

Roof Landscape & Biodiversity

Linton House, 39-51 Highgate Road, NW5 1RT

November 2016



This document has been prepared to support the discharge condition 2 and 3 of application Ref: 2015/6513/P granted 03/02/2016 [Variation of condition 2 (development in accordance with approved plans) of planning permission 2013/3494/P (granted on appeal under APP/X5210/A/13/2207697) dated 03/03/2014] which states as follow:

2 *Prior to the first occupation of the building, detailed plans showing the location and extent of photovoltaic cells to be installed on the building shall have been submitted to and approved by the Local Planning Authority in writing. The measures shall include the installation of a meter to monitor the energy output from the approved renewable energy systems. The cells shall be installed in full accordance with the details approved by the Local Planning Authority and permanently retained and maintained thereafter.*

Reason: To ensure the development provides adequate on-site renewable energy facilities in accordance with the requirements of policy CS13 of the London Borough of Camden Local Development Framework Core Strategy and policy DP22 of the London Borough of Camden Local Development Framework Development Policies.

3 *Prior to the first occupation of the building a plan showing details of the green roof including species, planting density, substrate and a section at scale 1:20 showing that adequate depth is available in terms of the construction and long term viability of the green roof, and a programme for a scheme of maintenance shall be submitted to and approved in writing by the local planning authority. The green roof shall be fully provided in accordance with the approved details prior to first occupation and thereafter retained and maintained in accordance with the approved scheme of maintenance.*

Reason: To ensure that the green roof is suitably designed and maintained in accordance with the requirements of policies CS13, CS14, CS15 and CS16 of the London Borough of Camden Local Development Framework Core Strategy and policies DP22, DP23, DP24 and DP32 of the London Borough of Camden Local Development Framework Development Policies.

In order to increase the biodiversity and the viability of the green roof vegetation, the PV panels have been relocated from the south area of the penthouse roof to the central roof of the winter gardens. The area previously dedicated to the PV panels will be occupied by the green roof and will result in a large combined vegetation area as opposed to the previous proposal where the vegetation area was more linear and thin (please refer to the comparison plan 152_128). This solution will allow for a more viable vegetation, more diverse planting scheme and will provide a natural habitat for biodiversity of flora and fauna.

The green roof area to the south side of the roof will be 100% vegetation cover, split between Sedum Blanket on 80mm substrate (60%) and biodiverse wildflower mixture of seeded and plug planted areas on 100-150mm substrate (40%). The sedum achieves the target of keeping the roof green all over the year (the sedum will blossom as well in spring time) whilst the wildflower mixture fulfil the

Council's requirements for biodiversity and a more native green-roof. The substrate for the roof will be typically 80mm increasing up to 150 mm where the wildflower mixture will be located.

The strategy of a sedum blanket with wildflower mixture of seed and 'plug' plants has been decided upon taking a number of factors into account:

- It is considered that the seed and 'plug' planting will provide a high level of biodiverse planting to the landscaped roof area, allowing the inclusion of a number of UK native species.
- The lower 80mm substrate depth allows for a shallower build-up at the edge, allowing a minimal profile for bulk-head detail, while maintaining the ability to incorporate 'plug' planting by increasing the depth to 150mm where necessary.
- The shallower depth of soil required will also aid in keeping the structural loading to a minimum, particularly relevant in this case as the new construction is proposed above an existing structure.

Biodiverse Specification for Linton House

System Build-up (roof laid with 1° - 2° fall) Parapet wall and Balustrade

All roofs will have good levels of natural light, with minimal shading at certain times of day.

Separation and Protection layers:

Green Roof system will be fitted above PE foil separation layer and FSM600 Protection mat as protection layer

Green Roof Build up:

20mm DSE20 drainage layer

Bauder filter fleece

Bauder (FLL Compliant) Extensive substrate: Varied substrate depth between 80mm - 150mm

AL150 Drainage Trim to separate substrate from Pebble border

Surface finishes as detailed below:

100% vegetation cover, split between Sedum Blanket on 80mm substrate (60%) and biodiverse wildflower mixture of seeded and plug planted areas on 100-150mm substrate (40%).

Sedum Blanket:

Bauder Xero Flor XF300 vegetation blanket is a sedum blanket product developed as an extensive green roof finish that provides instant precultivated vegetation. XF300 is intended for application directly over Bauder Extensive Substrate as the underlying growing medium. XF300 incorporates a patented polypropylene substrate retention mesh bonded to a water permeable base carrier. The advantage is that this ensures that the blanket substrate doesn't compact over time and this helps to maintain the vegetation in optimum condition. The vegetation within this product is a mix of hardy sedum species together with some grasses and moss.

Biodiverse Wildflower Mixture

Seed

Suggested Seed Mix (Bauder Flora 3 Seed Mix). Covering approx. 20% of the bio-diverse areas. This seed mix uses a tackifier and slow release fertiliser to maximise the germination of the seed mix. To give a seeded rate of 5gms per sqm the rate of Bauder Flora 3 mix required will be 100g/m².

Note: Bauder Flora 3 Seed Mix contains 38 wildflower species (mix is approved to be RHS “perfect for pollinators”), 9 annuals, 8 grasses and sedges. All of which are certified British Native Provenance (as defined by Flora Locale).

Plug Planting

Plugs planted at 15-25 per m². Covering approx. 20% of the biodiverse areas.

Possible suggested plug mix as follows:

Yarrow	<i>Achillea millefolium</i>
St John's Wort	<i>Hypericum perforatum</i>
Yellow-wort	<i>Blackstonia perfoliata</i>
Common Centaury	<i>Centaureum erythaea</i>
Kidney Vetch	<i>Anthyllis vulneraria</i>
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>
Bristly Ox-tongue	<i>Helminthotheca echioides</i>
Dove's-foot Crane's-bill	<i>Geranium molle</i>
Common Eyebright	<i>Euphrasia nemorosa</i>
Betony	<i>Stachys officinalis</i>
Mugwort	<i>Artemisia vulgaris</i>
Devil's – bit	<i>Scabious succisa pratensis</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Selfheal	<i>Prunella vulgaris</i>
Corncockle	<i>Agrostemma githago</i>

**Highlighted in the summary of existing habitat.*

Bauder (FLL Compliant) Extensive Substrate:

Bauder Biodiverse Substrate is a FLL Certified, GRO compliant substrate. Using 100% recycled crushed brick it is light weight, low nutrient, free draining.

Note: System depth will be fixed at 150mm (120 substrate depth) around the perimeter of the roof with shallower and deeper areas in the centre (80-150mm). Total system height will vary from 100mm to 180mm above WP layers.

Habitat Management Plan for Linton House

1. **Landscape Management Objectives**
2. **Review of the Management Plan**
3. **Maintenance and Monitoring**

Initial 10 weeks

Establishment Period 1-2 yrs

Maintenance Period 3-5 yrs

1. **Landscape Management Objectives**

The landscape and habitat management plan for Linton House is based on the initial Ecology report and subsequent biodiversity specification for the roof areas. The key components of which are:

- A broad variety of sustainable habitat
- An increasing number of flora and fauna species present on the site
- Sedum blanket covering no more than 60% of the total green roof area

To be read in conjunction with the roof plan of the green roof areas.

2. **Review of the Management Plan**

The flora and fauna on the roofs is likely to evolve over time. It is therefore highly likely that the plan be required to change and along with it the maintenance requirements. To facilitate this the plan calls for monitoring in the second summer with a review of the plan and maintenance for years three to five. This process to be repeated again after five years.

3. **Maintenance Programme**

2 visits per year in Spring/summer and autumn for five years.
Additional monitoring visit in summer of second and fifth year.

Work to be carried out by Bauder Green Roof Maintenance.

Note: None of the green roof are designed to be trafficked in any way, the roofs should not be accessed by anyone except for repair or essential maintenance works, any damage to the surface finishes of the roofs should be reported to Bauder immediately.

Initial 10 weeks (directly after installation)

The green roofs, both sedum and biodiverse are designed to need a minimum of maintenance. However, some initial watering will be required during the first 10 weeks after installation if there is insufficient rain fall.

- Watering of plugs and seeded areas (after the seed has germinated) should be regular (every day) when there are periods without rainfall, this can be reduced as the planting become more established.
- Watering should be carried out with a fine mist sprinkler or rose. Care should be taken not to wash out plugs and seed with excessive water or pressure.
- Efforts should be made to not to traffic the roof during watering.

Monitoring

Assess the % failure of plugs 10 weeks after planting. If failure rate are greater than 40% the failed plugs should be replaced. Any species with a >75% failure rate should be substituted.

Establishment Period (Yrs 1-2)

Maintenance. During the first 2 years maintenance visits should be twice yearly (spring/summer and autumn)

Maintenance Works

All Areas, every visit work required:

- Pebble Border: remove all vegetation from Pebble borders.
- Outlets: check outlets are clear and free from slit and detritus.

Biodiverse Roofs work required:

- Remove unwanted and invasive weeds.
- Log piles: check for movement caused by wind or animal activity.
- Sand and stone piles: If required weed some areas of sand to insure bare ground is present in some locations.
- Wildflower areas: Cut and remove flower seed heads and taller grasses above 150mm. if required (during autumn visit only).

Monitoring

Summer of year 2

- Assessment of the number of original plant species still present on site, plus additional species which may have colonised the roofs. After an initial introduction of 27 Plus plant species onto the range of roof habitats.
- Assessment of the success of the wet area, log piles. Stone and sand areas with details of what species are flourishing in these area.
- Assess the % failure of plugs. If failure rate are greater than 40% the plugs should be replaced. Any species with a >75% failure rate should be substituted.

From these assessments the management plan for the following 3 yrs can be adjusted.

Sedum Areas

Sedum is not tolerant of foot traffic. Access to the sedum areas should be restricted to essential maintenance only.

Work Required:

- Remove unwanted and invasive weeds.
- Fertilise blanket in spring/summer visit as per Bauder Specification.
- Remove grass and weed from sedum areas.
- Patch any open joints or bare areas with Xeroflor and sedum cuttings.

Maintenance Period (Yrs 3-5)

Maintenance. During the years three to five maintenance visits should be twice yearly (spring/summer and autumn)

Maintenance works all areas every visit:

- Pebble Border: remove all vegetation from Pebble borders.
- Outlets: check outlets are clear and free from silt and detritus.

Biodiverse Roofs work required:

- Remove unwanted and invasive weeds.
- Log Piles: check for movement caused by wind or animal activity.
- Sand and stone piles: If required weed some areas of sand to insure bare ground is present in some locations.
- Wildflower: Assess the percentage coverage of wildflowers.
- Cut and remove flower seed heads and taller grasses (above 150mm) if required during Autumn visit only.

Monitoring

Summer of year 5

- Assessment of the number of original plant species still present on site, plus additional species which may have colonised the roofs.
- Assessment of the success of the wet area, log piles. Stone and sand areas with details of what species are flourishing in these area.

From these assessments and reference to the local BAP (due 2016) the management plan for the following 5 yrs can be adjusted.

Sedum Areas

Access to the sedum areas should be restricted to essential maintenance only

- Remove unwanted and invasive weeds.
- Fertilise blanket in spring/summer visit as per Bauder Specification.
- Remove grass and weed from sedum areas.
- Patch any open joints or bare areas with Xeroflor and sedum cuttings.