



Biodiversity Management Plan for a Proposed Large-Scale Residential Development on Lands at Confey, Leixlip, Co. Kildare.



30th July 2026

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1. Introduction

1.1 Biodiversity Management Plan

The following Biodiversity Management Plan (BMP) has been prepared for a Proposed Large-scale Residential Development on Lands within the townlands of Confey, Leixlip, Co. Kildare

This BMP is informed by the landscape strategy prepared by Murphy + Sheanon Architects, in addition to the Objectives outlined in the KCC draft Biodiversity Action Plan 2026-2031. It outlines the measures implemented to improve and enhance the biodiversity value of the site and how to ensure that biodiversity is encouraged on site during the short, medium and long-term.

1.2 Contents of the Biodiversity Management Plan

The Biodiversity Management Plan cross-references both landscape and existing habitat elements. It initially describes the proposed project and outlines a series of mitigation measures to protect important biodiversity/habitats on site during construction and operation. The landscape elements of the proposed project include measures to enhance biodiversity across all landscape components on site. These biodiversity enhancement measures are outlined and will be implemented. Of significant importance to the long-term enhancement of the site for biodiversity are the habitat & biodiversity protection and maintenance measures that will be in place during operation. These measures are also outlined and will ensure the long-term biodiversity enhancement of the proposed development.

1.3 Relevant Planning Policy and Legislation

This BMP has been prepared with regard to the Kildare County Development Plan 2023-2029, County Kildare Draft Biodiversity Action Plan 2026-2031, and the National Biodiversity Action Plan 2023-2030, including objectives relating to biodiversity enhancement, and sustainable development, as set out in these plans.

In relation to European and national legislation, the requirements of the Habitats Directive and the Wildlife Act have been addressed within the Natura Impact Statement and the Ecological Impact Assessment included within the Environmental Impact Assessment report that have been prepared by Altamar for this development.

1.4 Description of the Proposed Project

The proposed development provides a total of 125 residential units, comprising 81 no. houses, 22 no. duplex units and 22 no. apartments. The housing element consists of a mix of semi-detached and terraced dwellings, including 56 no. 3-bedroom houses and 25 no. 4-bedroom houses, ranging in height from 2 to 3 storeys. The development includes 22 no. duplex units within 11 duplex blocks, comprising 11 no. 2-bedroom and 11 no. 3-bedroom duplex homes, arranged over 3 storeys. The apartment element comprises 22 no. units within a single apartment block of up to 5 storeys in height, consisting of 5 no. 1-bedroom apartments and 17 no. 2-bedroom apartments.

Provision of car, cycle and motorbike parking will be provided throughout the development.

Vehicular, pedestrian, and cyclist access points will be provided from the north of the site via R149, with additional pedestrian and cyclist access provided from the south via the Royal Canal Greenway. The development will also provide landscaping, public and communal open spaces and all associated site development works to facilitate the project. These include boundary treatments, plant and waste management areas, and other service provisions. The proposed site outline/location, and site plan demonstrated in Figures 3 & 4

1.5 Ecological Baseline

A field survey was carried out by Calvin Townsend-Smyth on the 11th September 2025 and by Jeff Boyle on the 7th July 2026 in relation to flora and fauna. The surveys were carried out in warm and dry conditions and covered all land within the site outline and the land immediately outside the site. The purpose of the field surveys were to identify habitat types according to the Fossitt (2000) habitat classification and map their extent. Additionally, more detailed information on the species composition and structure of habitats, conservation value and other data were gathered. Notes were also taken on any incidental sightings of fauna or signs of fauna that were made during the field surveys. It should be noted that the following habitats & species section is based on the most recent field survey undertaken on the 7th July 2026.

Survey Limitations

The field surveys were carried out in June. This is within the optimum survey period for full species assessments of floral cover. It should be noted that good coverage of the site was possible and there was full and clear access to all areas. There is no limitation in relation to the survey timings.

BC1- Arable crops

This habitat type was recorded in the northern field of the site, which was under active cultivation with common oat (*Avena sativa*) crops at the time of the survey.



Plate 1. Oat crop field

FW4- Drainage ditches

A vegetated drainage ditch traverses the western and southern boundaries of the site, known as the Silleachain Stream. This ditch was dry given that the survey was undertaken during a dry spell in July 2026. This linear aquatic habitat supports a range of wetland and riparian plant species, including duckweed (*Lemna minor*), horsetail (*Equisetum arvense*), marsh valerian (*Valeriana dioica*), water mint (*Mentha aquatica*), reed canary grass (*Phalaris arundinacea*), rose bay willowherb (*Chamerion angustifolium*), water cress (*Chamerion angustifolium*), willow (*Salix* sp.), bindweed (*Calystegia sylvatica*), and bramble (*Rubus fruticosus*)



Plate 2. Vegetated drainage ditch

BL3 - Buildings and artificial surfaces

There are no buildings within the site. Artificial surfaces within the site boundary consisted of the road to the north of the site and the pathway along the Royal Canal. No flora species of conservation concern were recorded in this habitat.

WL1 – Hedgerows & WL2 Treelines

There are treelines and hedgerows surrounding the site on the southern, eastern and northern perimeters. The species identified within these habitat types include ash (*Fraxinus excelsior*), ivy (*Hedera helix*), brambles (*Rubus fruticosus*), sycamore (*Acer pseudoplatanus*), creeping thistle (*Cirsium arvense*), dock (*Rumex obtusifolius*), elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), hogweed (*Heracleum sphondylium*), dandelion (*Taraxacum officinale*), horsetail (*Equisetum arvense*), Wych Elm (*Ulmus glabra*) and Dogrose (*Rosa canina*).



Plate 3. Treeline along northern site boundary



Plate 4. Treeline and hedgerow habitat

WS1 – Scrub

The boundaries between the treeline/hedgerow habitat and the arable crops habitat consisted of scrubby areas with opportunistic species including black mustard (*Brassica nigra*), creeping thistle (*Cirsium arvense*), broadleaved dock (*Rumex obtusifolius*), meadowsweet (*Filipendula ulmaria*), purple loosestrife (*Lythrum salicaria*), field sowthistle (*Sonchus arvensis*), marsh sowthistle (*Sonchus palustris*), marsh woundwort (*Stachys palustris*), hemp agrimony (*Eupatorium cannabinum*), common fleabane (*Pulicaria dysenterica*), sycamore maple (*Acer pseudoplatanus*), hogweed (*Heracleum sphondylium*), tufted vetch (*Vicia cracca*), poppy (*Papaver rhoeas*), charlock (*Sinapis arvensis*), rosebay willowherb (*Chamaenerion angustifolium*), elderberry (*Sambucus*), eared willow (*Salix aurita*), common teasal (*Dipsacus fullonum*) and buddleja (*Buddleja davidii*). This habitat is also present along the Royal Canal pathway.



Plate 5. Scrub habitat

ED2 – Spoil and bare ground

This habitat exists on the pathway along the Royal Canal to the south of the site, and in a small section to the north which is used as an entrance to the site. Along the canal walkway, there are patches of grasses within the centre and each side of the path. Species here include meadowsweet (*Filipendula ulmaria*) & Butterbur (*Petasites hybridus*).



Plate 6. Canal walkway

Evaluation of Habitats

Most habitats on site are of relatively low ecological value, reflecting intensive agricultural use. The arable (BC1)) areas are species-poor and offer limited wildlife value. In contrast, the drainage ditch (FW4), hedgerows (WL1), and treeline (WL2) support greater biodiversity and provide important habitat connectivity. These linear features contribute to the site's overall ecological function and should be retained and protected where possible.

Plant Species

The plant species encountered within the various habitats on site are detailed above. No plant species protected or restricted under Irish or international legislation were noted on site. Records of rare and threatened species from NBDC and NPWS were examined. No rare or threatened plant species were recorded within the proposed development site.

Terrestrial Mammals

All areas of the site were accessible. Although the surveys were not undertaken during the optimal survey season for mammals, no evidence of mammals of conservation importance was noted on site. No signs of badger (*meles meles*) were noted during the mammal survey. However, signs of otter (*Lutra lutra*) were observed along the Royal Canal. A small piece of otter (*lutra lutra*) scat was found under Cope bridge to the western extent of the site. No holts were recorded in this area or within 150m of the proposed development site. Records of rare and threatened species from NBDC and NPWS were examined. No rare or threatened faunal species were recorded within the proposed development site.

Emergent / Detector Surveys & Potential Roosting Features

All trees onsite were examined for features of bat roosting potential, including loose/lifting bark, deep trunk cracks and splits, knotholes, and dense ivy. A dusk bat detector survey was carried out on the 11th September 2025, 7th July 2026 and 20th July 2026 on the proposed development site using a Batbox Duet detector to determine bat

activity. During all surveys, the weather was dry, with little to no wind, and warm temperatures (>13 °C). Bats were identified by their ultrasonic calls, coupled with behavioral and flight observations.

A total of three bat species were recorded using the site: Leisler's bat (*Nyctalus leisleri*), common pipistrelle (*Pipistrellus pipistrellus*), and soprano pipistrelle (*Pipistrellus pygmaeus*). A single common pipistrelle bat roost is present within a tree along the southern site boundary. Further details on bat activity on site is outlined in Appendix I: Bat Fauna Impact Assessment.

Amphibians / Reptiles

The vegetated drainage ditch provides potentially suitable habitat for common Irish amphibians, including common frog (*Rana temporaria*) and smooth newt (*Lissotriton vulgaris*). However, no evidence of these species was recorded. This suggests that amphibian populations are likely absent or present at very low levels on site, potentially due to habitat limitations or connectivity constraints. The ditches were dry due to the dry spell and the season that surveys took place which likely also contributed to these findings.



Figure 1: Fossitt (2000) habitat map.



0 0.15 0.3 0.45 0.6 0.75 km

Project: Large-Scale Residential
 Location: Leixlip, Co. Kildare
 Date: 20th July 2026
 Drawn By: Bryan Deegan (Altamar)

ALTEMAR
 Marine & Environmental Consultancy

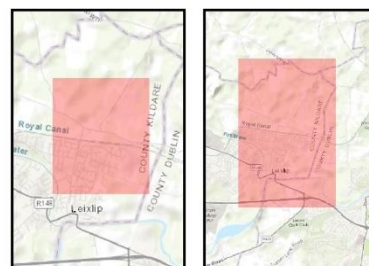


Figure 2. Site location map

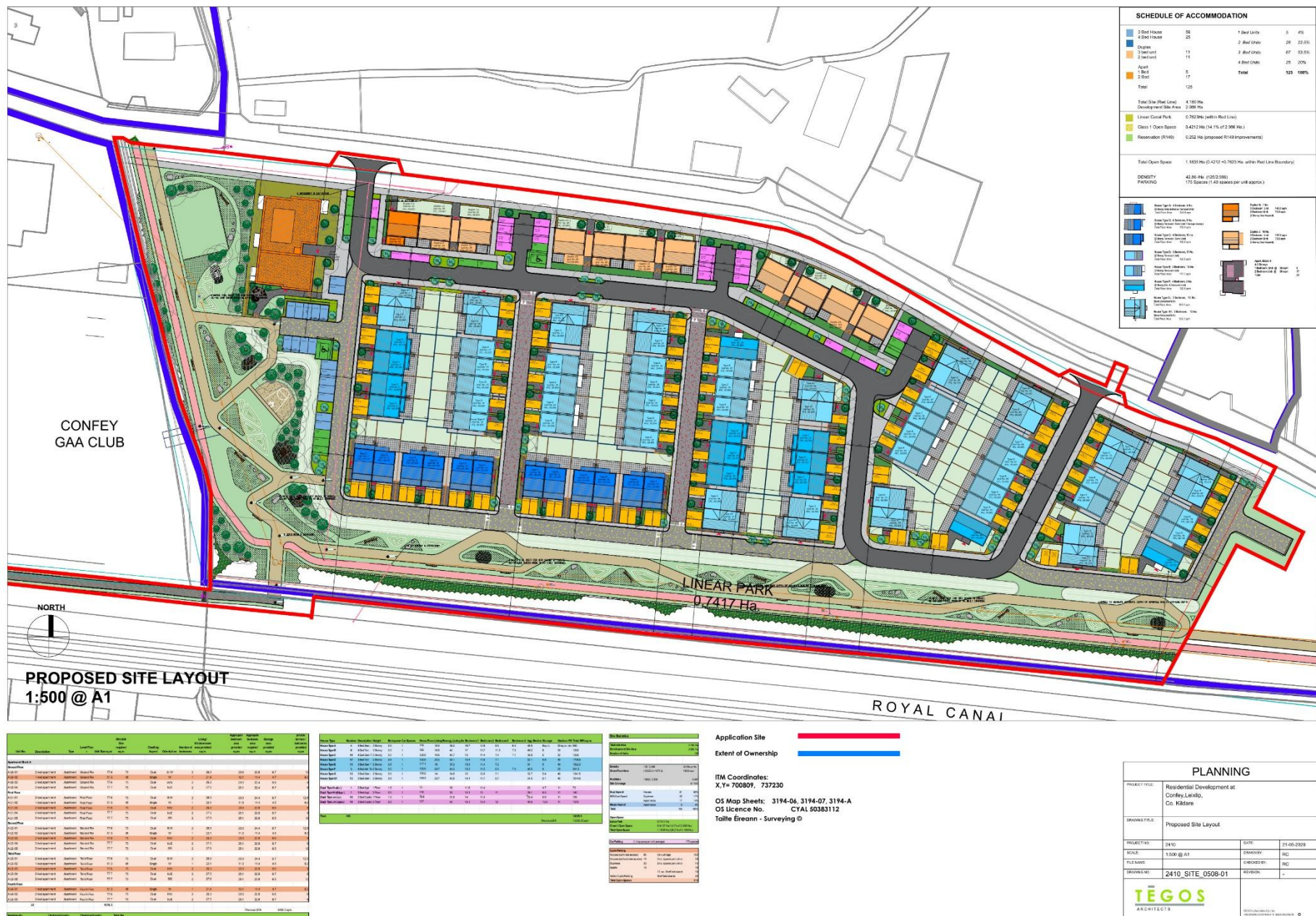


Figure 3. Site layout plan

1.6 Overall Landscape Masterplan

The landscape strategy for the proposed development has been prepared by Murphy + Sheanon Architects for this development. The landscape plan is demonstrated in Figure 4. As outlined in the landscape design strategy, the overall landscape objectives and landscape principles are as follows:

‘DESIGN STRATEGY

DESIGN OBJECTIVES

The following design objectives have been shaped through our analysis of the site and surrounding area, previous and current development initiatives within the area, information shared between the design and planning team, the LRD Opinion issued by Kildare County Council and the objectives of the Confey Masterplan and Confey Design Code.

- To deliver high-quality, multi-functional open spaces that support recreation, biodiversity, and community well-being.*
- To retain and enhance existing landscape features, including mature trees and hedgerows where practical, while strengthening the site's green infrastructure network through new tree and planting proposals.*
- To develop a coordinated hard and soft landscape palette that complements the proposed architecture, creates a strong sense of place and is robust, durable and suitable for long-term management.*
- To provide a diverse and resilient planting strategy that responds to site conditions, enhances biodiversity and delivers year-round visual interest, having regard to the All-Ireland Pollinator Plan.*
- To integrate Sustainable Urban Drainage Systems (SuDS and landscape design to improve water management, biodiversity, climate resilience and visual amenity.*
- To ensure the landscape proposals are fully integrates with the architectural, engineering and ecological design, creating a coherent development that responds to the wider Confey Masterplan. Collectively, these objectives inform the landscape strategy to ensure it meets the practical, ecological, and social needs of future residents while responding to the planning objectives for the wider Confey Masterplan area. The landscape design strategy for this development can be broken down as follows:*
- Open Space Strategy*
- Biodiversity Strategy*
- Hard Landscaping Elements and Surfaces Together, these elements create a coherent landscape framework that integrates movement, recreation, biodiversity, drainage and placemaking to deliver a high-quality residential environment.*

POLICIES & REFERENCES

The landscape design proposal detailed within this document has been developed having regard to the following policy documents, each of which has informed the design approach, open space provision, green infrastructure strategy, biodiversity measures and public realm proposals contained within this report. Local Policies:

- Kildare County Development Plan 2023 - 2029*
- Kildare County Council Sustainable Drainage Systems Guidance Document (2024)*
- Leixlip Local Area Plan 2020 - 2023 (as extended)*
- Confey Masterplan*
- Confey Design Code National Policies:*
- All-Ireland Pollinator Plan 2021-2025*
- National Biodiversity Action Plan*
- Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities International Policies:*

- *United Nations 2030 Agenda for Sustainable Development (2015)*
- *Convention on Biological Diversity (1992) - UN Decade on Ecosystem Restoration*

ECOLOGICAL STRATEGY

Biodiversity: A desire for greater species diversity has been expressed by Kildare County Council. We have developed a planting schedule that takes cognisance of this. We have also made reference to the All-Ireland Pollinator Plan 2021-2025 and the most up-to-date RHS Plants for Pollinators guidance. We have put forward planting schemes with a range of species and plant types to encourage a diversity of habitats that support a wide range of wildlife. Planting proposals have also been strategically located to provide screening and to create buffer zones where required.

Green Infrastructure: Green Infrastructure refers to an interconnected network of natural and semi-natural elements such as, parks, greenways, wetlands, street trees, bioretention areas, and hedgerows. It enhances biodiversity, mitigates flooding, manages stormwater, improves air quality, and supports climate resilience while also contributing to recreation, well-being, and place-making. The existing site is well connected to local green infrastructure network by way of boundary hedgerows and tree planting. Where possible, these hedgerows and trees will be retained. Where it is not possible to retained these trees and hedgerows, new trees and hedges are proposed. Additionally, the green infrastructure within the site will be enhanced through the proposed street trees planted along roads in bioretention tree pits and additional tree and shrub planting throughout the site.

Sustainable Urban Drainage Systems (SuDS): SuDS are drainage solutions designed to manage stormwater locally by mimicking natural drainage principles and reducing the strain on conventional urban drainage systems. The benefits of including SuDS solutions in new developments include;

- *Managing runoff volumes and flow rates from hard surfaces, reducing the impact of urbanisation on flooding*
- *Protecting and enhance water quality by reducing pollution from runoff*
- *Providing an attractive habitat for wildlife in urban watercourses*
- *Creating more interesting landscapes for play and recreation*
- *Improving air quality*
- *Aiding with carbon reduction and sequestration*

A comprehensive SuDS layout has been developed by Corrigan Hodnett Consulting Engineers. A key feature of the proposed SuDS layout is the inclusion of bioretention tree pits across the site. Tree pits are engineered to treat runoff through filtration and vegetation uptake, enhancing both sustainability and visual quality. These elements not only manage stormwater effectively but also enhance the visual and ecological value of the landscape. Bioretention areas use natural vegetation and engineered soil to filter and treat runoff, reducing pollution and flood risk while contributing to biodiversity and ecological resilience.'



Figure 4. landscape plan

2. Biodiversity Management Plan

4.1 Ecological Impact Assessment Overview

The EclA prepared by Altamar for the Development describes the design and mitigation measures, in line with the Wildlife Acts, to result in a neutral imperceptible and long-term residual impact on the ecology of the area and locality overall. This is primarily as a result of the loss of terrestrial habitats on site and the disturbance of local species during construction, which is alleviated during the operational phase by the creation of additional biodiversity features including sensitive landscaping and lighting strategy.

4.2 Management Plan Objectives

Taking into account the current Site conditions and development design in the preceding sections, the key objectives of this BMP are:

Objective 1 – To manage the balance between the operational purposes of the development and the proposed biodiversity enhancement features designed into the site.

Objective 2 - To maintain and enhance where possible habitat features that support species recorded within the Site, or which have the potential to colonise the Site, including but not limited to: breeding birds, bats, and invertebrates, through targeted habitat management and species-specific interventions.

Objective 3 - To implement a programme of ecological monitoring to assess the effectiveness of habitat and species measures and inform ongoing adaptive management decisions. Monitoring results will be used to identify emerging issues, track progress against defined success criteria, and guide responsive interventions where necessary.

4.2.1 Key Habitat & Ecological Deliverables

Habitat Measures

- Habitat Retention and Protection measures
- Retention and protection of existing high and moderate value trees, hedgerows and drainage features where feasible.
- Preservation of existing ecological corridors associated with the Royal Canal and internal drainage ditches.
- Protection of retained trees through Root Protection Areas (RPAs) and no-dig construction methods adjacent to tree protection zones.
- Retention and management of existing native hedgerows to maintain habitat connectivity and shelter for wildlife.
- Enhancement of onsite drainage features into improved aquatic and semi aquatic habitats

Species Measures

- Provision of 'bug hotels' to create opportunities for invertebrates.
- Placement of bird boxes in appropriate locations to encourage bird nesting onsite.
- Provision of bat boxes in appropriate locations to provide bat roosting opportunities onsite.
- Placement of log piles for small mammals and amphibian habitats.

4.3 Habitat Enhancement- Habitats and Overall Implementation

Hedgerows and Ecological Corridors

- Extension and reinforcement of the southern ecological corridor adjacent to the Royal Canal.
- Creation of wider riparian buffer zones.
- Replanting of removed hedgerows with native hedgerow mixes including Hawthorn, Hazel, Elder, Willow and Wild Rose.
- Coppicing and gap planting of degraded hedgerows to improve habitat quality and connectivity.
- Introduction of thorny native planting to improve nesting, shelter and wildlife movement corridors.
- Delivery of “Green Fingers” linking parks, drainage corridors and open spaces to improve ecological connectivity across the site.

Tree and Woodland Planting

- Extensive native and mixed species tree planting throughout the development.
- Woodland planting areas using native tree whips and saplings to create long-term natural woodland habitat.
- Replacement planting for removed Ash trees using mature specimens including Weeping Willow.
- New parkland and street tree planting including Oak, Birch, Scots Pine, Lime, Wild Cherry and Alder species.
- Retention and enhancement of mature tree canopy connectivity for bats and birds.
- Fruit orchards using heritage Irish apple and plum varieties to support pollinators, birds and community food growing.

Grassland and Pollinator Measures

- Creation of long grass meadow habitats with spring bulb planting.
- Reduced mowing regimes to increase floral diversity and pollinator value.
- Use of pollinator-friendly species in accordance with the All-Ireland Pollinator Plan.
- Native wildflower and meadow planting to support insects and seed-feeding birds.
- Seasonal planting designed to provide year-round nectar, pollen and foraging resources.

Watercourse and Aquatic Habitat Measures

- Retention and enhancement of existing drainage ditches as biodiversity features and SuDS infrastructure.
- Reprofilng and widening of drainage features to create seasonal wetland habitat and wildlife ponds.
- Installation of aquatic and semi-aquatic planting to support amphibians, invertebrates and wetland species.
- Creation of rain gardens, swales and open attenuation features planted with flood-tolerant species.
- Use of natural materials such as logs and puddling clay to slow water flow and improve aquatic habitat complexity.
- Extension of riparian planting buffers along drainage features and watercourses.
- Installation of twin 600mm culvert pipes beneath crossings to facilitate safe wildlife movement.
- Surface water attenuation through SuDS measures including rain gardens, tree pit attenuation and open attenuation basins.

Species-Specific Measures

Bats

- Retention of ecological corridors along the Royal Canal and drainage features.
- Reduction of light spill through sensitive lighting design and warm white LED lighting.
- Retention of linear vegetation features used as bat commuting and foraging routes.
- Enhancement of Treeline edge and hedgerow habitat for bat foraging.
- Addition of bat roosting boxes to mitigate loss of roosting habitat, locations in figure 5 & 6.

Birds

- Retention and enhancement of nesting and foraging habitat through native planting and hedgerow management.
- Creation of structurally diverse habitats including woodland edge, meadow and scrub planting.
- Provision of long grassland, berry-producing shrubs and orchard planting to support bird species.
- Addition of Bird nesting boxes to mitigate loss of nesting habitat, locations in figure 5 & 6.

Mammals, Amphibians and Invertebrates

- Improved habitat connectivity through continuous green corridors.
- Seasonal wetland and pond habitat creation for amphibians and aquatic invertebrates.
- Native scrub and hedgerow planting to provide shelter and movement corridors for small mammals.
- Rain gardens and wetland planting designed to attract pollinators and insect species.

Green Infrastructure and Open Space Deliverables

- Provision of linear park adjacent to the Royal Canal.
- Delivery of interconnected green infrastructure including linear parks, green fingers, pocket parks and rain gardens.
- Integration of biodiversity enhancement measures with public amenity, walking and cycling infrastructure.
- Creation of multifunctional landscapes combining recreation, SuDS, biodiversity and climate resilience.
- Long-term management strategy using differentiated mowing and low-maintenance ecological planting regimes.

4.4. Management Measures - Habitats

The Arborist's Report prepared by Charles McCorkell includes a range of measures relating to the protection of retained trees during construction of the proposed development. Furthermore, an EclA was prepared by Altamar which accompanies the planning application for this development. The EclA contains a range of mitigation measures that will ensure the protection of existing sensitive ecological features during the construction and operation of the proposed development. These measures have been reviewed and are considered appropriate in ensuring that there will be no significant negative impact on rare or protected species and habitats throughout the construction and operation of the proposed development.

The following recommended management measures intend to build on the existing measures contained within the Arborist's report and the EclA in order to achieve the above objectives and ensure that biodiversity within the site is enhanced. Management measures specific to the establishment of desired habitats are also set out below.

The measures outlined in this plan will cover five years of landscape maintenance and management following construction of the development to ensure the long-term success of these landscaping and biodiversity enhancement measures.

Table 1. Post-Development Habitats

Habitat	Fossitt (2000) Code
<i>Amenity Grassland</i>	<i>GA2</i>
<i>Dry Meadows</i>	<i>GS2</i>
<i>Scattered Trees & Parkland</i>	<i>WD5</i>
<i>Hedgerow</i>	<i>WL1</i>
<i>Treelines</i>	<i>WL2</i>
<i>Ornamental / Non-Native Shrub</i>	<i>WS3</i>
<i>Drainage Feature/ Ditch</i>	<i>FW4</i>
<i>Lowland/Depositing Rivers (along western boundary)</i>	<i>FW2</i>

4.4.1 Grassland Habitats (GA2 & GS2)

The proposed grassland areas will create habitats (GA2 & GS2) that fill the gaps between the proposed tree and shrub planting that will support floral diversity, invertebrates, and foraging opportunities for birds and other species such as small mammals. The following measures are based on the All-Ireland Pollinator Plan 2021-2025 and describe how grassland habitats will be established and maintained to support successful development.

Amenity Grasslands (short flowering meadows)

- Short grasslands are typically best to cut after Dandelions in April, in early June and in mid-July.
- Short grasslands should be cut every 4-6 weeks.
- Following a cut, it is recommended that all grass cuttings are lifted and removed from the area. This will gradually reduce the nutrients in the soil and allow for flowering plants to establish over more competitive herbaceous plants that otherwise dominate.
- Herbicides should not be used. These chemicals can negatively impact soil biodiversity. Undesirable herbaceous species should be removed manually. However, it is important to note that small flower plants such as daisy, dandelion, or clovers are beneficial for local pollinators.
- Where patches of flowers have appeared, it is recommended to mow around these areas until flowering is largely complete.

Dry Meadows (long flowering meadows)

- Remove between March and August
 - Between March and August, larger, fast-growing plants such as docks, nettles, hogweed, ragwort, and thistles should be removed. If not removed, they may come to dominate the meadow. In fertile soils, fast-growing rough grasses and other plants take advantage of the nutrients and grow quickly, at the expense of slower-growing wildflowers. Anything taller than knee-height should be manually removed in the first years as the meadow is established. Over time, the number of fast-growing plants that need to be manually removed greatly reduces each year.
- Cut in September and remove the grass
 - Long-flowering meadows or margins are cut once a year in September. It is vital that the grass is removed. Flower-rich meadows will only develop on sites with low soil fertility. Removing grass cuttings each autumn allows the soil fertility to slowly decrease. This gives flowers a chance to compete with the more dominant grasses. The less fertile the soil, the more flower-rich the meadow will be.
 - Extra cuts: If the grass growth is very strong and vegetation is falling over under its own weight, cut sooner, e.g. July and again in September. After a few years, as soil fertility reduces, this earlier cut will no longer be necessary.
 - Methods of cutting vegetation:
 - Small areas where grass growth is not very thick should be cut with a strimmer. If a lawn mower is used, initially set the blades at their highest setting and then do a second cut at a lower height.
 - In larger areas, cut out from the centre. This gives mammals and birds in the meadow a chance to escape.
 - If possible, let the cut lie for a few days. This allows more seed to drop and gives any insects a chance to escape. A dry cut is also easier to lift, particularly if it is done manually.

4.4.2 Woodland Habitats and Linear Woodland Features (WN1, WD2, WD5, WL1, WL2, & WS3)

Measures to protect retained trees during the construction phase of the proposed development are outlined in the Arboricultural Report prepared by Charles McCorkell, which accompanied the planning application for this development and should be read in conjunction with this management plan. The following recommended tree and shrub planting measures will ensure the successful establishment of newly planted trees and shrubs across the site. As these habitats mature, they will provide foraging and breeding opportunities for a variety of bird and bat species. The following measures describe how tree and shrub planting and monitoring will be carried out to ensure successful establishment of these habitats in the long-term:

- Carry out planting in accordance with the Landscape Masterplan.
- Monitor planting to ensure establishment.
- Take remedial action if plant growth fails.
- Ensure ground is treated and cleared appropriately.
- In periods of dry weather, apply sufficient water to maintain healthy growth.
- Wind Firming: All trees / hedges shall be inspected at monthly intervals for wind firmness, and re-firmed as necessary
- Stakes & Tree Ties Checking: Stakes shall be checked monthly for firmness, and re-firmed as necessary, and all tree and plant ties inspected and loosened as required.
- Weeding may only be done by hand, except in exceptional circumstances where persistent perennial weeds may be treated chemically. The use of chemicals shall only be upon approval from the Ecologist and Landscape Architect.
- Fertiliser: Apply top-dressing of organic matter such as cow, horse or sheep manure.

4.4.3 Drainage Features/ Drainage Ditch FW4 & Watercourse (FW2)

Measures to protect retained drainage features during the construction phase of the proposed development are outlined within the Landscape Masterplan and accompanying engineering drawings and should be read in conjunction with this management plan. The existing drainage ditches within the site will be retained and enhanced as ecological corridors and multifunctional SuDS features. Proposed interventions will improve habitat connectivity, biodiversity value, water attenuation and wildlife movement throughout the site. The following measures describe how the drainage features will be established, protected and managed in the long-term:

- Carry out all drainage enhancement works in accordance with the Landscape Masterplan and drainage design drawings.
- Retain existing drainage channels where feasible and protect them from unnecessary disturbance during construction works.
- Gently regrade sections of the drainage banks to create shallow wetland margins and improve accessibility for wildlife.
- Create seasonally wet attenuation areas and wildlife ponding zones where appropriate to support aquatic and semi-aquatic vegetation communities.
- Install natural flow attenuation measures, including timber trunks and impermeable clay barriers, where feasible to slow runoff and increase local water retention.
- Widen sections of the drainage ditch where appropriate to increase water storage capacity and enhance habitat diversity.
- Establish native wetland and marginal planting along drainage edges to provide habitat for amphibians, aquatic invertebrates and pollinator species.
- Allow sections of the drainage corridor to develop naturally with varied vegetation structure to maximise ecological value.
- Retain and protect existing vegetation adjacent to the drainage features where feasible to maintain ecological connectivity.
- Where drainage realignment is required, ensure disturbed areas are reinstated with appropriate native vegetation immediately following works.
- Monitor newly established wetland and marginal planting to ensure successful establishment.
- Take remedial action where vegetation establishment fails, including replacement planting during the next suitable planting season.
- In periods of prolonged dry weather, apply sufficient water to newly established planting to maintain healthy growth.
- Manage vegetation through selective cutting only where necessary to maintain hydraulic capacity while retaining ecological function.
- Weeding shall be undertaken manually where possible. Herbicide use shall be avoided unless necessary and only undertaken following consultation with the Project Ecologist.
- Monitor drainage features periodically to ensure continued hydrological function, water flow capacity and habitat quality, and to identify any excessive erosion, blockage or invasive species establishment.

4.4.4 Indicative Soft Landscape Material Approach

5.5. TREE AND HEDGE PLANTING

Existing Trees & Hedges

The site has existing trees and hedgerows on three boundaries, to the north, east and south. The existing trees and hedgerows will be retained wherever practical, except where connection points into the site are required. Where possible, these connection points have been located where minimal tree and hedgerow removal is required.

Proposed Hedges:

There are two hedges proposed around the boundaries of this site. The proposed hedges are often to delineate boundaries throughout the site. The following hedges are proposed:

Fagus sylvatica (Beech):

Proposed for boundaries between private spaces.

Plant Mix 3 - Native Hedgerow Mix:

The native hedgerow plant mix is proposed to the south of the site to supplement and enhance the existing hedgerows. This is a mix of eleven native species comprising:

- Betula pendula *^
- Corylus avellana *^
- Crataegus monogyna *^
- Ilex aquifolium ^
- Malus sylvestris *^
- Prunus spinosa *^
- Euonymus europaeus ^
- Prunus avium *^
- Rosa canina *^
- Lonicera periclymenum *^
- Viburnum opulus *^

* Pollinator - Friendly (On the All-Ireland Pollinator Plan or RHS Plants for Pollinators)
^ Native to Ireland

Proposed Trees

The trees proposed throughout the site aim to increase biodiversity and create green infrastructure connections through the site. These trees are proposed along roads in bioretention tree pits and within the open spaces. The following trees are proposed:

Tree Mix 1 - Front Garden Tree Mix

- Amelanchier canadensis *
- Ilex aquifolium *^

Tree Mix 2 - Parkland Tree Mix

- Sorbus Aucuparia (Rowan) *^
- Quercus petraea (Oak) ^
- Fagus sylvatica (Beech)
- Pinus sylvestris (Pine)
- Tilia cordata (Lime) *
- Betula pubescens (Downy Birch) *^
- Malus sylvestris (Crab Apple) *^
- Prunus avium (Cherry) *^
- Amelanchier canadensis (Juneberry) *
- Liquidambar styraciflua (Liquid Amber) *
- Quercus robur ^
- Betula pendula *^

Tree Mix 3 - Street Tree Mix

- Acer Campestre 'Elsrijk' (Field Maple) *^
- Liquidambar styraciflua (Liquid Amber) *
- Carpinus betulus



Sorbus aucuparia



Acer campestre



Carpinus betulus



Ilex aquifolium



Quercus petraea



Fagus sylvatica



Pinus sylvestris



Tilia Cordata



Betula pubescens



Malus sylvestris



Fagus Sylvatica Hedge



Native Hedgerow Mix



Prunus avium



Amelanchier canadensis



Liquidambar styraciflua



Quercus robur



Betula pendula

The proposed planting palette is outlined in the Landscape Design Statement. It contains a mix of both ornamental species and native pollinator friendly species.

5.6. PROPOSED PLANT MIXES

Plant Mix 1 - Ornamental Mix

An ornamental mix of shrubs, perennials and grasses. This mix is proposed throughout the site. The evergreen shrubs and grasses will ensure year-round interest and visual structure.

Shrubs:

- *Viburnum davidii*

Perennials:

- *Perovskia atriplicifolia* *
- *Echinops ritro* *
- *Achillea millefolium* ^^
- *Rudbeckia fulgida* *
- *Knautia macedonica* *
- *Pachysandra terminalis*

Grasses:

- *Deschampsia cespitosa* ^^
- *Stipa barbata*

Bulbs:

- *Narcissus cyclamin* ^^
- *Muscari armeniacum* *

Plant Mix 2 - Bioretention Mix

A wildlife-friendly plant mix specifically suited to the anticipated ecological and environmental conditions associated with the bioretention areas. Approximately 80% of the shrubs, perennials and bulbs proposed are included on the RHS plants for pollinators list. The grasses proposed will ensure year-round interest and structure within the planting.

Grasses:

- *Carex pendula*

Perennials:

- *Juncus effusus*
- *Bupththalmum salicifolium* *
- *Veronicastrum virginicum* *
- *Lythrum salicaria* *
- *Iris pseudacorus* ^^

Bulbs:

- *Narcissus* (in variety) ^^

Plant Mix 4 - Screening Mix

A mix of shrubs, perennials and grasses proposed around private balconies to add a layer of privacy for residents.

Shrubs:

- *Viburnum tinus* *
- *Cornus sanguinea* 'Midwinter fire' ^^
- *Pittosporum tenuifolium* 'Argyrophyllum' *
- *Choisya ternata* 'Aztec Pearl' *
- *Ceanothus x Purpureus* 'Betty Taudevin' *
- *Spiraea japonica* 'Little Princess'
- *Rosa Pink Flower Carpet* *
- *Fuchsia* 'Riccartonii'

Bulb Mix in Meadow Grass

A variety of bulbs planted within grassed areas where the grass is mown on a low maintenance regime involving only two cuts per year.

Bulbs:

- *Crocus* (in variety)
- *Galanthus* (in variety)
- *Muscari* (in variety)
- *Narcissus* (in variety)
- *Camassia* (in variety)
- *Allium* (in variety)
- *Colchicum* (in variety)



Viburnum davidii



Erica x darleyensis
'Kramer's rose'



Cornus sanguinea
'Midwinter Fire'



Pittosporum tenuifolium
'Argyrophyllum'



Choisya ternata 'Aztec Pearl'



Ceanothus x Purpurea
'Betty taudevin'



Spiraea japonica 'Little Princess'



Rosa Pink Flower Carpet



Fuchsia 'Riccartonii'



Deschampsia cespitosa



Stipa barbata



Carex pendula



Perovskia atriplicifolia



Echinops ritro



Achillea millefolium



Rudbeckia fulgida



Knautia macedonica



Pachysandra terminalis



Iris pseudacorus



Bulb Mix in Meadow Grass

* Pollinator - Friendly (On the All-Ireland Pollinator Plan or RHS Plants for Pollinators)
^ Native to Ireland

4.4.5 Management Measures - Species

Bird Boxes

To improve nesting habitats for local breeding birds, it is recommended that 10no. bird boxes are installed at various locations on site. Bird box locations will be decided by the project ecologist in conjunction with the landscape architects. These bird boxes should be installed under the supervision of suitably qualified ecologist to ensure they provided maximum benefit to local birds.



Plate 1 & 2. Bird Boxes

Bat Boxes

To improve potential roosting habitat for local bats on site, it is recommended that 5 bat boxes are installed at various locations on site. The type recommended is the 2F Schwegler Bat Box. These bat boxes should be installed under the supervision of suitably qualified ecologist to ensure they provided maximum benefit to local bats. The majority of bat boxes are proposed along the existing ecological corridors, which will remain unlit. Bat box locations will be decided by the project ecologist in conjunction with the landscape architects.



Plate 3. Bat Box

Bug Hotels

A total of 5 no. Bug Hotels will be placed in areas planted with pollinator friendly species. The inclusion of bug hotels will encourage local insect populations within the site, thereby increasing insect biodiversity within the site and creating potential food sources for local bat and bird populations. Bug hotel locations will be decided by the project ecologist in conjunction with the landscape architects.



Plate 5. Bug Hotel

Log Pile Habitats

Five locations across the site will be chosen for log pile habitats. Log piles provide animals with shelter and safety, especially small mammals and amphibians. These log piles will be placed in meadow habitats and adjacent to the ponds. Log pile locations will be decided by the project ecologist in conjunction with the landscape architects.



Plate 6. Log Pile Habitat



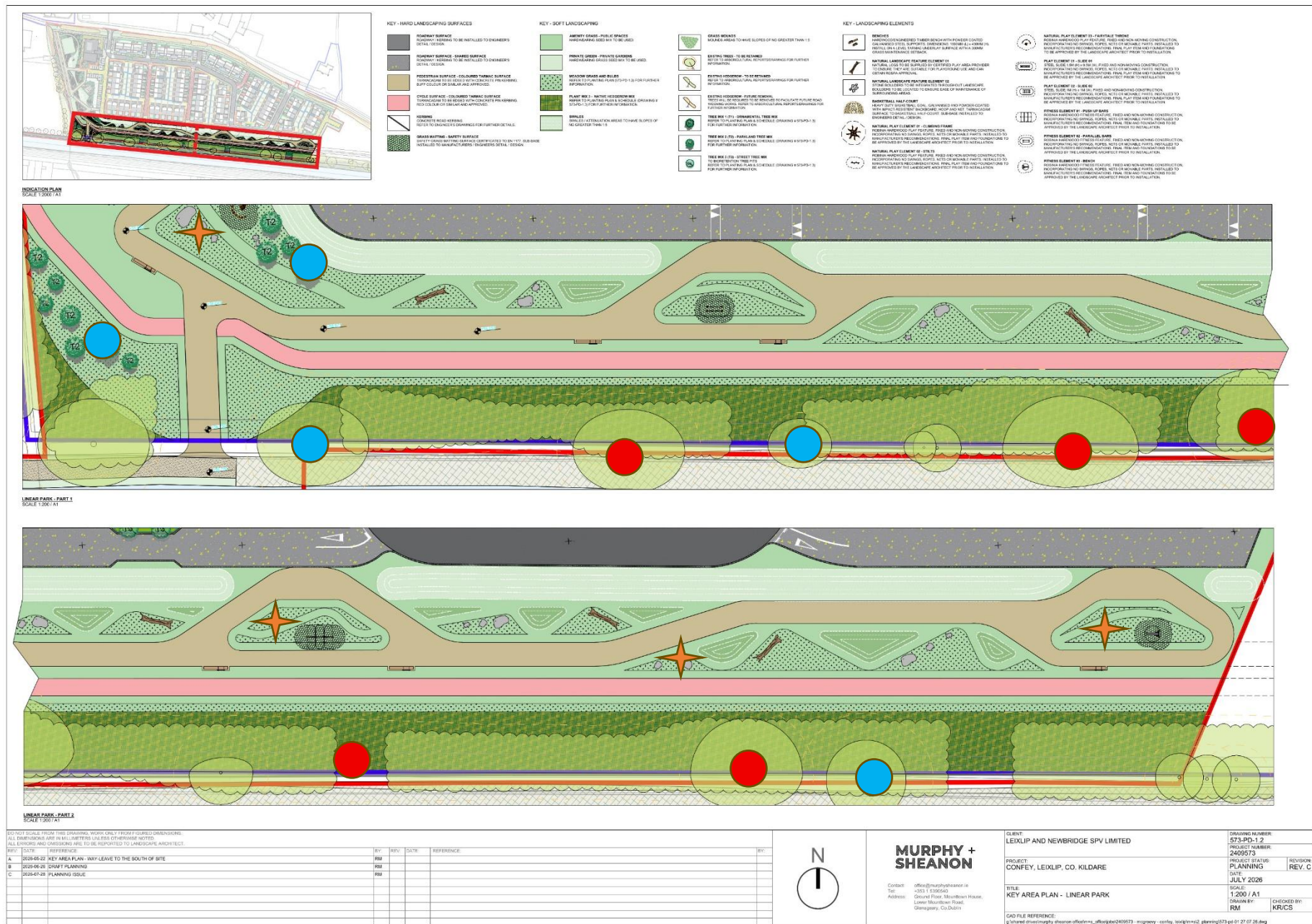


Figure 6. Locations of Bat Boxes (Red) Bird Boxes (Blue) Insect Hotels (Orange Stars)

Ecological Clerk of Works (ECoW)

A suitably qualified ecologist (SQE) will be appointed as Ecological Clerk of Works (ECoW) to oversee the ecological aspects of the construction phase. The ECoW will undertake site inspections at key stages of the works to ensure that construction activities are being conducted in accordance with conditional mitigation measures detailed in the EclA, and the ecological recommendations outlined in this BMP. This will involve a check of protection measures and regular visits during the works to monitor their effectiveness and to ensure ecological risk is minimised. Records of inspections will be made throughout the process and once construction is complete, the ECoW must provide written confirmation that construction activities were carried out in compliance with the aforementioned protection and enhancement measures.

5 Monitoring

Planting on the site will commence with the completion of each stage of the works and, as a result, the programme is closely tied to construction operations. Ground preparation will precede planting and will include weed clearance and amelioration where necessary. Planting of species will be carried out in the dormant period from November-March, with grass seeding carried out from April-September. This will ensure ample opportunity for planting to establish properly and reduce casualties during the maintenance period.

Intensive landscape aftercare for each area will run for 12 months from the practical completion date using contact herbicides and hand weeding. There will be a period of 12 months defects liability on all planting with plant failures being replaced in the following planting season.

The landscaping of the proposed development will be regularly monitored to ensure that the elements and mitigation measures outlined in this report and the BMP are maintained and as per proposals. This would include the monitoring of key habitat areas on site. However, it should also be noted that annual ecological monitoring will be required. This will include a site visit by the project ecologist to examine the habitats on site to ensure that their integrity is maintained or enhanced. This will require the monitoring of specific ecological parameters to measure the success of certain aspects of the BMP and the overall ecological 'health' of the site. Three years of annual Bat monitoring shall be undertaken by a suitably qualified ecologist and biennially thereafter. Monitoring would focus on the diversity and abundance of these species. Following the 5th year, a revised BMP will be prepared and submitted to the KCC Biodiversity Officer. This BMP will outline a summary of the successes and failures of the first 5 years and outline the long-term maintenance strategy and monitoring proposed for the site.

Conclusion

The Biodiversity Management Plan has been prepared by Altamar with the support of Murray + Sheanon Architects. It involves the implementation of significant measures. The proposed planting schedule outlines the heavy reliance on native and pollinator friendly species.

The biodiversity enhancement measures are outlined above and will be implemented. Of significant importance to the long-term enhancement of the site for biodiversity are the habitat & biodiversity protection and maintenance measures that will be in place during operation. These measures are also outlined and will ensure the long-term biodiversity enhancement of the proposed development. The works in relation to the Biodiversity Management Plan will be overseen by a project ecologist to ensure that the specifications outlined will be carried out.