Civil Structural Surveys Project Management

Report Title: **BIODIVERISTY & AMENITY PLAN**

Address: **Plot 8, Hendre Parc, Tycroes SA18 3FA**

Client: **Mr Tony Salini**

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1.0 INTRODUCTION

This document sets out the recommended planting scheme for individual SUDs devices to be constructed at the new industrial building development located at plot 8, Hendre Parc, Tycroes SA18 3FA.

The purpose of this document is to set out the appropriate species for each SUDs component. This is to ensure that both the adoptable and non-adoptable features will have suitable flora and fauna.

The species listed in this document are generic to the relative SuDS types and are purely recommendations. The final planting scheme for each SUDs feature (e.g. pond) will be developed by the approved landscape contractor.

2.0 PLANTING SCHEMES

*2.*1 Rainwater Gardens/Planters

Common Name	Scientific Name	Habitat	Sunlight and Aspect	Origin
Guelder Rose	Viburnum Opulus	Perennial shrub	Any	Native
Dogwood	Comus Sanguinea	Perennial shrub	Any	Native
Stinking Hellebore	Helleborus foetidus	Herbaceous perennial	Full sun or partial shade	Native
Bugle	Ajuga reptans	Rhizomatous perennial	Partial shade	Native
Hemp Agrimony	Eupatorium cannabinum	Herbaceous perennial	Full sun or partial shade	Native
Bellflower	Campanula glomerata	Herbaceous perennial	Full sun or partial shade	Native
Purple Loosestrife	Lythrum salicaria	Herbaceous perennial	Full sun or partial shade	Native
Yellow Flag	Iris pseudocorus	Rhizomatous perennial	Full sun or partial shade	Native
Water Mint	Mentha aquatica	Herbaceous perennial	Full sun or partial shade	Native
Soft Rush	Juncus effusus	Evergreen perennial	Full sun or partial shade	Native
Pendulous Sedge	Carex pendula	Rhizomatous perennial	Full sun or partial shade	Native
Ragged Robin	Lychnis flos-cuculi	Herbaceous perennial	Full sun or partial shade	Native
Marsh Woundwort	Stachys palustris	Rhizomatous perennial	Full sun or partial shade	Native
Royal Fern	Osmunda regalis	Deciduous fern	Any	Native
Male Fern	Dryopteris felix-mas	Deciduous or evergreen fern	Full sun or partial shade	Native
Broad Buckler Fern	Dryopteris dilatata	Deciduous or evergreen fern	Full sun or partial shade	Native

Table 1: Recommended Rainwater Garden/Planter Plants

Please refer to HCE-1715-CVD-SK02 for general locations [Ref.2].

*2.*2 Wildflower Meadow

The species listed below are taken from a generic British native wildflower seed mix [Ref.3] which flowers May to October and is suitable for a wide range of soil types and environments. Ideal for situations where a long-term meadow is required as well as immediate impact.

For best results sow into bare soil after clearing all existing plants and weeds from the area. Cultivate the ground to a depth of 10cm to relieve compaction and create a fine level tilth, free from obstructions (to allow for mowing at a later stage). Finish the seedbed by treading or lightly rolling the area, so that it is firm enough to stand on without leaving indentations. Where weeds have been prevalent, allow a flush of weeds to germinate and remove these before sowing. In areas of high fertility, it may be necessary to remove the topsoil and sow into the subsoil. High nutrient soils encourage weeds and fast-growing grasses which may outcompete the wildflowers in this mixture.

It is recommended that the seed mixture should be sown between March and November, where spring and autumn provide ideal conditions as moisture and warmth are in good supply. Distribute seed with a handheld or pedestrian spreader, at the recommended sowing rate of 5g/sqm. Mix the wildflower seeds with an inert carrier (such as sharp sand), at a ratio of four parts sand to one part seed (by weight). This makes it easier to achieve an even distribution and also provides a visual marker, making it easier to see any missed patches and avoid seeding areas twice. Regularly mix the seed when sowing, as seeds will naturally separate due to variations in size and weight. Once sown, ensure good 'seed to soil' contact by lightly raking to a depth of 0.5cm or rolling the area. It is also possible to broadcast, drill or hydroseed this mixture for larger or hard to reach areas. However, broadcast spreading throws heavier seeds further so this may impact the distribution and when drilling, the seed must not be buried deeper than 0.7cm.

Common Name	Scientific Name	Flowers	Type	Origin
Lady's bedstraw	Galium verum	Jun-Sep	Perennial	Native
Black medick	Medicago lupulina	May-Oct	Annual	Native
Salad burnet	Sanguisorba minor	Jun-Sep	Perennial	Native
Meadow buttercup	Ranunculus acris	May-Jun	Perennial	Native
Red campion	Silene dioica	Apr-Sep	Perennial	Native
White campion	Silene alba	May-oct	Perennial	Native
Wild carrot	Daucus carota	Jun-Oct	Perennial	Native
Night-flowering catchfly	Silene noctiflora	Jun-Aug	Annual	Native
Corn chamomile	Anthemis arvensis	Jun-Jul	Annual	Native
Wild clary	Salvia verbenaca	May-Aug	Perennial	Native
Corn cockle	Agrostemma githago	May-Aug	Annual	Native
Cornflower	Centaurea cyanus	Jun-Oct	Annual	Native
Cowslip	Primula veris	Apr-May	Perennial	Native
Ox-eye daisy	Leucanthemum vulgare	May-Sep	Perennial	Native
Field forget-me-not	Myosotis arvensis	May-Jul	Annual	Native
Wild fofglove	Digitalis purpurea	Jun-Aug	Biennial	Native
Goatsbeard	Aruncus dioicus	Jun-Aug	Perennial	Native
Common knapweed	Centaurea nigra	Jun-Sep	Perennial	Native
Greater knapweed	Centaurea scabiosa	Jun-Sep	Perennial	Native
Corn marigold	Chrysanthemum segetum	Jun-Oct	Annual	Native
Musk mallow	Malva moschata	May-Sep	Perennial	Native
Common poppy	Papaver rhoeas	May-Jul	Annual	Native
Self-heal	Prunella vulgaris	Jun-Sep	Perennial	Native
Common sorrel	Rumex acetosa	May-Jul	Perennial	Native
Common st John's-wort	Hypericum perforatum	Jun-Sep	Perennial	Native
Yarrow	Achillea millefolium	Jun-Oct	Perennial	Native
Yellow rattle	Rhinanthus minor	Jun-Sep	Annual	Native
Common bent	Agrostis castellana	N/A	Grass	Native
Crested dog's tail	Cynosurus cristatus	N/A	Grass	Native
Sheeps fescue	Festuca ovina	N/A	Grass	Native
Slender creeping red fescue	Festuca rubra, litoralis	N/A	Grass	Native

Smooth-stalked meadow grass	Poa pratensis	N/A	Grass	Native
Small leaved Timothy	Phleum pratense ssp Bertolinii	N/A	Grass	Native

Table 2: Recommended Wildflower Meadow Mix

Please refer to HCE-1715-CVD-SK02 for general locations [Ref.2].

3.0 BIODIVERSITY ENHANCEMENT STRUCTURES

3.1 Bug Hotels

The basic framework of the bug hotels is to be made of wooden pallets. Use recycles or reclaimed materials where possible. The structure does not need to be more than five pallets high. Although the structure should be stable, secure each pallet to the one below.

Fill the gaps in the bug hotel with:

- Dead wood – *Dead wood is an increasingly rare habitat and is essential for the larvae of wood-boring beetles. It also supports many fungi, which help to break down the woody material. Crevices under the bark hold centipedes and woodlice.*
- Hollow stems – *Hollow stems, such as old bamboo canes, or holes drilled into blocks of wood, make good nesting sites for solitary bees.*
- Stones and tiles – *Amphibians need a frost-free place to spend the winter. Providing stones and tiles in the centre of the habitat will give amphibians the conditions they need.*
- Straw and hay – *These provide many opportunities for invertebrates to burrow in and find safe hibernation sites.*
- Dry leaves – *Dry leaves offer homes for a variety of invertebrates by mimicking the litter on the forest floor.*
- Loose bark – *Beetles, centipedes, spiders, and woodlice all lurk beneath decaying wood and bark.*
- Corrugated cardboard – *Roll up a piece of corrugated cardboard and put it in a waterproof cylinder to create a home for lacewings.*
- Dry sticks – *Dry sticks are perfect for ladybirds to hibernate in.*
- Nectar-producing plants – *Plant some nectar-rich flowers in and around the habitat to provide food for butterflies and bees.*

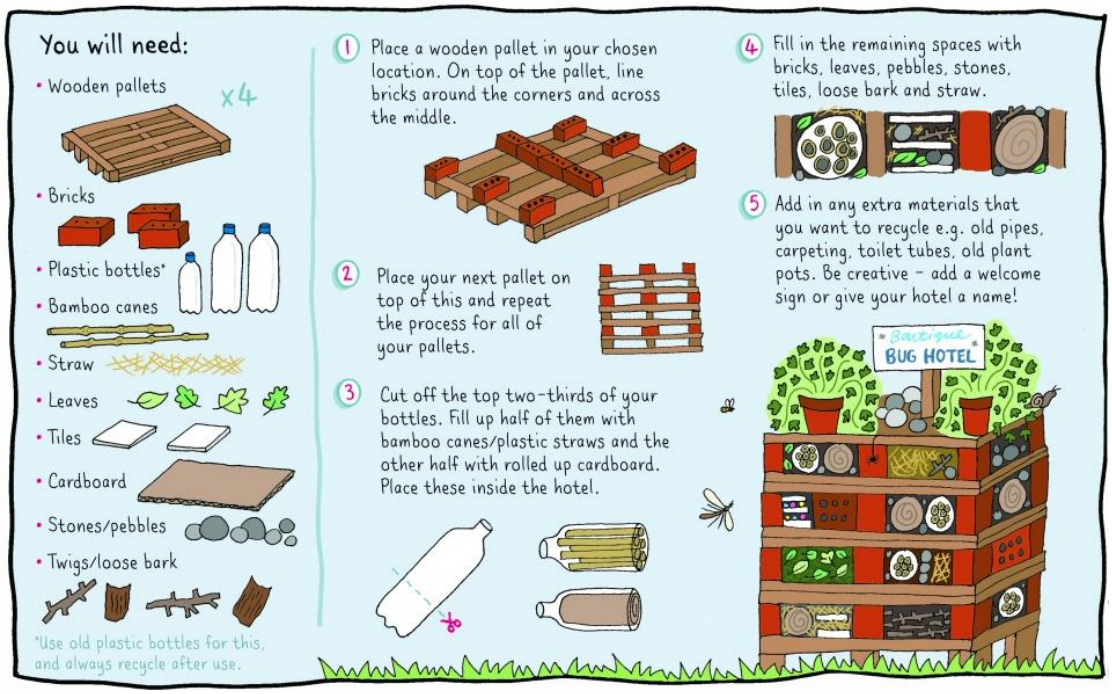

Figure 1: Bug hotel construction

Please refer to HCE-1715-CVD-SK02 for general locations [Ref.2].

3.2 Hibernacula

A hibernaculum will provide a safe space for amphibians and reptiles such as frogs, newts, lizards and snakes to hibernate/brumate over winter.

To construct a hibernaculum:

- In a sunny spot, dig a hole (circular) about 50cm deep and 1~1.5m across.
- Fill with logs, branches, bricks and rocks, leaving plenty of gaps in between.
- Insert entrance tubes (drainpipes) at ground level into the hole.
- Cover the pile with soil (to about 50cm high).
- Plant meadow seeds or long grasses over the mound to provide for summer pollinators.

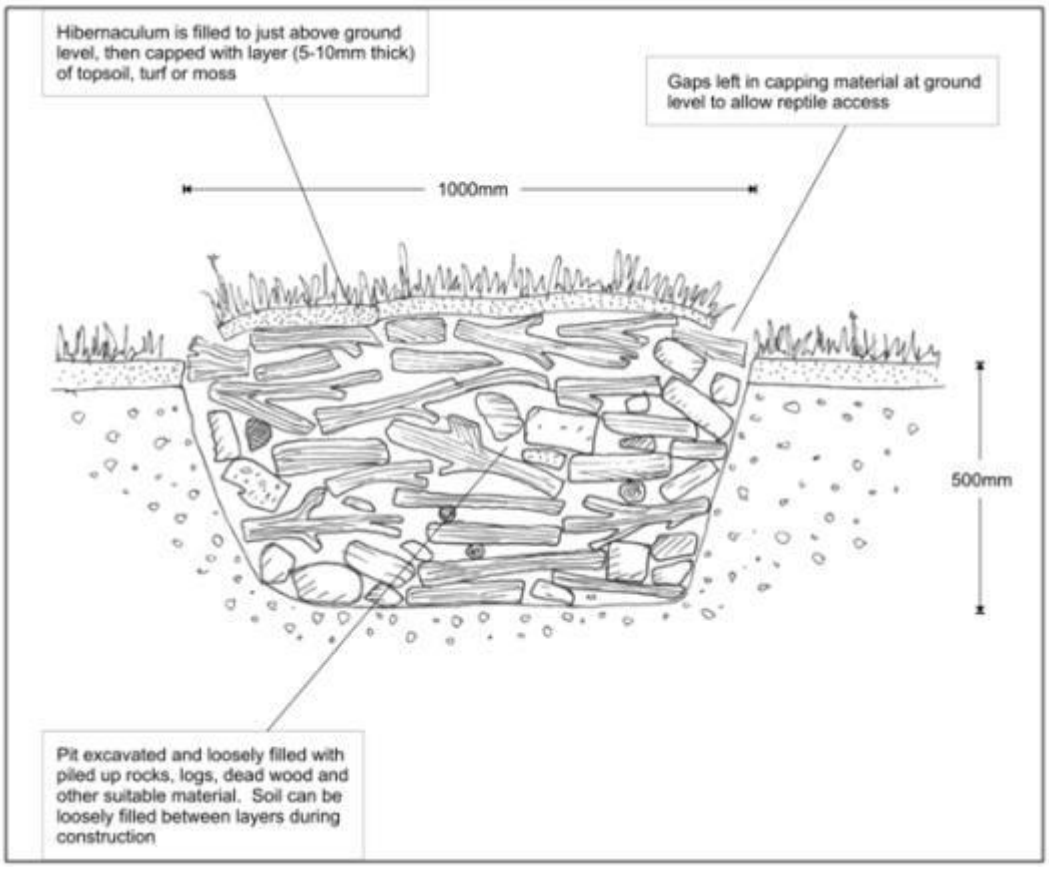

Figure 2: Hibernaculum example section

Hibernacula must be positioned a minimum of 0.5m from and water retention areas (e.g. ponds or wetland). Please refer to HCE-1715-CVD-SK02 for general locations [Ref.2].

3.3 Hedgehog Hotel

The number of hedgehogs in the UK has plummeted over recent years. While there were estimated to be around 1.5 million in 1995, today there is believed to be less than 500,000. Urban populations of hedgehogs have increased by up to a third, while rural populations have halved. This decline is likely caused by the loss and degradation of habitats due to pressures such as development, agricultural intensification and climate change.

To construct a hedgehog home the following will be required:

- Hammer and nails
- 2 metal hinges
- Soil
- Dry leaves
- Straw or dry grass
- Newspapers
- Polythene sheeting
- 20mm untreated FSC plywood boards (birch ideally) cut to the following sizes;
    - Back – 40cm x 30cm
    - 2 no. Side – 26cm x 30cm
    - Base – 40cm x 30cm
    - Lid – 40cm x 30cm
    - Front (L-shaped) – 40cm x 30cm with 17cm x 17cm square taken from corner
    - 4 no. Feet – 8cm x 8cm
    - 2 no. Tunnel Side – 30cm x 13cm
    - 2 no. Tunnel Top – 30cm x 17cm

To construct the hedgehog hotel, cut the timber to the dimensions stated above. Assemble tunnel and main chamber separately, attaching the feet and the hinge flap before putting the box together. The tunnel will be slightly shorter than the height of the opening so that it can be slotted at an angle, making a ramp. To further improve the structure, it is possible to drill a hole that will fit a small hose pipe into the back of the box to add some extra ventilation.

Position the hedgehog hotel at a shady, quiet spot once assembled. Lift the lid off the house, and put the newspaper, leaves and dry grass inside.

Cover with polythene sheeting (ensuring it's still accessible for future maintenance) and pack soil and dead leaves around the outside, leaving the entrance and air pipe free of debris.

Figure 3: Hedgehog hotel example

Please refer to HCE-1715-CVD-SK02 for general locations [Ref.2].

5.0 REFERENCES

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2. HCE Storm Water Drainage Strategy HCE-1715-CVD-SK02
3. Lanfdlife wildflowers – LWXM Dual Purpose Wildflower Mix
4. The Wildlife Trust, How to build a bug hotel - https://www.wildlifetrusts.org/actions/how-build-bug-mansion
5. The Wildlife Trust, How to build a hibernacula - https://www.wildlifetrusts.org/actions/how-build-hibernaculum-amphibians-and-reptiles