Arbtech Consulting Ltd
Arboricultural and Ecological Consultants
www.arbtech.co.uk

Report of Enhancement Measures

Site: Dinting Lane, Glossop

20th December 2012

Author:
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Report signed off:
Robert Oates
MD

General Information

Author

The author is Martin O'Connor Dip. BSc (Hons.) CEnv MIEEM. Martin holds licences from Natural England and the Countryside Council for Wales to survey for Bats, GCN and Dormouse:

Scope

To provide a suggested/indicative enhancement scheme to increase the biodiversity value of the project.

Locality

- The site is located near Glossop.
- The grid reference at its centre is SK09950.
- The nearest postcode is SK13 2BL.

Site Description and further information

The Dinting Lane site is situated in Hadfield, Glossop. Dinting Rd runs south to west along the western boundary. To the eastern boundary lies a railway line running south/north. To the northern boundary Shaw lane is located, consisting of residential housing.

The site itself consists of a large open field, with scattered trees across the site. A tree line runs along the railway line on the eastern boundary. Dinting Rd is located to the western boundary running the length of the site. Small pockets of scattered scrub are also found around the site.

To the northern boundary an area consisting of marshy grassland and tall ruderal vegetation is found. An ephemeral pond is located in the marshy grassland area. It is understood that this is dry for the best part of the year, only holding water on occasion.

A Phase 1 survey was conducted in 2011 to assess the site for habitats and protected species, none were found. Further to this in December 2012 an update visit was undertaken, as the survey was over 12 months old and an ephemeral pond became apparent.

Proposed works at the site.

The current plans include for residential dwellings with associated gardens, roads and green space.

Generic Enhancement Measures

Enhancements

The owners have asked that an enhancement plan for biodiversity be drawn up to increase the potential of the site for biodiversity. With the retention of green space, native planting and enhancements the site can be enhanced for biodiversity.

It is currently understood that an area to the north of the site can be retained and enhanced for wildlife value. This area currently contains the ephemeral pond, marshy grass and tall ruderal vegetation, with scattered retained trees (see Figure 1 for location).

The following suggested enhancements can be incorporated into the wildlife area to increase its value as habitat.

Bats

Roosting opportunities can/will be incorporated around the site, these can be simple bat boxes attached the retained trees.

Boxes should be no less than 3m from ground level, these should face south or southwesterly were possible.

Additional lighting should not be directed at any created roost or box, ideally all lighting should be on PIR sensors and have downward deflectors, when situated close to enhancements.

Any landscape plan should incorporate an element of native planting (it is understood that the landscape architect and ecologist will finalise this at a later date), which should include night flowering species such as honeysuckle *Lonicera spp*. these will provide nectar for invertebrates and therefore a food source for bats and other insectivores.

1. Bat boxes should be of the Schweglar type 1FF (see Figure 2), these are known to support brown long eared bats and crevice dwelling species (the most likely to be found if present), from bat boxes projects around the country e.g. Finmere woods bat box project.

Figure 2: Type 1FF bat box

Birds

The following boxes have been chosen to be used in the scheme, these are also produced by Schwelgar, these will be installed as detailed below.

1. Install swift boxes (Schwegler 1MF Double Swift) on the new buildings (Figure 3).

Figure 3: Swift box

2. Install standard song bird boxes (Schwegler 1B Bird Box and Schwegler 2H Open Fronted Robin Box) see Figure 4 and 5).

Figure 4: Standard bird box

Figure 5: Robin box

Insect Boxes

There are numerous insect boxes available built from woodcrete, the following are suggested for the site.

1. Over ground/underground bumblebee boxes which can be located in the wildlife area.

Figure 7: Above ground bumblebee box.

2. Combination insect box designed to house lacewings,earwigs, ladybirds, up to 200 different types of wild bees, masked hunters,robber flies, thrips,solitary wasps and occasionally butterflies.

Figure 8: combination insect box.

The above boxes have been chosen for their longevity and minimal maintenance requirements. All are made from woodcrete which has a life span of at least 25yrs, far outlasting a standard untreated timber box.

Plants

It is currently understood that the wildlife area could be enhanced with native/wildlife friendly planting. Species will be chosen according to their value to wildlife in consultation with the landscape architect. Examples of species that could be used are detailed in Appendix 1.

Where possible planted species should be of local provenance and or local seed sources, Flora Local can provide information on nursery's which can supply these species.

Pond

The pond could be managed to prevent succession in the long term, this would include clearing one-third of the vegetation on a rotation to allow standing water to form on a regular basis. Arising's can be used to form habitat piles around the wildlife area.

Refuge(s)

Refuges for common amphibians, insects and small mammals can be easily created by forming log piles around the wildlife area. Stacked logs, rubble and arising's from management can all be used to create these habitat features.

Badgers

It is currently understood that evidence of foraging and/or commuting badgers' *meles meles* was found on site. No setts could be located on the site; however it is

most likely that any setts (if present) could be along the railway line. This indicates that the badger population (if present) is use to disturbance from the trains, the roads and residential dwellings, thus development work is unlikely to affect their use of the site.

As no building will occur within 30m of the boundary fence running along the track embankment, no further work is deemed necessary and simple precautions and enhancements can be made to protect and enhance for foraging/commuting badgers.

Mitigation

1. No machines (tracked/wheeled etc.) are to be used within 30m of the railway line embankment/fence line.
2. No storage of materials should occur within the 30m of the track/fence line, any chemicals should be stored in line with COSHH requirements.
3. Any trenches/footings should be back filled were possible overnight. If this is unfeasible a rough sawn plank should be place into the hole in order to prevent trapping of any species.
4. Badger exclusion fencing could be utilized along the railway buffer (see Figure 1) to prevent ingress into the development zone.

Enhancements

The current master-plan shows an approximate 40 -60m buffer zone running along the railway. This area can be utilized to provide a foraging/commuting corridor for both badgers and other species. The following details suggested enhancements that could be used to improve the buffer zone for wildlife:

1. Any planting should use an element of native/wildlife friendly species, these could include fruit bearing species e.g. *Prunus spp*.
2. As little man-management should be used in the long term to allow the strip to develop into a naturalised habitat. Monitoring for health and safety should still form part of this management.
3. Habitat piles e.g. log piles can be placed along the buffer zone, helping to increase insect diversity and available food for badgers and other inverstivore species.
4. Where possible minimal disturbance should occur in the buffer zone.

Conclusion

The above measures are currently suggested enhancement and mitigation that could be utilized on site to increase the habitat and biodiversity value. Firm details of suggested planting, locations for boxes and management will require discussions with the landscape architect, architect and ecologist.

Overall the above measures will increase the current value of the site by providing know measures for biodiversity. Currently the site lacks several of these habitat features. Safeguards can be put in place to protect suspected wildlife interest during the build and gains can be made in the long term.

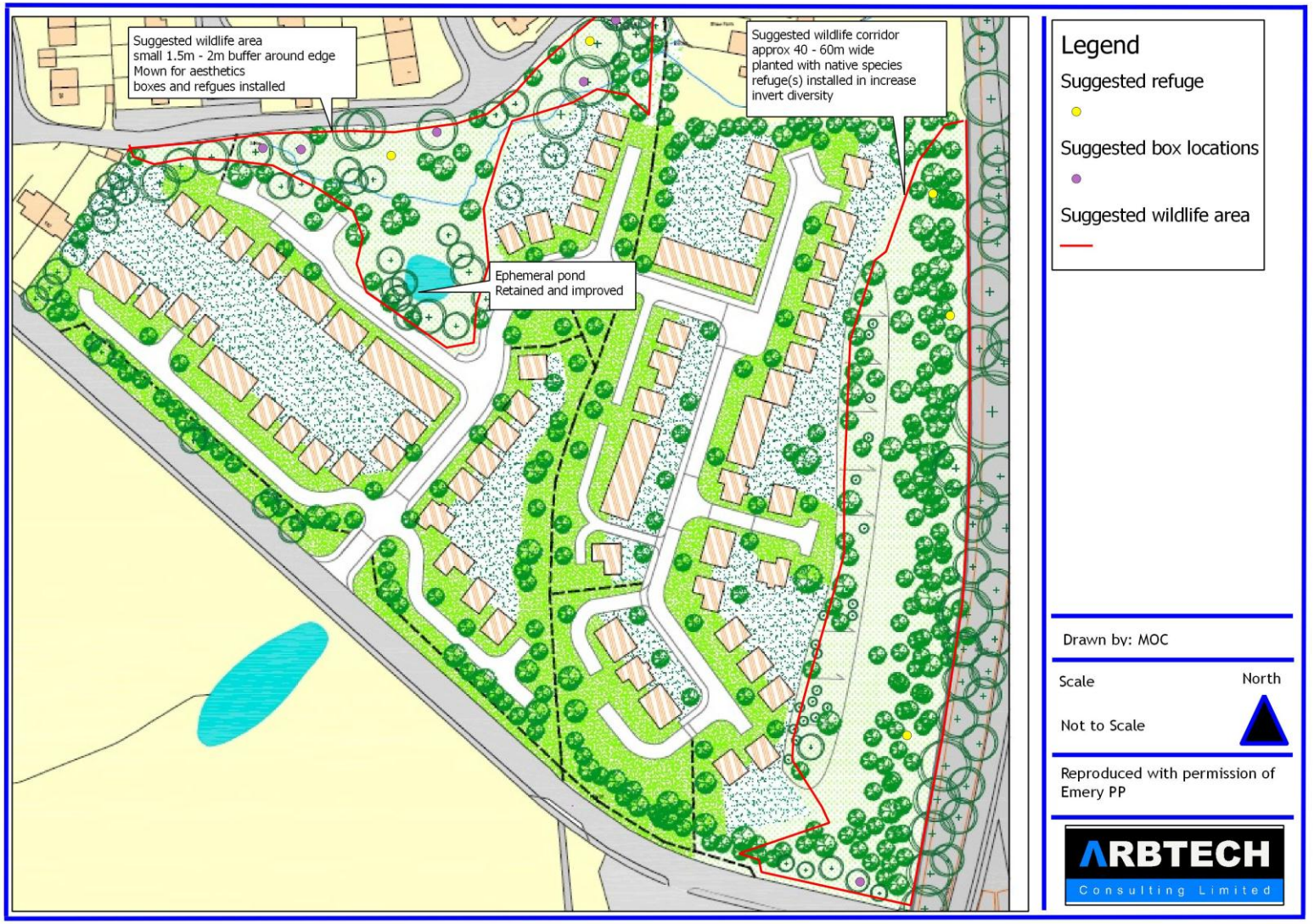

Figure I Locations of wildlife areas

Contact Information

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More information about our company, people and services can be accessed via our Web site, at the URL: http://www.arbtech.co.uk.

Document Production and Approval

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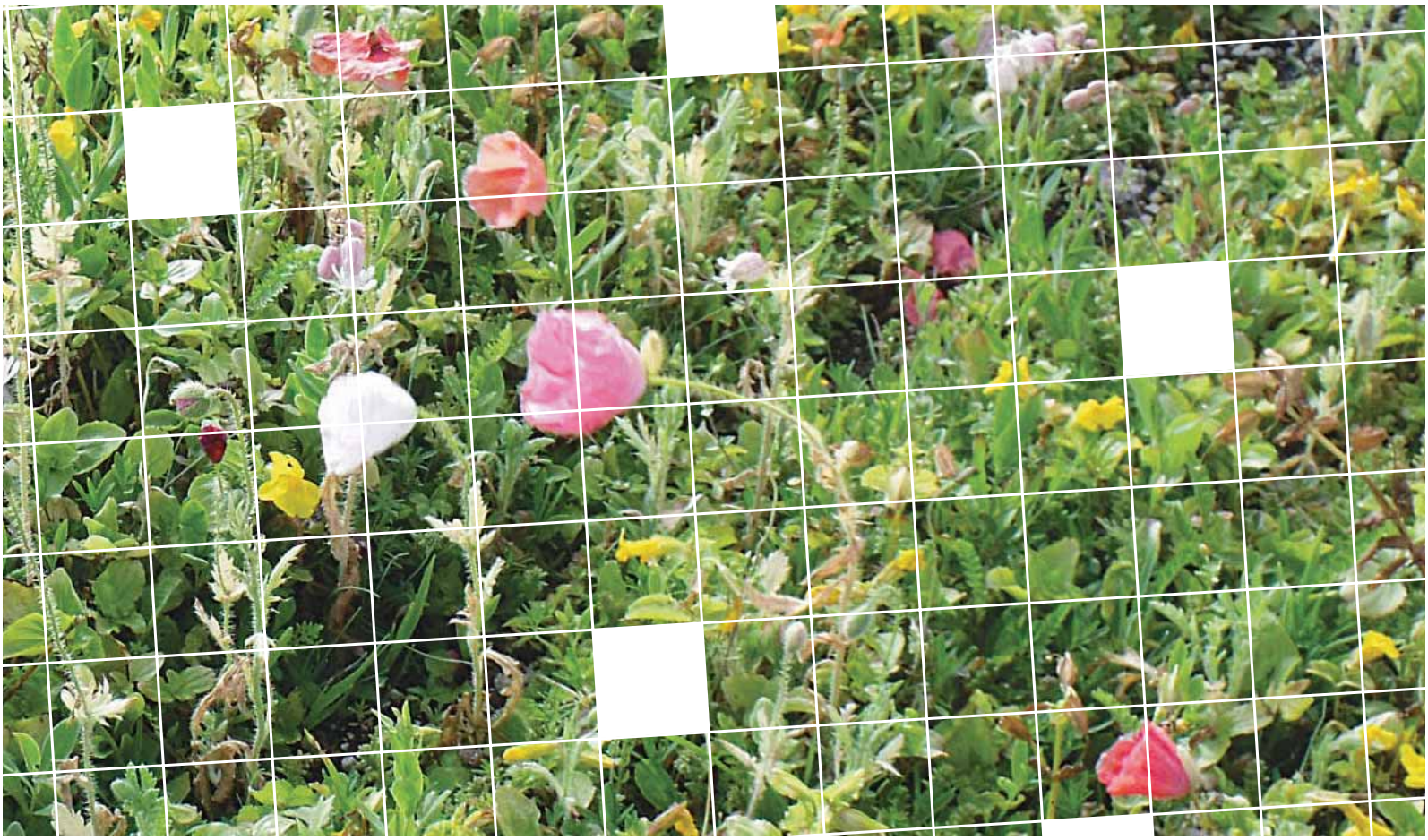
BAUDER



UK NATIVE SPECIES PLUG PLANTS

SELECTING UK NATIVE SPECIES PLUG PLANTS

The introduction of the BREEAM and Sustainable Homes codes has lead 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 wild flowers, provides a fresh challenge for the specifier.

To keep pace with changing market demand, we have worked with an established UK grower of wild flowers 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 range 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, it should be borne in mind that 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.

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

SPECIES SELECTION OPTIONS

'Plant Community Type' Selection
To assist you in your deliberations, we have identified four different species mixes, for grassland, chalk, wildflower meadow and alpine plant communities, which are listed opposite. If you decide upon one of these selections, we will supply the mix as indicated, providing suitable alternatives should any species not be available from the growers stock. This is our preferred option of supply.

Client Selection from Stock
Should you wish to self-select, we list on the back page the full species list available for you to choose from. Please select the species and number of plants required and we will advise on availability and alternatives prior to delivery

Custom Growing
On larger developments, where there are specific species requirements, it may be possible for the vegetation to be grown specifically for the project. It should be noted that a minimum full growing seasons notice is required to offer this service, that a deposit will be required at the time of placing the order and that additional charges will arise should the order be modified or reduced prior to delivery.

Should you wish to consider this option please contact Bauder Sales Office in the first instance.

All 27cc plugs come in trays of 135 pieces, charged only for 130 plants.

CHALK PLUG PLANTS SELECTION

Latin Name	Common Name	Exposure (sun - shade)	Colour	Height of Flowers	27cc Plugs	Bare Root Stock
Achillea millefolium	Yarrow	☀◐	White	250 mm	✓	
Armeria maritima	Thrift	☀	Pink	120 mm	✓	
Briza media	Quaking Grass	☀	Grass	300 mm		✓
Campanula rotundifolia	Harebell	☀◐	Blue	120 mm	✓	
Campanula glomerata	Clustered Bellflower	☀	Blue	150 mm	✓	
Daucus carota ssp maritimus	Wild Sea Carrot	☀	White	150 mm	✓	
Festuca ovina	Sheep's Fescue	☀◐	Grass	300 mm		✓
Festuca rubra ssp juncea	Red Fescue	☀◐	Grass	300 mm	✓	
Galium verum	Lady's Bedstraw	☀◐	Yellow	150 mm	✓	
Helianthemum nummularium	Common Rock-Rose	☀◐	Yellow	80 mm	✓	
Leontodon hispidus	Rough Hawkbit	☀	Yellow	80 mm	✓	
Leucanthemum vulgare	Oxeye Daisy	☀	White/Yellow	200 mm	✓	
Linaria vulgaris	Yellow Toadflax	☀◐	Yellow	150 mm	✓	
Lotus corniculatus	Birds-Foot Trefoil	☀	Yellow	80 mm	✓	
Origanum vulgare	Wild Marjoram	☀◐	Mauve	40 mm	✓	
Plantago coronopus	Bucks-Horn Plantain	☀	Brown	80 mm	✓	
Primula veris	Cowslip	☀◐	Yellow	120 mm	✓	
Prunella vulgaris	Selfheal	☀◐	Purple	50 mm	✓	
Ranunculus bulbosus	Bulbous Buttercup	☀	Yellow	200 mm	✓	
Sanguisorba minor	Salad Burnet	☀	Pink	150 mm	✓	
Scabiosa columbaria	Small Scabious	☀	Blue	250 mm	✓	
Sedum acre	Biting Stonecrop	☀	Yellow	60 mm	✓	
Sedum album	White Stonecrop	☀	White	100 mm	✓	
Silene maritima	Sea Campion	☀	White	120 mm	✓	
Thymus polytrichus	Wild Thyme	☀	Mauve	40 mm	✓	

ALPINE PLUG PLANTS SELECTION

Latin Name	Common Name	Exposure (sun - shade)	Colour	Height of Flowers	27cc Plugs	Bare Root Stock
Armeria maritima	Thrift	☀	Pink	120 mm	✓	
Carex flacca	Glaucous Sedge	☀◐	Blue foliage	150 mm	✓	
Linaria vulgaris	Yellow Toadflax	☀◐	Yellow	150 mm	✓	
Origanum vulgare	Wild Marjoram	☀◐	Mauve	150 mm	✓	
Sedum acre	Biting Stonecrop	☀	Yellow	60 mm	✓	
Sedum album	White Stonecrop	☀	White	100 mm	✓	
Thymus polytrichus	Wild Thyme	☀	Mauve	40 mm	✓	

SELECTING UK NATIVE SPECIES PLUG PLANTS

WILDFLOWER MEADOW PLUG PLANTS SELECTION

Latin Name	Common Name	Exposure (sun - shade)	Colour	Height of Flowers	27cc Plugs	Bare Root Stock
Achillea millefolium	Yarrow		White	250 mm	✓	
Anthyllis vulneraria	Kidney Vetch		Yellow	150 mm	✓	
Bellis perennis	Daisy		White/Yellow	30 mm	✓	
Geranium sp.	Geranium Varieties		Blue/Pink	50 - 200 mm	✓	
Campanula rotundifolia	Harebell		Blue	120 mm	✓	
Campanula glomerata	Clustered Bellflower		Blue	150 mm	✓	
Festuca rubra ssp juncea	Red Fescue		Grass	300 mm	✓	
Fragaria vesca	Wild Strawberry		White	50 mm		✓
Galium verum	Lady's Bedstraw		Yellow	150 mm	✓	
Glechoma hederacea	Ground Ivy		Blue	100 mm		✓
Hypochaeris radicata	Cats Ear		Yellow	150 mm	✓	
Leontodon autumnalis	Autumn Hawkbit		Yellow	80 mm	✓	
Leontodon hispidus	Rough Hawkbit		Yellow	80 mm	✓	
Leucanthemum vulgare	Oxeye Daisy		White/Yellow	200 mm	✓	
Linaria vulgaris	Yellow Toadflax		Yellow	150 mm	✓	
Potentilla reptans	Creeping Cinquefoil		Yellow	30 mm	✓	
Primula veris	Cowslip		Yellow	120 mm	✓	
Primula vulgaris	Primrose		Yellow	100 mm	✓	
Prunella vulgaris	Selfheal		Purple	50 mm	✓	
Ranunculus bulbosus	Bulbous Buttercup		Yellow	200 mm	✓	
Sanguisorba minor	Salad Burnet		Pink	150 mm	✓	
Scabiosa columbaria	Small Scabious		Blue	250 mm	✓	
Silene latifolia ssp. alba	White Campion		White	200 mm	✓	
Silene vulgaris	Bladder Campion		White	200 mm	✓	
Stachys officinalis	Betony		Purple	150 mm	✓	
Thymus polytrichus	Wild Thyme		Mauve	40 mm	✓	
Viola hirta	Hairy Violet		Purple	120 mm	✓	
Viola riviniana	Common Dog Violet		Purple	50 mm	✓	
Viola tricolor	Wild Pansy		Purple/Yellow	50 mm	✓	

GRASSLAND PLUG PLANTS SELECTION

Latin Name	Common Name	Exposure (sun - shade)	Colour	Height of Flowers	27cc Plugs	Bare Root Stock
Armeria maritima	Thrift		Pink	120 mm	✓	
Briza media	Quaking Grass		Grass	300 mm		✓
Campanula rotundifolia	Harebell		Blue	120 mm	✓	
Carex flacca	Glaucous Sedge		Blue foliage	150 mm	✓	
Festuca ovina	Sheep's Fescue		Grass	300 mm		✓
Glechoma hederacea	Ground Ivy		Blue	10 mm		✓
Helianthemum nummularium	Common Rock-Rose		Yellow	80 mm	✓	
Hypericum perforatum	Perforate St Johns Wort		Yellow	150 mm	✓	
Linaria vulgaris	Yellow Toadflax		Yellow	150 mm	✓	
Potentilla reptans	Creeping Cinquefoil		Yellow	30 mm	✓	
Thymus polytrichus	Wild Thyme		Mauve	40 mm	✓	

INSTALLATION & MAINTENANCE GUIDELINES

Installation

Plant trays should be lifted to roof level and unpacked immediately, or alternatively may be kept in cool covered storage prior to lifting to roof level for a maximum of 2 days.

It is essential that both the growing medium and the plugs are thoroughly watered both prior to and immediately after installation.

Please ensure that all operatives carrying out the vegetation installation have read and understand the Bauder installation and establishment guidelines for vegetation plugs, which are available in a separate document.

Maintenance

Designated biodiversity areas should be disturbed as little as possible during maintenance so as not to disrupt any micro-habitats that may have colonised.

Biodiversity roofs usually require only minimal maintenance and we are happy to offer advice on issues concerning your roof and how to maintain it in good order. We believe that our products and systems are of the highest standard and are willing to talk through any queries or concerns that you may have. It is always useful to provide photographs to accompany queries where possible.

COMPLETE LIST OF UK NATIVE SPECIES PLUG PLANTS IN MULTI TRAYS

UK NATIVE SPECIES PLUG PLANTS SELECTION

Latin Name	Common Name	Exposure (sun - shade)	Colour	Height of Flowers	27cc Plugs	Bare Root Stock
Achillea millefolium	Yarrow	☀◐	White	250 mm	✓	
Anthyllis vulneraria	Kidney Vetch	☀	Yellow	50 mm	✓	
Armeria maritima	Thrift	☀	Pink	120 mm	✓	
Bellis perennis	Daisy	☀◐	White/Yellow	30 mm	✓	
Briza media	Quaking Grass	☀	Grass	30 mm		✓
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Campanula glomerata	Clustered Bellflower	☀	Blue	150 mm	✓	
Carex flacca	Glaucous Sedge	☀◐	Blue foliage	150 mm	✓	
Daucus carota ssp maritimus	Wild Sea Carrot	☀	White	150 mm	✓	
Festuca ovina	Sheep's Fescue	☀◐	Grass	300 mm		✓
Festuca rubra ssp juncea	Red Fescue	☀◐	Grass	300 mm	✓	
Fragaria vesca	Wild Strawberry	☀✹	White	50 mm		✓
Galium verum	Lady's Bedstraw	☀◐	Yellow	150 mm	✓	
Geranium sp	Geranium Varieties	☀✹	Blue/Pink	50 - 200 mm	✓	
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Linaria vulgaris	Yellow Toadflax	☀◐	Yellow	150 mm	✓	
Lotus corniculatus	Birds-Foot Trefoil	☀	Yellow	50 mm	✓	
Origanum vulgare	Wild Marjoram	☀◐	Mauve	150 mm	✓	
Plantago coronopus	Bucks-Horn Plantain	☀	Brown	80 mm	✓	
Plantago lanceolata	Ribwort Plantain	☀◐	White	150 mm	✓	
Potentilla reptans	Creeping Cinquefoil	☀◐	Yellow	30 mm	✓	
Primula veris	Cowslip	☀◐	Yellow	120 mm	✓	
Primula vulgaris	Primrose	☀✹	Yellow	100 mm	✓	
Prunella vulgaris	Selfheal	☀◐	Purple	50 mm	✓	
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Thymus polytrichus	Wild Thyme	☀	Mauve	40 mm	✓	
Viola hirta	Hairy Violet	☀◐	Purple	120 mm	✓	
Viola riviniana	Common Dog Violet	☀✹	Purple	50 mm	✓	
Viola tricolor	Wild Pansy	☀	Purple/Yellow	50 mm	✓	