



VEGETATION FOR
EXTENSIVE & BIODIVERSE
GREEN ROOFS



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TRADITIONAL PLUG PLANTS

Bauder offers a range of vegetation in plug plant format for use in green roof installations. The plants have individual structure and form and the variety of colours provide a diverse aesthetic appearance of the roof.

KEY FEATURES

- Broad palette of plants for varied aesthetic appearance.
- Greater depth of substrate enables a broader range of plant species to be incorporated on the roof
- Increased rainwater attenuation capacity compared to XF301 vegetation blanket installations
- Cost effective on large roofs

PLANT TYPES

Sedums –These succulent plants are drought, wind and frost tolerant, will steadily grow and spread to provide an even vegetative cover over time.

Wildflowers, Herbs and Grasses - For greater biodiversity and interest, we also provide a mix of wildflowers, herbs and grasses, to be incorporated with sedums at the rate of 2 sedums to 1 other species.



SEDUM PLUG PLANTING SELECTION

Available as 4 cm units. Recommended substrate depth of 80 mm

Botanical Name	Height	Blossom	Exposure (sun or shade)	Shallow Substrate Option (60mm depth)
<i>Sedum acre</i>	30 mm	Yellow	☀	
<i>Sedum acre aurea</i>	50 mm	Yellow	☀	
<i>Sedum aizoon</i>	400 mm	Yellow	☀	
<i>Sedum album</i>	100 mm	Opaque	☀	✓
<i>Sedum album 'Micrantha'</i>	50 mm	White	☀	
<i>Sedum album 'Coral Carpet'</i>	150 mm	White	☀	✓
<i>Sedum album 'Murale'</i>	150 mm	Pink	☀	✓
<i>Sedum album 'Laconicum'</i>	150 mm	Pink	☀	
<i>Sedum anacampseros</i>	150 mm	Pink	☀	
<i>Sedum cauticolium</i>	200 mm	Reddish	☀	
<i>Sedum ewersii</i>	150 mm	Pink	☀	✓
<i>Sedum floriferum</i>	100 mm	Yellow	☀	✓
<i>Sedum forsteranum</i>	150 mm	Yellow	☀	✓
<i>Sedum hybridum</i>	150 mm	Yellow	☀	✓
<i>Sedum hispanicum</i>	100 mm	White	☀	
<i>Sedum kamtschaticum</i>	200 mm	Yellow	☀	✓
<i>Sedum kamtschaticum var.</i>	150 mm	Red / Yellow	☀	
<i>Sedum lydium</i>	150 mm	Pink	☀	
<i>Sedum reflexum</i>	150 mm	Yellow	☀	✓
<i>Sedum sarmentosum</i>	120 mm	Yellow	☀	
<i>Sedum selskianum</i>	50 mm	Light Yellow	☀	
<i>Sedum sexangulare</i>	50 mm	Yellow	☀	✓
<i>Sedum spathulifolium</i>	150 mm	Yellow	☀	
<i>Sedum spurium 'coccineum'</i>	150 mm	Red	☀	✓
<i>Sedum spurium 'kaukasus-sedum'</i>	120 mm	Red	☀	✓
<i>Sedum spurium 'Album'</i>	120 mm	Pink / White	☀	✓
<i>Sedum spurium 'Tri-color'</i>	120 mm	Pink / Yellow	☀	
<i>Sedum telephium'</i>	400 mm	Red	☀	✓

SPECIES SELECTION

Bauder Species Selection

Our Green Roof Technical Team provides a service whereby we will select the type of plants best suited to the building location, height of the roof, slope and orientation. This helps to ensure that the optimum mix is selected and reduces loss of individual species because of incorrect specification.

If any species is not available we will provide alternative species from the growers stock.

Client Selection from Stock

The client may have a preference for the species to be planted and can do so from our large range of traditional plug plants. These plants are grown as standard supply stock and are available on confirmation of quantity. This list indicates the regular varieties offered, and if any are not available, due to previous high demand, we will suggest alternatives prior to delivery.

Custom Growing of Plug Plants

On larger developments, where specific requirements for an exact combination of vegetation mix is required we are able to propagate the plants to suit the project. This service requires sufficient notification of species and quantities required as well as adequate lead time to enable the specified plants to reach established early stage growth before the predetermined delivery date. This could be as much as eight months.

Custom grown plug plants will incur additional charges should the order be modified or cancelled prior to delivery.

This bespoke service is arranged with your Area Technical Manager or the Green Roof Technical Team.



MIX PERENNIAL PLUG PLANTING SELECTION

(including wildflowers, herbs and grasses etc) - Available as 5-6cm units. Recommended substrate depth of 80mm

Botanical Name	Height (mm)	Blossom	Exposure (sun or shade)	Shallow Substrate Option (60mm depth)
<i>Achillea millefolium</i>	350	White	☼	
<i>Achillea tomentosa</i>	150	Yellow	☼	
<i>Allium schoenoprasum</i>	300	Lilac	☼	✓
<i>Allium sphaerocephalon</i>	400	Purple	☼	
<i>Allium moly</i>	250	Yellow	☼	
<i>Alyssum saxatile</i>	150	Yellow	☼	
<i>Antennaria dioica</i>	150	Reddish	☼	
<i>Armeria maritima</i>	150	Red	☼	
<i>Campanula poscharskyana</i>	150	Blue	☼	
<i>Campanula rotundifolia</i>	200	Blue	☼	
<i>Cerastium tomentosum</i>	200	White	☼	
<i>Dianthus alpinus</i>	100	Pink	☼	
<i>Dianthus deltoides</i>	150	Red	☼	✓
<i>Dianthus carthusian</i>	450	Red	☼	
<i>Dianthus caesius</i>	150	Pink	☼	
<i>Dianthus plumarius</i>	250	Pink	☼	
<i>Euphorbia cyparissias</i>	250	Yellow	☼	
<i>Euph. myrsinitis</i>	150	Yellow	☼	
<i>Fragaria viridis</i>	100	Opaque	☼	
<i>Gypsophylla repens</i>	100	Pink	☼	
<i>Geranium macrorrhizum</i>	300	Pink	☼	
<i>Geranium sanguineum</i>	200	Lilac	☼	
<i>Geranium x cantabrigiense</i>	250	Pink / White	☼	
<i>Heianthemum num.</i>	100	Yellow	☼	
<i>Hyssopus officinalis</i>	400	Blue	☼	
<i>Inula ensifolia</i>	400	Yellow	☼	
<i>Iris pumila</i>	300	Blue	☼	
<i>Jovibarba hirta</i>	100	Yellow	☼	
<i>Lavandula angustifolia</i>	400	Blue	☼	
<i>Lychnis alpina</i>	200	Pink	☼	
<i>Linum perenne</i>	300	Blue	☼	
<i>Muscari</i>	250	Blue	☼	✓
<i>Nepeta fasseni</i>	250	Blue	☼	
<i>Origanum vulgare</i>	150	Pink	☼	
<i>Petrorhagia saxifraga</i>	150	Pink	☼	✓
<i>Potentilla aurea</i>	150	Yellow	☼	
<i>Potentilla verena</i>	50	Yellow	☼	✓
<i>Prunella vulgaris</i>	100	Violet	☼	
<i>Saponaria ocymoides</i>	100	Pink	☼	
<i>Sanguisorba minor</i>	100	White	☼	
<i>Scabiosa canescens</i>	350	Blue	☼	
<i>Satureja montana</i>	200	Lilac	☼	
<i>Saxifraga aizoon</i>	100	White	☼	
<i>Saxifraga arendsii</i>	100	Red / Pink	☼	
<i>Saxifraga umbrosa</i>	100	White	☼	
<i>Sempervivum</i>	100	Pink	☼	✓
<i>Silene maritima</i>	150	White	☼	
<i>Teucrium chamaedrys</i>	200	Pink	☼	✓
<i>Thymus serpyllum</i>	150	Pink	☼	✓
<i>Thymus vulgaris</i>	250	Pink	☼	
<i>Verbascum phoenicum</i>	700	Blue	☼	
<i>Verbascum nigrum</i>	700	Yellow	☼	
<i>Veronica teucrium</i>	180	Blue	☼	

UK PROVENANCE NATIVE SPECIES PLUG PLANTS

The introduction of the BREEAM and Sustainable Homes codes has led to a significant change in the requirement for the supply of vegetation to be incorporated into green roofs. Whereas sedum species have been widely used in green roofs for many years, the incorporation of native species varieties, which include grasses, herbs and wildflowers, provides a fresh challenge for the specifier.

To keep pace with changing market demand, we have worked with an established UK grower of wildflowers to make available a range of native species vegetation, grown from UK provenance seed stock, all of which will flourish in traditional substrate-based green roof systems. This provides a broad palette from which the project ecologist may ask us to select or alternatively may wish to select for themselves, to secure the credits needed to meet the scheme requirement.

BREEAM AND SUSTAINABLE HOMES CODES

In considering how green roofs will support both BREEAM and Sustainable Homes code projects, a number of credits can be secured in the Land Use and Ecology section by improving the ecological value of the site. This is achieved by increasing the number of locally significant species as specified by a registered ecologist found on the site after construction. The calculation is dependant upon the number of species included and the green area of the roof.

KEY FEATURES

- Broad palette for ecologically focused green roofs
- UK provenance plants
- Greater depth of substrate enables a broader range of plant species to be incorporated on the roof
- Increased rainwater attenuation capacity compared to XF301 vegetation blanket installations
- Cost effective on large roofs

SPECIES SELECTION

Bauder Plant Community Selection Service

Our Green Roof Technical Team provides a service whereby we will select the type of plant community suited for the biodiversity action plan for the roof. Generally, there are four categories that we look to provide; grassland, chalk soil, wildflower meadow and coastal tolerant plants. If any species is not available we will provide alternatives from the growers stock.

Client Selection

The client may self-select the plants required from our large range of UK provenance plug plants. These plants are grown as standard supply stock and are available on confirmation of quantity. This list indicates the regular varieties offered, and if any are not available, due to previous high demand, we will suggest alternatives prior to delivery.

Custom Growing of Plug Plants

On larger developments, where specific requirements for an exact vegetation mix is required we are able to propagate the plants to suit the project. This service requires notice of a full season to enable the specified plants to reach sufficient early stage growth, furthermore a deposit is required at the time of placing the order and additional charges will arise should the order be modified or cancelled prior to delivery.

This bespoke service is arranged with your area Technical Manager or the Green Roof Technical Team.





UK NATIVE SPECIES PLUG PLANTS SELECTION

Botanical Name	Height (mm)	Blossom	Exposure (sun or shade)	Plugs	Bare Root Stock
<i>Achillea millefolium</i>	250	White	☀️	✓	
<i>Anthyllis vulneraria</i>	50	Yellow	☀️	✓	
<i>Armeria maritima</i>	120	Pink	☀️	✓	
<i>Bellis perennis</i>	30	White / Yellow	☀️	✓	
<i>Briza media</i>	30	N/A (Grass)	☀️		✓
<i>Campanula rotundifolia</i>	120	Blue	☀️	✓	
<i>Campanula glomerata</i>	150	Blue	☀️	✓	
<i>Carex flacca</i>	150	Blue foliage	☀️	✓	
<i>Daucus carota ssp maritimus</i>	150	White	☀️	✓	
<i>Festuca ovina</i>	300	N/A (Grass)	☀️		✓
<i>Festuca rubra ssp ruba</i>	300	N/A (Grass)	☀️	✓	
<i>Fragaria vesca</i>	50	White	☀️	✓	
<i>Galium verum</i>	150	Yellow	☀️	✓	
<i>Geranium robertinum</i>	50 - 200	Blue / Pink	☀️	✓	
<i>Helianthemum nummularium</i>	80	Purple	☀️	✓	
<i>Hypericum perforatum</i>	150	Yellow	☀️	✓	
<i>Hypochaeris radicata</i>	150	Yellow	☀️	✓	
<i>Leontodon autumnalis</i>	80	Yellow	☀️	✓	
<i>Leontodon hispidus</i>	80	Yellow	☀️	✓	
<i>Leucanthemum vulgare</i>	200	White / Yellow	☀️	✓	
<i>Linaria vulgaris</i>	150	Yellow	☀️	✓	
<i>Lotus corniculatus</i>	50	Yellow	☀️	✓	
<i>Origanum vulgare</i>	150	Mauve	☀️	✓	
<i>Plantago coronopus</i>	80	Brown	☀️	✓	
<i>Plantago lanceolata</i>	150	White	☀️	✓	
<i>Primula veris</i>	120	Yellow	☀️	✓	
<i>Prunella vulgaris</i>	50	Purple	☀️	✓	
<i>Ranunculus bulbosus</i>	200	Yellow	☀️	✓	
<i>Sanguisorba minor</i>	150	Pink	☀️	✓	
<i>Scabiosa columbaria</i>	250	Blue	☀️	✓	
<i>Sedum acre</i>	60	Yellow	☀️	✓	
<i>Sedum album</i>	100	White	☀️	✓	
<i>Silene latifolia ssp. alba</i>	200	White	☀️	✓	
<i>Silene maritima</i>	120	White	☀️	✓	
<i>Silene vulgaris</i>	200	White	☀️	✓	
<i>Thymus polytrichus</i>	40	Mauve	☀️	✓	
<i>Viola riviniana</i>	50	Purple	☀️	✓	
<i>Viola tricolor</i>	50	Purple / Yellow	☀️	✓	

All plants are grown in peat-free compost

Please note that Bauder Ltd cannot guarantee the supply of the exact mix of vegetation ordered.

INSTALLATION AND MAINTENANCE

Key to the success of any green roof installation is the care taken of the vegetation at the time of installation and immediately thereafter to ensure that it establishes in its new location and will require only minimal maintenance to keep it in good condition in the future.

Whilst every installation will have a marginally different requirement, dependent upon a broad range of factors, the following information is

intended to provide a general insight into what will be needed in most situations. For further information please see the green roof section of our website, bauder.co.uk, for our guides on Bauder Installation, Maintenance and Watering appropriate to the vegetation and system.

BAUDER VEGETATION BLANKETS (XF301, XF300 & XF118)

Harvesting and Delivery to Site

The Bauder vegetation blankets are harvested and transported to site within 24 hours and so deliveries to a building project only occur on Tuesday-Friday.

On-site Requirements

A water supply at roof top level is required during the installation of any vegetation blanket. Once an area of installation is completed the vegetation blanket is heavily watered to ensure that the plants and substrate are saturated before moving on to the next area.

The installation pattern is quite straightforward and will be devised by the Bauder Approved Contractor to suit the roof shape, orientation and pitch. Upon completion of the installation, Bauder organic slow release fertiliser is applied and watered-in to assist the plants' establishment and providing them with nutrients to promote growth.

Vegetation Barriers

Vegetation barriers are created and installed by using 20 - 40mm round washed pebbles at the perimeters, upstands and abutments and provides protection against wind uplift at the edges of the blanket as well as rapid surface drainage during heavy rainfall.

XF301 Combination Sedum Blanket

The XF301 Sedum Blanket already incorporates the depth of substrate required in to which the plants are established.

XF300 Sedum Blanket and XF118 Wildflower Blanket

These vegetation blankets are installed over a depth of substrate which will be levelled and watered to the point of saturation before the blankets are positioned. If large areas are to be installed then watering and installation is done in sections of as much area as can be completed within 4 hours.

Post Installation Watering Requirements

The vegetation blankets will require a post-installation irrigation period of 4 weeks for sedums and 10 weeks for wildflowers where the blankets should not be allowed to dry out. The amount of watering the plants will require depends upon the location of the building, the roof type and degree of pitch, local climate and exposure levels and the type of plants in the vegetation blanket.

It may also be necessary to irrigate for longer than this if installation is followed by a warm, dry spell of weather. To encourage the plants to survive without topical irrigation and harden them ready to survive the winter it is important to start cutting back watering from early September. The maintenance requirement in the years following installation will depend upon the weather experienced through the winter and early spring of each year and should follow our standard extensive green roof maintenance guidelines, excepting where weather conditions have caused significant damage to the vegetation.



▲ Rolls being harvested and prepared for delivery.



▲ Long length rolls being craned into position and installed.



▲ Bauder SS40 Drainage and Edge Trim

INSTALLATION AND MAINTENANCE

BAUDER PLUG PLANTS

Delivery to Site

The plant trays will be delivered either shrink-wrapped on pallets or sealed in cardboard boxes which should either be placed in a cool area out of direct sunlight for overnight storage or opened, the plug trays spread around and watered and left overnight to acclimatise.

In exceptional weather we are unable to make available the plugs for delivery until conditions improve. We are only able to advise three days before delivery if such a problem occurs.

We recommend that plug plants are installed in the periods from mid-March to the end of May and September to October. If it is necessary to carry out an installation outside of these periods, please contact Bauder Technical Services for advice before proceeding with the works.

On-site Requirements

A water supply at roof top level is required during the installation of plug plants. Once an area of installation is completed the area is heavily watered to ensure that the plants and substrate are saturated before moving on to the next area.

The plug plants in their trays are saturated prior to the commencement of planting out. Plugs are placed in groups of 5-13 of the same species, dependent upon the overall roof size, at the density per m² as specified. The completed area is watered to saturation point before moving on to the next section.

Upon completion of the installation Bauder organic slow release fertiliser is applied at a rate of 80g/m² and watered in.

Vegetation Barriers

Vegetation barriers are created and installed by using 20-40mm round washed pebbles at the perimeters, upstands and abutments and provide protection against wind uplift at the perimeter as well as rapid surface drainage during heavy rainfall.

Post Installation Watering Requirements

After completion of the installation it will be necessary to keep the substrate and plants damp for a period of at least 4 weeks immediately afterwards for traditional plugs and 10 weeks for native species plugs, and it may be necessary to irrigate for longer than this if installation is followed by a warm, dry spell of weather. To encourage the plants to survive without topical irrigation and harden them ready to survive the winter it is important to start cutting back watering from early September.

The anticipated period of establishment to provide good vegetated cover is at least two full years. The maintenance requirement over this period will depend to a large extent upon the weather experienced through the winter and early spring of each year and should follow our standard extensive and biodiverse green roof maintenance guidelines, excepting where weather conditions have caused significant damage to the vegetation.



INSTALLATION AND MAINTENANCE

KS PLUS SEED MIXTURE

The seeds are pre-mixed with nutrients, fertiliser and a tackifying carrier which bulks out the volume to aid installation whilst also providing the ideal nutritional background to support initial establishment.

Substrate Requirements

The seeds require sufficient depth of Bauder extensive substrate to support the roots of the plants once they are fully established. This is a lightweight growing medium that is manufactured to FLL standards which is then top-dressed with Bauder Seed Bed Substrate, which has a finer consistency and higher level of organic matter to enable the seeds to germinate.

The substrate is watered sufficiently, almost to saturation, before the seed mix is broadcast on the roof.

Sowing Rate

The seed mix has a coverage rate of 1Kg to 10m² of roof area and is provided in either 2Kg or 5Kg bags. The seeds will only be sown in fair weather, as strong winds will disperse the seeds before they reach the substrate.

Even coverage is gained by sowing 50% of the mix longitudinally down the roof, and then over-sown at 90° with the remainder of the seed mix.

Best results are achieved from spring and autumn sowings; however the mix can be sown throughout the year.

Establishment

Due to the components incorporated within the seed mix there is no requirement for establishment maintenance. It is advisable to ensure that the roof surface is not trafficked other than for essential roof maintenance for the first 12 months after sowing. Bare patches can be over-sown if considered necessary, but will develop vegetative cover over time in any case. The anticipated period of establishment to provide a good vegetated cover is at least two years.



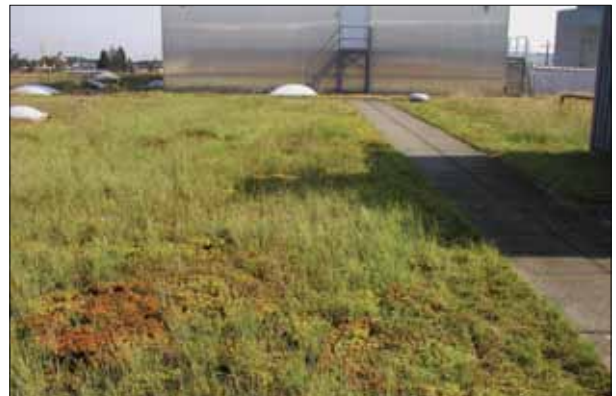
▲ After about 8 weeks



▲ At 12 - 16 weeks



▲ The second growing season



▲ After a few years



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