Infrastructure and Environment

# Ecological Guidance for Green Roofs

## More Habitats for Wildlife - Better Living Spaces for People

Picture courtesy of Leeds Skelton Lake Services

## Vision

Imagine looking out of your window where normally you see slate, concrete, or asphalt and instead you see a green roof full of colourful wildflowers vibrantly buzzing with insect life. Birds visit this roof during the day and at night it becomes a haven for bats. Even if you cannot directly see a green roof from your work or home, green roofs contribute to the overall riches of wildlife, improve noise absorption and improve air quality for all in the local environment.

Although not yet common in Jersey, green roofs are becoming an increasingly popular way to enhance our built environment.

Jersey is a small Island with a population of over one-hundred-thousand people making space a precious commodity, especially in our built-up areas. Providing green habitats at roof level can have significant benefit for people and for biodiversity. This aligns with the policies set out in the Bridging Island Plan

Policy NE1 –All development must ensure that the importance of habitats, designated sites and species is taken into account and should seek to improve biodiversity and geodiversity value and, where possible, deliver a biodiversity net gain.

Policy NE2 –Development must protect and improve existing green infrastructure assets and contribute towards the delivery of new green infrastructure assets and wider green infrastructure networks.

Policy NE3 -Development must protect or improve landscape and seascape character.

The full detail of the Bridging Island Plan can be read via the link below.

P Natural environment.pdf (gov.je)

## Scope

The aim of this document is to briefly describe the several types of green roof available, to encourage people towards choosing the most biodiverse green roofs, to highlight some of their benefits and to define the most suitable plants to grow on them. It also aims to signpost anyone thinking about fitting a green roof towards the relevant ecological legislation and strategies.

For technical information on creating a green roof, we suggest working with qualified professionals and referencing an industry standard such as the GRO Green Roof Code. Greenrooforganisation.org The Green Roof Organisation (GRO) is an independent not-for-profit Trade Association representing the UK Green, Blue and BioSolar Roofing industries. The Code gives an in-depth explanation of all aspects of green roofs.

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## What is a Green Roof and what are the different types?

Put simply a green roof is a construction made of layers that are added to a roof to create an environment suitable for growing vegetation. Although there are examples of green roofs that date from early history these were more about keeping buildings insulated and about ornamentation. The modern phenomenon of green roofs to address environmental issues began in Germany and Switzerland in the 1970s.

Continental green roofs often have the advantage of being fitted to buildings already designed to withstand heavy snowfall. Retrofitting a green roof in Jersey can be more challenging and requires the assistance of a chartered structural engineer or surveyor that can advise whether your building can take the weight of the design you have in mind.

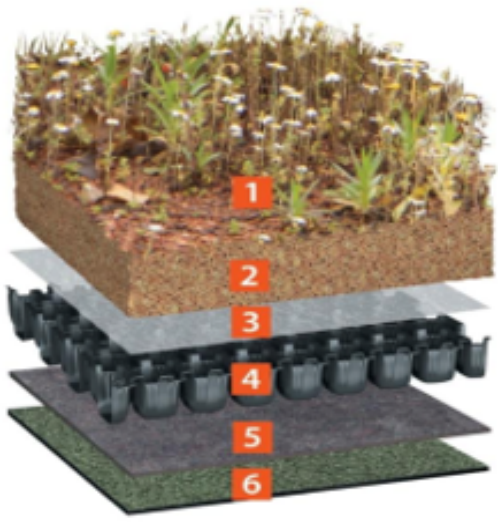
## Structure

Below is an illustration of a seeded wildflower green roof to show the typical construction layers and materials required for a green roof.

Roofs do not need to be flat to be green. Pitched roofs can also be planted.

Pebbles are often laid around the perimeter of the roof to prevent drainage blockages. These pebbles or similar drainage aids also provide basking sites for insects.

The top can be left unplanted to create a brown roof which will eventually self-seed with species from the local environment.




1 = Plants

2 = Soil or growing substrate

3 = Filter fleece to stop soil blocking drainage

4 = Drainage layer

5 = Layer to stop root penetration

6 = waterproof layer to prevent damp penetration

Photo from Bauder.com

Wherever practical we would encourage people towards establishing biodiverse roofs as these provide the most benefit for people and wildlife.

## Extensive Biodiverse Roofs

Extensive biodiverse roofs are light to moderate weight and have around 50-150 mms of growing medium. They can support a range of flowering plants and grasses. They establish very quickly especially when the plants are provided in pre-grown mats, but they can also be established from seed. They require maintenance and watering much like a garden would. The large number of plant species with a wide range of flowering times supports a wider range of biodiversity so this is preferred ecologically over sedum or grass roofs. The roof pictured has been sown with a pollinator mix suitable for the area it is in but not this is not a mix that is suitable for Jersey.

Photograph of Ikea Greenwich courtesy of Bridgman and Bridgman.

Light weight extensive roofs can make attractive additions to sheds and garages.

## Intensive Biodiverse Roofs

Intensive biodiverse roofs have deeper substrate, typically between 200- 400 mms, so can support a wider range of plants, shrubs, and even small trees. They are more like traditional roof gardens and often have access for people to enjoy them built into the design. They have a higher nutrient requirement and require regular watering or an irrigation system. The larger weight loading needs careful consideration at the planning stage making them most suited to new builds. This type of roof can provide the maximum benefit for both people and biodiversity.

Below is Lille Train Station an example of an intensive roof in a very built-up area.

Photo by Bram D'hondt

## Sedum Only Roofs

There is a place for sedum roofs, however their disadvantage is they do not provide the best ecological value compared to more diverse green roof types. Pre-seeded mats often contain *Sedum album* White Stonecrop which has been identified as an invasive non-native plant in Jersey which poses a threat to our unique local flora. Use of such mats would need to be accompanied by a tight maintenance plan to prevent and manage escape. It would not be recommended for use in a development within or near a designated ecological Site of Special Interest.

Sedum roofs can however be an easy option for retrofits. They only require very shallow growing medium, between 20– 60 mms, and only need low nutrient levels. They support less biodiversity than other roof types because of their short flowering season and because they have often been

planted with non-native species that do not attract native insects. They can be established quickly, and they require periodic, but modest, maintenance. They can help manage rainwater flow so contribute towards sustainable drainage systems SuDS.

Photo of a sedum roof provided by Watertight Ltd.

## Grass Only Roofs

Photo by Chris Bester

A variety of native drought resistant grasses can be used to create a grass only green roof. The green roof of the **Healing Waves Centre** at Le Braye is planted with native fescue grasses. The photo also shows how green roofs can soften buildings into the wider landscape. Plant choice and design was especially important as this lies within the **Jersey National Park**.

## Getting the Most Benefit for Wildlife on Your Biodiverse Green Roof

Having a mosaic of habitats that include; pebbles, bare substrate, logs or a small water feature will be of most benefit to wildlife. Your designer can advise on weight suitability. Unvegetated areas hold heat well and are used by basking invertebrates. Differences in soil depth across the roof may create natural dew ponds important for birds and invertebrate. Logs are a useful habitat for burrowing invertebrates. Have a varied vegetation structure with flowering species that provide nectar for a range of invertebrates at various times of the year.

Photo by Bridgman & Bridgman

You may also want to encourage bats or small birds to nest by adding suitable boxes.

## Multi-function Roofs – Blue Roofs and Solar Panelled Roofs

Multifunction roofs are not an additional roof type but illustrate that several themes can be incorporated into a green roof design.

Blue roofs can be stand alone or incorporated into the green roof design. As the rainfall intensity of weather events increases due to changes in climate, the likelihood of flooding is increased. Blue roofs are constructed to reduce the speed of rainwater run-off and so manage stormwater. In areas of known flood risk, they are becoming a more common requirement and are part of what is known as Sustainable drainage systems SuDS.

Green roofs can be planted alongside solar panels and air conditioning units. Research shows that the plants benefit from the sheltering effects of the panels and from the warmth they generate on site. In 2015, the French parliament passed a law that mandates all new buildings constructed in a commercial zone to partially cover their roofs in either plants or solar panels.

Photo from Barnet. Bridgman & Bridgman.

## What can I plant on my green roof?

In an ideal world, to be of the best ecological value, a green roof would be planted with native species found in the surrounding location and habitat, grown from local seeds, or planted with plants of local provenance. These plants species have evolved alongside our native insects, butterflies and birds and so are the most beneficial at supporting of our local wildlife.

- Aim for plants native to Jersey but if non-native garden species are present, they should not be detrimental to the habitat or native wildlife.
- Watch out for plants that are native species but are supplied in seed mixes as agricultural varieties. These are more vigorous in the way they grow and would not be allowed in sensitive ecological areas.

**To support our incredibly special local environment if you see any plants "escaping" from your roof or garden please act and remove it before it spreads.**

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# Species Recommended for use on Green Roofs in Jersey

Natural Environment has worked with the Société Jersiaise Botany Section to produce a set of criteria to choose the most suitable plant species for green roofs.
The criteria used for selecting recommended plant species for green roofs are:

- exclude all plant species protected under the Wildlife (Jersey) Law 2021 (jerseylaw.je)
- exclude non-native species.
- exclude invasive or potentially invasive species Jersey » NNSS (nonnativespecies.org)
- exclude any other species which are of conservation concern (e.g. only a single known population) - a trained botanist or ecological consultant can advise on this.

The selection was made by looking at widely available seed mixes that are suitable for growing on green roofs. The species recommended meet the above criteria.

| | | | |
|---|---|---|---|
| Autumn Hawkbit | *Scorzoneroides autumnalis* | Field Forget-me-not | *Myosotis arvensis* |
| Bell Heather | *Erica cinerea* | Foxglove | *Digitalis purpurea* |
| Betony | *Betonica officinalis* | Gorse/Western Gorse | *Ulex europaeus/Ulex galli* |
| Biting Stonecrop | *Sedum acre* | Heather | *Calluna vulgaris* |
| Black Medick | *Medicago lupulina* | Herb-Robert | *Geranium robertianum* |
| Bladder Campion | *Silene vulgaris* | Lady's-bedstraw | *Galium verum* |
| Broom | *Cytisus scoparius* | Lesser Stitchwort | *Stellaria graminea* |
| Buck's-horn Plantain | *Plantago coronopus* | Meadow Buttercup | *Ranunculus acris* |
| Bulbous Buttercup | *Ranunculus bulbosus* | Mouse-ear-hawkweed | *Pilosella officinarum* |
| Common Bird's-foot-trefoil | *Lotus corniculatus* | Musk-mallow | *Malva moschata* |
| Common Cat's-ear | *Hypochaeris radicata* | Oraches | *Atriplex spp* |
| Common Centaury | *Centaurium erythraea* | Oxeye Daisy | *Leucanthemum vulgare* |
| Common Daisy | *Bellis perennis* | Perforate St. John's-wort | *Hypericum perforatum* |
| Common Dog-violet | *Viola riviniana* | Red Campion | *Silene dioica* |
| Common Knapweed | *Centaurea nigra* | Red Clover | *Trifolium pratense* |
| Common Poppy | *Papaver rhoeas* | Red Valerian | *Centranthus ruber* |
| Common Sorrel | *Rumex acetosa* | Ribwort Plantain | *Plantago lanceolata* |
| Common Stork's-bill | *Erodium cicutarium* | Rock Samphire | *Crithmum maritimum* |
| Common Vetch | *Vicia sativa* | Saw-wort | *Serratula tinctoria* |
| Corn Marigold | *Glebionis segetum* | Scarlet Pimpernel | *Anagallis arvensis* |
| Corncockle | *Agrostemma githago* | Scented Mayweed | *Matricaria recutita* |
| Cornflower | *Centaurea cyanus* | Scentless Mayweed | *Tripleurospermum inodorum* |
| English Stonecrop | *Sedum anglicum* | Sea Campion | *Silene uniflora* |
| Fennel | *Foeniculum vulgare* | Sea Holly | *Eryngium maritimum* |

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|---|---|---|---|
| Sea Mayweed | *Tripleurospermum maritimum* | Viper's Bugloss | *Echium vulgare* |
| Sea Purslane | *Atriplex portulacoides* | Wild Carrot | *Daucus carota* |
| Sea Sandwort | *Honckenya peploides* | Wild Clary | *Salvia verbenaca* |
| Selfheal | *Prunella vulgaris* | Wild Marjoram | *Origanum vulgare* |
| Sheep's-bit | *Jasione montana* | Wild Teasel | *Dipsacus fullonum* |
| Thrift | *Armeria maritima* | Wild Thyme | *Thymus polytrichus* |
| Tormentil | *Potentilla erecta* | Yarrow | *Achillea millefolium* |

## Suggested graminoid species (grasses and sedges) for green roofs

| | | | |
|---|---|---|---|
| Common Bent | *Agrostis capillaris* | Marram Grass | *Ammophila arenaria* |
| Common Sedge | *Carex nigra* | Red Fescue | *Festuca rubra* |
| Crested Dog's-tail | *Cynosurus cristatus* | Sea Couch | *Elymus athericus* |
| Crested Hair-grass | *Koeleria macrantha* | Sweet Vernal-grass | *Anthoxanthum odoratum* |
| Glaucous Sedge | *Carex flacca* | Sheep's-fescue | |

An exception has been made for Yellow Rattle *Rhinanthus minor* which although protected has already been commonly used to create or restore wildflower meadows where it maintains species diversity by suppressing dominant grasses. Shown below.

Photo by Natural Environment

## General Points to Consider When Choosing Plants

Choose native species appropriate to your location that are likely to establish well. Some companies now provide seed mixes in line with our recommend list or ask for a personalised seed mix to suit your site. Local ecologists can help advise on this further.

Some colonisations from native species already present in the area may take place. This is a positive thing. Substrates are between pH 6 -8 but substrates can be chosen to be like nearby habitats to maximise the colonisation of native species.

We understand that this is not always achievable or enforceable to strictly follow the recommended list and that gardened landscapes can be of tremendous value to wildlife. The plants used and the design plan need to also meet the needs of people who will enjoy it.

## Where to get plants and seeds

Photo by Natural Environment

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## Local Suppliers

Local garden centres and agricultural suppliers may be able to supply seed of the listed species.

**The Wildflower Hub**, based at the **Botanic Gardens at Samarès Manor**, grows, and sells seed and plant plugs of local provenance.

## Examples of some UK Suppliers

**Sky Garden** has developed a seed mix to be compatible with our recommended plant species Brochures | Sky Garden (sky-garden.co.uk)
**Bauder** produce pre-planted mats of plant species compatible with our recommended list Bauder Green Roof Seeds
**British Flora** British Flora Grass and Flower Mixes
**Meadow Mania** Meadow Mania Website
**Kings Seeds** King Seed Website

## Do I need planning permission to fit a green roof?

Please consult your architect and the Government web page Planning and Building Permissions for information.

Planning Permissions Domestic Developments

Planning Permissions Changes to Properties

## Assessing the Impact of a Proposal on Existing Biodiversity

Works to roofs and roof voids can have a negative impact on protected animals such as birds and bats. You have a legal obligation to ensure that your building work does not have an impact on protected animals. This may necessitate a wildlife survey taking place before work begins.

Photo by Natural Environment

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Information on ecological surveys can be found at the link below.

Biodiversity and development (gov.je)

Gulls are protected in Jersey. They prefer nesting sites with good views of potential threats, sometimes making the edges of the roof space less hospitable can be enough to deter them. If you have concerns about nuisance caused by nesting gulls in residential areas the following guidance is available. Nesting Gulls Web Page

## Establishing and Maintaining Your Green Roof

Like any growing project extra care is needed during the establishment stage and you will need to have a plan of how your plants will be watered and fed nutrients.

You will also have to have a plan of how the structure of your roof will be maintained. Suitable and safe access for maintenance will be required.

You may be required to submit a **Landscape Maintenance Plan** as part of your planning permission. Your green roof installer should provide you with a detailed maintenance plan.

Advice can also be found at

Bauder Maintaining Your Green Roof

## Using your intensive green roof to collect wildlife data.

If your roof can be observed from a distance or has safe access to be used by people, you may want to participate in some of the Island's wildlife recording projects or you may want to informally take up bird, bat or butterfly watching. Information on how to get involved in existing recording schemes can be found on the **Jersey Biodiversity Centre** website under the Get Involved tab.

The Jersey Biodiversity Centre

Alternatively, you can get information by contacting Wild about Jersey at

wildaboutjersey@gov.je

## Other Benefits of Green Roofs

Photo by Bridgman and Bridgman

## Carbon Reduction - Help Jersey reach its net zero targets.

Green roofs can help us reach our Carbon NetZero targets through improved insulation and increased carbon sequestration. Buildings with green roofs retain heat better reducing energy consumption, they insulate against excessive outside temperature reducing use of air conditioning, and they mitigate the heat island effect. The urban heat island (UHI) effect is where buildings act like storage heaters and contribute to higher daytime temperatures, reduced nighttime cooling and higher air pollution levels. This UHI effect contributes to heat related illness. Green roofs help towns regulate temperatures.

Jersey's Carbon Neutral Roadmap shows how we can get to net zero emissions. A summary of this can be found at the following link. Climate emergency (gov.je)

This brief guidance document ends with an image of Maggie's Centre in Leeds. Maggie's is a charity that provides free practical and emotional support for people with cancer. It is situated within the St James's University Hospital campus. The green roof of this

inspirational building was designed by the award-winning landscape designers Balston Aguis. It is inspired by the nearby Yorkshire woodlands and features native English plants. It has been designed with the belief that great design contributes to wellbeing.