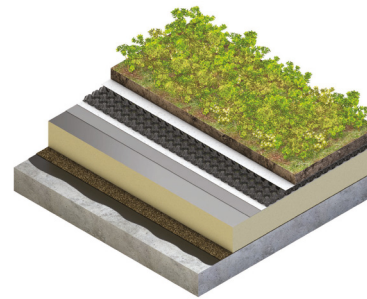


Green Roof Systems Overview

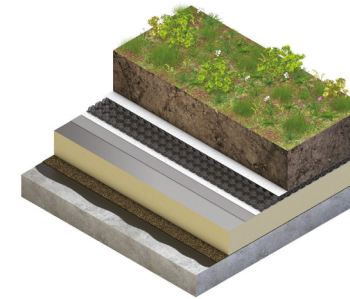
The vegetating of a roof surface is described under a number of generic terms: 'brown roof', 'biodiverse roof', 'living roof' etc. Each has evolved from the original terminology 'green roof' for marketing reasons or to differentiate specific methods of achieving habitat creation for flora or fauna. To further complicate matters there are generic technical descriptions, used globally in standards and code of practice, to describe the construction of green roof systems. These are Extensive, Semi-Intensive, Intensive and Biodiverse.

Following is a guide to some of the more common options available together with a brief overview of what they are and what they provide.

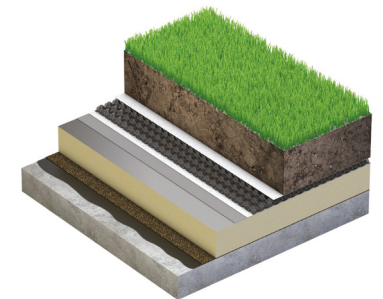
Extensive (Built Up)



Biodiverse



Intensive



Class	Generic term	Planting Options	Substrate depth	Typical weight	Benefits	Notes
Extensive	Green Roof/ Sedum Roof	Sedum blanket: A mixture of hardy succulents, primarily Sedum species supplied in a pre-cultivated blanket (20-25mm thick). Circa 6-9 species m ²	50mm, increasing to 70mm in exposed coastal locations	Saturated weight 100 kg/m ² @ 70mm depth	90-95% plant cover on installation	Suitable for all roof shapes including pitches up to circa 60°.
		Plug Planted: Pre-grown hardy succulents, primarily Sedums, installed at a rate of 16-20 per m ²	70-90mm substrate depth depending on plants chosen and location	Saturated weight 100kg/m ² @ 70mm depth Saturated weight 1235 kg/m ² @ 90mm depth	40+ species enabling tailoring of planting to suit building geography, topography, orientation, shading and/or colour/ flowering schemes	<5% plant cover on installation. Approximately 18-24 months to develop 100% cover. Wildflower plugs can be included for additional diversity.
		Cuttings & Seed: Sedum cuttings and seed sprayed in a mulch solution Circa 6-9 species m ²	70mm, increasing to 90mm in exposed coastal locations	Saturated weight 100kg/m ² @ 70mm depth Saturated weight 125kg/m ² @ 90mm depth	Lowest cost solution especially suitable for unseen or large scale roofs.	0% plant cover on installation. Approximately 18-30 months to develop 100% cover.

Extensive	Green Roof/ Wildflower Roof	Wildflower blanket: A mixture of grasses, wildflowers and hardy succulents supplied in a pre-cultivated wildflower turf (30mm + thick) Circa 9 species m ²	110mm substrated depth depending on plants chosen and location	Saturated weight 180kg/m ² @ 110mm depth	90-95% plant cover on installation.	Can be tailored to provide optimal growth in extreme rooftop conditions. Species count can be specified for BREEAM/regulatory benefit. Suitable for all roof shapes including pitches up to circa 60°
		Plug Planted: Pre-grown hardy succulents, primarily Sedums, installed at a rate of 16-20 per m ²	90- 150mm substrate depth depending on plants chosen and location	Saturated weight 125kg/m ² @ 90mm depth Saturated weight 205kg/m ² @ 150mm depth	100+ species enabling tailoring of planting to suit building geography, topography, orientation, shading and/or colour/ flowering schemes.	< 10% plant cover on installation. Approximately 18-24 months to develop 100% cover. Can be tailored to provide optimal growth in extreme rooftop conditions. Species count requirements can be specified for BREEAM and the Code for Sustainable Homes assessment.
		Seed: Wildflower seed sprayed in a mulch solution onto a prepared substrate Or Wildflower seed hand sown onto a prepared substrate. Up to 38 species m ²	90- 150mm substrate depth depending on plants chosen and location	Saturated weight 125kg/m ² @ 90mm depth Saturated weight 205kg/m ² @ 150mm depth	Lowest cost solution especially suitable for unseen or large scale roofs.	0% plant cover on installation. Approximately 18-30 months to develop 100% cover. Can be tailored to provide optimal growth in extreme rooftop conditions. Species count requirements can be specified for BREEAM and the Code for Sustainable Homes assessment.
Biodiverse	Brown Roof	Left to nature to self colonise	50mm to 450mm dependent upon the design and specification	Loading dependent upon the design and specification	Left to nature and plant species establishes without human intervention	0% plant cover on installation. Indeterminate time to develop cover. Exposed uneven substrate is utilised to create a habitat for a variety of Flora and Fauna native to brownfield sites. Includes habitat incidentals to attract beetles, insects, birds etc.
Biodiverse	Biodiverse/ Green Roof/ Living Roof	Habitat Replication or Enhancement: The use of plug plants identical to the local native plants, creating an integrated habitat template that mimics the building's surroundings.	50mm to 450mm dependent upon the design and specification	Loading dependent upon the design and specification	Can support and/or enhance planning applications. Plant species selected in sympathy with the local environment or blending or masking a project within its locality.	Can enhance site ecology for common, uncommon and rare species, including those under Biodiversity Action Plans (BAP's). Can focus on support for specific fauna such as Bees and Butterflies, Invertebrates and Birds, Bats etc. Plant cover varies on specification. Time to develop 100% cover dependant on specification. Uneven substrate is utilised for a variety of native Flora and Fauna. Includes habitat incidentals to attract beetles, insects, birds etc. Can support Biodiversity Action Plans (BAP's).
Intensive	Green Roof/ Roof Garden/ Roof Terrace	A broad variety of trees, shrubs, bushes, grasses and other plants.	300mm plus depending on planting specified	Saturated weight 450kg/m ² plus depending on specification	Amenity function at roof level creates more urban living space.	Only suitable for low pitched roofs. Can be used to create social space, sports space or simply enhance the working environment. Can be used to produce foods.