

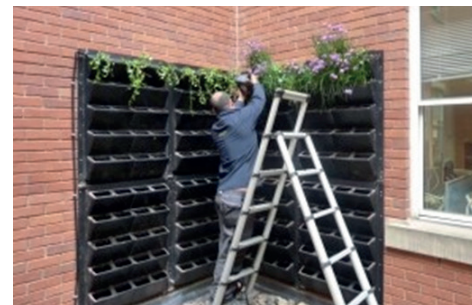
Green roofs can be built directly onto a building structure (following structural advice), using layers of waterproofing membrane, substrate and plants. This is most suitable for large areas. However, smaller buildings which may be less structurally robust can have roofs built onto frames which support the weight rather than the building or “pocket habitats” can be used, which are prefabricated containers or raised bed type structures made with green roof materials and placed on or around the roof.



Sedum green roof installed as part of an extension in Fife. (photo: Muir Dorrans)



Window box style green roof on a bin shelter. (photo: gardensite.co.uk)



Small scale module green wall system. (photo: urbanplanters.co.uk)

Case study | The Torrance Park Water Project

A partnership between the Scottish Government, Taylor Wimpey, C&D Associates, CSGNT and Abertay University has been formed to focus on encouraging greener gardens in new housing developments and highlight the contribution gardens can make to the green network and the wider environment.

Using shared resources and expertise they launched The Torrance Park Water Project to look at storm water management and the green infrastructure that is needed to cope with our ever-changing weather patterns. The project won the VIBES Collaboration award in 2015.

Project aims:

- To support the delivery of the green infrastructure within house plots
- Showcase effective solutions for homeowners and the wider house building industry
- Encourage biodiversity
- Create sustainable gardens and developments
- Reinforce Taylor Wimpey West Scotland's credentials as a developer leading the way in environmentally friendly design
- Support the Scottish Government's Green Infrastructure: Design and Placemaking Guide
- Supporting CSGN in securing quality environments for communities

Project features:

- The installation of a natural raingarden feature at Taylor Wimpey's Torrance Park development in Holytown
- A two-year trial with Abertay University to look at the 'in-ground' Suds Box as a source control technique to assist with pluvial flooding
- The installation of a raised bed raingarden unit as a source control technique



Two of the raingarden options installed at Torrance Park. (photos: Taylor Wimpey)

- Installation of a tap water saving device by providing a 250 litre water butt
- The collaboration of the partners to create a supporting leaflet to raise the profile of greener gardens for use with a wide range of audiences including new homeowners, local schools, businesses and the wider house building industry

This work demonstrates private sector engagement with the integration of green infrastructure in placemaking that contributes to the delivery of the CSGN, helping communities to become more resilient to climate change challenges.





Greener Gardens

Central Scotland Green Network Trust

Hillhouse ridge
Shottskirk Road
Shotts
North Lanarkshire
ML7 4JS
01501 822015

www.centralscotlandgreennetwork.org



Supported by

improving living in scotland

