Planning and Environmental Consultants

Biodiversity & Habitat Management Plan

Strategic Development Zone, Tile 1 at Clonburris, Cappagh, Dublin 22.

DOCUMENT DETAILS

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Prepared By:	**MKO** **Tuam Road** **Galway** **Ireland** **H91 VW84**

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APPENDICES

1. INTRODUCTION

1.1 Background

MKO was commissioned to prepare a Biodiversity Management Plan (BMP) for Tile 1 within the Clonburris Strategic Development Zone (SDZ) at Clonburris, Cappagh, Dublin 22. The BMP focuses on green and blue spaces that form part of the project seen in Drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1), along with habitat creation, management and enhancement. The measures outlined in this report identify the areas where biodiversity retention and enhancement can be incorporated into the development thereby contributing to local biodiversity.

1.2 Site Location

The site is located at Clonburris, Cappagh, Dublin 22; approximately 11km west of Dublin City Centre (Grid Reference: O 06107 32375). The surrounding area is characterised by the established residential suburb of Ronanstown and Clondalkin to the north-east and east. Lands adjoining the site, to the north is a railway line while the Grand Canal and grasslands lie to the south and west.

A Regional Road (R113) lies adjacent to the eastern boundary and links to the M50 route serving the city. The proposed site has an area of approximately 17.02 ha including internal roads and associated infrastructure.

1.3 Characteristics of Proposed Works

1.3.1 General Project Description

The development will consist of the following construction: 563 dwellings, a creche, innovation hub, flexible community space and open space as detailed below.

1. Construction of 171 houses, all storey comprising semi-detached, terraced, end terrace units (with parking and private open space).

   - 6 no. 2 bedroom houses
   - 153 no. 3 bedroom houses
   - 12 no. 4 bedroom houses

2. Construction of 148 duplex apartments all to have terraces/pitched roof.

   - 74 no. 2 bedroom units
   - 74 no. 3 bedroom units

3. Construction of 244 apartments (Block 1, 2 & 3) all to have terrace or balcony.

   - Block 1
     - 60 no. 1 bedroom units
     - 103 no. 2 bedroom units
     - 5 no. 3 bedroom units
   - Block 2
     - 16 no. 1 bedroom units
     - 22 no. 2 bedroom units
   - Block 3
     - 16 no. 1 bedroom units

- 22 no. 2 bedroom units

4. Provision of an innovation hub (664.6 sq.m) and creche (c. 534 sq.m) along with a Community Multi-purpose room of c. 74 sq. m in a part 3/4 storey 'local node' building.

5. Provision of shared communal and private open space, car parking, bicycle parking, bin storage, public lighting, site landscaping, services, signage, substation, and all associated site development works.

6. Public Open Space/landscaping of c. 4.1 hectares (to include Local Park and MUGA in CSW-S3, Grand Canal Park, along the southern and eastern boundaries of the site to connect to existing Grand Canal towpath) as well as a series of communal open spaces to serve apartments and duplex units (c. 0.39 ha).

7. All ancillary development works including footpaths, landscaping boundary treatments, public, private open space areas, car parking (656 no. spaces) and bicycle parking (672 no. spaces), single storey ESB substations/bike/bin stores, 'Gateway' entrance signage (2 no.), solar panels at roof level of apartments, and all ancillary site development/construction works.

8. Permission is also sought for revisions to attenuation permitted under SDZ20A/0021 as well as connection to water supply, and provision of foul drainage infrastructure.

1.4 Statement of Authority

Field surveys were undertaken on the 8th of December 2022 and 12th, 19th, 24th of January 2023 by Neansaí O'Donovan (BSc., Wildlife Biology) of MKO. This report has been prepared by Neansaí O'Donovan (BSc., Wildlife Biology) of MKO after consultation with the South Dublin County Council (SDCC) Heritage Office and National Parks and Wildlife Services (NPWS). Neansaí O'Donovan has over 3 years' professional ecological consultancy experience and is a qualified member of the Chartered Institute of Ecology and Environmental Management. This report has been reviewed by Rachel Walsh (B.Sc. Env.), who has several years of extensive experience in ecological assessments.

1.5 Characteristics of the Receiving Environment

The northern half of the site is comprised primarily of ***Dry meadows and grassy verges (GS2)*** habitat (Plate 1-1), dominated by Clustered Dock (*Rumex conglomeratus*), Daisy (*Bellis perennis*), White clover (*Trifolium repens*), Spear thistle (*Cirsium vulgare*) and Bulbous buttercup (*Ranunculus bulbosus*). Overgrown ***Hedgerow (WL1)*** habitats also occur in the north (Plate 1-1). The hedgerows are dominated by Hawthorn (*Crataegus monogyna*), Wych Elm (*Ulmus glabra*) Ash (*Fraxinus excelsior*) Elder (*Sambucus nigra*), Dog Rose (*Rosa canina*), Hazel (*Corylus avellana*) and Blackthorn (*Prunus Spinosa*). Spindle (*Euonymus europaeus)* and Guelder Rose (*Viburnum opulus*), Crack Willow (*Salix fragilis*) and Goat Willow (*Salix caprea*) occur in wetter areas, much of which is overgrown with Bramble (*Rubus fruticosus*) and Ivy (*Hedera hibernica*), the majority of which are single hedgerows. However, several double hedgerows are present and associated with wet ***Drainage ditches (FW4)*** (Plate 1-2) consisting of Common reed (*Phragmites australis)* and Water mint *(Mentha aquatica)*. Scattered ***Scrub (WS1)*** habitat dominated by Bramble (*Rubus fruticosus*), has encroached in some areas of grassland, most of the encroachment occurring near hedgerows.

The southern half of the site is dominated by ***Dry meadows and grassy verges (GS2)*** with ***Hedgerows (WL1)*** demarking field boundaries, the hedgerows species composition mimics that of the north with the exception of scattered Sycamore (*Acer pseudoplatanus*).

Scrub (WS1) (Plate 1-3) habitat is located along the southern boundary, dominated by Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Bramble (*Rubus fruticosus*) and Ivy (*Hedera helix*) Bramble (*Rubus fructicosus*).

An area of ***Wet grassland (GS4)*** habitat is present in the south-west of the site, consisting of Common spotted orchid (*Dactylorhiza fuchsii*), Red clover (*Trifolium repens*), Tormentil (*Potentilla erecta*), Yorkshire fog (*Holcus lanatus*), Ribwort (*Plantago lanceolata*), Lesser stitchwort (*Stellaria grami),* White clover (*Trifolium pratense*), Creeping buttercup (*Ranunculus repens*) and Creeping bent (*Agrostis stolonifera*). A wetter habitat of ***Tall-herb swamps (FS2)*** (Plate 1-4) which is in very poor condition is located south of the wet grassland, comprised of Meadowsweet, (*Filipendula ulmaria*), Yellow flag iris (*Iris pseudacorus*), Goat Willow (*Salix caprea*) and Water mint *(Mentha aquatica).*

A hardstanding area categorised as ***Buildings and artificial surfaces (BL3)***, ***Spoil and bare ground (ED2)*** *and* ***Recolonising bare ground (ED3)*** (Plate 1-5) habitats are located along the south-western site boundary, consisting of Common Nettle (*Urtica dioica*), Dandelion (*Taraxacum spp.*), Ivy (*Hedera hibernica*), Bramble (*Rubus fructicosus*) and Ragwort (*Senecio spp.*) A proposed natural heritage area (pNHA) the Grand Canal, categorised as ***Canals (FW3)*** habitat lies south of the southern site boundary. The south site boundary is bounded by an overflow channel for the Grand Canal. This channel runs alongside the canal towpath north of the canal before re-entering the canal downstream, it does not appear that local drainage connects to this overflow channel.

An existing built structure- Omer Lock House categorised as ***Buildings and artificial surfaces (BL3)*** (Plate 1-6) habitat is located adjacent to the southern site boundary between the overflow channel and the canal.

An ecological assessment of the site prepared by Altemar (JSA, 2021) concluded that there were no invasive plant species within the project area. Pre-commencement surveys undertaken by MKO in 2022 and 2023 also confirmed that no invasive plant species had since moved in.

No rare and/or protected flora were recorded during the surveys. None of the habitats within the development site correspond to those listed on Annex I of the EU Habitats Directive.

Plate 1-1 Dry meadows and grassy verges (GS2) with Hedgerow (WL1) habitat.

Plate 1-2 Drainage ditch (FW4) associated with hedgerow.

Plate 1-3 Scrub (WS1) encroaching.

Plate 1-4 Tall-herb swamp (FS2) along southern project boundary.

Plate 1-5 Spoil and bare ground (ED2) and Recolonising bare ground (ED3)

Plate 1-6 Omer Lock House categorised as Buildings and artificial surfaces (BL3) is located adjacent to the southern site boundary between the overflow channel and the canal.

2. SITE CLEARANCE

2.1 General Site Clearance

Full site clearance details are included in Landscape Works Specifications and Landscape Management Plan for the Residential Development Clonburris, Clonburris SDZ in Appendix 2. Section 2.1.1 and 2.1.2 below summarise the clearance relating to biodiversity.

2.1.1 Tree and Vegetation Removal

Prior to topsoil stripping, the site will be cleared of any rubbish, debris, and some vegetation; topsoil will not be compacted. A suitable non-residual herbicide will be applied to areas which will receive planting. Prior to the removal of any small trees, shrubs, hedges and roots the areas will be identified, clearly marked, and then cut. Roots will then be grubbed up and disposed of without undue disturbance to the soil and/or adjacent areas. Large trees are defined as trees which have a girth of over 600mm, any large trees to be removed will be identified, clearly marked, and then felled as close to the ground as possible. Any works taking place near retained trees will be done carefully and in small sections to avoid any damage to adjacent trees which will be retained. All actions will comply with the Forest Industry Safety Accord safety leaflets. All chipping and shredding will then be removed from the site.

2.1.2 Topsoil

Prior to any general excavations, topsoil will be stripped from areas where buildings, paving's and roads are depicted on the landscape drawings. An average depth of 250mm is to be removed, notice will be given where the depth of topsoil is difficult to determine. All topsoil will be kept separate from excavated sub-soil. With regards to any invasive plant species, the ECoW will be notified of the presence of any species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 and will advise before topsoil containing the species is removed. No topsoil will be mixed with the following: subsoil, stone, hardcore, rubbish, material from demolition work, other soils or material containing aggressive weeds, sharps, plastics, non-soil forming materials and notifiable animal or plant diseases, oil, fuel, cement or other substances harmful to plant growth. The multiple handling of topsoil will be kept to a minimum and should be used immediately after stripping or placed in a storage heap before removal off site. All handling of topsoil will be done in accordance with the standard BS 3882.

2.2 Site Establishment Access Route

The site will be accessed off a roundabout on the Regional road R113, (Grid Reference: O 06107 32375). The pedestrian access routes on all Cairn Homes sites are indicated using red gates. A site map will be displayed at the notice board compound and at the start of the access point to the site showing the site-specific access routes. All maps relating to access routes are illustrated in the Clonburris T1 Site Compound and Logistics Plan which can be found in Appendix 3.

2.3 Site Compound

A site compound will be introduced by the following means:

- Site management will review the ESB, Gas, Irish Water and reference drawings, before commencing works.
- The site compound area will be checked for services prior to excavation, by use of a cable avoidance tool (CAT) scanner, by a construction sector certification scheme (CSCS) location of underground services (LUGS) operative.
- The excavation area will be marked out by an engineer before any excavation takes place and will be checked for underground services.
- The contractor Shannon Valley Plant Hire (SVPH) will implement a permit to dig system before any excavation works commence.
- All operatives to sign off the dig permit before work commences.
- A geosynthetic material (Terram) will be installed at ground level, 300mm of stone will then be placed in layers of 150mm and well compacted.
- A trench will then be excavated to the required line and depth, 1.1m, with soil being loaded onto dumper and placed in temporary spoil heap.
- Ducting will then be laid in the trench for the insertion of drainage pipes which will facilitate the canteen and toilets block.
- A waste area will also be installed, then bedded and surrounded with sand. A warning tape will be placed in position on top of the sand.
- SVPH will lay the connection, but it will be connected by the main contractor.
- Access into the excavations will be by means of a ramp excavated at the end of the trench.
- The trench will then be backfilled and compacted in layers of stone.
- An excavator will be used to place the stone into the trench.
- The size of the excavations for the services will be per the engineer's drawings.

3. ECOLOGICAL OBJECTIVES & RECOMMENDATIONS, RETENTION & ENHANCEMENT MEASURES

The Clonburris Tile 1 BMP aims to demonstrate how the project will adhere to the prospects set out in the Clonburris SDZ Scheme, the Clonburris Biodiversity Management Plan and Parks and Open Space Strategy. The document sets out how the ecological objectives and recommendations within these schemes and strategies will be implemented during the lifetime of the project.

The recommended objectives within this BMP have been informed by ecological surveys carried out by FERS Ltd. in 2018, Scott Cawley Ltd. in 2019, 2020, 2021 and MKO in 2022 and 2023, as well as a desktop review of the following plans:

- Draft Biodiversity Action Plan for South Dublin County 2020 – 2026
- The National Biodiversity Action Plan 2017-2021
- The National Biodiversity Action Plan 2023-2027 is currently in Draft status (23/02/2023).
- All Ireland Pollinator Plan 2021-2025

Tile 1 within the Clonburris SDZ Scheme will be implementing several actions to align with objectives from both the above Biodiversity and Pollinator plans as seen below in Tables 3-1 and 3-2.

Table 3-1 Objectives within the National Biodiversity Action Plan 2017-2021.

Objective Code	Biodiversity Measures	Adhere/Implement
1	Mainstream biodiversity into decision-making across all sectors.	Biodiversity will be considered in decision making throughout this project via mitigation measures during development, strategic planning, retention of habitats and enhancement of habitats where feasible. Green and blue infrastructure will be developed at a local level using nature-based solutions.
2	Strengthen the knowledge base for conservation, management, and sustainable use of biodiversity.	Information will be displayed on local biodiversity and conservation throughout the scheme.
3	Increase awareness and appreciation of biodiversity and ecosystem services.	The incorporation of signs regarding wildlife within the development e.g., Signs in meadows from the National Biodiversity Data Centre- *Don't mow let it grow.*
4	Conserve and restore biodiversity and ecosystem services in the wider countryside.	The project will work in line with the All-Ireland Pollinator Plan raising awareness and expanding knowledge of pollinators by the

Objective Code	Biodiversity Measures	Adhere/Implement
		implementation of bee hotels and signs within the development. Invasive species will be controlled reducing the risk of spreading.
6	Expand and improve management of protected areas and species.	The project will allow for increased connectivity between the project area and proposed natural heritage area using appropriate buffer zones, corridors, and ecological stepping-stones.

Table 3-2 Objectives within the All-Ireland Pollinator Plan 2021-2025.

Objective Code	Biodiversity Measures	Adhere/Implement
2	Making public land pollinator friendly	By working together with SDCC, Waterways Ireland and the NPWS the aim is to develop Tile 1 in such a way that it can better coexist with the surrounding biodiversity and help return food and shelter for pollinators in the local area.
3	Making private land pollinator friendly	In the gardens, open spaces, parkland, local park and green roofs the aim is to create a network of pollinator friendly habitat across the development.
5	Conserving rare pollinators	By raising awareness through signs and the installation of bee hotels in the development area, the aim is to protect as much wild pollinator diversity as possible.

3.1 Clonburris Strategic Development Zone Scheme

The key objectives taken from the Clonburris SDZ Planning Scheme which could affect biodiversity at Tile 1 can be seen below:

- **Sensitively design pedestrian access points to the Grand Canal.**
  The existing access point to the Grand Canal at the south-east will be utilised by pedestrians to enter the project area. This green route will consist of a bridge over the overflow channel linking the Canal Towpath to the Fonthill road. Existing vegetation will be retained as/where possible. Additional tree and native hedgerow planting will be undertaken to aid in the connectivity and continuity of the green route. A lighting plan will be devised to avoid and/or minimise the effect of artificial lighting on the local bat and wildlife populations following guidelines from Bat Conservation Ireland, Bat Conservation Trust and Dark Sky Ireland. At present, the existing access route at the south-east is the only planned pedestrian access.

- **Seek the refurbishment and re-use of Thomas Omer's Lock House.**
  The refurbishment and re-use of Thomas Omer's Lock House is yet to be determined, any works will be done so with the guidance from the Project Ecologist, NPWS and SDCC to minimise disturbance on local flora and fauna.

3.2 Clonburris SDZ Biodiversity Management Plan

Section 3.2.1 demonstrates the biodiversity measures set out in the overarching Clonburris BMP which are relevant to Tile 1. Tables 3-3 to 3-7 demonstrate how the proposed measures will be adhered to and specific actions which will be undertaken to implement these measures.

3.2.1 Habitat Retention

3.2.1.1 General Habitat Retention

Table 3-3 Biodiversity Objectives for Habitat Retention from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HR01	Where feasible having regard to the SDZ Masterplan proposed developments should retain habitats of ecological value that can be accommodated. Particular consideration must be given to retaining ecological features which provide connectivity between habitats (e.g., hedgerows and treelines) to promote green and blue infrastructure within the SDZ lands. Retention of townland boundary hedgerows within open space, which have high biodiversity and heritage value should be given priority.	Existing treelines, hedgerows, scrub, and woodland thicket along the Grand Canal will be retained and where necessary additional planting will be undertaken to support the pNHA biodiversity and enhance the habitat. Additionally, existing vegetation along the Fonthill embankment will also be retained and additional planting of hedgerows will be undertaken to support the biodiversity and enhance the ecological corridor.

Objective Code	Biodiversity Measures	Adhere/Implement
HR02	Where hedgerows, treelines, woodland, and other semi-natural habitats are being retained within the SDZ lands, details of their management and protection should be provided in a Habitat Management Plan (HMP) to be provided to the Council by the developer alongside the planning documentation.	A Habitat Management Plan (HMP) has been incorporated into the BMP for Tile 1. Full details of Habitat Management can be found in Section 4.
HR03	Proposed developments, subject to agreement with the Planning Authority on a case-by-case basis, within the Clonburris SDZ must be subject to an Ecological Impact Assessment (EcIA) and the EcIA must set out appropriate biodiversity mitigation compensation and enhancement measures in line with SDZ and BMP requirements. This does not absolve the proposed development/developer from carrying out other statutory environmental assessments that may be required. The Ecological Impact Assessment should include but may not be limited to the following: › An assessment of potential impacts on bird species, including breeding birds, wintering birds, barn owl and kingfisher. Bird surveys must be carried out in the appropriate season. › An assessment of potential impacts on bat species. Bat surveys must be carried out in the main season of bat activity (May-August inclusive). › An assessment of potential impacts on mammals. Mammal surveys must cover the proposed development site and lands at least 150m from the proposed development site boundary. › An assessment of potential impacts on amphibians. Amphibian surveys must be carried out if there is suitable habitat (i.e., wetlands) present on or near the proposed development site.	A robust Environmental Impact Assessment Report (EIAR) was undertaken for this project which included specialised bird, bat, other mammals, amphibians and other flora and fauna surveys undertaken at appropriate timings. For which, planning has been as granted under planning reference: SDZ22A/0018 Additionally, pre-commencement surveys for flora and fauna inclusive of invasive species was undertaken within Tile 1.

Objective Code	Biodiversity Measures	Adhere/Implement
	› An assessment of potential impacts on habitats and habitat connectivity within the lands. › Cumulative impact of planned development within 50m of the Grand Canal. Consideration must be given to whether impact assessment on other species is required for a proposed development e.g., white-clawed crayfish, common lizard etc.	
HR04	Development must be set back from the Grand Canal 1. All buildings must be set back 50m from the Grand Canal pNHA boundary 2. Other development (with the exception of footpaths and bridges) must be set back 30m from the Grand Canal pNHA boundary 3. Any proposed works including footpath surfacing or access points through the existing vegetation north of the existing northern tow path will be subject to detailed discussions with South Dublin County Council and will require: › Ecological surveys › Arborist survey › Consultation with National Parks and Wildlife Service › Consultation with Waterways Ireland › Site walks with relevant stakeholders, if necessary. Footpaths and bridges may be constructed within the pNHA boundary with regard to actions HR06 and HR07 below.	The project will adhere to objective HR04, and the planning conditions as granted under planning reference: SDZ22A/0018

3.2.1.2 Aquatic Habitat Retention

Table 3-4 Biodiversity Objectives for Aquatic Habitat Retention from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HR05	Prior to any works, watercourses will be fenced off at a minimum distance of 10m from the watercourse bank in order to maintain a biodiversity protection zone of not less than 10 metres from the top of the bank.	There are no watercourses within Tile 1. A water feature existing along the southern boundary will be fenced off and enhanced for biodiversity as described in Section 3.4.5. All buildings will be set back 50m from the Grand Canal pNHA boundary. All other developments (with the exception of footpaths and bridges) will be set back 30m from the Grand Canal pNHA boundary.
HR06	Where construction works are planned in the vicinity of the Grand Canal and Griffeen River no storage / stockpiling of materials or machinery or construction works activities (except for those required to construct footpaths or bridges) will be undertaken within 50m of the watercourse. Where construction works will take place within 50m of a watercourse, a risk assessment must be carried out on a case-by-case basis by a suitably qualified ecologist in order to determine if the works will require a Construction Environmental Management Plan (CEMP) outlining how the watercourse will be protected during works must be produced. This is to protect the habitats associated with the Grand Canal.	The project will adhere to objective HR06, and the planning conditions as granted under planning reference: SDZ22A/0018.
HR07	Where other works e.g., footpath maintenance must take place within 10m of the edge of a watercourse or tributary thereof, a risk assessment should be carried out on a case-by-case basis by a suitably qualified ecologist in order to determine if the works will require a Construction Environmental Management Plan (CEMP) outlining how pollution of watercourses during and after the construction period will be prevented and / or mitigated. If a substantial risk is identified, the CEMP must be developed in consultation with	The project will adhere to objective HR07, and the planning conditions as granted under planning reference: SDZ22A/0018.

Objective Code	Biodiversity Measures	Adhere/Implement
	Inland Fisheries Ireland at application stage where feasible.	

3.2.1.3 Grass and Meadow Habitat Retention

Table 3-5 Biodiversity Objectives for Grass and Meadow Habitat Retention from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HR09	The following document should be consulted prior to the design of wildflower meadows: National Biodiversity Data Centre (2017) Creation and management of a wildflower meadow. All-Ireland Pollinator Plan, How-to-Guide 4. National Biodiversity Data Centre Series no. 13. Management guidelines are also set out in this document.	The project will adhere to objective HR09 along with consultation with the NPWS.

3.2.1.4 Woodland and Scrub Habitat Retention

Table 3-6 Biodiversity Objectives for Woodland and Scrub Habitat Retention from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HR10	Where woodland or individual trees are being retained, the root protection zone / area must be calculated by a qualified arborist. Protective barriers must be installed to exclude construction activities from the root protection area of the woodland / trees in accordance with BS 5837.	The project will adhere to objective HR10 along with consultation from the Project Arborist. Throughout the development process all tree protection measures as outlined in BS5837: 2012 and measures outlined in the Arboricultural report (See Appendix 7) will be adhered to, some of which, are detailed below: Tree protection will affectively comprise of exclusion zones to protect any trees parts (both above and below ground) which are due to be retained. After the completion of primary vegetation clearance, but prior to the commencement of construction works, all "Construction Exclusion" and "Protective" fencing will be erected and "signed-off" as complete, by the Project Arborist. Only on completion of all construction works will any/all tree

Objective Code	Biodiversity Measures	Adhere/Implement
		protective measures be removed, and only then in a manner, that does not compromise the "Protection Zones". After construction works have been completed, all retained trees will be reviewed regarding their condition and longer-term management recommendations and regarding site handover.
HR11	Particular consideration must be given to retaining woodland which provides ecological connectivity to other habitats of ecological importance. This is to strengthen the green and blue infrastructure network.	Woodland thicket and scrub along the southern boundary adjacent to the Grand Canal will be retained and where necessary additional planting will be undertaken to enhance the habitat, strengthen the ecological corridor and green infrastructure.

3.2.1.5 Hedgerow and Treeline Habitat Retention

Table 3-7 Biodiversity Objectives for Hedgerow and Treeline Habitat Retention from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HR12	The Parks and Landscape Strategy indicates the retention of 7,720m of hedgerow / linear woodland habitat within the strategic open spaces - 5,200m along the canal, 520m along the Griffeen river and 2,000m of hedgerow within parks and open spaces. When final landscape designs are being prepared for open spaces, this level of retention is considered to be the minimum acceptable.	The figures outlined in HR12 indicate the required retention of hedgerows / linear woodland within the entire Clonburris SDZ Scheme. This BMP only considers Tile 1. Where feasible hedgerows and linear woodland habitat will be retained and will ultimately be included in the final retained areas for the entire Clonburris SDZ Scheme as stipulated in HR12.
HR13	Where hedgerows and treelines are being retained, the root protection zone / area must be calculated by a qualified arborist. Protective barriers must be installed to exclude construction activities from the root protection area of the hedgerows and treelines during construction works in accordance with BS 5837.	The project will adhere to objective HR13 along with consultation from the Project Arborist.
HR14	Pedestrian access points to the Grand Canal must be located in areas that are sparsely vegetated and should avoid as	This objective has been considered and adhered to as demonstrated in the final landscape drawings:

Objective Code	Biodiversity Measures	Adhere/Implement
	much tree and vegetation removal as possible. Where vegetation removal is required, this should be focused on vegetation of lower ecological importance and avoid mature trees and hedgerows.	1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1).
HR15	Appropriate pedestrian access points to the Grand Canal will be sensitively designed to prevent damage to adjacent vegetation.	The project will adhere to objective HR15 along with consultation from the Project Ecologist and Landscape design team.
HR16	Where hedgerows are proposed for retention, management measures should be set out, appropriate to their location and function, and in accordance with guidance set out in the following document: The Heritage Council (2016) Conserving Hedgerows. Management must also include the removal of non-native invasive species such as butterfly-bush (*Buddleja davidii)* and filling in sparse patches with native species planting.	The project will adhere to objective HR16 along with consultation from the Project Ecologist.

3.2.2 Habitat Creation

3.2.2.1 Native vs Non-native Planting

Table 3-8 Biodiversity Objectives for Habitat Creation: Native vs Non-native Planting from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC01	Planting schedules for all areas within the lands should include predominantly native species, and non-native species should be limited to specific areas.	The project will adhere to objective HC01, full details of the implementation in each development area can be seen in Section 3.2.9.
HC02	No invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 will be planted on the lands. Under the regulations, to do so would constitute an offence.	The project will adhere to objective HC02 and in consultation with the NPWS.
HC03	Planting schedules should have regard to Invasive Species Ireland's Amber list. Planting schedules must not include species on these lists, as they may have invasive properties which	The project will adhere to objective HC02 and in consultation with the NPWS.

Objective Code	Biodiversity Measures	Adhere/Implement
	would be detrimental to the overall biodiversity of the SDZ.	
HC04	Where native species planting is not feasible, planting schedules should include species that provide biodiversity value (food and shelter resources) to pollinators and other fauna species. Suitable plant species can be found in the All-Ireland Pollinator Plan's Pollinator Friendly Planting Code.	The project will adhere to objective HC04, full details of the implementation in each development area can be seen in Section 3.2.9.
HC05	Native species should be used for formal hedging proposed within Clonburris SDZ. Suitable species include *Corylus avellana, Ligustrum vulgare, Viburnum opulus* and *Taxus baccata.*	The species suggested in objective code HC05 have been adhered to and further native species have been introduced such as *Ilex aquifolium, Rosa Canina, Prunus avium* and *Prunus spinosa.* Additionally, some non-native species described in the All-Ireland pollinator plan will also be introduced to offer additional support to local pollinators. Examples are: *Fuchsia* 'Riccartonii', *Olearia x scilloniensis* 'Master Michael and *Lavandula angustifolia* 'Hidcote'. Full details of the implementation can be seen in Section 3.2.9.

3.2.2.2 Wildflower meadow / Strip / Garden

Table 3-9 Biodiversity Objectives for Habitat Creation: Wildflower meadow / Strip / Garden from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC06	Native wildflower meadows proposed within the SDZ should reflect the existing biodiversity in the area. This may be achieved in the following ways: › Where possible and subject to season restriction, seeds may be harvested from the existing meadows (if there are no non-native invasive species present in the area) to ensure that local biodiversity is retained. › Local biodiversity may be retained by translocation. Intact turves may	Native wildflower meadows within the development will be seeded with native and pollinator perennial wildflowers harvested from the Clonburris area (where possible) using the Green hay seeding technique or native seed mix (to be agreed with SDCC Parks department, subject to approval of NPWS if required). This approach will ensure consistency with previous ecological surveys undertaken in the area.

Objective Code	Biodiversity Measures	Adhere/Implement
	be removed from donor sites with a suitable excavator and incorporated into a suitable receptor site. › Seed mixes may be bought from a wildflower provider. Species known to be present in the area should be chosen for the seed mixes. Full species lists for the SDZ can be found in Ecological Survey of Clonburris (FERS Ltd., 2018).	Additional wildflower meadows to be planted will contain native Irish varieties and to be compliant with the All-Ireland Pollinator plan, in consultation with Project Ecologist and SDCC. Long-flowering wildflower species to be incorporated into the woodland planting area are: *Fragaria vesca, Hyacinthoides non-scripta, Anthriscus sylvestris, Digitalis purpurea, Hedera helix, Allium ursinum, Lonicera periclymenum* and *Vinca minor.* Should any of those species be unavailable at the time of planting then they will be substituted with the following native wildflowers: *Ficaria verna, Arum maculatum, Prunella yulgaris/Rumex acetosa, Geum rivale, Anemone nemorosa, Oxalis acetosella* or *Primula vulgaris.*
HC07	If seed mixes will be bought, a perennial mix must be used to create wildflower meadows on site, rather than continually planting annuals. Even though a perennial mix meadow may be less colourful than an annual mix meadow, this is a more cost-effective approach and provides a better source of food for pollinators than an annual mix. Native Irish perennial seed mixes can be sourced from various supplies.	The project will adhere to objective HC07 and refer to the National Biodiversity Data Centre (2017) Creation and management of a wildflower meadow. All-Ireland Pollinator Plan, How-to-Guide 4. National Biodiversity Data Centre Series no. 13 for guidance.
HC08	Where wildflower meadows are being planted on site, proper ground preparation and weed elimination is integral to the successful creation of the wildflower meadow. Steps to be taken to prepare the site for sowing with wildflower are described in the following document: National Biodiversity Data Centre (2017) Creation and management of a wildflower meadow. All-Ireland Pollinator Plan, How-to-Guide 4. National Biodiversity Data Centre Series no. 13. These steps must be	The project will adhere to objective HC08 and refer to the National Biodiversity Data Centre (2017) Creation and management of a wildflower meadow. All-Ireland Pollinator Plan, How-to-Guide 4. National Biodiversity Data Centre Series no. 13 for guidance.

Objective Code	Biodiversity Measures	Adhere/Implement
	followed for the proposed wildflower meadow habitats on site.	
HC09	The following document must be consulted prior to the design of wildflower meadows: National Biodiversity Data Centre (2017) Creation and management of a wildflower meadow. All-Ireland Pollinator Plan, How-to-Guide 4. National Biodiversity Data Centre Series no. 13. This resource follows the principles set out in the All-Ireland Pollinator Plan 2015-2020.	The project will adhere to objective HC09 and refer to the National Biodiversity Data Centre (2017) Creation and management of a wildflower meadow. All-Ireland Pollinator Plan, How-to-Guide 4. National Biodiversity Data Centre Series no. 13 for guidance.
HC10	Factors such as soil and aspect will need to be considered in the design of wildflower meadows, as these can heavily influence the successful creation of this habitat.	The project will adhere to objective HC09. For example, wetland species will be planted in areas containing wet/waterlogged soils to ensure greater success and minimal human intervention.

3.2.2.3 Green / Brown Roof Sustainable Development System (SuDS) Measure

Table 3-10 Biodiversity Objectives for Habitat Creation: Green / Brown Roof (SuDS Measure) from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC11	Green roofs are recommended in the Clonburris SDZ Planning Scheme Surface Water Strategy (2017)14 for consideration within the Clonburris SDZ on appropriate apartment and commercial buildings. In addition to improving the biodiversity value of an area, they are recommended SuDS measure and can contribute to climate mitigation and adaptation. These advantages are all outlined as Key Principles of the Planning Scheme.	Green roofs designed specifically for biodiversity will be incorporated into the project on the apartment buildings and creche/local node. Green roofs will be planted with a wide range of dry grassland wildflowers and sedum species (40+ ideally).
HC12	All planting proposed for green roofs must be of native species and preferably species that are local to the area. Native Irish perennial seed mixes can be sourced from various supplies.	Green roofs will be planted with a wide range of native, dry grassland wildflowers and sedum species (40+ ideally).
HC13	Brown roofs are recommended for consideration as they replicate existing 'recolonising bare ground' habitat which is present within the SDZ lands.	Brown roofs were considered as part of this project but will not be incorporated on this occasion in Tile 1.

Objective Code	Biodiversity Measures	Adhere/Implement
	They should have a substrate applied but be left unplanted. This will allow local plants to colonise which will improve local biodiversity. The following links provide information and advice on brown roofs: › Tepui (2008). Green Roofs Over Dublin. A Green Roof Policy Guidance Paper for Dublin. › ELIOS (2012). Case Study. Green and Brown Roofs. › WWT Consulting & RSPB (2012). Sustainable Drainage Systems. Maximising the potential for people and wildlife	
HC14	A plan for the maintenance of green and brown roofs must be prepared for each roof. Plans should include maintenance measures such as mowing and weed removal etc. and responsibility for such management must be identified within the maintenance plan.	The project will adhere to objective HC14. Full details of Habitat Management can be found in Section 4.

3.2.2.4 Hedgerows

Table 3-11 Biodiversity Objectives for Habitat Creation: Hedgerows from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC15	The planting of hedgerows within the parks areas and along roadways is a key habitat creation objective. The planting of hedgerows should also be considered in Development Areas. Species lists must be comprised of a range of native species and preferably comprised of the species already present locally. Species should include a range of trees and shrubs as well as suitable understorey planting. Full species lists for the hedgerows within Clonburris SDZ can be found in the document Ecological survey of Clonburris Strategic Development Zone, Clondalkin, Co. Dublin (FERS Ltd., 2018).	The project will adhere to objective HC05. Full details of hedgerow implementation in each project area can be seen in Section 3.2.9.
HC16	Where hedgerow planting is proposed within the lands, the new hedgerows	All hedgerows created within the project area will consist of double-

Objective Code	Biodiversity Measures	Adhere/Implement
	should take the form of a double line of native tree with shrub species. Translocation of existing hedgerows and their seed banks to new locations should be considered where feasible. Hedgerows must be correctly maintained according to the following document: The Heritage Council (2016) Conserving Hedgerows.	staggered hedge planting. Hedgerows will be maintained according to The Heritage Council (2016) Conserving Hedgerows document. Full details of hedgerow management can be found in the HMP in Section 4.
HC17	Hedgerow locations must be chosen to connect features of ecological value (particularly the Griffeen River, the Grand Canal and the railway line, as well as existing hedgerows, treelines and woodland) to the ecological network in the wider landscape where possible and promote green infrastructure within the lands. This can be achieved by planting hedgerows where they do not already exist and in this way minimising the number of gaps in the hedgerow network that would affect ecological connectivity within the SDZ lands and the surrounding areas.	Hedgerow creation within the linear park has been chosen to enhance the ecological corridor and increase biodiversity. Hedgerow planting along the eastern boundary has been chosen to link the east to the wider landscape and improve the green infrastructure. Further hedgerow creation throughout the project area will act as stepping-stone habitats allowing connection to the wider landscape and providing continuity of biodiversity throughout the project area.
HC18	Where existing tree planting is present along roadsides, supplementary native understorey shrub and herbaceous planting should be considered. This would help compensate for the loss of hedgerow habitat and strengthen green and blue infrastructure within the lands.	Supplementary planting will be undertaken where necessary.
HC19	Where hedgerows are being retained within parkland, consideration should be given to incorporate sufficient space for hedgerows to develop into linear woodland features.	Hedgerows along with their surrounding existing vegetation will be retained along the linear park. Some hedges in this area have already developed into woodland thicket and will be retained to allow for the continuation of their natural succession.

3.2.2.5 Tree Planting

Table 3-12 Biodiversity Objectives for Habitat Creation: Tree Planting from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC20	For every tree felled within the Clonburris SDZ, a replacement tree should be planted within the SDZ. Planning proposals shall demonstrate same. This ensures compliance with South Dublin County Council's Tree Management Policy.	The project will adhere to objective HC20. Many of the trees within the project area are suffering from disease and in poor condition. These trees will be removed and replaced with a much greater density of trees in healthy condition.
HC21	Preferably, all tree planting (including street planting) should be of native species. Where this is not possible, tree species should be chosen with regard to the All-Ireland Pollinator Plan's Pollinator Friendly Planting Code.	Where possible native trees will be planted within the project area, to support the local pollinators and support biodiversity. Where the planting of native trees is not possible, trees will be chosen with regard to the All-Ireland Pollinator Plan's Pollinator Friendly Planting Code.
HC22	Where tree planting is proposed, multi aged canopy is preferred. Semi mature specimens will be required at strategic locations. This will help compensate for the loss of mature trees across the SDZ and immediately provide nesting and feeding habitat for fauna species	Tree planting of a multi-aged canopy will be undertaken as part of this project. Trees consisting of the following girths will be introduced: › 8-10cm › 12-14cm › 14-16cm › 16-18cm › 18-20cm › 20-25cm › 30-35cm
HC23	Tree planting must take into consideration the connectivity of existing ecological features (e.g., hedgerows, treelines, woodland, watercourses) within the SDZ lands and planting must aim to contribute towards it. This can be achieved by, for example, planting trees and/or groups of trees relatively close to each other across amenity grasslands and wildflower meadows thus providing 'stepping-stones' for wildlife over open areas, and/or by planting treelines along streets and other linear features and consequently improving green	Tree planting along the western boundary to create a treeline has been decided to link the north to the south and provide greater connectivity to the Grand Canal and linear park. Native woodland planting within the local park will act as a stepping-stone habitats to hedgerows and wildflower meadows. Parkland tree planting, urban edge tree planting and rear garden tree planting will also act as stepping-

Objective Code	Biodiversity Measures	Adhere/Implement
	infrastructure and the overall ecological connectivity within the SDZ lands	stone habitats for wildlife throughout the development area.

3.2.2.6 Living Walls

Table 3-13 Biodiversity Objectives for Habitat Creation: Living Walls from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC26	Living walls should be considered for incorporation into developments where appropriate within the lands for cleaning or attenuating water. Advice on how to implement living walls can be found in section 6 of the following document: Greater London Authority (2004) Building Green. A guide to using plants on roofs, walls and pavements.	Green living walls with trellis to enable climbing plants will be incorporated throughout the project area.
HC27	Native, high biodiversity value species should be chosen for inclusion within living walls e.g., Ivy (*Hedera helix)* and native Honeysuckle (*Lonicera periclymenum).*	Native, high biodiversity value species will be chosen for the living walls, including: *Hedera helix, Lonicera periclymenum* and *Pyracantha coccinea.*

3.2.2.7 Swales (SuDS Measure)

Table 3-14 Biodiversity Objectives for Habitat Creation: Swales (SuDS Measure) from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC28	Where swales are proposed within the SDZ, the design should include native grass species to enhance biodiversity and wildlife and be in accordance with the SDCC Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide.	Planted swales will be located throughout the project area, they will be enhanced by seeding with native and pollinator friendly perennial wildflowers harvested from the Clonburris area using the Green hay seeding technique or native seed mix (to be agreed with SDCC Parks department, subject to approval of NPWS if required). This approach will ensure consistency with previous ecological surveys undertaken in the area. Typical species which are

Objective Code	Biodiversity Measures	Adhere/Implement
		local and suitable for swale planting are: *Iris pseudacorus, Typha latifolia, Schoenoplectus lacustris, Phalaris arundinacea, Deschampsia cespitosa* and *Primula vulgaris.*

3.2.2.8 Rainwater Gardens (SuDS Measure)

Table 3-15 Biodiversity Objectives for Habitat Creation: Rainwater Gardens (SuDS Measure) from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC29	High biodiversity value rainwater gardens should be considered for inclusion within new developments as a SuDS measure and be in accordance with the SDCC Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide. It is recommended that planting lists are comprised of water-tolerant native species and preferably of species which are known to be present locally. Where it is not possible to plant entirely native species, ornamental species should be chosen with regard to the All-Ireland Pollinator Plan's Pollinator Friendly Planting Code.	Rain gardens were considered as part of this project but will not be incorporated on this occasion in Tile 1.

3.2.2.9 Pond

Table 3-16 Biodiversity Objectives for Habitat Creation: Pond from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC30	New wetlands should be created with biodiversity in mind. Detention and attenuation ponds/ basins should have shallow, gently sloping areas to create suitable habitat for amphibians and other fauna. Details to be in accordance with the SDCC Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide (when available)	A wetland area along the southern boundary will be enhanced for biodiversity; with the planting of native submergent, emergent and marginal plant species. Sloping features including a wildlife beach will be created to increase the ponds' usage by wildlife. Full details can be found in Section 3.4.5.
HC31	New wetlands should connect to other features of ecological interest within the lands such as meadows and hedgerows. This is to strengthen the biodiversity	The wildlife beach will connect to existing vegetation including overgrown hedgerows forming into

Objective Code	Biodiversity Measures	Adhere/Implement
	value of the lands and improve green and blue infrastructure. Details to be in accordance with the SDCC Sustainable Drainage Systems (SuDS) Explanatory, Design and Evaluation Guide (when available).	woodland thicket, partial scrub, and wet grassland. Other wet bio-retention areas within the local park will link to hedgerows and to the native woodland area. Additional wet bio-retention areas in the south-east will link to wildflower meadows.
HC32	Often in nature, marsh and wet grassland grade into each other and therefore, it may be possible to create a more natural habitat by mimicking nature in this way. Examples of typical species for both wet grassland and marsh are given below, as an indicator of species which should be planted to create a natural wetland habitat: Wet grassland habitat: rushes (e.g., *Juncus effusus, Juncus inflexus, Juncus articulatus)*, sedges (e.g., *Carex flacca, Carex hirta*), grasses (*Holcus lanatus, Alopecurus geniculatus, Agrostis stolonifera*), broadleaved herbs (*Ranunculus repens, Cirsium palustre, Potentilla anserina, Filipendula ulmaria, Mentha aquatica, Galium palustre, Iris pseudacorus, Cardamine pratensis and Equisetum spp*). Clumps of reeds such as *Phragmites australis* could also be considered but these should not dominate. It is important that wet grassland habitat contains structural diversity, so that it can offer a variety of micro-habitats and support a range of species, especially invertebrates, which may have different habitat requirements. Therefore, a range of species of different heights should be selected. In addition, the proportion of grasses to herbs should be considered- typically the proportion of broadleaved herbs is often high. Marsh habitat: rushes (*Juncus spp.*), sedges (*Carex spp.*), grasses (e.g., *Agrostis stolonifera, Molinia caeruleae, Festuca arundinacea*), broadleaved herbs (*Filipendula ulmaria, Mentha*	Species suggestions outlined in objective HC32 will be considered. The existing vegetation within the wet grassland area will be retained. At present, the habitat most closely resembles a tall-herb swamp (Fossitt code FS2) habitat which is in very poor condition. Therefore, heavy planting of tall grasses, reeds and sedges will not be undertaken, to ensure those species do not dominate. Instead, the emphasis will be on allowing the native broadleaved herb species to regenerate. Potentially the planting of native submergent, emergent and marginal plant species broadleaved species which are listed in Section 3.4.5. may be undertaken to aid the regeneration process.

Objective Code	Biodiversity Measures	Adhere/Implement
	aquatica, Cirsium palustre, Angelica sylvestris, Caltha palustris, Lychnis flos-cuculis, Lythrum salicaria, Potentilla palustris, Iris pseudacorus and Equisetum spp.) Reeds and other native tall grasses and sedges may also be planted but these should not dominate. To be considered as marsh, the proportion of sedges and grasses should not exceed 50%.	

3.2.2.10 Watercourses

Table 3-17 Biodiversity Objectives for Habitat Creation: Watercourses from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC39	Inland Fisheries Ireland (IFI) and Waterways Ireland must be consulted on any proposed planting within the biodiversity protection zones (within 10m) of the Griffeen River and the Grand Canal prior to works.	The project will adhere to objective HC39 and consult IFI and Waterways Ireland as necessary.

3.2.2.11 Grand Canal (including pNHA)

Table 3-18 Biodiversity Objectives for Habitat Creation: Grand Canal (including pNHA) from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
HC40	Any proposed planting along and adjacent to the Grand Canal must take into consideration measures for the protection of existing habitats by including an appropriate set-back distance from the pNHA boundary to facilitate protected species, biodiversity, and a fully functioning green and blue infrastructure network. This distance is dependent on the ecological feature (e.g., bat tree roost, rare flora) in question and should be assessed on a case-by-case basis by a suitably qualified ecologist.	The project will adhere to objective HC40, in consultation with the Project Ecologist, the NPWS and SDCC.
HC41	Planting schedules along the boundary of the Grand Canal pNHA must have	The project will adhere to objective HC41, in consultation with the

Objective Code	Biodiversity Measures	Adhere/Implement
	regard to the habitat creation recommendations provided above.	Project Ecologist, the NPWS and SDCC.
HC42	Planting along the boundary of the Grand Canal pNHA should take into consideration management requirements of proposed species in the planting schedules and prevent their encroachment into the habitats of the pNHA.	The project will adhere to objective HC42, in consultation with the Project Ecologist, the NPWS and SDCC.
HC43	A permission should be sought from Waterways Ireland if any proposed works require access to the Grand Canal footpath.	The project will adhere to objective HC42, in consultation with Waterways Ireland.

3.2.3 Birds

3.2.3.1 General

Table 3-19 Biodiversity Objectives for Birds from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
Bi01	In order to minimise disturbance of breeding birds, their nests, eggs and/or their un-flown young, all works involving the removal of trees or hedgerows should be undertaken outside of the nesting season (1st March to 31st August inclusive). Or where this seasonal restriction cannot be observed then: A breeding bird survey will be undertaken during the appropriate survey season (between early March and late June) by a suitably qualified ecologist with experience undertaking breeding bird surveys in order to confirm whether birds are nesting within suitable habitat affected. Should nesting birds be encountered during surveys, the removal of the affected trees or hedgerows may be required to be delayed until after the nesting season (1st March to 31st August inclusive).	The project will adhere to objective Bi01.

Objective Code	Biodiversity Measures	Adhere/Implement
Bi02	Where possible, existing grassland habitat should be retained or created as it provides important feeding and nesting habitat for birds. Meadows should be left uncut during the winter months to provide a continuous food source for seed-eating birds. Where retained, measures will be incorporated to protect from construction impacts including soil stockpiling etc.	The project will adhere to objective Bi02.
Bi04	All proposed developments, as agreed with the Planning Authority, within Clonburris SDZ must consider including nest boxes or bricks for swallows, house martins and swifts within the proposed building's structure following manufacturer's guidance. Specific guidance to attract swifts can be found in this document: Swift Conservation Ireland (2019) How to build-in swift nest boxes into cement block walls.	Nest boxes or bricks for swallows, house martins and swifts within the project building's structure were all considered. Full details of bird boxes which will be installed throughout the project area can be found in Section 3.4.2.
Bi05	Consideration should be given to installing nest boxes within the parks and development zones. Nest boxes designed to accommodate a range of different species should be installed including boxes for raptors, large birds, small birds etc.	A variety of nest boxes were considered and will be installed. Full details of the bird box varieties which will be installed throughout the project area can be found in Section 3.4.2.

3.2.3.2 Barn Owl

Table 3-20 Biodiversity Objectives for Barn Owl from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
Bi06	Developments within the Clonburris SDZ must consider impacts on Barn owl (*Tyto alba*) which is likely to breed within the lands, which must be addressed through the EcIA being prepared for the proposed development (as per the requirements of HR02 of this BMP). Particular attention must be given to sites which have suitable nesting habitat i.e., derelict buildings, barns or sheds on the lands or suitable foraging habitats such as the Canal i.e., rough grassland,	No suitable nesting habitat such as derelict buildings, barns or sheds are located within the project area. Suitable foraging habitats such as rough grassland, hedgerows, woodland edges, and wetlands along the canal will all be retained and where necessary, enhanced. An annual barn owl monitoring program will also be initiated as part of the overall Clonburris SDZ

Objective Code	Biodiversity Measures	Adhere/Implement
	hedgerows, woodland edges and wetlands. Specialist barn owl surveys will be required where suitable barn owl habitat is present. Where a development will impact on barn owl breeding and foraging sites, suitable mitigation must be outlined in the EcIA. This might include measures such as but not limited to the installation of barn owl boxes. Birdwatch Ireland should be consulted in relation to any development which may potentially impact upon barn owl's breeding or foraging habitat and feedback sought on suitable mitigation measures relevant to the level of impact predicted.	Scheme, these surveys will be undertaken by Ecologists/Ornithologists at RSK Engineering and Environmental Consultancy.
Bi07	The parks onsite should be managed to retain suitable foraging habitat for barn owl. A network of rough grassland habitat, particularly that is associated with wetland habitat should be retained throughout the parks.	The project will adhere to objective Bi07.

3.2.4 Bats

Table 3-21 Biodiversity Objectives for Barn Owl from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
Ba01	Where buildings will be demolished/ refurbished or trees with suitability for bats will be removed within the lands, bat surveys must be carried out at the appropriate time of year by a suitably qualified ecologist to assess whether roosting bats are present (at least 2 surveys separated by a minimum of a week carried out between May and August). If bat roosts are confirmed within the lands (either in trees or buildings), the roost should be retained wherever possible. Should retention of any bat roost not be possible, then in order for a derogation licence to be granted there must have been no reasonable alternative, the loss of the roost must not affect the conservation status of the species. In all cases it is strongly recommended that loss of bat roosts is offset by providing	A suitably trained Ecologist undertook bat surveys at the appropriate times of year, no bat roosts were recorded with the project area.

Objective Code	Biodiversity Measures	Adhere/Implement
	replacement roost opportunities. All recommendations for mitigation should be adapted to the species and the function of the roost.	
Ba02	All proposals for development near bat roosts or ecological corridors must address the potential adverse impacts of lighting on bats. Lighting should be at a low level, directional and should follow guidance provided by Bat Conservation Trust (2018). Guidance note 08/18 Bats and artificial lighting in the UK. Lighting plans near ecological corridors should be reviewed by a suitably qualified bat ecologist. If adverse impacts are anticipated, a derogation licence must be obtained from the NPWS.	A lighting plan will be devised to avoid and/or minimise the effect of artificial lighting on the local bat and wildlife populations having consideration of the following guidelines: › Bat Conservation Ireland guidelines; Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) › Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018), to minimise light spillage, thus reducing any potential disturbance to bats. › Dark Sky Ireland Lighting Recommendations, 2019.
Ba03	Lighting on the northern Grand Canal bank (towpath & 30m buffer) should be avoided and all lighting along the canal should be minimised. It is recommended that the design and operation of the artificial lighting on the southern tow path is reviewed by SDCC in consultation with a suitably qualified ecologist.	A lighting plan will be devised to avoid and/or minimise the effect of artificial lighting on the local bat and wildlife populations having consideration of the following the guidelines and in consultation with the Project Ecologist and SDCC. › Bat Conservation Ireland guidelines; Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) › Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018), to minimise light spillage, thus reducing any potential disturbance to bats.

Objective Code	Biodiversity Measures	Adhere/Implement
		› Dark Sky Ireland Lighting Recommendations, 2019.
Ba04	Any developments located close to a known bat roost or ecological corridor should consider incorporating enhancement measures into the design. Appropriate measures may include installing bat boxes onto buildings, planting hedgerows, pond creation and planting of night-scented flowers.	Enhancement features will be incorporated as part of this project along the southern ecological corridor. Full details of these enhancements can be found in the following sections: › Section 3.1.9.2 › Section 3.4.1 › Section 3.4.5
Ba05	All proposed developments within Clonburris SDZ must consider installing bat bricks into the building's design following manufacturer's advice.	Bat brick installation was considered as part of this project. However, on this occasion the installation of bat boxes will instead be undertaken, full details of which can be found in Section 3.4.1.

3.2.5 Mammals

Table 3-22 Biodiversity Objectives for Mammals from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
M01	Where relevant developments are proposed within the Clonburris SDZ, mammal surveys, as agreed with the Planning Authority, must be carried out within the proposed development site and up to 150m around the boundary to ensure no protected mammals will be negatively impacted by the development. It is an offence to disturb the breeding or resting place of a protected mammal. If disturbance to a protected mammal is unavoidable, an application for a derogation licence must be made to the NPWS.	A robust Environmental Impact Assessment Report (EIAR) was undertaken for this project which included a targeted mammal survey. For which, planning has been granted for this project under planning reference SDZ22A/0018. The EIAR concluded that several mammals may utilise the area for roaming and foraging. However, no breeding or resting areas were observed. Additionally, targeted mammal pre-commencement surveys were undertaken within Tile 1 and the surrounding vicinity. Several rabbits were observed during the survey, along with fox and badger prints. No evidence of Otter was recorded. Historical badger setts were recorded. However, no active or recently used setts were recorded.

Objective Code	Biodiversity Measures	Adhere/Implement
M02	A 10m riparian habitat buffer zone will be provided around existing and proposed rivers, streams and wetland habitat where space allows to maintain commuting and foraging routes for otter. Exceptions to the 10m buffer zone will apply where required to provide for road crossings, services and landscaping features.	The project will adhere to objective MA02.

3.2.6 Invertebrates

Table 3-23 Biodiversity Objectives for Invertebrates from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
I01	Grassland / meadow habitat retained or created throughout the lands should be managed to keep important foodplants of the invertebrate species recorded (*Poa* spp., *Agrostis* spp., *Lolium* spp., *Urtica dioica, Cirsium* spp., *Lotus corniculatus, Lotus pedunculatus, Senecio jacobaea, Centaurea nigra, Rubus fruticosus agg., Dipsacus fullonum* etc.).	Grassland and meadow habitats will be managed for biodiversity. Full details of Habitat Management can be found in Section 4.
I02	Installation of 'insect hotels' should be considered throughout the site. Insect hotels can include solitary bee bricks that can be built into buildings, purpose built 'insect houses' or standing deadwood. The creation of earth banks or bare ground free from vegetation should be considered to provide nesting habitat for solitary bees. These should be created facing southwards. Detailed instructions for the creation of wild pollinator nesting habitat can be found in the following document: National Biodiversity Data Centre (2016) Creating wild pollinator nesting habitat. All-Ireland pollinator plan, How-to-guide 1. National Biodiversity Data Centre Series no. 5.	Several small bee hotels will be installed throughout the project area alongside areas which contain suitable pollen sources as described in the National Biodiversity Data Centre (2016) Creating wild pollinator nesting habitat. All-Ireland pollinator plan, How-to-guide 1. National Biodiversity Data Centre Series no. 5. Leaf litter areas and log piles will be installed in designated areas within the project area. Full details of these installations can be found in Sections 3.4.3 and 3.4.4.
I03	Planting throughout the site should focus on native species that provide food for pollinators. Where this is not	Native wildflower meadows within the development will be seeded with native and pollinator perennial

Objective Code	Biodiversity Measures	Adhere/Implement
	possible, species included in ornamental planting lists should be chosen with pollinators in mind. A range of plants that produce pollen and nectar throughout the year should be chosen. A list of suitable species that provide food for pollinators can be found in the All-Ireland Pollinator Plan's Pollinator Friendly Planting Code.	wildflowers harvested from the Clonburris area (where possible) using the Green hay seeding technique or native seed mix (to be agreed with SDCC Parks department, subject to approval of NPWS if required). This approach will ensure consistency with previous ecological surveys undertaken in the area. Additional wildflower meadows to be planted will contain native Irish varieties and to be compliant with the All-Ireland Pollinator plan, in consultation with Project Ecologist and SDCC. Long-flowering wildflower species to be incorporated into the woodland planting area are: *Fragaria vesca, Hyacinthoides non-scripta, Anthriscus sylvestris, Digitalis purpurea, Hedera helix, Allium ursinum, Lonicera periclymenum* and *Vinca minor.* Should any of those species be unavailable at the time of planting then they will be substituted with the following native wildflowers: *Ficaria verna, Arum maculatum, Prunella yulgaris/Rumex acetosa, Geum rivale, Anemone nemorosa, Oxalis acetosella* or *Primula vulgaris.*
I04	The presence of white-clawed crayfish (WCC) within the lands is ecologically significant as it is an Annex II species and is currently in decline across Europe. It is recommended that a habitat management and conservation plan be put in place and actions taken to reverse the decline of this species within Clonburris SDZ.	This objective is part of the overall Clonburris SDZ Scheme. WCC surveys were undertaken by Ecologists at RSK Engineering and Environmental Consultancy in May 2023 in the Grand Canal and overflow channel, south of the project area. No WCC were recorded during this survey, a follow up survey will be undertaken by Ecologists at RSK Engineering and Environmental Consultancy in September 2023. Should populations be recorded a conservation plan for WCC will be constructed.

3.2.7 Fish and Amphibians

Table 3-24 Biodiversity Objectives for Fish and Amphibians from the Clonburris SDZ BMP.

Objective Code	Biodiversity Measures	Adhere/Implement
FA01	Should any areas of permanent or significant semi-permanent standing water require infilling then must be first checked by a suitably qualified ecologist for presence of fish, newts and frogs or evidence of their breeding. If required, a licence permitting their removal should be applied for from the NPWS and translocated to suitable alternative habitat within the SDZ (i.e., the proposed attenuation ponds).	The project will adhere to objective FA01.

3.2.9 Developments

3.2.9.1 Local Park

Table 3-25 Suggested Biodiversity Measures for the Local Park from the Clonburris SDZ BMP.

Biodiversity Measures	Adhere/Implement
Retention of treelines and enhancement of treelines.	An urban edge treeline will be planted along the northern boundary, consisting of *Acer campestre, Tilia cordata, Ulmus* 'Lobel' and *Betula pubescens*. A local street treeline will be planted along the eastern boundary, consisting of *Alnus glutinosa, Acer campestre, Carpinus betulus* and *Betula pubescens*. Finally, parkland trees consisting of *Acer campestre, Alnus glutinosa, Betula pendula, Fagus sylvatica, Pinus sylvestris, Prunus avium, Prunus padus, Sorbus aria, Sorbus aucuparia, Quercus robur, Betula nigra, Crataegus monogyna, Salix alba* 'Tristis', *Ulmus* 'Lobel', *Corylus avellana, Castanea sativa* and *Juglans nigra* will be planted along the entire perimeter of the local park.
Retention, enhancement, and creation of hedgerows.	New native hedgerows will be planted connecting the north-east of the local park to the south-east of the park, further hedge planting will be undertaken in the south-east. Consisting of *Crataegus monogyna, Corylus avellana, Euonymus europaeus, Ilex aquifolium, Lonicera periclymenum, Viburnum opulus, Ilex spp, Prunus avium, Prunus spinosa, Rosa canina, Fushia* 'Ricarrartonii', *Crataegus laevigata* 'Paul's Scarlet', *Osmanthus delavayi, Olearia x scilloniensis* 'Master Michael' and *Lavandula angustifolia* 'Hidcote'.
Retention, enhancement, and creation of woodland (pockets in park, near railway line and Grand Canal and around other water features).	Native woodland will be planted throughout the local park perimeter, consisting of the following native species: *Alnus glutinosa, Betula pendula, Betula pubescens, Crataegus monogyna, Pyrus malus, Quercus robur, Prunus avium, Acer campestre, Prunus spinosa, Salix* spp., *Prunus padus, Corylus avellana, Pinus sylvestris, Sorbus aria, Arbutus unedo, Taxus baccata 'fastigata', Malus sylvestris, Sambucus nigra, Rosa canina, Ilex aquifolium, Sorbus aucuparia, Euonymous europaeus, Prunus padus* and *Viburnum opulus.* The woodland will be created based on the Miyawaki method of planting, which is suggested to be a highly effective method for

Biodiversity Measures	Adhere/Implement
	rapidly creating forest cover. The essential principle of the Miyawaki method uses species of trees that would occur naturally in the area and that work together to create a diverse, multi-layered forest community. This creates a resilient and thriving forest ecosystem with species that complement one another with little need for human intervention. To achieve this, species will be planted in high densities, forcing them to grow fast and compete for light, natural selection will favour the faster growing individuals and naturally thin out the forest. Resulting in a densely packed woodland grown in 20-30 years rather than 100-150 years. Miyawaki forests are found to have approx. 18 times higher biodiversity when compared with neighbouring traditional planted woodlands.
Planting of native flowering and fruiting tree species.	The following native flowering and fruiting trees will be planted: *Arbutus unedo, Taxus baccata 'fastigata', Malus sylvestris, Sambucus nigra, Rosa canina, Ilex aquifolium, Corylus avellana, Crataegus monogyna, Sorbus aucuparia, Euonymous europaeus, Prunus avium, Prunus padus,*
Creation of short-flowering species rich grassland (roadside verges, pavement verges).	Bulbs will be planted in the north-west and south, consisting of the following short-flowering species: *Crocus tommasinianus* 'Barrs Purple', *Crocus vernus* ' Jeanne d'Arc', *Crocus vernus* 'Golden yellow', *Muscari armeniacum, Hyacinthoides non-scripta*, *Narcissus* 'Jack snipe', *Narcissus recurves* and *Narcissus 'W.P. Milner'.*
Creation of long-flowering wildflower meadows (areas in parkland).	The entire northern perimeter of the park will be seeded with native, and pollinator perennial wildflowers harvested from the Clonburris area using the Green hay seeding technique or native seed mix (to be agreed SDCC Parks department, subject to approval of NPWS if required). This approach will ensure consistency with previous ecological surveys which were undertaken in the area. Additional wildflower meadows will be planted south, and west in the local park, to contain native Irish varieties and to be compliant with the All-Ireland Pollinator plan, in consultation with Project Ecologist and SDCC. Other long-flowering wildflower species to be incorporated into the parkland planting are:

Biodiversity Measures	Adhere/Implement
	Fragaria vesca, Hyacinthoides non-scripta, Anthriscus sylvestris, Digitalis purpurea, Hedera helix, Allium ursinum, Lonicera periclymenum and *Vinca minor*. Should any of those species be unavailable at the time of planting then they will be substituted with the following native wildflowers: *Ficaria verna, Arum maculatum, Prunella yulgaris/Rumex acetosa, Geum rivale, Anemone nemorosa, Oxalis acetosella* or *Primula vulgaris.*
Herbaceous pollinator-friendly planting (urban planters, areas of annual bedding).	A native meadow grassland will be planted north, south and west in the local park, to contain native Irish varieties, compliant with the All-Ireland Pollinator plan, in consultation with the Project Ecologist and SDCC. Additionally, the following pollinator-friendly species semi-woody and herbaceous species will be planted within the hedgerows of the local park: *Lonicera periclymenum, Ilex aquifolium, Viburnum opulus, Rosa canina, Fuchsia* 'Ricarrartonii', *Olearia x scilloniensis* 'Master Michael' and *Lavandula angustifolia* 'Hidcote'.
Creation and enhancement of ponds, swales, and other water-retention features.	Swales will be created along the entire northern perimeter of the local park, they will be enhanced by seeding with native and pollinator perennial wildflowers harvested from the Clonburris area using the Green hay seeding technique or native seed mix (to be agreed SDCC Parks department, subject to approval of NPWS if required). This approach will ensure consistency with previous ecological surveys which were undertaken in the area. Typical species which are local and suitable for swale planting are *Iris pseudacorus*, *Typha latifolia, Schoenoplectus lacustris, Phalaris arundinacea, Deschampsia cespitosa* and *Primula vulgaris.* Additionally, a bio-retention area will be created along the perimeter of the eastern boundary which will be planted as per the proposed swales species. Furthermore, a wet area will be created in the south-east of the park which will receive any runoff from swales.
Addition of bird and bat boxes on trees.	Full details can be found in Sections 3.4.1 and 3.4.2
Sensitive lighting design and innovative lighting (e.g., red light) for the protection of bats.	A lighting plan will be devised to avoid and/or minimise the effect of artificial lighting on the

Biodiversity Measures	Adhere/Implement
	local bat and wildlife populations having consideration of the following guidelines: › Bat Conservation Ireland guidelines; Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) › Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018), to minimise light spillage, thus reducing any potential disturbance to bats. › Dark Sky Ireland Lighting Recommendations, 2019.
Addition of leaf litter and log piles, earth banks and bee and bug hotels.	These will be incorporated where possible and safe to do so – see Sections 3.4.2 and 3.4.3 for full details.

3.2.9.2 Grand Canal and Fonthill Embankment

Table 3-26 Suggested Biodiversity Measures for the Grand Canal and Fonthill Embankment from the Clonburris SDZ BMP.

Biodiversity Measures	Adhere/Implement
Retention of treelines and enhancement of treelines.	All treelines along the pNHA boundary to be retained and where necessary additional planting will be undertaken to support the pNHA biodiversity and enhance the habitat. An urban edge treeline will be planted along the south-eastern boundary, along the Fonthill embankment and again along the northern boundary of the linear park, consisting of *Acer campestre, Tilia cordata, Ulmus* 'Lobel' and *Betula pubescens*. A local street treeline will be planted along the eastern boundary, consisting of *Alnus glutinosa, Acer campestre* 'Elegant', *Carpinus betulus* and *Betula pubescens*. Green corridor trees will be planted in the southern section, connecting the development pathway to the linear park. Planting along with green corridor will consist of *Acer campestre, Tilia cordata* and *Fagus sylvatica*. Finally, parkland trees consisting of *Acer campestre, Alnus glutinosa, Betula pendula, Fagus sylvatica, Pinus sylvestris, Prunus avium, Prunus padus, Sorbus aria, Sorbus aucuparia, Quercus robur, Betula nigra, Crataegus*

Biodiversity Measures	Adhere/Implement
	monogyna, Salix alba 'Tristis', *Ulmus* 'Lobel', *Corylus avellana, Castanea sativa* and *Juglans nigra* will be planted in the southern section along the linear park adjacent to the Grand Canal.
Retention, enhancement and creation of hedgerows.	All hedgerows along the pNHA boundary to be retained and where necessary additional planting will be undertaken to support the pNHA biodiversity and enhance the habitat. Hedgerows will be planted connecting the north-east to the south-east and the east to the west. Consisting of *Crataegus monogyna, Corylus avellana, Euonymus europaeus, Ilex aquifolium, Lonicera periclymenum, Viburnum opulus, Ilex spp, Prunus avium, Prunus spinosa, Rosa canina, Fushia* 'Ricarrartonii', *Crataegus laevigata* 'Paul's Scarlet', *Osmanthus delavayi, Olearia x scilloniensis* 'Master Michael' and *Lavandula angustifolia* 'Hidcote'. The newly created hedgerow, consisting of native species along the Fonthill embankment and the linear park will enhance the biodiversity of the habitat and the ecological corridor.
Retention and enhancement of existing scrub habitat.	Existing scrub will be retained in the south-west along the Canal, including areas which have succeeded to woodland thicket. Full details of Habitat Management can be found in Section 4.
Creation of short-flowering species rich grassland (roadside verges, pavement verges, canal towpath).	A native meadow grassland will be planted at the south-east and all along the southern boundary. The mix will contain native Irish varieties and will be compliant with the All-Ireland Pollinator plan, in consultation with the Project Ecologist and SDCC.
Sensitive lighting design and innovative lighting (e.g. red light) for the protection of bats.	A lighting plan will be devised to avoid and/or minimise the effect of artificial lighting on the local bat and wildlife populations having consideration of the following guidelines: › Bat Conservation Ireland guidelines; Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers, BCI, 2010) › Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK (BCT, 2018), to minimise light spillage, thus reducing any potential disturbance to bats.

Biodiversity Measures	Adhere/Implement
	› Dark Sky Ireland Lighting Recommendations, 2019.

Additionally, to enhance biodiversity along the Canal and Fonthill embankment the following installations will be constructed, full details of which can be found in Section 3.4

- Bat boxes
- Bird boxes
- Bee hotel
- Earth bank and log pile
- Wildlife beach

3.2.9.3 Houses & Apartments

Table 3-27 Suggested Biodiversity Measures for the Houses and Apartments from the Clonburris SDZ BMP.

Biodiversity Measures	Adhere/Implement
Planting of native flowering and fruiting tree species.	Local streets will be planted with the following native flowering and fruiting tree species: *Alnus glutinosa, Carpinus betulus, Betula pubescens*, *Corylus avellana, Betula pendula, Prunus avium* and *Ligustrum vulgare.*
Creation of short-flowering species rich grassland (roadside verges, pavement verges).	Planted swales will be located throughout the project area, they will be enhanced by seeding with native and pollinator perennial wildflowers harvested from the Clonburris area using the Green hay seeding technique or native seed mix (to be agreed SDCC Parks department, subject to approval of NPWS if required). This approach will ensure consistency with previous ecological surveys undertaken in the area.
Herbaceous pollinator-friendly planting (urban planters, areas of annual bedding).	Street planting will be undertaken, consisting of the following semi-woody and herbaceous pollinator friendly species: *Lavandula angustifolia* 'Hidcote', *Sarcoccoca* spp., *Erica* spp., *Mahonia aquifolium, Viburnum opulus, Ajuga reptans, Liriope muscari, Lonicera periclymenum* and *Helleborus niger.*
Creation of rainwater gardens, swales, green and brown roofs and living (green) walls.	Green roofs designed specifically for biodiversity will be incorporated into the project on the apartment buildings and creche/local node. Green roofs will be planted with a wide range of dry grassland wildflowers and sedum species (40+ ideally). Green living walls with trellis to enable climbing plants are also to be incorporated throughout

Biodiversity Measures	Adhere/Implement
	the housing/apartment areas. Plant species to include: *Hedera helix, Lonicera periclymenum* and *Pyracantha coccinea.* Planted swales will be located throughout the project area, they will be enhanced by seeding with native and pollinator perennial wildflowers harvested from the Clonburris area using the Green hay seeding technique or native seed mix (to be agreed SDCC Parks department, subject to approval of NPWS if required). This approach will ensure consistency with previous ecological surveys undertaken in the area. Typical species which are local and suitable for swale planting are *Iris pseudacorus*, *Typha latifolia, Schoenoplectus lacustris, Phalaris arundinacea, Deschampsia cespitosa* and *Primula vulgaris.*
Bird boxes on trees.	Full details can be found in Section 4.4.2.

3.2.9.4 Local node and Creche

Table 3-28 Suggested Biodiversity Measures for the Local Node and Creche from the Clonburris SDZ BMP.

Biodiversity Measures	Adhere/Implement
Planting of native flowering and fruiting tree species.	Local streets will be planted with the following native flowering and fruiting tree species: *Alnus glutinosa, Carpinus betulus* and *Betula pubescens.*
Creation of short-flowering species rich grassland (roadside verges, pavement verges).	Planted swales will be located throughout the project area, they will be enhanced by seeding with native and pollinator perennial wildflowers harvested from the Clonburris area using the Green hay seeding technique or native seed mix to be agreed SDCC Parks department, subject to approval of NPWS if required. This approach will ensure consistency with previous ecological surveys which were undertaken in the area. Typical species which are local and suitable for swale planting are *Iris pseudacorus*, *Typha latifolia, Schoenoplectus lacustris, Phalaris arundinacea, Deschampsia cespitosa* and *Primula vulgaris.*
Herbaceous pollinator-friendly planting (urban planters, areas of annual bedding).	Street planting will be undertaken consisting of the following semi-woody and herbaceous pollinator friendly species: *Lavandula angustifolia* 'Hidcote', *Sarcoccoca* spp., *Erica* spp., *Mahonia aquifolium, Viburnum opulus,*

Biodiversity Measures	Adhere/Implement
	Ajuga reptans, Liriope muscari, Lonicera periclymenum and *Helleborus niger.*
Creation of rainwater gardens, swales, green and brown roofs and living (green) walls.	Green roofs designed specifically for biodiversity will be incorporated into the project on the apartment buildings and creche/local node. Green roofs will be planted with a wide range of dry grassland wildflowers and sedum species (40+ ideally). Green living walls with trellis to enable climbing plants are also to be incorporated throughout the project area. Plant species to include: *Hedera helix, Lonicera periclymenum* and *Pyracantha coccinea.* Planted swales will be located throughout the project area, they will be enhanced by seeding with native and pollinator perennial wildflowers harvested from the Clonburris area using the Green hay seeding technique or native seed mix (to be agreed SDCC Parks department, subject to approval of NPWS if required). This approach will ensure consistency with previous ecological surveys which were undertaken in the area. Typical species which are local and suitable for swale planting are *Iris pseudacorus*, *Typha latifolia, Schoenoplectus lacustris, Phalaris arundinacea, Deschampsia cespitosa* and *Primula vulgaris.*
Bird boxes on trees	Full details can be found in Section 3.4.2.

3.3 Parks & Open Space Landscape Strategy

The Clonburris Parks and Landscape Strategy included in the Clonburris SDZ Strategy applies to the design of parks, open spaces, and landscapes within the entire Clonburris SDZ. The policies and objectives relating to the design and delivery of parks, open spaces, the provision of street trees and relating to the protection and development of Green Infrastructure, contained within South Dublin County Council's County Development Plan applies to Clonburris SDZ's parks and landscapes where relevant.

The Grand Canal is identified as a Strategic Green Corridor in the Planning Scheme and has high biodiversity potential. Consideration has been given to existing vegetation that has high biodiversity value and that provides links between habitats. Therefore, existing vegetation along this corridor will be retained and additional planting will be undertaken to enhance the habitats as/where needed.

The Parks and Landscape Strategy requests that a number of parks, open spaces, and recreational facilities are introduced into Tile 1. These will be introduced having regard to the overarching Biodiversity Management Plan for the Clonburris SDZ Scheme i.e., the provision of artificially lighting will be carefully located to ensure viability of protected species and maintenance of dark corridors.

Existing green infrastructure will be enhanced to form biodiversity corridors which will connect new green spaces. New substantial links will also be planted to enhance and strengthen the future ecological network as suggested within the Parks and Landscape Strategy.

The Parks and Landscape Strategy contains several recommendations which will be adhered to and implemented in the project at Tile 1 as specified further below in Sections 3.3.1 to 3.3.5.

3.3.1 Hedgerows

In areas of development where the retention of hedgerows and existing vegetation is not possible, compensatory measures such as the installation of green roofs, green living walls, swales and bio-retention areas will be introduced along with additional tree, hedge, and pollinator friendly flowering/fruiting species to minimise the negative impacts on biodiversity and to provide for alternative green links and biodiversity enhancement.

Where it is not possible to retain existing hedgerows, new planting will replace hedgerow removal as follows:

- Where it is not possible to retain existing trees and/ or hedgerows, replacement trees and/or hedgerows will be planted.
- Native species will be selected in favour of ornamental species where possible.
- A planting scheme which emulates the structure and character of a hedgerow will be undertaken (Further details of hedgerow creation and management can be found in Sections 3.2.2.4 & 4.6).

3.3.2 Tree Planting

Tree species have been selected for longevity, suitability to local soil conditions and micro-climate, biodiversity (native species as much as possible) and suitability for proximity to residential buildings. A range of tree species and sizes have been chosen from semi-mature specimen trees to multi-stems. The All-Ireland Pollinator Plan 2015-2020 has formed the basis of the proposed tree species along with the South Dublin County Council's Living with Trees, Tree Management Policy 2021-2026.

On-street parking will be broken up into a series of bays separated by planted build outs. Streets will be generously planted at frequent intervals to soften the impact of parking and strong building frontages.

In the interest of biodiversity and place making, reduced spacing between street trees will be considered where appropriate and achievable.

Further details of tree planting and management can be found in Sections 3.2.2.5 & 4.13.

3.3.3 Bioswales

Bioswales will be situated throughout the project area. Bio-retention areas will be designed to enhance the biodiversity value within the project area by contributing to the ecological value of the area. SuDS features throughout the project will form part of the high-quality open space and will feature landscape elements such as walkways, planting, wetlands and habitats. The development will provide SuDS that maximise the amenity, water cleansing and biodiversity value of these systems.

3.3.4 Green Infrastructure

The proposed strategic routes and local links will create a network between open spaces. Existing green infrastructure elements will be retained where possible to develop smaller scale ecological links that link to the strategic and local green corridors. Replacement and/or new planting will be created to maintain green links. Existing vegetation will be retained where possible and carefully managed in accordance with the specifications of a qualified arborist. Additional planting will be incorporated to supplement loss of vegetation and to improve the proportion of native species on site.

The green infrastructure along the canal will be enhanced by retaining existing vegetation, trees and replanting gaps as/where necessary. The vegetation of the canal will then extend into the linear park implementing a key principle of the Clonburris SDZ planning scheme which is to 'connect parks and areas of open space with ecological and recreational corridors. This will facilitate the movement of biodiversity and people and strengthen the overall Green Infrastructure network.'

New green corridors have been designed to run along urban structures such as roads and streets and open spaces. These green corridors consist of swales, tree lines, woodland planting, and new hedgerows.

Local Links have been incorporated in the design of each development area, linking local and strategic open spaces. Local links have been designed with the following outline design principles in mind:

- Retention of existing trees and vegetation where possible.
- Use of small-scale SuDS features where appropriate.
- Proposed tree lined streets and avenues.
- Appropriate tree species for street width and scale with guidance from Design Manual for Urban Roads and Streets (DMURS).
- Appropriate tree species with regard to biodiversity and future management, with guidance from SDCC Tree Management Policy.

Further details of green infrastructure creation and management can be found in Sections 3.2.2.3, 3.2.2.6, 3.2.2.7 & 4.5.

3.3.5 Soft Landscape

The landscape strategy promotes the integration of managed meadow areas throughout the strategic open spaces on the SDZ lands, in accordance with the Biodiversity Management Plan. Wildflower meadow planting will be introduced and in line with the All-Ireland Pollinator Plan, where possible and seed mixes will be selected to suit local conditions. Mown areas are included in the project and will be left flexible for informal sports, events, or passive uses. Full details on the maintenance regime of soft landscapes can be found in the Outline Landscape & Maintenance Specifications Report in Appendix 4.

3.4 Faunal Habitat Enhancement Measures

To enhance the habitat within the project area for wildlife, the installation of the following features is proposed for biodiversity enhancement.

- Bat boxes
- Bird boxes
- Bee hotel
- Earth bank and log pile
- Wildlife beach

As described in the preceding sections, the plant species incorporated into the proposed landscaping will provide feeding, commuting and refuge locations for a variety of invertebrates and other faunal species. The below sections outline specific measures incorporated into the proposed development that focus specifically on the provision of additional refuge, roosting and breeding structures for a wide range of wildlife. Additionally, hard infrastructures such as walls and fencing will be constructed where necessary. However, soft infrastructures such as hedging will be used instead where possible to aid in the movement of small mammals, reptiles and amphibians and enhance ecological corridors within the project area.

3.4.1 Bat boxes

Although no bat roosts were recorded within the site during pre-construction surveys, several common bat species were recorded in the wider area. For this reason, it is proposed to install bat boxes which can be used by the local bat population. Bat boxes will be provided within tree line habitats along the Canal line within the linear park, close to the canal water source and where limited lighting will occur (Lux levels less than 1lx). The installation of boxes, facing south, south-east and south-westerly directions will allow bats to best choose a preferred roost during seasonal changes in temperate. This will provide greater potential for the establishment of roosting bats in the area. Bat boxes will be similar to the general purpose Schwegler 2F type and placed at a minimum height of 3m from the ground on mature trees with a variety of different aspects. This will increase the likelihood of bat boxes being used at different times of the year. An appropriately qualified ecologist will advise on the locations at which bat boxes will be erected. An example of a suitable Schwegler 2F type bat box is provided in Plate 4-1. Additional information on the correct installation methods and other specifications for the successful occupancy of bat boxes is provided in Appendix 5 of this report (Bat Conservation Trust, 2014).

Plate 3-1 Example of Schwegler 2F type bat box suitable for roosting bat species within woodland habitat.

3.4.2 Bird boxes

Trees, hedgerows and creeping climbers on tree trunks and walls will provide excellent natural refuge and nesting sites for birds as well as creeping climbers on walls and tree trunks. In addition to this, artificial structures such as nest boxes can create a valuable additional source of nesting opportunities for various species, especially where there has been some habitat loss within the project area.

Nest boxes will be placed securely on a tall tree, as high as possible (2-5m from the ground) away from easy access to predators (e.g., cats), facing north-east, and in a sheltered spot. As described by BirdWatch Ireland, different nest boxes have different sized holes to suit particular species (Plate 4-2 to Plate 4-4).

Plate 4-2 shows a nesting box with a 32mm entrance hole is which is ideal for House Sparrows and can also be used by species like Great Tits, Tree Sparrows, and possibly Blue Tits or Coal Tits. Blue tit nest boxes are best placed within areas of tree clusters or dense planting within a suitable tree or other structure. Obvious sun traps, such as south-facing walls, will be avoided to reduce overheating. It is preferable to face the entrance hole in a north-easterly direction. The box does not need to be positioned within cover, as blue tits like to scan for predators before leaving the box, thereby avoiding predation. These bird boxes will be positioned approximately 2m or greater from the ground.

Plate 4-3 shows an open facing nest box which is ideal for Blackbirds, Robins and Wrens. Unlike the forementioned nest box, this box shouldn't be placed any higher than 2m and will be placed amongst ivy, brambles or some sort of other vegetation that will help hide it from predators, while maintaining a clear flight path for the birds to access it.

Plate 4-4 shows a nest box design unique for Treecreepers, built to mimic the narrow gaps and clefts behind loose bark on mature trees, where they would naturally nest. Treecreepers are very common around Ireland, though not often seen.

Plate 3-2 Bird nesting box with 32mm entrance for House sparrows, Great Tits, Tree Sparrows, and possibly Blue Tits or Coal Tits.

Plate 3-3 Open faced bird nesting box for Wren, Robin and Blackbird.

Plate 3-4 Tree creeper nesting box.

(Birdwatch Ireland, 2023)

3.4.3 Bee Hotel

In Ireland, there are ten cavity-nesting bee species that use 'bee hotels'. The incorporation of solitary bee nest boxes and hotels within Tile 1 will provide nesting habitat for solitary bees and can be a good tool to raise awareness for the importance of appreciating and protecting nature. Large bug hotels or bee hotels can become susceptible to predation of disease. Therefore, several small bee hotels are suggested throughout the project area. These will be installed in sunny, dry spots, approx. 1.5 - 2m above ground. These will be installed alongside areas which contained suitable pollen sources.

3.4.4 Micro-mounds

The incorporation of micro-mounds, consisting of sandy soil or other inert material on green roofs within the project area will aid in enhancing the habitat and increasing biodiversity. Providing areas of bare substrate can promote perching and burrowing habitat for invertebrates, the latter consisting of more fine and non-compacted aggregates could promote the nesting of mining bees.

3.4.5 Leaf Litter and Log Pile

By providing suitable refuge, resting, and foraging habitat for insects and other invertebrates this in turn will help to provide food for other wildlife within the area. Leaf litter and log piles provide valuable pockets of habitat. These piles of leaf litter and dead wood can be placed within the linear park near the wildlife beach. This will allow the pile to be utilised as a suitable hibernation station and shelter for amphibians as well as passing hedgehogs. In general, the bigger the log pile, the better. This will allow more room for wildlife inside and it will stay warmer in winter. The use of a mix of logs from native species which may have been removed from other areas within the project area such as Ash, Elder and Willow with the bark left on the wood is encouraged. Leaf litter can be added in autumn to attract wildlife looking for good hibernation sites.

3.4.6 Wildlife Beach

An existing open water feature is located within the project area at the south-western boundary. The habitat type is classified as a poor quality tall-herb swamp. This area will be closed off to the public for safety and enhanced for wildlife.

The enhancement of the water feature has the potential to increase biodiversity in the area by attracting birds such as blackbirds to bathe, mammals such as badgers to drink, invertebrates both terrestrial and aquatic such as dragonflies and water beetles to breed, bats such as pipistrelles to feed and amphibians such as the smooth newt and common frog to breed. All of which have been recorded in the area.

The natural water feature will be enhanced by creating a long, shallow, gentle sloping beach area on one side of the water using a layer of gravels, pebbles, cobbles, or flat stones. Beach areas are not only popular with invertebrates, but they allow other wildlife such as hedgehogs to enter and exit the water safely without drowning. A shallow boggy area will create a damp habitat vital for many beetles, bugs and flies. Frogs and newts will need a point above the water on which to rest and breathe, areas of shallow water are best. However, a few rocks or logs half in and half out of the water will also suffice. Submerged plants can supply additional oxygen to the habitat. Native aquatic vegetation will be encouraged and where necessary introduced to enhance the quality of the habitat and encourage the usage by wildlife. Shading will be kept to a minimum, ideally no more than 10%.

If the correct plants colonise or are introduced, this can keep the pond in an ecologically balanced state, limiting management. Suggestions below for plant species in different areas depending on water depth.

Table 3-29 Plant species to enhance biodiversity at water feature.

Location	Suggested native plant species
Totally submerged in deep water – oxygenating plants	› Spiked Water-milfoil - *Myriophyllum spicatum* › Hornwort - *Ceratophyllym demersum* (pollution intolerant) › Shining Pondweed - *Potamogeton lucens* › Horned Pondweed - *Zannichellia palustris* › Fennel Pondweed - *Potamogeton pectinatus* (pollution tolerant) › Water Starwort - *Callitriche stagnalis* (pollution intolerant)
Submerged but with floating leaves also in deep water - oxygenating plants	› Water Crowfoot/Buttercup - *Ranunculus aquatilis* (pollution intolerant) › Bladderwort - *Urticularia* spp › Frogbit - *Hydrocharis morsus-ranae* › Water violet – *Hottonia palustris* › Curled Pondweed - *Potamogeton crispus* (pollution tolerant)
Emergent in shallower water	› Amphibious bistort - *Persicaria amphibium* › Arrowhead - *Sagittaria aquatilis* › Water crowfoot - *Ranunculus aquatilis* › Water plantain - *Alisma plantago-quuatica* (tall) › Water forget-me-not - *Myosotis scorpiodes* › Marsh cinquefoil - *Potentilla palustris* › Greater pond-sedge - *Carex riparia* (sedges and grasses are good for pond invertebrates)
Marginal growing in the pond edge and bog areas.	› Lady's Smock - *Cardamine pratensis* › Purple Loosestrife - *Lythrum salicaria* (tall, good for bees) › Gipsywort - *Lycopus europaeus* › Meadowsweet - *Filipendula ulmaria* (tall, good for birds in autumn) › Brooklime - *Veronica beccabunga* › Ragged-Robin - *Lychnis flos-cuculi* › Soft Rush - *Juncus effusus* › Water Forget-me-not - *Myosotis scorpioides* › Bungle - *Ajuga reptans* › Water Avens - *Geum rivale* (spreading) › Marsh Woundwort - *Stachys palustris* (tall) › Great Willowherb - *Epilobium hirsutum* (tall) › Hemp Agrimony - *Eupatorium cannabinum* (tall) › Fleabane - *Pulicaria dysenterica* › Creeping Bent - *Agrostis stolonifera* › Marsh Foxtail - *Alopecurus geniculatus* › Fool's Watercress - *Apium nodiflorum* › Common Spike-rush- *Eleocharis palustris*

Location	Suggested native plant species
	› Water Pepper - *Persicaria hydropiper* › Silverweed - *Potentilla anserina* › Creeping Jenny - *Lysimachia nummularia* (low-growing ground cover)

4. FLORA HABITAT MANAGEMENT PLAN

The habitat management plan is based on minimising the use of chemical herbicides and fertiliser for the implementation and management of the landscapes within the project area. The habitat management plan has been prepared with reference to the following documents to ensure the management plan is in accordance with the following relevant policies:

- South Dublin Guidelines Taking in Charge of Public Open Space
- South Dublin County Council – Living With Trees 2015-2020
- Clonburris SDZ Planning Scheme
- Clonburris SDZ - Parks and Landscape Strategy

The main aims and objectives of the habitat management plan are highlighted below:

- All plants to be maintained so that they remain in good health.
- All plants to have a habit and form consistent with species type and aesthetic objectives.
- Specialist operations for particular types of plants where necessary to achieve the aesthetic or functional objectives, e.g., pruning, dead heading of flowering plants, formative clipping, etc. are included in the plan.
- Areas surrounding plants will be maintained in such a way that potential threats to plant viability are addressed, e.g., invasive plant species control.
- Re-planting when necessary to ensure the habitat remains healthy.
- Mature hedgerows will be allowed to grow freely and naturally.
- New hedgerows will be managed to enable them to develop.
- Appropriate control of ivy will be undertaken in activity areas (play area/exercise area/pathways/crossings) which pose a safety issue.
- Enable recognition of site vegetation (including trees) at the end of its viable life is important to ensure that it is removed and replaced in a timely manner to avoid dangers to park users.
- Where Ash trees fail and are structurally unstable, they will be made safe. Use will be made of standing deadwood and where appropriate deadwood will be left to naturally decay back into the soil.
- Broadleaf re-planting will take place at the earliest opportunity using light standard trees, utilising native tree species to establish a cover of trees in advance of the ultimate decline in Ash species within the project area.
- Pollinator friendly practices to encourage bee and insect populations via habitat management.
- All works involving tree surgery or removal of trees / hedgerows will be carried out outside the nesting season (unless required for health and safety or is unavoidable).

New and existing hedgerows will have different maintenance regimes until the new hedgerows become established. The following is general guidance for maintenance of hedgerows:

- Carry out hedgerow maintenance between September 1st and the last day of February to avoid the bird nesting season, in accordance with Wildlife Act.
- Prior to carrying out maintenance operations, the hedgerow will be inspected to identify trees and other wildlife features, as well as any obstacles or hazards that may be present.
- Retain old trees and standing dead trees within the hedgerow, where it is safe to do so.
- Dead standing trees will be pruned of side branches and ivy to minimise hazard to park users.
- Hedgerows will be cut once every three years.
- Consider carrying out maintenance in rotation, so that not all hedgerows are pruned at once. If possible, one side of a hedge will be trimmed in a season, and the other side in the following year.

- In cutting hedgerows, a triangular-shaped profile with bushy structure is preferred, to encourage the development of a dense hedge with good wind resistance.
- Cut different hedges to different heights to vary the habitat value.
- Finger bar cutters with a pair of reciprocating blades will be used for trimming young growth.
- Flail cutters may be used on soft growth, and not on woody growth. If woody growth is inadvertently damaged, any ripped or ragged ends will be pruned back to the next branch junction.
- Where feasible, hedge trimmings will be piled in an agreed location on-site to provide habitat.
- Maintain 2m wide (minimum) buffer strips containing long grassland immediately adjacent to hedgerows, in accordance with Parks Biodiversity Plan.

Further details on habitat management for specific habitat types are detailed below in Sections 4.1 to 4.5 and in Appendices 4 and 6. Results of habitat management measures will be reviewed on a regular basis and adjusted as necessary in order to maintain habitats in healthy condition. Only structurally essential works will be carried out to the existing trees.

4.1 Amenity Lawn Areas

Amenity grassland areas are situated throughout the project area. These areas are situated in the north-west, south-east and south, as demonstrated in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). The amenity grassland in the north-west will be situated in centre of the local park. In the south-east, in the centre of the apartment complex and further south will serve as informal kick about areas for the community. These areas will be sown with *Coburn's grass seed mix.* These areas will be restricted and highly managed. Actions for habitat management as described in the Clonburris Landscape and Maintenance Specifications document (Appendix 4) can be found below in Table 4-1.

Table 4-1 Habitat Management of Amenity Lawn Areas as described in the Clonburris Landscape and Maintenance Specifications document.

Criterion	Standards & Actions
Aesthetic / functional requirements	Amenity lawn areas are those grass areas which will be maintained for general access and amenity purposes, to create a lawn which is neat, healthy, close-cut and with minimal weed content.
Height of Cut	Minimum 20mm; maximum permissible height 50mm. At the commencement of the contract, following flowering cycle of seasonal bulbs or if grass cutting has been forestalled due to poor ground conditions resulting in the grass growing above the maximum permissible height, it will be cut to 50mm on the initial cut, then to 25mm on the subsequent cut. Such initial long grass will be collected and removed off site.
Frequency	Mow weekly during spring; summer and autumn; only, when necessary, in winter. Mowing is not permitted when ground conditions are very soft, waterlogged, or frozen, or during spells of cold, drying winds or when the grass is frosty or wet.
Finish	Even finish. Vary direction/pattern of cutting every 3 months. Grass will be trimmed from around the bases of walls and fences, back of footpaths and kerbs, litter bins, sluice valves and hydrant markers, trees, poles, signage, and public lighting columns, etc., and this interface between grass and walls, fences, etc., as noted above, kept in a neat and tidy condition. This trimming will be deemed to be included for at every grass cutting. The Landscape Contractor is bound to comply with this instruction and herbicide application is not permitted to achieve this.
Clippings	To be gathered at every cut and disposed of in designated area or off-site. Box to be emptied

Criterion	Standards & Actions
	regularly during cutting to avoid clumps being left on the grass.
Fertiliser	In mid-spring (late March to April), use a proprietary organic lawn fertiliser at the manufacturer's recommended rates, to be approved by the ER. Apply fertilisers when the soil is moist, or when rain is expected. If grass loses vigour and freshness between late spring and late summer (often May to August), repeat the application of lawn fertiliser.
Weed Control	Maximum weed content permitted i.e.: (1) <5% of species content; (2) <10% of total grass area. Mechanical weed control only, no synthetic herbicides permitted (unless as described below). Contractor to provide method statement. Any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 to be treated in May, June and August and prevented from flowering. In these limited circumstances, weed control by herbicide may be unavoidable or represent the best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations.
Scarifying	Scarifying to be carried out to keep levels of thatch (old grass stems, dead moss, and other debris) at an acceptable level (i.e., less than 1cm deep). To remove thatch, rake vigorously but carefully with a power-scarifier. Recommended to be carried out in autumn only.
Aeration	Spiking with holes 10-15cm (4-6in) apart and deep to be carried out once per annum.
Rolling	Amenity grass areas should be reasonably even, with no variations greater than 25mm over a 1m straight edge. In September, to repair any uneven areas of the lawn, use an edging iron to slice through the turf and roll it back. Fork over the underlying ground and add or remove soil as needed. Replace the turf, pressing the edges together, roll with lawn roller (nominally 100kg, subject to site conditions) and water thoroughly.
Edging	Lawn to be edged by hand or edging machine regularly to leave an even, straight edge and to

Criterion	Standards & Actions
	ensure that the grass or soil does not protrude over the edge by more than 25mm.
Over-seeding	After moss or weeds have been removed, or where grass is growing sparsely, over-seeding may be necessary. (Early autumn or mid-spring). Break up the surface with a fork and rake to leave a fine, even tilth; Sow grass seed at half the recommended rate (usually 10-15g/sq.m); lightly rake to incorporate the seed into the surface; water if weather remains dry for 2-3 days following seeding.
Watering	Watering to be carried out when required. Ensure that the water reaches a depth of 10cm (4in) after each watering. Rate: max. 20 litres per square metre.

4.2 Rough Cut Grass

Rough cut grass areas are situated throughout the project area. These areas can be found bordering the wildflower grass/meadows which are situated in the north-west, south-east and south, as demonstrated in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). In the north-west, this habitat is located in the local park. In the south-east and south, this habitat surrounds the wildflower areas adjacent to the informal kick about areas. These areas will be sown with *Coburn's grass seed mix.* These areas will buffer the wildflower areas from the amenity grassland areas and will require less management than the amenity grassland areas. Actions for habitat management as described in the Clonburris Landscape and Maintenance Specifications document (Appendix 4) can be found below in Table 4-2.

Table 4-2 Habitat Management Plan for Rough Cut Grass as described in the Outline Landscape and Maintenance Specifications.

Criterion	Actions
Aesthetic / functional requirements	Rough cut grass areas are those grass areas which will not usually be accessed by users and will usually be in low priority areas, or in the background. These areas are to be maintained to create a grass area which is healthy, with grass allowed to grow relatively long between infrequent and regular cuts.
Height of Cut	Grass areas will be cut to a height of c. 75mm.
Frequency	Five times during the growing season, at regular intervals of approximately 6 weeks.
Finish	Rough cut will mean grass of minimum height 75mm, with informal appearance.
Clippings	To be gathered at every cut and disposed of in designated area or off-site.
Fertiliser	In mid-spring (late March to April), use a proprietary organic lawn fertiliser at the manufacturer's recommended rates, to be approved by the ER. Apply fertilisers when the soil is moist, or when rain is expected.
Weed Control	Maximum weed content permitted i.e.: (1) <5% of species content; (2) <15% of total grass area. Mechanical weed control only, no synthetic herbicides permitted (unless as described below). Contractor to provide method statement. Any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 to be treated in May, June and August and prevented from flowering. In these limited circumstances, weed control by herbicide may be unavoidable or represent the

Criterion	Actions
	best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations.
Edging	Rough-cut grass areas to be edged by hand or edging machine regularly to leave an even, straight edge and to ensure that the grass or soil does not protrude over the edge by more than 25mm.

4.3 Meadow Grass and Wildflower Areas

Wildflower areas are situated throughout the project area. These areas are mainly situated in the north-west, south-east, and south, as demonstrated in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). In the north-west, this habitat is located in the local park. In the south-east and south, this habitat lies adjacent to the informal kick about areas. These areas will be sown with native, pollinator perennial wildflowers harvested from the Clonburris area (where possible) using the Green hay seeding technique or native seed mix as described in detail in Section 3.2.2.2

To ensure establishment, this habitat will require regular management for the first three years. The habitat management will align with the National Biodiversity Data Centre (2017) Creation and management of a wildflower meadow which follows the principles as set out in the All-Ireland Pollinator Plan 2015-2020. Further habitat management as described in the Clonburris Landscape and Maintenance Specifications document (Appendix 4) can be found below in Table 4-3.

Table 4-3 Habitat Management of Meadow Grass and Wildflower Areas as described in the Clonburris Landscape and Maintenance Specifications document.

Criterion	Actions
Aesthetic / functional requirements	Meadow grass or wildflower areas are areas which will not usually be accessed by users and will usually be in low priority areas or kept for biodiversity reasons. These areas are to be maintained to create a meadow area which is healthy and without invasive species as listed on the Third Schedule. Grass species allowed to grow relatively long between infrequent cuts.
Height of Cut	Grass areas will be cut to a height of c. 75mm.
Frequency	**Year 1:** In the first year it is important to keep the area cut short. This is firstly to keep "weeds" down but also to provide light to seedlings to help them grow. Cut the sward to a height of 75 mm whenever the vegetation reaches 150mm and remove the cut vegetation if possible. Over the first season perennial weeds should be treated (removed by mechanical means) after cutting. Cut the meadow no later than mid-November to a height of 30 mm and remove all vegetation. **Years 2 and 3:** After year one, the meadow is cut just once annually. The goal in years 2 and 3 is to encourage germination the following year. Cut the sward just once, after the seed has set (or no later than mid-November), to a height of 30 mm. Leave the cut vegetation for 3 days then remove. After cutting, perennial weeds should continue to be treated through mechanical removal.

Criterion	Actions
	It is difficult to provide exact ideal timing for annual cutting as it can depend on weather and other unpredictable factors. The goal is to allow the seed to ripen and fall from the seed heads before cutting. Yellow rattle is a semi-parasite that reduces grass dominance. There, after cutting in Year 2 and 3, Yellow rattle can be over-sown to reduce grass, encourage wildflowers and enhance the wildflower areas. To further enhance diversity, the area can be enhanced with plug plants of other wildflowers. The above plan follows the National Biodiversity Data Centre (2017) Creation and management of a wildflower meadow. All-Ireland Pollinator Plan, How-to-Guide 4. National Biodiversity Data Centre Series no. 13. This resource follows the principles set out in the All-Ireland Pollinator Plan 2015-2020.
Finish	Meadow.
Clippings	To be gathered at every cut and disposed of in designated area or off-site.
Weed Control	Mechanical weed control only, no synthetic herbicides permitted (unless as described below). Contractor to provide method statement. Any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 to be treated in May, June and August and prevented from flowering. In these limited circumstances, weed control by herbicide may be unavoidable or represent the best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations.
Edging	Meadow grass areas to be edged by hand or edging machine regularly to leave an even, straight edge and to ensure that the grass or soil does not protrude over the edge by more than 25mm.

4.4 Herbaceous Perennial Planting (including Ferns and Ivy)

Bulb planting will be located within the local park in the north-west and in the south as demonstrated in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). Bulb plating will consist of the following species: *Crocus tommasinianus* 'Barrs Purple', *Crocus vernus* 'Jeanne d'Arc', *Crocus vernus* 'Golden yellow', *Muscari armeniacum, Hyacinthoides non-scripta, Narcissus* 'Jack snipe', *Narcissus recurves* and *Narcissus 'W.P. Milner'.* These areas will be restricted and will require management.

Ivy and fern species will be located in several areas throughout Tile 1. Ferns and Ivy will be planted in areas of public street planting, ferns will also be located in woodland habitats. These herbaceous plants will not be restricted and will require little management (only Ivy in terms of overgrowth on trees causing potential safety issues in activity areas). Actions for habitat management as described in the Clonburris Landscape and Maintenance Specifications document (Appendix 4) can be found below in Table 4-4.

Table 4-4 Habitat Management of Herbaceous Perennial Planting (including Ferns and Ivy) as described in the Clonburris Landscape and Maintenance Specifications document.

Criterion	Actions
Watering	Ensure that bulbs have adequate water throughout growth period, up until cutting back occurs (see below).
Fertiliser	Annual feeding with general-purpose organic fertiliser in February, applied at the manufacturers' recommended rates (rake back mulch prior to application).
Cutting Back	Cut back dead foliage to ground level six weeks after the end of flowering (or earlier if foliage is yellow and straw-like). Do not tie or knot the leaves.
Deadheading	High prominence areas only. Deadhead flowers by cutting back spent flowers to the base of the flower stalk.
Herbicides	Herbicides may not be used in or around bulb areas.

4.5 Green Roofs

Green roofs designed specifically for biodiversity will be incorporated throughout the project area on apartment buildings and the creche/local node as demonstrated in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). Green roofs will be planted with a wide range of dry grassland wildflowers and sedum species. These areas will be restricted and managed. Actions for habitat management as described in the Moy Establishment, Inspection and Maintenance document (Appendix 8) can be found below in Table 4-5.

Table 4-5 Habitat Management of Green roofs as described in the Moy Establishment, Inspection and Maintenance document.

Criterion	Actions
Aesthetic / functional requirements	Healthy green roof, typical for plant species and time of year. Informal habitat. Located in areas not accessed by the public, kept for biodiversity reasons.
Inspection	Twice yearly, in spring and autumn. Additionally, inspection is needed after severe storms.
Cleaning	Remove leaves, twigs, cans, balls, etc. which could plug roof drains. Bag and remove all debris from the roof since debris on the roof surface will be quickly swept into drains by heavy rains and drainage problems may occur.
Monitoring	All sedum roofs must be carefully monitored through their first summer flowering cycle. It is recommended that maintenance be carried out three times in the first year and twice per year in each subsequent year.
Tracking	Trafficking of the planted roof on the basis of 2-3 times a year will have no detrimental effect on the plant layer. If works are to be carried out on the roof surface or to adjacent structures care should be taken to minimise damage to the plant layer resulting from repeated trafficking. Designated access routes to the works are advised to ensure damage is minimized.
Weed Control	No synthetic herbicides permitted (unless as described below). Contractor to provide method statement. Any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 to be treated in May, June and August and prevented from flowering. In these limited circumstances, weed control by herbicide may be unavoidable or represent the

Criterion	Actions
	best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations.
Fertiliser	Annual feeding with 35g/M2 Osmocote Exact in March / Early April.
Pruning	Dead flowers will eventually disintegrate but the heads may be removed in late summer or early autumn if required by careful clipping.
Leaf litter	The ideal position for a green roof is in full sun. In certain situations, adjacent trees could shed leaves onto the roof surface. Depending on quantity, these may need to be removed with a leaf-blowing machine. This would be a seasonal requirement.
Edging	The maintenance of the extensive green roof does not require the use of any sharp-edged tools. The use of shovels, spades, edging tools, rakes, hoes etc. are not required and should not be used in the maintenance of the extensive green roof.
Watering	Newly installed green roofs will need plenty of water, they should not be allowed to dry out. Relying on ambient rainfall to irrigate newly installed roofs is not sufficient. Green roofs quite resistant to drought. However, if an extended period of dry weather should occur (14 or more dry days), periodic checks should be made of the roof to examine the reservoir and drainage board to determine if all the water contained has been used by the plant layer. Apply water using a sprinkler attachment until the substrate is thoroughly saturated and the reservoir cups are filled.

4.6 Bioretention Areas and Bioswales

Bioretention areas and bioswales will be incorporated throughout the project area as demonstrated in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). Bioretention areas and bioswales will be planted with native, and pollinator friendly perennial wildflowers harvested from the Clonburris area using the Green hay seeding technique or native seed mix (to be agreed with SDCC Parks department, subject to approval of NPWS if required).

Typical species which are local and suitable for bioretention areas are: *Cardamine pratensis, Lythrum salicaria, Lycopus europaeus, Filipendula ulmaria, Veronica beccabunga, Lychnis flos-cuculi, Juncus effusus, Myosotis scorpioides, Ajuga reptans, Geum rivale, Stachys palustris, Eupatorium cannabinum, Pulicaria dysenterica, Alopecurus geniculatus, Apium nodiflorum, Eleocharis palustris, Persicaria hydropiper, Potentilla anserina* and *Lysimachia nummularia.*

Typical species which are local and suitable for swale planting are: *Lythrum salicaria*, *Filipendula ulmaria, Lychnis flos-cuculi, Geum rivale, Eupatorium cannabinum, Pulicaria dysenterica*, *Iris pseudacorus, Typha latifolia, Schoenoplectus lacustris, Phalaris arundinacea, Deschampsia cespitosa* and *Primula vulgaris*. These areas will be restricted and managed. Actions for habitat management can be found below in Table 4-6.

Table 4-6 Habitat Management of Bioretention areas and bioswales

Criterion	Actions
Aesthetic / functional requirements	Healthy habitat, typical for plant species and time of year. Relatively informal habitat in areas which will not usually be accessed by users and will usually be in low priority areas or kept for SuDS and biodiversity reasons. These areas are to be maintained in healthy condition and without invasive species as listed on the Third Schedule. Grass species allowed to grow relatively long between infrequent cuts.
Establishment	Reseed any bare areas and water during the initial establishment.
Inspection	Twice yearly, in spring and autumn and after severe storms. Checking for bare soil, scour erosion.
Cleaning	Sediment accumulation may need to be removed twice annually. Rubbish and debris will be removed more frequently.
Cutting	Annually mow (September) during a dry period, remove any dormant vegetation. Vegetation should be cut no less than 100mm to allow for filtration and protection against erosion. Wetter areas containing *Typha* and *Iris* can be let grow as they will have attractive foliage in winter and provide cover for wildlife when it is scarce. Dead leaves should be removed and composted.

Criterion	Actions
Weed Control	No synthetic herbicides permitted (unless as described below). Contractor to provide method statement. Any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 to be treated in May, June and August and prevented from flowering. In these limited circumstances, weed control by herbicide may be unavoidable or represent the best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations.
Fertiliser	Avoid the use of fertiliser.

4.8 New Hedgerows – First 3 years

New hedgerows will be planted throughout the project area as demonstrated in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). Hedge plating will consist of the following species: *Cotoneaster simonsii, Cotoneaster lacteus, Laurus nobilis, Rosmarinus officinalis, Ligustrum vulgare, Ligustrum vulgare* 'Jackmans variety', *Choisya ternate, Mahonia aquifolium, Ilex aquifolium, Viburnum opulus, Corylus avellana, Fuchsia* 'Riccartonii', *Crataegus laevigata* 'Paul's scarlet', *Osmanthus delavayi, Olearia x scilloniensis* 'master michael', *Lavandula angustifolia* 'hidcote', *Crataegus monogyna, Corylus avellana, Euonymus europaeus, Lonicera periclymenum, Prunus avium* and *Rosa canina.*

Hedgerows will be restricted and will require certain management for the first three years in order to become established. Actions for habitat management as described in the Tree and Hedgerow Protection & Management Plan (Appendix 6) can be found below in Table 4-7.

Table 4-7 Habitat Management of New Hedgerows – First 3 years as described in the Tree and Hedgerow Protection & Management Plan.

Criterion	Actions
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Relatively informal habit acceptable.
Weed Control	No weeds which would reduce the quality of structural composition of the hedgerow. Mechanical weed control only, no synthetic herbicides permitted (unless as described below). Contractor to provide method statement. Any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 to be treated in May, June and August and prevented from flowering. In these limited circumstances, weed control by herbicide may be unavoidable or represent the best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations.
Bark Mulch	Recommended – 50mm deep; to be kept always topped up.
Fertiliser	Annual feeding with 50g/sq.m of general-purpose fertiliser in February (rake back mulch prior to application).
Pruning	Pruning once per annum for the first three years to encourage development of bushy form; all clippings to be gathered at every pruning and disposed of in designated area.

Criterion	Actions
Watering	Watering required only in periods of prolonged drought (i.e., after more than 2 weeks)

4.9 Mature Hedgerows

At present, Tile 1 does not contain healthy, mature hedgerows; hedgerow damage and disease are prevalent throughout the site. Therefore, the habitat management plan outlined below in Table 4-8 relates to the planting of new hedgerows after the three-year maintenance plan as outlined in Table 4-7 in Section 4.6.

Actions for habitat management as described in the Tree and Hedgerow Protection & Management Plan (Appendix 6) can be found below in Table 4-8.

Table 4-8 Habitat Management of Mature Hedgerows as described in the Tree and Hedgerow Protection & Management Plan.

Criterion	Actions
Aesthetic / functional requirements	Natural finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Informal habit acceptable.
Weed Control	Native weeds permitted in the hedge area as natural for the species. Any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 to be treated in May, June and August and prevented from flowering. In these limited circumstances, weed control by herbicide may be unavoidable or represent the best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations.
Bark Mulch	Not required.
Fertiliser	None.
Cutting	Cutting once every three years as necessary to maintain the required height and width and prevent “leggy” growth; all clippings to be gathered at every cutting and disposed of in designated area for habitat.
Watering	Not required.

4.10 Shrub Planting - Groundcover / Mixed Borders / Mass Shrub Plantation

Public street realm planting, consisting of mixed borders and shrub planting will be located throughout the project area as demonstrated in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). Public street realm planting will consist of the following species: *Hydrangea* spp., *Sarcococca* spp., *Polystichum* spp., *Dryopteris* spp., *Erica* spp., *Luzula* spp., *Carex oshimensis* 'Evergold', *Hypericum* 'Hidcote', *Mahonia aquifolium, Salvia Rosmarinus, Lonicera pileate, Vinca minor, Viburnum davidii, Hedera helix, Ajuga reptans, Liriope muscari, Molinia caerulea, Helleborus niger, Heuchera maxima, Libertia grandiflora*, *Viburnum opulus, Lavandula angustifolia* 'hidcote' and *Lonicera periclymenum.*

Street realm planting will be restricted and will require management. Actions for habitat management as described in the Clonburris Landscape and Maintenance Specifications document (Appendix 4) can be found below in Table 4-9.

Table 4-9 Habitat Management of Shrub Planting as described as described in the Clonburris Landscape and Maintenance Specifications document.

Criterion	Actions
Aesthetic / functional requirements	Shrub planting areas will be kept clean at all times, with an even finish. Plants to have a healthy, lush appearance, typical for plant species and time of year.
Weed Control	Weeds will not be allowed to cover more than 5% of the ground at any one time, neither will weeds exceed 50mm in height. Mechanical weed control only, no synthetic herbicides permitted (unless as described below). Contractor to provide method statement. Any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 to be treated in May, June and August and prevented from flowering. In these limited circumstances, weed control by herbicide may be unavoidable or represent the best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations.
Bark Mulch	Required – min. 50mm deep; to be always kept topped up.
Fertiliser	Annual feeding with general-purpose organic fertiliser in February, applied at the manufacturers' recommended rates (rake back mulch prior to application).
Pruning / Clipping	Pruning once per annum to maintain the typical size and form of the plant, for sightlines and for

Criterion	Actions
	plant health; all clippings to be gathered at every pruning and disposed of in designated area or offsite.
Edging	Beds to be edged by hand or edging machine twice per annum to leave an even, straight edge. Shrubs or soil not to protrude past the edge by more than 50mm.
Watering	Not required.
Deadheading	Not required.

4.11 Ornamental Shrubs

Public street realm planting, consisting of ornamental shrub planting will be located throughout the project area as demonstrated in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). Shrub planting will consist of the following species: *Hydrangea* spp., *Sarcococca* spp., *Hypericum* 'Hidcote', *Mahonia aquifolium, Salvia Rosmarinus, Lonicera pileata, Viburnum davidii, Viburnum opulus, Lavandula angustifolia* 'hidcote' and *Lonicera periclymenum.*

Shrub planting will be restricted and will require management. Actions for habitat management as described in the Clonburris Landscape and Maintenance Specifications document (Appendix 4) can be found below in Table 4-10.

Table 4-10 Habitat Management of Ornamental Shrubs as described as described in the Clonburris Landscape and Maintenance Specifications document.

Criterion	Actions
Aesthetic / functional requirements	Specimen shrub planting areas shall be kept clean at all times, with an even finish. Shrubs to have a healthy, lush appearance at all times, typical for plant species and time of year.
Weed Control	No weeds permitted in the shrub areas. Mechanical weed control or weed suppression by blanket or mulch is permitted, (unless as described below). Contractor to provide method statement. Any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 to be treated in May, June and August and prevented from flowering. In these limited circumstances, weed control by herbicide may be unavoidable or represent the best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations.
Bark Mulch	Required – 75mm deep; to be always kept topped up.
Fertiliser	Annual feeding with general-purpose organic fertiliser in February, applied at the manufacturers' recommended rates. (Rake back mulch prior to application).
Pruning / Clipping	Regular pruning as necessary to maintain the typical size, habit, and form of the plant, for health and to maintain best appearance; all clippings to be gathered at every pruning and disposed of in designated area or off-site.

Criterion	Actions
Watering	Watering required to ensure consistent availability of water to plant during periods of drought (i.e., after more than 5 days) – minimum.

4.12 Native shrubs

Public street realm planting, consisting of native shrub planting will be located throughout the project area as demonstrated in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). Native shrub planting will consist of the following species: *Erica* spp., *Luzula* spp., *Hedera helix, Viburnum opulus,* and *Lonicera periclymenum.*

Native shrub planting will be restricted and will require management. Actions for habitat management as described in the Clonburris Landscape and Maintenance Specifications document (Appendix 4) can be found below in Table 4-11.

Table 4-11 Habitat Management of Native Shrubs as described in the Clonburris Landscape and Maintenance Specifications document.

Criterion	Actions
Aesthetic / functional requirements	Even, clean finish to ground plane. Shrub to have a healthy, lush appearance, typical for plant species and time of year. Relatively informal habit acceptable.
Weed Control	Weed free circle of 250mm radius to be maintained around each plant until established. Mechanical weed control or weed suppression by blanket or mulch is permitted, no synthetic herbicides permitted (unless as described below). Contractor to provide method statement. Any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 to be treated in May, June and August and prevented from flowering. In these limited circumstances, weed control by herbicide may be unavoidable or represent the best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations.
Bark Mulch	Required for high prominence areas; recommended for medium areas – 50mm deep; to be always kept topped up.
Fertiliser	Not required.
Pruning / Clipping	Pruning once per annum for shrubs such as Dogwood and Guelder Rose or to control height and spread when necessary.
Watering	Watering required only in periods of prolonged drought (i.e., after more than 2 weeks).

4.13 Scrub

No maintenance operations required, except to ensure that any edge plants are kept cut back at least 1m from road edges and relatively tidy were prominent.

4.14 Invasive Plant Species

Invasive weeds of any kind, most particularly any plant species listed as Third Schedule will not be allowed to establish in any area of the site. It will be the responsibility of the contractor to be able to identify and control such plants at the first sign of emergence.

In certain limited circumstances, weed control by herbicide may be unavoidable or represent the best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations. Any such pesticide application must be approved by a Pesticide Advisor registered with the Dept. of Agriculture. Contractor may be requested to further prove that such advice has been received.

4.15 Trees and Woodland

Tree maintenance is detailed within the Clonburris Landscape and Maintenance Specifications document (Appendix 4) and within the Tree and Hedgerow Protection and Management Plan (Appendix 6). The main protection and maintenance points taken from those documents are highlighted below in Sections 4.1.3.1 to 4.1.3.3. However, slight changes have been made in order to maintain and enhance the habitats for biodiversity.

4.15.1 General

- Canopies overhanging a pedestrian path to be maintained to 2.2m and canopies overhanging vehicular access to 4m.
- Limb damage caused by wind, passing traffic, etc. to be pruned resulting in a clean even wound.
- No signs, security boxes, etc. to be attached to trees.
- Surface tree roots not to cause a trip or mowing hazard. In grass areas, top up soil over roots and re-seed.
- Raised paviours or cracked/bulging walls due to root growth will be reported to the Contract Administrator.
- Exposed roots from construction works to be kept moist by wrapping damp hessian around roots until soil is backfilled and then apply a one-off generous application of water. Root damage to be pruned resulting in a clean even wound prior to backfilling / topsoiling.
- The excessive growth of Ivy on trees which are situated near activity areas (play area/exercise area/pathways/crossings) will be controlled for public safety.
- Informal monitoring of trees for change of condition or evidence of a fungal fruiting body.

4.15.2 Specimen, Solitary Trees

Existing trees to be retained within the site boundary are all located in the south. These trees are highlighted in drawings 1738_T_P_01.1 and 1738_T_P_01.2 (Appendix 1). All tree protection measures as outlined in BS5837: 2012 and measures outlined in the Arboricultural report (See Appendix 7) will be adhered to, some of which, are detailed below:

Tree protection will affectively comprise of exclusion zones to protect any trees parts (both above and below ground) which are due to be retained. After the completion of primary vegetation clearance, but prior to the commencement of construction works, all "Construction Exclusion" and "Protective" fencing will be erected and "signed-off" as complete, by the Project Arborist. Only on completion of all construction works will any/all tree protective measures be removed, and only then in a manner, that does not compromise the "Protection Zones". After construction works have been completed, all retained trees will be reviewed regarding their condition and longer-term management recommendations and regarding site handover.

Retained and new planted trees will be maintained in healthy condition. Tree trunks of trees situated near activity areas (play area/exercise area/pathways/crossings) will be kept free from excessive ivy growth to allow for tree inspections to be undertaken and defects noted. A 1m diameter of mulch will be maintained around all individual trees within grassed areas. Stakes and ties to be retained for a maximum period of 3 years, with tie loosened annually and both stake and tie to be removed after 3-year period. All nursery marking, bamboo and labels to be removed off all trees. Tree grilles in hard surface areas to be maintained weed free. Any visible change in condition to be reported.

4.15.3 Tree Groups, Woodland, Grid, Hedgerow Trees

These areas will be kept free of any amber listed invasive species or species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011. 1m diameter mulch or spray rings will be maintained along the group perimeter and around all plants in young woodland areas where canopy cover has not been achieved. Established woodland areas will not be treated with herbicide. Bramble should not exceed 20% of ground cover of any woodland. Ivy will be controlled and will not be allowed to establish excessively on trees along the perimeter and within falling distance of activity areas (exercise areas/children's play areas) within woodland areas. Understorey (excluding saplings) not to exceed 1m in height in order to retain visibility for user safety in areas of activity. Tree numbers not to exceed 4 per sq.m of trees with a girth of less than 250mm and numbers not to exceed 2 per sq.m for trees with a girth of over 300mm. Fallen or felled trees in woodland areas to be maintained on-site where permissible, for reasons of biodiversity and ecology which contribute to the overall health of the woodland.

5. FAUNA HABITAT MANAGEMENT PLAN

5.1 Bat Box Maintenance

Once bats have inhabited an installed bat box, the box can only be opened, moved or in any way disturbed by a licenced professional (licence issued by the NPWS). Maintenance can be undertaken biennially. The best time to clean the majority of bat boxes (those suitable for summer roosts) is during the autumn or winter. Once the bat box is not occupied, it can be opened and clean out for any droppings. High pressured water is advisable, refrain from using cleaning agents and leave to dry. During this time an internal inspection should be undertaken, checking for damages or broken seams. Daily heating and cooling can cause roof seams to separate after a few years. A roof sealant is recommended to repair any damaged seams.

5.2 Bird Box Maintenance

Nest boxes should be cleaned biannually (January and October), after the breeding season has finished. Some birds may make more than one nesting attempt in a year and may use the same site for a second or third clutch. Birds may also use a nest box during the winter to roost. If a nest box is found with cold eggs, it should be left untouched and checked again a week later to see if there are more eggs, or if the eggs are warm. Many birds lay one egg a day, and only incubate when the clutch is complete. If the same number of cold eggs remain, it is safe to remove them with the old nest and clean the box. Unhatched eggs can only be removed outside of the breeding season (September – February) and must be disposed of. The nest box should be cleaned using boiling water to kill any parasites and should be left to completely dry out before being returned outside. Insecticides and powders should never be used.

5.3 Invertebrate Habitat Maintenance

5.3.1 Bee hotel

These structures should be inspected annually (September) to remove and clean dead cells. This will prevent mould and mites that would multiply on the dead bees or larvae. Without timely maintenance and clean-up, a once-occupied insect hotel may not attract a new batch next season. Insect hotels can degrade naturally after two or more years because the material used is untreated. Change the nesting blocks or parts every two years to avoid build-up of mould, mites, and parasites overtime.

5.3.2 Micro-mounds

These micro-habitats situated on green roofs can be inspected during green roof maintenance, additional material can be added annually as/when needed.

5.3.3 Leaf Litter and Log Pile

An annual check is sufficient. The addition of new logs as the old logs decay is encouraged. Growing climbing plants to clamber over the wood pile such as brambles and honeysuckle can help discourage people from disturbing it. To beautify the log pile, plant woodland plants around and near it. Spring native flowering bulbs such as *Galanthus nivalis* along with native perennials.

5.4 Wildlife Beach Maintenance

The wildlife beach should be checked regularly for rubbish/debris. Any logs which have been inserted half in/half out for wildlife to safely enter the water should be checked to ensure they have not completely fallen in.

The water itself may become cloudy from time to time, usually after heavy rain, but this will often settle after a few days. Sometimes an oily film can appear, which usually precedes algae. A small amount of algae or duckweed should not become problematic as young tadpoles and snails feed on them. However, if growth does become excessive, one third of it can be removed from the water. If the growth of emergent plants becomes excessive these can be trimmed back in autumn. However, it is not advisable to remove more than one third of plant material from the water in any one year. Any plant material removed from the water/water's edge should be left to lie adjacent to the water's edge for a day or two so that invertebrates within the vegetation can make their way back to the water.

6. CONCLUSION

The BMP demonstrates how the project proposes to adhere and implement the ecological objectives and recommendations of the Clonburris SDZ Scheme, the overarching Clonburris SDZ Biodiversity Management Plan and the Parks and Open Space Strategy. The detailed habitat management section within the BMP offers specific, detailed information on the maintenance of each habitat and enhancement features to ensure successful habitat establishment and conservation.

The retention, creation, and enhancement of habitats within Tile 1 of the Clonburris SDZ Scheme have the potential to create a rich, safe haven for wildlife in the area. The incorporation of several SuDS features such as bioretention areas and bioswales offers new and innovative methods of working with nature to reduce flooding risks, improve water quality, provide amenity areas and create new habitats to influence and increase biodiversity.

7. REFERENCES

Altemar Ltd (2022). Non-Avian Fauna Survey.

Bat Conservation Ireland (2010). Bat Conservation Ireland guidelines; Bat Conservation Ireland (Bats and Lighting: Guidance Notes for Planners, Engineers, Architects and Developers.

Bat Conservation Trust (2018). Bat Conservation Trust (Guidance Note 08/18 Bats and Artificial Lighting in the UK, to minimise light spillage, thus reducing any potential disturbance to bats.

Bat Conservation Trust (2020). Bat Information Box.

Bat Conservation Trust (2023). *Maintaining your bat box.* Available online: https://www.bats.org.uk/our-work/buildings-planning-and-development/bat-boxes/maintaining-your-bat-box Last Accessed 12/05/2023.

Birdwatch Ireland (2023). *Nest Boxes.* Available online: https://birdwatchireland.ie/irelands-birds-birdwatch-ireland/garden-birds/nestboxes/ . Last accessed: 14/04/2023.

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and Directive 2009/147/EC (codified version of Directive 79/409/EEC as amended) (Birds Directive) – transposed into Irish law as European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477/2011).

Dark Sky Ireland Lighting Recommendations, (2019).

Dermot Foley Landscape Architects (2022). Clonburris SDZ Parks & Landscape Strategy

Draft National Biodiversity Action Plan 2023-2027 (2023). Department of Housing, Local Government and Heritage.

ELIOS (2012). Case Study. Green and Brown Roofs.

Entomologist Lounge (2017). *Insect Hotels: A Refuge or a Fad?.* Available online: https://entomologistlounge.wordpress.com/2017/09/18/insect-hotels-a-refuge-or-a-fad/ . Last accessed 12/05/2023.

European Communities (Natural Habitats) Regulations, SI 94/1997, SI 233/1998 & SI 378/2005 – http://www.irishstatutebook.ie.

Feidhlim Harty (2019). *In praise of swales.* Available online: https://horticultureconnected.ie/horticulture-connected-print/2019/autumn-winter-2019/insight-autumn-winter-2019/in-praise-of-swales-feidhlim-harty/. Last accessed 12/05/2023.

Fers (2018). Ecological Survey of Clonburris Strategic Development Zone, Clondalkin, Co. Dublin.

Fossitt, J. A. (2000). A Guide to Habitats in Ireland. Dublin: The Heritage Council.

Foster., H. (2020). *Where to hang and how to maintain your bat box.* Available online: https://www.nhbs.com/blog/nhbs-guide-where-to-hang-and-how-to-maintain-your-bat-box. Last Accessed 12/05./2023.

Greater London Authority (2004) Building Green.

Habitats Directive (92/43/EEC).

JSA (2021). Environmental Impact Assessment Report

Murray and Associates, (2021). Landscape Report.

Murray and Associates, (2021). Outline Landscape & Maintenance Specifications.

Murray and Associates, (2022). Landscape Works Specifications and Landscape Management Plan for Residential Development Clonburris Clonburris SDZ.

Murray and Associates, (2022). Tree and Hedgerow Protection Management Plan.

Murray and Associates, (2023). Masterplan- Landscape drawings.

Nargi. L., (2019). *The Miyawaki Method: A Better Way to Build Forests?*. Natural history museum (2021). *Pond life: facts about pond habitats, plants and animals.* Available online: https://daily.jstor.org/the-miyawaki-method-a-better-way-to-build-forests/ . Last accessed: 14/04/2023.

National Biodiversity Data Centre (2016) Creating wild pollinator nesting habitat. All-Ireland pollinator plan, How-to-guide 1. National Biodiversity Data Centre Series no. 5.

National Biodiversity Data Centre (2017) *Creation and management of a wildflower meadow.* All-Ireland Pollinator Plan, How-to-Guide 4. National Biodiversity Data Centre Series no. 13 for guidance

National Biodiversity Data Centre (2021). All Action Pollinator Plan 2021-2025

Natural history museum (2021). *Pond life: facts about pond habitats, plants and animals.* Available online: https://www.nhm.ac.uk/discover/pond-life-facts-about-habitats-plants-animals.html. Last accessed: 14/04/2023.

NPWS of the DEHLG (2008) The Report on Status of Habitats and Species in Ireland: Technical Reports and Forms.

NRA (2006) Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post-Construction of National Road Schemes. Dublin: National Roads Authority.

Robertson., J. (2014). *Log Piles – Creating a Flourishing Wildlife Community*. Available online: https://creativestarlearning.co.uk/early-years-outdoors/log-piles-creating-a-flourishing-wildlife-community/ Last Accessed: 12/05/2023.

Royal Horticultural Society (2017). *Keeping ponds and aquaria without harmful invasive plants.* Available online: https://invasivespeciesireland.com/wp-content/uploads/2017/10/AQUATICS_BOOK5.pdf Last accessed: 14/04/2023.

Royal Society for the Protection of Birds (2023). *Cleaning nest boxes.* Available online: https://www.rspb.org.uk/birds-and-wildlife/advice/how-you-can-help-birds/nestboxes/nestboxes-for-small-birds/cleaning-nestboxes/#:~:text=Maintaining%20your%20box,powders%20must%20not%20be%20used. Last Accessed: 12/05/2023.

Royal Society for the Protection of Birds (2023). *Wildlife pond care & maintenance.* Available online: https://www.rspb.org.uk/birds-and-wildlife/advice/gardening-for-wildlife/water-for-wildlife/looking-after-your-pond/ Last Accessed: 12/05/2023.

Part 1 of the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011).

Rainscaping Iowa (2014). *Landscaping for clean water.* (pdf). Available online: https://watershed-wc.frb.io/assets/documents/Bioswales2014_11x17.pdf. Last accessed 12/05/2023.

Scott Cawley (2021). Clonburris Strategic Development Zone Biodiversity Management Plan Clonburris, Co. Dublin

Scott Cawley (2020). Outline Invasive Species Management Plan. Clonburris SDZ, Clonburris, Co. Dublin

Scott Cawley (2021). Wintering Bird Survey Report, Clonburris Strategic Development Zone, Clonburris, Co. Dublin

South Dublin County Council (2015). Living With Trees 2015-2020

South Dublin County Council (2018). Taking in Charge Policy.

South Dublin County Council (2019). Clonburris Strategic Development Zone Planning Scheme.

South Dublin County Council (2020). Draft Biodiversity Action Plan for South Dublin County 2020-2026.

Swift Conservation Ireland (2021). *Building nest boxes for the swift into cement block, brick and externally insulated walls.* Available online: https://www.swiftconservation.ie/wp-content/uploads/2021/12/Booklet-Building-Next-Boxes-into-Walls-PDF.pdf Last accessed: 14/04/2023

Teagasc (2008). *Nest Boxes.* Available online: https://www.teagasc.ie/media/website/environment/biodiversity-countryside/Teagasc_Birdnestboxes.pdf. Last accessed: 12/05/2023.

Tepui (2008). Green Roofs Over Dublin. A Green Roof Policy Guidance Paper for Dublin.

The Bridge Project (2023). *Ponds*. Available online: https://www.thebrideproject.ie/ponds. Last accessed: 14/04/2023.

The Heritage Council (2016). Conserving Hedgerows.

The Heritage Council (2020) Gardening for Biodiversity.

The National Biodiversity Action Plan 2017-2021 (2017). Department of Housing, Local Government and Heritage.

The Watershed Institute (2023). *Green Infrastructure Maintenance.* Available online: Available online: https://thewatershed.org/green-infrastructure-maintenance/. Last accessed: 12/05/2023.

The Wildlife Trust (2023). *How to build a pond*. Available online: https://www.wildlifetrusts.org/actions/how-build-pond .Last accessed: 14/04/2023.

Webber. S., (2022). *The Miyawaki Method for Creating Forests.* Available online: https://www.creatingtomorrowsforests.co.uk/blog/the-miyawaki-method-for-creating-forests .Last accessed: 14/04/2023.

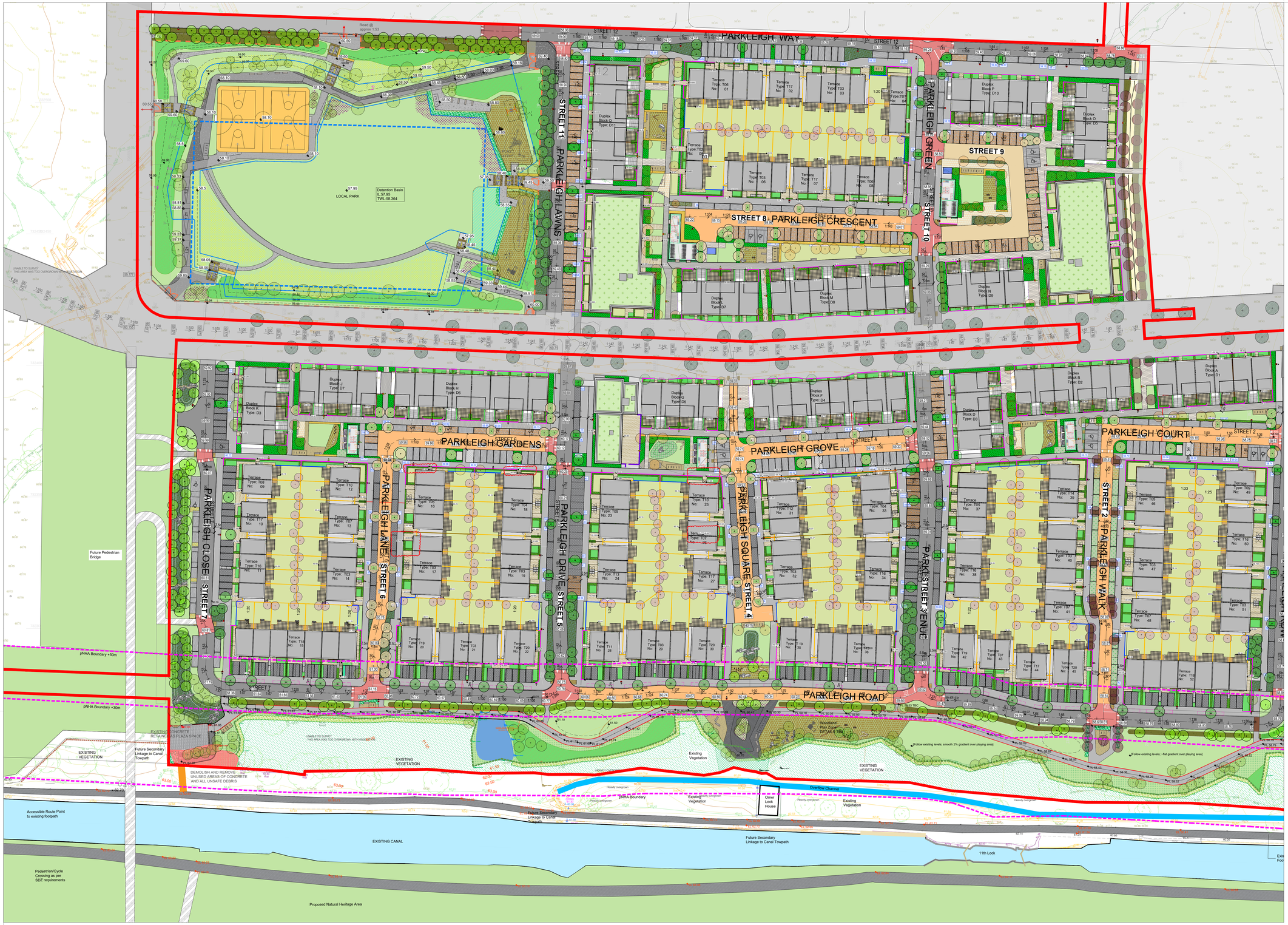
Wildlife Act 1976 and Wildlife (Amendment) Act 2000.

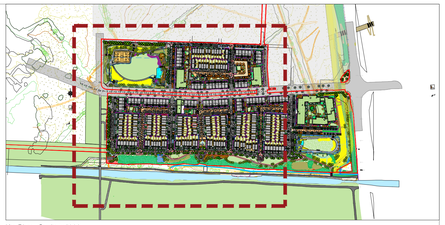
Wolfgang Reforest (2023). *Ireland's First Miyawaki Forest is Flourishing*. Available online: https://www.wolfgangreforest.ie/irelands-first-miyawaki-forest-is-flourishing/ .Last accessed: 14/04/2023.

WWT Consulting & RSPB (2012). Sustainable Drainage Systems. Maximising the potential for people and wildlife.

APPENDIX 1

DRAWINGS





KeyPlan - Scale 1:5000

LEGEND

- Site Boundary - Extent of works;
- Wayleaves - Gas & Water;

HARD LANDSCAPE

- Existing Pathways along the Canal;
- Future Pedestrian Bridge;
- Proposed Street
  Asphalt Roadway with in-situ concrete kerbs (to Engineer's specification and details);
- Proposed Homezone Local Street
  Asphalt (HRA) with buff coloured chip (to Engineer's specification and details);
- Proposed Footpaths
  In-situ concrete, Brushed Finish (to Engineer's specification and details);
- Proposed Paths
  Permeable Solid Surface
  Sustainable Surface Solution, Flexipave or Porous Asphalt, color TBC, or similar and approved;
- House - Private Side Entrance
  In-situ concrete, Brushed Finish (to Engineer's specification and details);
- Footpaths
  Compacted Gravel Surface with Timber Edge. Self-Binding Gravel surface - 6-10mm to dust Ø aggregate - Ballylusk or similar and approved;

Paving:

- UP1 - Public Spaces: Footpaths
  Kilsaran, Newgrange, 3 size mix x 60mm D, Silver, Black detailing / Textured Granite, Random Stretcher, or similar and approved;
- UP2 - Public Spaces: Seating Areas, Feature Spaces
  Kilsaran, Newgrange, 3 size mix x 60mm D, Silver, Black detailing / Textured Granite, Coursed Stretcher, or similar and approved;
- UP3 - Car Parking Spaces - Permeable Paving - Off Curtilage
  Kilsaran, Climapave Slane, 200 x 100 x 80, Silver / Textured Granite, Herringbone, or similar and approved;
- UP4 - Car Parking Spaces - Permeable Paving - On Curtilage
  Kilsaran, Climapave Newgrange, 3 size mix x 60mm D, Black / Textured Granite, Random Stretcher, or similar and approved;
- UP5 - Entrance to houses / gardens / driveways
  Kilsaran, Newgrange, 600 x 400 x 50mm, Silver Granite, Stretcher Bond, or similar and approved;
- UP6 - Private patios / GL terraces
  Kilsaran, Newgrange, 600 x 400 x 50mm / 400 x 400 x 50mm, Buff Granite, Stretcher Bond, or similar and approved;
- RG1 - Fire / Maintenance routes / Parking Spaces
  Ritter, Prograss, 500 x 390 x 45 mm, Standard - recycled plastic: HD-PE ingredients, sorted, environmentally neutral; Green; or similar and approved. To manufacturer's Connection system;
- PS1 - Play Area Surface
  Grass Safety Matting (in Detention Basins) & Play Bark mulch suitable for play areas;
- PS2 - Safety Surfacing - Playground Surface
  Play bark mulch and low grass berm to contain Play Bark.
  Wood fibre manufactured using 100% seasoned, recycled softwood fibres. 300mm depth
  Supplier: Connaught Timber, Product: Playground Wood Chip or similar and approved;
- Gravel Strip
  Wicklow Granite 11-14mm, 50mm deep layer over 150mm of Pea Gravel, Prsusre Treated timber edging, min. 25mm thick;
- Steps
  -Pre-cast concrete steps with Step Nosing - Grip / Visibility Strip recessed into concrete step. Refer to Engineer's package for specifications and build-up.
  -Tactile Paving
  -Handrail;
- Tactile Paving
  -Stepped & Ramped accesses_Corduroy tactile concrete flag. Double wide line of tactile surface on top and bottom landing, 400mm apart from landings
  -Pedestrian crossings
  -Cycleway
  Refer to Engineer's package for specifications and build-up;

FURNITURE

Note: specification and installation as per manufacturer's product sheet.

- Bench
  Powder coated stainless steel (colour Anthracite Grey RAL 7016 or similar approved) and recycled composite timber seat. Supplier: Hartecast, Product: HC2033S Seat or similar and approved. To include back and arm rests. Size 1800x360x460mm. To be fixed to concrete pad;
- Bins
  Semi domed top, cast ductile iron litter bin with half circle aperture, 254x125mm. Dimensions 1080 x 430 x 390mm. Galvanised with powder coated finish (colour Anthracite Grey RAL 7016 or similar approved). Supplier: Hartecast, product: HC2055 - 100 litre, or similar and approved. To be supplied with detachable base plate. To be fixed to concrete pad;
- Bollards
  Stainless steel bollard (2 un.)
  Supplier: Pittman, product: Semi Dome Stainless Steel Bollard (P-895760), dim.: 1200(H) x Ø 114mm; high-grade 304 stainless steel, or similar and approved
- Stainless steel bollard - removable (2 un.)
  Supplier: Pittman, product: Semi Dome Stainless Steel Bollard (P-895750), dim.: 1200(H) x Ø 114mm; 304 grade stainless steel, or similar and approved
- Outdoor Bicycle Stands (100 stands) - Short stay Bicycle Spaces (200 spaces)
  Sheffield Bicycle Stands (uncovered - located in open spaces)
  Supplier: Hartecast (&/or similar and approved), Product: Sheffield stand, or similar and approved; Material: 316 grade stainless steel, Dim. H825mm, W850mm (c/c 1000mm), Fixing: concrete foundation under proposed surface treatment;
- Retaining Walls/Raised Planters (+450mm - 600mm)
  Rendered Concrete Block with PC Concrete Coping;
- Raised Planters +450mm height
  Exposed Aggregate Concrete with shot-blasted finish.Timber seating elements incorporated.
- Lighting Columns (with 5m exclusion Zone)
  see Lighting Engineers drawings for details;

PROPOSED PLAYGROUND EQUIPMENT

to comply with BS EN 1176

Note: specification and installation as per manufacturer's product sheet.

- Mixed playground and fitness equipment;
- Mixed fitness equipment;
- Natural play elements

BOUNDARIES TREATMENT

- W1 - Boundary between Residential and Public Realm
  Rendered Concrete Block Wall with PC concrete coping & Brick Piers +2.0m high; or similar and approved;
- W2 - Rear House Garden Dividing Boundary
  Timber Panel with Concrete Post; +1.8m high; or similar and approved;
- W3_Rear House Garden Dividing Boundary with retaining elements
  Timber Panel with concrete post, To include 300mm concrete board as retaining element; 1.8m high; or similar and approved;
- W4_Front houses Retaining wall with railing
  Retaining wall, less than 0.6m height, with 0.9m estate railing guarding. Retaining wall, 0.6m height or more, with 1.1m vertical railing.
  Delta membrane as DPC to the rear of all retaining walls before backfilling; or similar and approved;
- W5_Apartment Courtyard Railing
  Steel Bar Railing, Powder-coated, Colour: Black; +1.8m high; or similar and approved with gate to match
- W6_Front Houses and Duplexes Railing
  Estate fence railing, 900mm high with horizontal bars; Colour: Black; or similar and approved;
- W7_Local Park Railing
  Low wall with heavy duty round bar, 16mm diam. galvanized and powder coated matt metal railing, Colour: Black, 1.8m high, Gates to match, or similar and approved;
- W7.1_Steel Bar Gate
  Double and single steel bar gate to match railing; Automation TBC
- W8 - Creche fencing (2m high)
  Composite (Recycled Timber / Plastic Slats) in Anthracite Grey Irfen Composite by Irish Fencing or equal approved;
- F1_Duplex Terrace - Composite panel fence (1.6m high)
  Between Duplex properties for privacy. Supplier: Irish Fencing, Product: Composite timber fencing, dim.: height 1600mm, post size 100x100mm, board dim: 206x1910mm. Color Dark Gray or similar and approved;
- F2_Protective Fencing along existing Hedgerow
  Chestnut Pale Fencing, 1.2m high; to protect existing vegetation within the pNHA;
- Proposed Kerbs
  refer to Eng's "Proposed pavement & kerbing details sheets" and specifications;
- Below Ground Attenuation Tank
  See Engineer's drawings for more information;
- Attenuation Basin

TREE PITS

(Refer to drawing no.: 1738_PLC_D_01 and Engineer's details, drawing no.: CLB-1A-94-SW-XXX-DR-DBFL-CE-5304)

Type1

Tree Pit in Paving with Tree Grill and Structural Soil.

SOFT LANDSCAPE (refer to 1738_T_P_07.107.2)

Existing Trees
to be retained

Existing Trees
to be removed

Existing Vegetation to Canal boundary and Fonthill Rd
to be retained and enhanced;

Proposed Street Trees
Tree Pit in Paving - Structural Soil where shown

- **Link Street**
- **Green Corridor**
- **Local Streets**
- **Small Residential Streets/Homezones**

Proposed Open Space Trees

- **Parkland Trees**
- **Urban Edge**

Proposed Communal Open Spaces/Garden Trees

- **Communal Open Space/Apt/Duplex/ Specimen Ornamental**
- **Rear Garden Trees**
- **Native Woodland Planting**
- **Street/Public Realm Planting**
- **Front Garden Planting**
- **Residential Hedge Planting**
- **Open Space Hedge Planting**
- **Open Space Native Hedge**
- **Planted Swale**
- **Bioretention Area**
- **Wet Area**
- **Amenity Grass Lawn**
- **Garden Lawn**
- **Native Meadow Grass**
- **Bulb planting in grass**
- **Climbers - Green Wall Planting with trellis**
- **Proposed Green Roof**

Note:
refer to drawing no.:

- 1738_T_P_00 for Masterplan;
- 1738_T_P_01.1 for Masterplan - 01/02;
- 1738_T_P_01.2 for Masterplan - 02/02;
- 1738_T_P_02 for Curtilage detailed Plan
- 1738_T_P_03 for Landscape Plan - Grand Canal Park Potential connections to the canal Towpath
- 1738_T_P_04.1 for Boundary Treatment Plan & Details | Residential Boundaries;
- 1738_T_P_04.2 for Boundary Treatment Plan & Details | Open Space Boundaries;
- 1738_T_P_5.1 for Hard Landscape and Earthwork Plan - 01/02
- 1738_T_P_5.2 for Hard Landscape and Earthwork Plan - 02/02
- 1738_T_P_06 for Play Areas;
- 1738_T_P_07.1 for Soft Landscape Plan - 01/02;
- 1738_T_P_07.2 for Soft Landscape Plan - 02/02;
- 1738_T_P_08 for Removed/Retained/Compensatory Planting Plan;
- 1738_T_D_01 for Soft Landscape and SuDS | Details;

1. This drawing is intended to show landscape architectural proposals only. Please refer to Architect's and Engineer's drawings for relevant details of buildings, structures, roads, parking, etc.
2. The copyright of this drawing is vested with Murray & Associates. This drawing may not be reproduced without permission of Murray & Associates.
3. All materials referred to on the drawing - including plant species - are indicative and subject to change following detailed site investigation. Significant changes, if any are required, will be referred to the relevant authority for agreement.
4. This drawing is not suitable for use for construction purposes.
5. Discrepancies to be referred to Murray & Associates for clarification.

murray & associates
landscape architecture
16 The Seapoint Building, 44-45 Clontarf Road, Dublin 3, D03 RF63
mail@murray-associates.com
www.murray-associates.com
+353 (01) 854 0080

REV	DATE	REVISION	DRAWN	CHECKED
0	01/03/23	Tender	FT/IS	MB

CLIENT
CAIRN HOMES

PROJECT TITLE
RESIDENTIAL DEVELOPMENT
CLONBURRIS

SHEET TITLE
Masterplan - 01/02

SHEET NO
1738_T_P_01.1

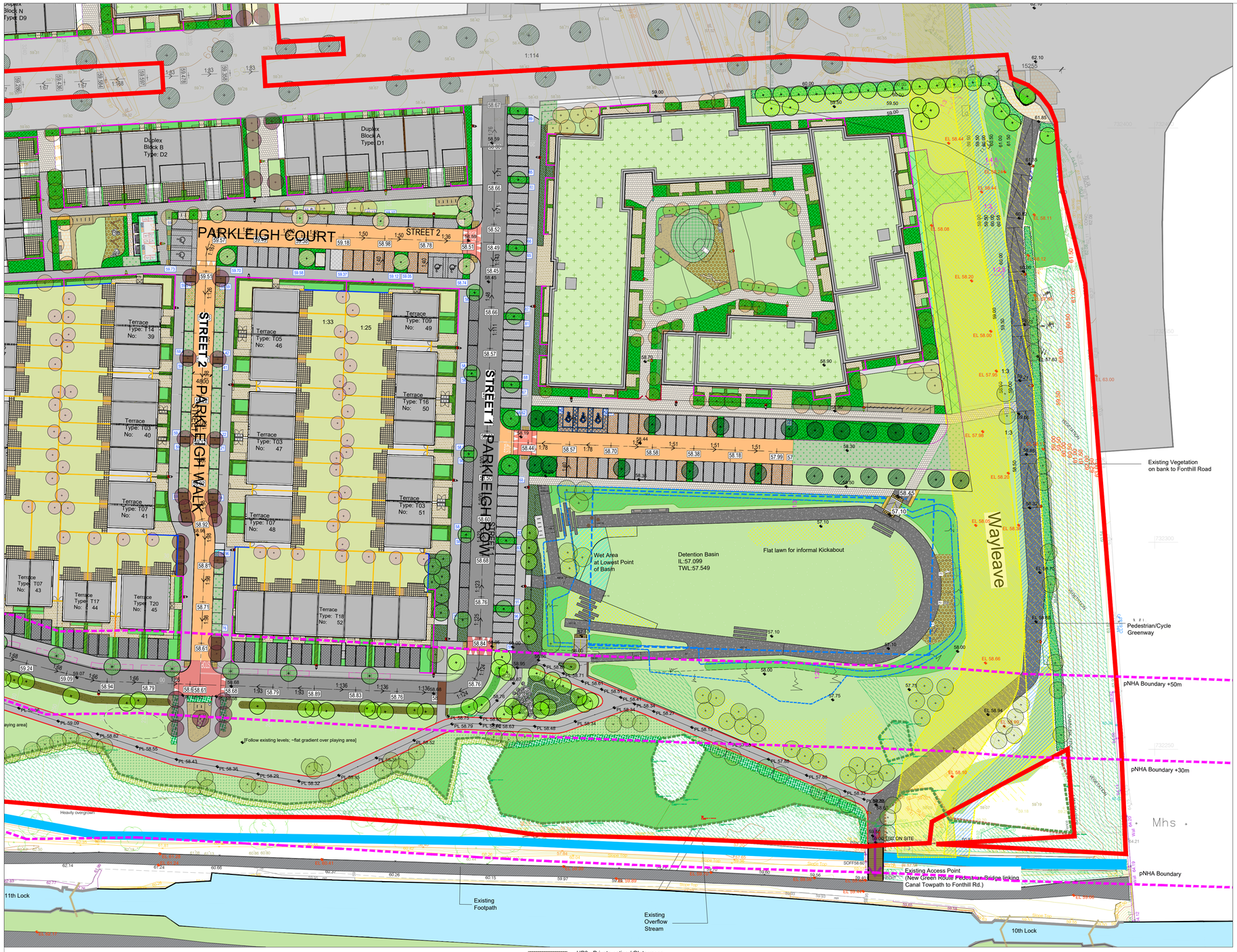
SHEET SIZE
A0

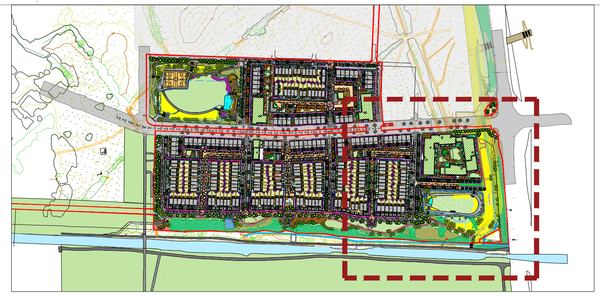
SCALE
1:500

REVISION
0

STAGE
Tender

DATE
01/03/23





KeyPlan - Scale 1:5000

PROPOSED PLAYGROUND EQUIPMENT
to comply with BS EN 1176
Note: specification and installation as per manufacturer's product sheet.

Mixed playground and fitness equipment;

Mixed fitness equipment;

Natural play elements

BOUNDARIES TREATMENT

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Between Duplex properties for privacy. Supplier: Irish Fencing, Product: Composite timber fencing, dim.: height 1600mm, post size 100x100mm, board dim: 206x1910mm. Color Dark Gray or similar and approved;

F2_Protective Fencing along existing Hedgerow
Chestnut Pale Fencing, 1.2m high; to protect existing vegetation within the pNHA;

Proposed Kerbs
refer to Eng's "Proposed pavement & kerbing details sheets" and specifications;

Below Ground Attenuation Tank
See Engineer's drawings for more information;

Attenuation Basin
- Top & Bottom of proposed slope;

SOFT LANDSCAPE (refer to 1738_T_P_07.1/07.2)

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to be retained

Existing Trees
to be removed

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Green Corridor

Local Streets

Small Residential Streets/Homezones

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Proposed Communal Open Spaces/Garden Trees

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Bioretention Area

Wet Area

Amenity Grass Lawn

Garden Lawn

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Bulb planting in grass

Climbers - Green Wall Planting with trellis

Proposed Green Roof

TREE PITS
(Refer to drawing no.: 1738_PLC_D_01 and Engineer's details, drawing no.: CLB-1A-94-SW-XXX-DR-DBFL-CE-5304)

Type1
Tree Pit in Paving with Tree Grill and Structural Soil only.

LEGEND

Site Boundary - Extent of works;

Wayleaves - Gas & Water;

HARD LANDSCAPE

Existing Pathways along the Canal;

Future Pedestrian Bridge;

Proposed Street
Asphalt Roadway with in-situ concrete kerbs (to Engineer's specification and details);

Proposed Homezone Local Street
Asphalt (HRA) with buff coloured chip (to Engineer's specification and details);

Proposed Footpaths
In-situ concrete, Brushed Finish (to Engineer's specification and details);

Proposed Paths
Permeable Solid Surface
Sustainable Surface Solution, Flexipave or Porous Asphalt, color TBC, or similar and approved;

House - Private Side Entrance
In-situ concrete, Brushed Finish (to Engineer's specification and details);

Footpaths
Compacted Gravel Surface with Timber Edge. Self-Binding Gravel surface - 6-10mm to dust Ø aggregate - Ballylusk or similar and approved;

Paving:

UP1 - Public Spaces: Footpaths
Kilsaran, Newgrange, 3 size mix x 60mm D, Silver, Black detailing / Textured Granite, Random Stretcher, or similar and approved;

UP2 - Public Spaces: Seating Areas, Feature Spaces
Kilsaran, Newgrange, 3 size mix x 60mm D, Silver, Black detailing / Textured Granite, Coursed Stretcher, or similar and approved;

UP3 - Car Parking Spaces - Permeable Paving - Off Curtilage
Kilsaran, Climapave Slane, 200 x 100 x 80, Silver / Textured Granite, Herringbone, or similar and approved;

UP4 - Car Parking Spaces - Permeable Paving - On Curtilage
Kilsaran, Climapave Newgrange, 3 size mix x 60mm D, Black / Textured Granite, Random Stretcher, or similar and approved;

UP5 - Entrance to houses / gardens / driveways
Kilsaran, Newgrange, 600 x 400 x 50mm, Silver Granite, Stretcher Bond, or similar and approved;

UP6 - Private patios / GL terraces
Kilsaran, Newgrange, 600 x 400 x 50mm / 400 x 400 x 50mm, Buff Granite, Stretcher Bond, or similar and approved;

RG1 - Fire / Maintenance routes / Parking Spaces
Ritter, Prograss, 500 x 390 x 45 mm, Standard - recycled plastic: HD-PE regranulate, sorted, environmentally neutral; Green; or similar and approved. To maunfacturer's Connection system;

PS1 - Play Area Surface
Grass Safety Matting (in Detention Basins) & Play Bark mulch suitable for play areas;

PS2 - Safety Surfacing - Playground Surface
Play bark mulch and low grass berm to contain Play Bark.
Wood fibre manufactured using 100% seasoned, recycled softwood fibres. 300mm depth
Supplier: Connaught Timber, Product: Playground Wood Chip or similar and approved;

Gravel Strip
Wicklow Granite 11-14mm, 50mm deep layer over 150mm of Pea Gravel, Prrsure Treated timber edging, min. 25mm thick;

Steps
-Pre-cast concrete steps with Step Nosing - Grip / Visibility Strip recessed into concrete step. Refer to Engineer's package for specifications and build-up.
-Tactile Paving
-Handrail;

Tactile Paving
-Stepped & Ramped accesses_Corduroy tactile concrete flag. Double wide line of tactile surface on top and bottom landing, 400mm apart from landings
-Pedestrian crossings
-Cycleway
Refer to Engineer's package for specifications and build-up;

FURNITURE
Note: specification and installation as per manufacturer's product sheet.

Bench
Powder coated stainless steel (colour Anthracite Grey RAL 7016 or similar approved) and recycled composite timber seat. Supplier: Hartecast, Product: HC2033S Seat or similar and approved. To include back and arm rests. Size 1800x360x460mm. To be fixed to concrete pad;

Bins
Semi domed top, cast ductile iron litter bin with half circle aperture, 254x125mm. Dimensions 1080 x 430 x 390mm. Galvanised with powder coated finish (colour Anthracite Grey RAL 7016 or similar approved). Supplier: Hartecast, product: HC2055 - 100 litre, or similar and approved. To be supplied with detachable base plate. To be fixed to concrete pad;

Bollards
Stainless steel bollard (2 un.)
Supplier: Pittman, product: Semi Dome Stainless Steel Bollard (P-895766), dim.: 1200(H) x Ø 114mm; high-grade 304 stainless steel, or similar and approved

Stainless steel bollard - removable (2 un.)
Supplier: Pittman, product: Semi Dome Stainless Steel Bollard (P-895750), dim.: 1200(H) x Ø 114mm; 304 grade stainless steel, or similar and approved

Outdoor Bicycle Stands (100 stands) - Short stay Bicycle Spaces (200 spaces)
Sheffield Bicycle Stands (uncovered - located in open spaces)
Supplier: Hartecast (&/or similar and approved), Product: Sheffield stand, or similar and approved; Material: 316 grade stainless steel, Dim. H825mm, W850mm (c/c 1000mm), Fixing: concrete foundation under proposed surface treatment;

Retaining Walls/Raised Planters (+450mm - 600mm)
Rendered Concrete Block with PC Concrete Coping;

Raised Planters +450mm height
Exposed Aggregate Concrete with shot-blasted finish.Timber seating elements incorporated.

Lighting Columns (with 5m exclusion Zone)
see Lighting Engineers drawings for details;

Note:
refer to drawing no.:
- 1738_T_P_00 for Masterplan;
- 1738_T_P_01.1 for Masterplan - 01/02;
- 1738_T_P_01.2 for Masterplan - 02/02;
- 1738_T_P_02 for Curtilage detailed Plan
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murray & associates
landscape architecture
16 The Seapoint Building, 44-45 Clontarf Road, Dublin 3, D03 RF63
mail@murray-associates.com
www.murray-associates.com
+353 (01) 854 0090

REV	DATE	REVISION	DRAWN	CHECKED
0	01/03/23	Tender	FT/IS	MB

CLIENT
CAIRN HOMES

PROJECT TITLE
RESIDENTIAL DEVELOPMENT
CLONBURRIS

SHEET TITLE
Masterplan - 02/02

SHEET NO.
1738_T_P_01.2

SHEET SIZE
A1

SCALE
1:1000

REVISION
0

STAGE
Tender

DATE
01/03/23

APPENDIX 2

LANDSCAPE WORKS SPECIFICATIONS AND LANDSCAPE MANAGEMENT PLAN

murray & associates

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LANDSCAPE WORKS SPECIFICATIONS and LANDSCAPE MANAGEMENT PLAN

for

Residential Development Clonburris

Clonburris SDZ

CLIENT:

Cairn Homes PLC

November 2022

murray & associates

landscape architecture

16 The Seapoint Building
44-45 Clontarf Road, Dublin 3
Tel: 01 8540090

mail@murray-associates.com
www.murray-associates.com

Member of the Irish Landscape Institute

CONTROL SHEET

Project No.		**1738**		
Project Name		**Clonburris T1**		
Filename:		**1738_Spec**		
Document Title:		**Landscape Works Specifications and Landscape Maintenance Works**		
Rev. No.	Issue Status	Date	Prepared By	Checked By
0	**Planning Compliance**	18/11/22	FT/IS	MB

TABLE OF CONTENTS

A General Comments

A13. Description of the Work

PRELIMINARIES
In addition to Preliminaries/General Conditions identified by the Employer's Agent (EA), the contractor shall provide the following:

Identify the tree and shrub nurseries from which it is intended to supply the plants.

Prior to delivering shrubs and groundcover to site, images shall be provided showing container size, root growth and size of the plant.

Prior to delivering to site, images shall be provided of all hedge planting pre-grown and field grown showing container size or through size, root growth and height.

Prior to delivering trees to site, images shall be provided showing height, container size or root ball size, clear stem height (person standing on root ball).

All planting shall be inspected prior to planting and checked for damage that may have occurred during transit. Damaged plants will be rejected, and a replacement shall be provided.

The contractor needs to be aware that the bare rooted planting season is from the 1st of November till the 17th of March. Dependant on the construction phasing, the planting of bare-root plants may be completed post construction to tie in with the following bare-root season. If the contractor's program does not tie in with these dates the trees may need to be priced as container grown or spring ringed a minimum of 8 months in advance. Any cost if any for out of season planting will need to be included for within the tender.

Any costs associated with offsite maintenance will need to be included for in the tender.

When existing topsoil is no longer available on site, the contractor shall be responsible for importing the necessary remaining topsoil. Topsoil quality to comply with the specification clauses outlined in Q28.

SCOPE OF WORKS
GENERAL DESCRIPTION OF WORKS:

The works described in this document comprise hard works including granite paving, limestone paving, soft works including shrub and tree planting, landscape maintenance and street furniture.

PAVING SPARES:

The contractor shall provide an additional quantity of 5% of all paving materials / finishes included within the works at the completion of the development to the Employer's Agent (EA) for storage to a location to be agreed in writing.

Street furniture items to be supplied and installed as part of the site works area proposals shall include, but is not limited to the following:

- Timber benches and seats.
- Playground equipment.
- Cycle stands.

The defects liability period for hard elements shall is given in the contract preliminaries. For specific items the following shall apply:

- All paving and street furniture items: 12 months.
- All soft landscape areas including shrub planting and wildflower meadows: 12 months.
- All trees: 12 months.

The Contractor shall provide to the Employer all information that he may reasonably require to monitor and assess the Contractor's performance against the targets for those performance indicators.

Where the Employer considers that a target for any of those performance indicators may not be met, he may inform the Contractor who shall submit his proposal for improving his performance against that target to the employer.

MATERIALS

MATERIALS – GENERAL:

Where and to the extent that materials, products and workmanship are not fully detailed or specified they are to be:

- of a standard appropriate to the Works and suitable for the purposes stated in or reasonably to be inferred from the project documents;
- in accordance with good building practice, including provisions of building standards, Codes of Practice and British Standards and in accordance with the Specification for Highway Works.

MATERIALS – SUPPLIERS:

The Contractor shall submit to the EA's a list of suppliers from whom he proposes to purchase the materials necessary for the execution of the Works. Each supplier must be willing to admit the EA, or his Representative, to his premises during ordinary working hours for the purpose of inspecting materials and obtaining samples of the materials proposed. Alternatively, if directed by the EA, the Contractor shall deliver samples of the materials to the EA's office without charge.

The Contractor shall inform the EA of any subsequent additions to be made to the list and shall not change any source of supply without the EAs prior approval. Should the Contractor require to change any source of supply he shall inform the EA of this and supply a sample of the material from the new source for approval.

Samples of materials approved will be retained at the EA's office until the completion of the Contract.

A sample palette of 5sq.m of all paving to be laid out on site one month prior to commencement of contract works.

Materials to be equal to samples - all material incorporated in the Works after approval of samples shall be equal to the approved samples.

The Contractor shall produce written evidence of sources of supply when requested by the EA.

BRITISH STANDARDS

Where British Standard Specifications (hereinafter abbreviated to BS) and British Standard Codes of Practice (hereinafter abbreviated to CP) published by the British Standards Institution are referred to in the Specification the references shall be taken as referring to the latest editions including all amendments and additions thereto issued up to one month prior to the date of this document unless the year and/or Clause is given in the Specification.

Where any BS or CP provides for alternatives and no reference is made in the Specification or Drawings to the alternative required for the Works, then the Contractor shall request the EA to issue an instruction specifying the applicable alternative. If such instruction is not requested, then any resulting alterations subsequently required by the EA to materials and workmanship shall be at the Contractor's expense.

BRITISH STANDARD KITE MARKS

All products or installations specified to confirm to a British Standard or other accredited Quality Assurance scheme shall be clearly marked with the appropriate kite mark or other approved symbol.

TEST CERTIFICATES

Where materials are to comply with the relevant British Standards the Contractor shall arrange for the appropriate test certificates to be submitted free of charge to the EA or the EA's Representative prior to the materials being incorporated in the Works. All paving materials or walkable surfaces shall require to be tested for slip resistance by a Pendulum test and PTV values to be provided prior top handover. Anywhere a contrast is required an LRV test (Light Reflective Value) is required (steps nosing and risers, corduroy paving to top and bottom of stepped approach to buildings) the LRV requires to differ 30 units to be considered contrasting.

INSPECTION AND DESPATCH OF MATERIALS OFF THE SITE

Where inspection of materials off the Site is referred to in the Contract, the Contractor shall, having regard to the location of the material and the nature of the test, inspection or examination required, give to the EA or his representative at least one week's notice of such materials being ready for inspection, test or examination.

Delay to the Works arising from the late submission of such notice will not be acceptable as a reason for delay in the completion of the Works. On the previous working day to each such test or inspection the Contractor shall confirm that the material is ready for inspection. Where materials are to be inspected off the Site, such materials shall not be despatched to the Site or elsewhere without written authority from the EA or the EA's Representative.

STORAGE OF MATERIALS

All materials to be used in the Permanent Works shall be stored neatly and orderly on racks, on supports, in bins under cover or in like manner as appropriate to prevent deterioration or damage from any cause whatsoever to the entire satisfaction of the EA's Representative.

Materials to be stored in such a manner to:

Prevent over-stressing, distortion and any other type of physical damage.

Keep materials free from contamination.

- Prevent staining, chipping, scratching or other disfigurement, particularly of products exposed to view in the finished work.
- Keep materials dry and in a suitably low humidity atmosphere to prevent premature setting, moisture movement and similar defects. Where appropriate store off the ground and allow free air movement around and between stored products.
- Protect material adequately from rain, damp, frost, sun and other elements as appropriate.
- Keep different types and grades of products separately and adequately identified.

- So far as possible keep products in their original wrappings, packings or containers, with unbroken seals, until immediately before they are used.
- Ensure that protective measures are fully compatible with and not prejudicial to the products/materials.

USE OF PERMANENT MATERIALS FOR TEMPORARY WORKS

No materials to be incorporated in the Permanent Works shall be used for Temporary Works prior to their incorporation in the Permanent Works unless otherwise directed in this Specification or approved in writing in each case by the EA.

DISCREPANCIES

It is the Contractor's responsibility to report any inconsistencies on the drawings or between drawings and the Bill of Quantities or this Specification to the EA as soon as they become apparent. The Contractor shall request clarification and instruction from the EA before proceeding.

ACCEPTANCE OF WORK

The checking, approval or confirmation of works by the EA or the EA's Representative does not relieve the Contractor of his responsibility for the correctness thereof.

WORK BY HAND

Works around the base or within the root spread of existing trees or other plants to be retained shall be undertaken by hand.

BUILDING STANDARDS

All works installed and executed shall be in accordance with the relevant Building Regulations Technical Guidance Documents (TGD's) prepared by the Department of the Environment. Refer to website www.environ.ie

A33. Quality Standards / Control

STANDARDS OF PRODUCTS AND EXECUTIONS

110 INCOMPLETE DOCUMENTATION

General:

- Where and to the extent that products or work are not fully documented, they are to be:
- Of a kind and standard appropriate to the nature and character of that part of the Works where they will be used.
- Suitable for the purposes stated or reasonably to be inferred from the project documents. Contract documents: Omissions or errors in description and/ or quantity shall not vitiate the Contract nor release the Contractor from any obligations or liabilities under the Contract.

120 WORKMANSHIP SKILLS

- Operatives: Appropriately skilled and experienced for the type and quality of work.
- Registration: With Construction Skills Certification Scheme.
- Evidence: Operatives must produce evidence of skills/ qualifications when requested.

130 QUALITY OF PRODUCTS

- Generally: New. (Proposals for recycled products may be considered).
- Supply of each product: From the same source or manufacturer.
- Whole quantity of each product required to complete the Works:
- Consistent in kind, size, quality and overall appearance.
- Source of supply: Submit evidence when requested.

170 MANUFACTURER'S RECOMMENDATIONS/ INSTRUCTIONS

- General: Comply with manufacturer's printed recommendations and instructions current on the date of the Invitation to tender.
- Changes to recommendations or instructions: Submit details.
- Ancillary products and accessories: Use those supplied or recommended by main product manufacturer.
- Agrément certified products: Comply with limitations, recommendations and requirements of relevant valid certificates.

180 WATER FOR THE WORKS

- Mains supply: Clean and uncontaminated.
- Other: If proposed, provide evidence of suitability.

SAMPLES/ APPROVALS

220 APPROVAL OF PRODUCTS

- Submissions, samples, inspections and tests: Undertake or arrange to suit the Works programme.
- Approval: Relates to a sample of the product and not to the product as used in the Works.
- Do not confirm orders or use the product until approval of the sample has been obtained.
- Complying sample: Retain in good, clean condition on site. Remove when no longer required.

230 APPROVAL OF EXECUTION

- Submissions, samples, inspections and tests: Undertake or arrange to suit the Works programme.
- Approval: Relates to the stated characteristics of the sample. (If approval of the finished work as a whole is required this is specified separately). Do not conceal, or proceed with affected work until compliance with requirements is confirmed.
- Complying sample: Retain in good, clean condition on site. Remove when no longer required.

D Groundwork
D20 Excavating and filling

To be read with Preliminaries/General conditions

Generally/the site

145 Variations in ground water level

1. Give notice: If levels encountered are significantly different from levels in the site investigation report or previously measured.

150 Existing services, features and structures

1. Services: Refer to the appointed Engineer's drawings for details.
2. Site features to be retained: See drawing 1738_C_P_01.1/01.2 for details.
3. Structures: None.

Clearance/excavating

164 Tree Roots

1. Protected area: Do not cut roots within precautionary protection area.
   1.1. Size of area: As drawing no. 1738_PLC_TPP_01
2. Outside protected area: Give notice of roots exceeding 25 mm and do not cut without approval.
3. Cutting
   3.1. Make clean smooth cuts with no ragged edges
   3.2. Pare cut surfaces smooth with a sharp knife.
   3.3. Treatment of cut roots.

164 Tree Roots

1. Trench: Sever all roots.
   1.1. Depth:
2. Root barrier:
3. Cutting roots: As clause 164.
4. Root barrier installation: Full depth of excavation. Fit closely to trench wall nearest the tree.
5. Backfill material: As dug material excavated from trench.
6. Backfilling: Lay and compact thoroughly in layers not more than 300 mm thick.

168 Site clearance

1. Timing: Before topsoil stripping, if any.
2. General: Clear site of rubbish, debris and vegetation. Do not compact topsoil.
3. Treatment: Apply a suitable non-residual herbicide to areas to receive planting

170 Removing small trees, shrubs, hedges and roots

1. Identification: Clearly mark trees to be removed.
2. Small trees, shrubs and hedges: Cut down.
3. Roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.
4. Safety: Comply with Forest Industry Safety Accord safety leaflets.

175 Felling large trees

1. Definition: Girth over 600 mm.
2. Identification: Clearly mark trees to be removed.
3. Safety: Comply with Forest Industry Safety Accord safety leaflets.
4. Felling: As close to the ground as possible.
5. Work near retained trees: Take down trees carefully in small sections to avoid damage to adjacent trees that are to be retained, where tree canopies overlap and in confined spaces generally.

180 Chipping and shredding

1. General: Permitted, remove arisings from site

220 Stripping topsoil

1. General: Before beginning general excavation or filling, strip topsoil from areas where there will be regrading, buildings, pavings/ roads and other areas shown on drawings.
2. Depth
   2.1. Remove to an average depth of 250 mm.
   2.2. Give notice where the depth of topsoil is difficult to determine.
3. Handling: Handle topsoil for reuse or sale in accordance with clause 225.
4. Site storage: Keep separate from excavated sub-soil

221 Treating topsoil

1. Treatment: Apply a suitable translocated nonresidual herbicide.
2. Timing: Not less than two weeks before excavating topsoil.

225 Handling topsoil

1. Standard: To BS 3882.
2. Aggressive weeds
   2.1. Species: Notify the presence of species included in the Weeds Act, section 2, or the appropriate Wildlife and Countryside Act for the relevant jurisdiction.
   2.2. Give notice: Obtain instructions before moving topsoil.
3. Contamination: Do not mix topsoil with:
   3.1. Subsoil, stone, hardcore, rubbish or material from demolition work.
   3.2. Other soil or material containing aggressive weeds, sharps, plastics and non soil forming materials and notifiable animal or plant diseases.
   3.3. Oil, fuel, cement or other substances harmful to plant growth.
   3.4. Other classifications of topsoil.
4. Multiple handling: Keep to a minimum. Use topsoil immediately after stripping.

240 Adjacent excavations

1. Requirement: Where an excavation encroaches below a line drawn at an angle from the nearest formation level of another higher excavation, the lower excavation, all work within it and backfilling thereto, must be completed before the higher excavation is made.
2. Angle of line below horizontal: To be agreed on an individual area by area basis.
3. Backfill material: To be agreed on an individual area by area basis.

242 Excavations adjacent to existing backfilled trenches

1. Proximity: When width of undisturbed ground between the two excavations will be less than 1m.
2. Action: Assume that the ground between the trenches is unstable and provide side support accordingly.

244 Excavations adjacent to existing foundations

1. Prior to commencing excavation
    1.1. Excavate trial pits adjacent to existing foundations to determine extent and formation levels.
    1.2. Allow for inspection of trial pits.
    1.3. Allow time for amendment of details if required.
        1.3.1. Time period: 5 working days
2. Backfill material to new excavation: To be agreed on an individual area by area basis.

250 Permissible deviations from formation levels

1. Beneath mass concrete foundations: ±25 mm.
2. Beneath ground bearing slabs and r.c. foundations: ±15 mm.
3. Embankments and cuttings: ±50 mm.
4. Ground abutting external walls: ±50 mm, but such as to ensure that finished level is not less than 150 mm below dpc.

255 Accuracy – linear dimensions

1. Permissible deviations from linear dimensions generally: +/- 15mm

260 Inspecting formations

1. Give notice: Make advance arrangements for inspection of formations for foundations and filling formations; service trenches; roads and pavings.
    1.1. Notice (minimum): 3 days
2. Preparation: Just before inspection remove the last 150 mm of excavation. Trim to required profiles and levels.
    2.1. Loose material: Remove
3. Seal: Within 4 hours of inspection, seal formations with concrete.

270 Foundations generally

1. Give notice if
    1.1. A natural bearing formation of undisturbed subsoil is not obtained at the depth shown on the drawings.
    1.2. The formation contains soft or hard spots or highly variable material.

280 Trench fill foundations

1. Excavation: Form trench down to formation in one operation.
2. Safety: Prepare formation from ground level.
3. Inspection of formations: Give notice before commencing excavation.
   3.1. Period of notice: Three working days
4. Shoring: Where inspection of formation is required, provide localised shoring to suit ground conditions.
5. Concrete fill: Place concrete immediately after inspection and no more than four hours after exposing the formation.

290 Foundations in made up ground

1. Depth: Excavate down to a natural formation of undisturbed subsoil.
2. Discrepancy: Give notice if this is greater or less than depth given.

310 Unstable ground

1. Generally: Ensure that the excavation remains stable at all times.
2. Give notice: Without delay if any newly excavated faces are too unstable to allow earthwork support to be inserted.
3. Take action: If instability is likely to affect adjacent structures or roadways, take appropriate emergency action.

330 Unrecorded features

1. Give notice: If unrecorded foundations, beds, voids, basements, filling, tanks, pipes, cables, drains, manholes, watercourses, ditches, etc. not shown on the drawings are encountered.

350 Existing watercourses

1. Diverted watercourses which are to be filled: Before filling, remove vegetable growths and soft deposits.

360 Excess excavation

3. Excavation taken wider than required
   3.1. Backfill: Foundation bearing
4. Excavation taken deeper than required
   4.1. Backfill: Foundation bearing

370 Underground structures in landscape areas

1. Generally: Remove walls, roads, foundations, disused services, drains, manholes and the like to minimum depth.
2. Minimum depth below finished levels
   2.1. Grass, ground cover and perennial planting: 500 mm
   2.2. Shrub planting: 750 mm.
   2.3. Within 2 m of tree planting: 1000 mm.
3. Walls and slabs remaining: In every 10 m² of wall or slab, make a drainage hole at least 600 mm diameter.

Disposal of materials

410 Excavated topsoil storage

1. Storage: Stockpile in temporary storage heaps location to be agreed .

415 Excavated topsoil removal

1. General: Remove from site.

420 Topsoil storage heaps

1. Location: to be agreed
2. Standard: To BS 3882.
3. Protection
   3.1. Do not place any other material on top of storage heaps.
   3.2. Do not allow construction plant to pass over storage heaps.
   3.3. Prevent compaction and contamination.

421 Topsoil storage heap treatment

1. Treatment: Apply a suitable herbicide at appropriate times to prevent seeding of weeds

441 Surplus subsoil

1. Excavated material: Stockpile in temporary storage heaps.
2. Retained material: Spread and level surplus subsoil on site.
   2.1. Locations: to be agreed
   2.2. Protected areas: Do not raise soil level within root spread of trees that are to be retained.
3. Remaining material: Remove from site.

450 Water

1. Generally: Keep all excavations free from water until:
   1.1. Formations are covered.
   1.2. Below ground constructions are completed.
   1.3. Basement structures and retaining walls are able to resist leakage, water pressure and flotation.
2. Drainage: Form surfaces of excavations and fill to provide adequate falls.
3. Removal of water: Provide temporary drains, sumps and pumping as necessary. Do not pollute watercourses with silt laden water.

454 Ground water level, springs or running water

1. Give notice: If it is considered that the excavations are below the water table.
2. Springs/ Running water: Give notice immediately if encountered.

457 Pumping

1. General: Do not disturb excavated faces or stability of adjacent ground or structures.
2. Pumped water: Discharge without flooding the site or adjoining property.
3. Sumps: Construct clear of excavations. Fill on completion.
   3.1. Locations: to be agreed.

Filling

500 Proposed fill materials

1. Details: Submit full details of proposed fill materials to demonstrate compliance with specification, including:
   1.1. Type and source of imported fill.

1.2. Proposals for processing and reuse of material excavated on site.

1.3. Test reports as required elsewhere.

2. Timing: 2 weeks prior to starting on site.

510 Hazardous, aggressive or unstable materials

1. General: Do not use fill materials which would, either in themselves or in combination with other materials or ground water, give rise to a health hazard, damage to building structures or instability in the filling, including material that is:
   1.1. Frozen or containing ice.
   1.2. Organic.
   1.3. Contaminated or noxious.
   1.4. Susceptible to spontaneous combustion.
   1.5. Likely to erode or decay and cause voids.
   1.6. With excessive moisture content, slurry, mud or from marshes or bogs.
   1.7. Clay of liquid limit exceeding 80 and/or plasticity index exceeding 55.
   1.8. Unacceptable, class U2 as defined in the 'Specification for highway works', clause 601.

520 Frost susceptibility

1. General: Except as allowed below, fill must be non frost-susceptible as defined in the 'Specification for highway works', clause 801.8.
2. Test reports: If the following fill materials are proposed, submit a laboratory report confirming they are non frost- susceptible:
   2.1. Fine grained soil with a plasticity index less than 20%.
   2.2. Coarse grained soil or crushed granite with more than 10% retained on a 0.063 mm sieve.
   2.3. Crushed chalk.
   2.4. Crushed limestone fill with average saturation moisture content in excess of 3%.
   2.5. Burnt colliery shale.
3. Frost-susceptible fill: May only be used:
   3.1. At depths below the finished ground surface greater than: 500 mm
   3.2. Within the external walls of buildings below spaces that will be heated. Protect from frost during construction.
   3.3. Where frost heave will not affect structural elements.

530 Placing fill

1. Surfaces of excavations and areas to be filled: Free from loose soil, topsoil, organic material, rubbish and standing water.
2. Freezing conditions: Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing.
3. Adjacent structures, membranes and buried services
   3.1. Do not overload, destabilise or damage.
   3.2. Submit proposals for temporary support necessary to ensure stability during filling.
   3.3. Allow 14 days (minimum) before backfilling against in situ concrete structures.
4. Layers: Place so that only one type of material occurs in each layer.
5. Earthmoving equipment: Vary route to avoid rutting.

535 Compaction generally

1. General: Compact fill not specified to be left loose as soon as possible after placing.
2. After compaction: Surface of each layer must be well closed, showing no movement under compaction plant, and without cracks, holes, ridges, loose material and the like.
3. Defective areas: Remove and recompact to full thickness of layer using new material.

540 Benching in fill

1. Adjacent areas: If, during filling the difference in level between adjacent areas of filling exceeds 600 mm, cut into edge of higher filling to form benches 600 mm minimum width and height equivalent to depth of a layer of compacted filling.
2. New filling: Spread and compact to ensure maximum continuity with previous filling.

550 Geotextile sheet

1. Manufacturer: Contractor's choice, compliant to BS 8661.
   1.1. Product reference: Terram T1000
2. Type: Nonwoven
3. Polymer type: Polypropylene
4. Jointing: 300 mm overlap
5. Preparation of subgrade: Before laying sheet, remove humps and sharp projections. Fill hollows
6. Protect from
   6.1. Exposure to light.
   6.2. Contaminants.
   6.3. Materials listed as potentially deleterious by geotextile manufacturer.
   6.4. Wind uplift.

610 Compacted filling for landscape areas

1. Fill: Material capable of compaction by light earthmoving plant.
2. Filling: Layers not more than 200 mm thick. Lightly compact each layer to produce a stable soil structure.

615 Loose tip filling for landscape areas

1. Filling: Do not firm, consolidate or compact when laying. Tip and grade to approximate levels in one operation with minimum of trafficking by plant.

650 Protection of compacted filling

1. Temporary protective filling: Before allowing construction traffic, raise level of compacted cohesive soil filling at least 150 mm above formation level using properly compacted temporary filling.
2. Removal: Remove temporary protective filling from site before permanent construction.

700 Backfilling around foundations

1. Under oversite concrete and pavings: Hardcore as clause 710.
2. Under grassed or soil areas: Material excavated from the trench, laid and compacted in 300 mm maximum layers.

710 Hardcore filling

1. Fill: Granular material, free from excessive dust, well graded, all pieces less than 75 mm in any direction:
    1.1. Test requirements
        1.1.1. Minimum 10% fines value tested in a soaked condition to BS 812-111 50 kN.
2. Material
    2.1. Permitted materials in any one layer
        2.1.1. Crushed rock (other than argillaceous rock) or quarry waste with not more binding material than is required to help hold the stone together.
        2.1.2. Crushed concrete, crushed brick or tile, free from plaster, timber and metal.
        2.1.3. Crushed non-expansive slag.
        2.1.4. Gravel or hoggin with not more clay content than is required to bind the material together, and with no large lumps of clay.
        2.1.5. Well-burned non-plastic colliery shale.
        2.1.6. Natural gravel.
        2.1.7. Natural sand.
3. Filling: Spread and level in 150 mm maximum layers. Thoroughly compact each layer.

F Masonry
F10 Brick/ block walling

To be read with Preliminaries/ General conditions

Types of walling

110 Clay facing brickwork

1. Description: TO EXTERNAL WALLS AROUND THE LOCAL PARK
2. Bricks: To BS EN 771-1.
3. Mortar: As section Z21.
   3.1. Standard: To BS EN 998-2
   3.2. Additional requirements: Coloured mortar to match bricks
4. Joints: Recessed
5. Features: Brick capping

255 Concrete facing blockwork

3. Description: Concrete facing blockwork (see drawing 1738_PLC_P_02.1)
4. Blocks: To BS EN 771-3.
   4.1. Manufacturer: Submit proposals
      4.1.1. Product reference: Submit proposals
   4.2. Finish/ colour: Concrete render finish to public realm
5. Mortar: As section Z21.
6. Joints: as per appointed engineer's specifications

Workmanship generally

430 Conditioning of clay bricks/ blocks

1. Bricks and blocks delivered warm from manufacturing process: Do not use until cold.
2. Absorbent bricks in warm weather: Wet to reduce suction. Do not soak.

440 Conditioning of concrete bricks/ blocks

1. Autoclaved concrete bricks/ blocks delivered warm from manufacturing process: Do not use.
2. Age of nonautoclaved concrete bricks/ blocks: Do not use until at least four weeks old.
3. Avoidance of suction in concrete bricks/ blocks: Do not wet.
   3.1. Use of water retaining mortar admixture: Submit details.

500 Laying generally

1. Mortar joints: Fill vertical joints. Lay bricks, solid and cellular blocks on a full bed.
2. AAC block thin mortar adhesive and gypsum block adhesive joints: Fill vertical joints. Lay blocks on a full bed.
3. Clay block joints
   3.1. Thin-layer mortar: Lay blocks on a full bed.
   3.2. Interlocking perpends: Butted.
4. Bond where not specified: Half-lap stretcher.

5. Vertical joints in brick and concrete block facework: Even widths. Plumb at every fifth cross joint.

520 Accuracy

1. Courses: Level and true to line.
2. Faces, angles and features: Plumb.
3. Permissible deviations
   3.1. Position in plan of any point in relation to the specified building reference line and/ or point at the same level: ± 10 mm.
   3.2. Straightness in any 5 m length: ± 5 mm.
   3.3. Verticality up to 3 m height: ± 10 mm.
   3.4. Overall thickness of walls: ± 10 mm.

545 Levelling of separate leaves

1. Locations for equal levelling of cavity wall leaves: As follows:
   1.1. Every course containing vertical twist type ties or other rigid ties.
   1.2. Every third tie course for double triangle/ butterfly ties.
   1.3. Courses in which lintels are to be bedded.

560 Coursing brickwork

1. Gauge: Four brick courses including bed joints to 300 mm.

615 Brickwork to receive asphalt dpc

1. Substrate: Mortar bed finished flush, smooth and level.

635 Jointing

1. Profile: Consistent in appearance.

645 Accessible joints not exposed to view

1. Jointing: Struck flush as work proceeds.

665 Pointing

1. Description:
2. Joint preparation: Remove debris. Dampen surface.
3. Mortar: As section Z21.
   3.1. Standard: To BS EN 998-2
   3.2. Mix: To Eng Spec
4. Profile: Recessed

671 Fire-stopping

1. Avoidance of fire and smoke penetration: Fit tightly between cavity barriers and masonry. Leave no gaps.

690 Adverse weather

1. General: Do not use frozen materials or lay on frozen surfaces.

2. Air temperature requirements: Do not lay bricks/ blocks:
   2.1. In cement-gauged mortars when at or below 3°C and falling or unless it is at least 1°C and rising.
   2.2. In hydraulic lime:sand mortars when at or below 5°C and falling or below 3°C and rising, or as manufacturer's/ supplier's recommendations.
   2.3. In thin-layer mortars when outside the limits set by the mortar manufacturer.
3. Temperature of walling during curing: Above freezing until hardened.
4. Newly erected walling: Protect at all times from:
   4.1. Rain and snow.
   4.2. Drying out too rapidly in hot conditions and in drying winds.

Additional requirements for facework

710 The term facework

1. Definition: Applicable in this specification to brick/ block walling finished fair.
   1.1. Painted facework: The only requirement to be waived is that relating to colour.

730 Brick/Concrete block samples

1. General: Before placing orders with suppliers submit for approval of appearance labelled samples.
2. Selection of samples: Representative of the range in variation of appearance.

750 Colour consistency of masonry units

1. Colour range: Submit proposals of methods taken to ensure that units are of consistent and even appearance within deliveries.
2. Conformity: Check each delivery for consistency of appearance with previous deliveries and with approved reference panels; do not use if variation is excessive.
3. Facing bricks should be blended on site from a minimum of three packs to ensure an even distribution of colour and texture variation.
4. Finished work: Free from patches, horizontal stripes and racking back marks.

760 Appearance

1. Brick/ block selection: Do not use units with damaged faces or arrises.
2. Cut masonry units: Where cut faces or edges are exposed cut with table masonry saw.
3. Quality control: Lay masonry units to match relevant reference panels.
   3.1. Setting out: To produce satisfactory junctions and joints with built-in features and components.
   3.2. Coursing: Evenly spaced using gauge rods.
4. Lifts: Complete in one operation.
5. Methods of protecting facework: Submit proposals.

780 Ground level

1. Commencement of facework: Not less than 150 mm below finished level of adjoining ground or external works level.

790 Putlog scaffolding

1. Use: Not permitted in facework.

800 Toothed bond

1. New and existing facework in same plane: Bond together at every course to achieve continuity.

830 Cleanliness

1. Facework: Keep clean.
2. Mortar on facework: Allow to dry before removing with stiff bristled brush.
3. Removal of marks and stains: Rubbing not permitted.

Ω End of Section

F31 Precast concrete sills/ lintels/ copings/ features

Types of component

105 Precast

1. Description: Capping stone on top of the wall concrete rendered finish Dim. 500x375x75 mm
2. Concrete: Components manufacturer's 'proprietary' concrete.
   2.1. Identity: To Eng spec
3. Conformity: To BS 8500-2 and the recommendations of
   3.1. BS 8500-1, Annex A.4 for the specified exposure class.

General requirements

220 Concrete generally

1. Specification: To BS 8500-2 and BS EN 206.
2. Producer: Accredited to BS 8500-2 requirements where product conformity certification is required.

250 Reinforcement

1. Carbon steel reinforcement: As appropriate to BS 4449, BS 4482 and BS 4483.
   1.1. Cutting and bending: To BS 8666.
2. Galvanized reinforcement: Galvanized to BS EN ISO 1461 after cutting. Chromate treated.
3. Stainless steel reinforcement: To BS 6744.
   3.1. Designation 1.4301.
   3.2. Cutting and bending: To BS 8666.
4. Non-structural reinforcement: Include to resist shrinkage and handling stresses.
5. Bimetallic corrosion and staining: Prevent by appropriate selection and use of materials.
6. Condition at time of placement: Clean, free of corrosive pitting, loose materials and substances that adversely affect reinforcement, concrete, or bond between the two.
7. Fixing: Accurate and secure.
   7.1. Method: Wire tying, approved steel clips or tack welding if permitted.
   7.2. Concrete cover: Maintain free of all tying wire or clips.

260 Casting and curing

1. Placing of concrete: Thoroughly compact.
2. Protection against drying out: Methods and duration to BS EN 13369.
3. Immature components: Avoid movement, vibration, overloading, physical shock, rapid cooling and thermal shock.
4. Delivery to site: Minimum 14 days after casting.

261 Cutting

1. Cutting of precast concrete components: Not permitted.

Fair-faced components - Not Used

Installation

420 Laying

6. Mortar for bedding and jointing: As section Z21.
   6.1. Type: To Eng spec
   6.2. Mix: To Eng spec
   6.3. Packing: If required use slate.
7. Bedding components: On full bed of mortar.
8. Removal of marks, stains and extraneous mortar on visible faces: Rubbing not permitted.

L Window/Doors/Stairs
L37 External stair, ramps, handrail, and balustrades systems

To be read with Preliminaries/General conditions.

General

110 Stair systems

1. Description: All external stairs as per drawings
2. Type: Built in situ
3. Base/ Fabric: In situ concrete, as section E10
4. Surface: Precast concrete slabs, as section Q25
5. Unobstructed width:
6. Accessories: 'Corduroy' hazard warning surface, as section Q24; Handrail system

120 Ramp systems

1. Description: Throughout site
2. Type: Built in situ
3. Base/ Fabric: as per Eng. specs
4. Gradients
   4.1. Going: as per drawings
5. Accessories: Handrail system if required

150 Handrail systems

1. Description: TO STAIRS AND RAMPS IF REQUIRED, as per drawings
2. System manufacturer: Larkin or similar and approved

System performance

210 Design

1. Description: OF STAIR AND RAMP SYSTEMS
2. Inclusive design: Complete detailed design in accordance with Building Regulations (Eng) Approved Document M, volume 2 and BS 8300-1; highlight discrepancies and outcomes
3. Structure and associated features: Complete detailed design to BS EN 1991-1-1
4. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

220 Design

1. Description: OF HANDRAIL SYSTEM
2. Inclusive design: Complete detailed design in accordance with Building Regulations (Eng) Approved Document M, volume 2
3. Structure and associated features: Complete the design to meet structural and safety requirements of BS 6180 and in accordance with BS 8300-2
4. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

Fabrication

510 Fabrication generally

1. Design: Complete the detailed design and obtain approval prior to commencing fabrication.
2. Shop drawings: Submit.
3. Structural calculations: Submit.
4. Frameworks: Assemble and brace, including temporary members required for installation.
5. Contact between dissimilar metals: Avoid.
6. Fixings: Fully bolt together. Tighten bolts.
7. Temporary support: Do not subject members to non-design loadings.

Execution

610 Loading

1. Site activities: Restrict, to ensure that design loads are not exceeded, or submit proposals for temporary supports.

620 Concrete foundations generally

1. Standard: To BS 8500-2.
2. Concrete: Designated not less than GEN 1 or standard prescribed not less than ST2.
3. Admixtures: Do not use.
4. Foundation holes: Neat vertical sides.
5. Depth of foundations, bedding, haunching: Appropriate to provide adequate support and to receive overlying soft landscape or paving finishes.

640 Concrete foundations generally

1. Surfaces exposed by minor cutting and drilling: Treated by immersion or with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.
2. Heavily worked sections: Re-treat.

650 Installation generally

1. Fasteners: To section Z20.
2. Structural members: Do not modify, cut, notch or make holes in structural members, except as indicated on drawings.
3. Temporary support: Do not use finished work as temporary support or strutting for other work.
4. Applied finishes: Substrates to be even, dry, sound and free from contaminants. Make good substrate surfaces and prepare/ prime as finish manufacturer's recommendation before application.

662 Adverse weather

1. General: Do not use frozen materials and do not lay on frozen surfaces.
2. Working limits: Do not lay blocks/ dressings:
    2.1. Cement gauged mortars: When the air temperature is at or below 3°C and falling or below 1°C and rising (unless mortar has a temperature of not less than 4°C when laid and work is thoroughly protected).

2.2. Hydraulic lime:sand mortars: When the air temperature is at or below 5°C and falling or below 3°C and rising.

3. Temperature of the work: Maintain above freezing until mortar has fully set.
4. Newly erected work: Protect from precipitation; Prevent rapid drying in hot conditions.
5. Remedial work: Rake out and replace mortar damaged by frost.
   5.1. Damaged work: Rebuild.

670 Installation of tread inserts/ nosings

1. Treads: Fully cured, sound and level.
2. Fixing
   2.1. Location/ position: In accordance with BS 8300-1
   2.2. Fixings: As manufacturer's recommendations

Q Paving/Planting/Fencing/Paving accessories

Q10 Kerbs/edgings/channels/paving accessories

Types of kerbs/edgings and channels

170 Linear slot drainage channel systems

1. Manufacturer: Submit proposals
    1.1. Product reference: Submit proposals

Roads/paving accessories/marking/demarcation

305 Tree grilles and surrounds

1. Manufacturer: Castit or similar
    1.1. Product reference: Square Starburst Tree Grille or Similar and Approved
2. Size: 1200×1200 mm, central hole of ø450 mm. Formed by 4 pieces, width 1200mm, length, 1200
3. Material: Cast iron
4. Colour: Black

Laying

510 Laying kerbs, edgings and channels

1. Cutting: Neat, accurate and without spalling. Form neat junctions.
    1.1. Long units (450 mm and over) minimum length after cutting: 300 mm.
    1.2. Short units minimum length after cutting: The lower of one third of their original length or 50 mm.
2. Bedding of units: Positioned true to line and levelled along top and front faces, in a mortar bed on accurately cast foundations or on a race of fresh concrete.
3. Securing of units: After bedding has set, secured with a continuous haunching of concrete or on a race of fresh concrete with backing concrete cast monolithically.

520 Adverse weather

1. Conditions: Do not construct if the temperature is below 3°C on a falling thermometer or 1°C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind.

530 Concrete for foundations, races and haunching

1. Standard: To BS 8500-2.
2. Designated mix: Not less than GEN0 or Standard mix ST1.
3. Workability: Very low.

540 Cement mortar bedding

1. General: To section Z21.
2. Mix (Portland cement:sand): 1:3.
    2.1. Portland cement: Class CEM I 42.5 to BS EN 197-1.
    2.2. Sand: to BS EN 12620, grade 0/4 or 0/2 (MP).
3. Bed thickness: 12-40 mm.

570 Channels

1. Installation: To an even gradient, without ponding or backfall.
2. Lowest points of channels: 6 mm above drainage outlets.

580 Drainage channel systems

1. Installation: To an even gradient, without ponding or backfall. Commence laying from outlets.
2. Silt and debris: Removed from entire system immediately before handover.
3. Washing and detritus: Safely disposed without discharging into sewers or watercourses.

590 Drainage channel systems with built in fall

1. Installation: Top of channels level, installed in correct sequence to form an even gradient without ponding or backfall. Commence laying from outlets.
2. Silt and debris: Removed from entire system immediately before handover.
3. Washings and detritus: Safely disposed without discharging into sewers or watercourses.

600 Radius kerbs/ channels

1. Usage: Radii of 15 m or less.

610 Angle kerbs

1. Usage: Internal and external 90° changes of direction.
2. Cutting of mitres: Not permitted.

620 Accuracy

1. Deviations (maximum)
    1.1. Level: ± 6 mm.
    1.2. Horizontal and vertical alignment: 3 mm in 3 m.

625 Regularity of paved surfaces

1. Maximum undulation of (non-tactile) paving surface: 3 mm.
    1.1. Method of measurement: Under a 1 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface).
2. Difference in level between adjacent units (maximum)
    2.1. Joints flush with the surface: Twice the joint width (with 5 mm max difference in level).
    2.2. Recessed, filled joints: 2 mm.
        2.2.1. Recess depth (maximum): 5 mm.
    2.3. Unfilled joints: 2 mm.
3. Sudden irregularities: Not permitted.

630 Narrow mortar joints

1. Jointing: Ends of units buttered with bedding mortar as laying proceeds. Joints completely filled, tightly butted and surplus mortar removed immediately.
    1.1. Joint width: 3 mm.

Q21 In situ concrete roads/ pavings/ bases

To be read with Preliminaries/General conditions.

Types of paving

115 Brushed Concrete

1. Description: Brushed Concrete in open spaces & Side house entrances. See drawings
2. Granular sub-base: Well compacted Clause 804 stone to falls/crossfalls required
   2.1. Compacted thickness: 250 mm
3. Separation membrane: Polyethylene sheet 125 micrometres thick, edges lapped 300 mm.
4. Embedded metal: R252 Reinforcing Mesh in centre of slab
5. Concrete: To BS 8500-2.
   5.1. Designation: Concrete as per Engineer's details and specifications
6. Slab thickness (minimum): 150 mm
7. Finish: Brushed with trowelled edges (50mm)

General/ preparation

140 Ready-mixed concrete

1. Production plant: Currently certified by a body accredited by UKAS to BS EN ISO/IEC 17065 for product conformity certification.
2. Source of ready-mixed concrete: Obtain from one source if possible. Otherwise, submit proposals.
   2.1. Name and address of depot: Submit before any concrete is delivered.
   2.2. Delivery notes: Retain for inspection.
3. Declarations of nonconformity from concrete producer: Notify immediately.

145 Admixtures

1. Calcium chloride and admixtures containing calcium chloride: Do not use.

155 Project testing of concrete - general

1. Testing: To BS EN 206-1, annex B and BS 8500-1, annex B.
2. Recording: Maintain complete correlated records including:
   2.1. Concrete designation.
   2.2. Sampling, site tests, and identification numbers of specimens tested in the laboratory.
   2.3. Location of the parts of the structure represented by each sample.
   2.4. Location in the structure of the batch from which each sample is taken.
3. Testing laboratory: Accredited by UKAS or other national equivalent.
4. Tests results
   4.1. Submission of reports: Within one day of completion of each test.
      4.1.1. Number of copies:
   4.2. Reports on site: A complete set, available for inspection.
5. Nonconformity:

240 Sub-base preparation

1. Surface: Sound, free of debris, mud and soft spots, and suitably close textured.
2. Levels and falls: Within specified tolerances:
   2.1. Vehicular areas: ±20 mm.
   2.2. Pedestrian areas: ±12 mm.

2.3. Drainage outlets: +0 to -10 mm of required finished level.

3. Kerbs and edgings: Complete, adequately bedded and haunched, and to required levels.

260 Steel formwork

1. Side forms: Steel, drilled for dowel bars, free from warping and kinks.
2. Fixing
   2.1. To required line, ±10 mm.
   2.2. To required level, ±3 mm.
3. Locking plates: Use where necessary to ensure rigidity and prevent movement during laying and compaction of concrete.
4. Removal of forms: Six hours (minimum) after completing compaction. Treat exposed edges with waterproof compound.

265 Timber permanent formwork

1. Side forms: Softwood board.
   1.1. Fixing: Galvanized nails to 50 x 50 x 450 mm long softwood pegs driven into the ground at 1200 mm centres.
2. Preservative treatment: As section Z12 and Wood Protection Association, Industrial wood Preservation Commodity Specification C4.
   2.1. Type: Contractor's choice

Laying concrete

310 Transporting concrete

1. General: Avoid contamination, segregation, loss of ingredients, excessive evaporation and loss of workability. Protect from heavy rain.
2. Entrained air: Anticipate effects of transport and placing methods in order to achieve specified air content.
3. Placing: Use suitable walkways and barrow runs for traffic over reinforcement and freshly placed concrete.

320 Laying concrete generally

1. Timing: Place as soon as practicable after mixing and while sufficiently plastic for full compaction. After discharge from the mixer do not add water or retemper.
2. Temperature of concrete at point of delivery
   2.1. In hot weather (maximum): 30°C.
   2.2. In cold weather (minimum): 5°C.
3. Cold weather
   3.1. Do not use frozen materials.
   3.2. Do not place concrete against frozen or frost covered surfaces.
   3.3. Do not place concrete when air temperature is below 3°C on a falling thermometer. Do not resume placing until rising air temperature has reached 3°C.
4. Surfaces on which concrete is to be placed: Free from debris and standing water.
5. Placing in final position: Place in one continuous operation up to construction joints.
   5.1. Do not place concrete simultaneously on both sides of movement joints.
6. Spreading: Spread and strike off with surcharge sufficient to obtain required compacted thickness.

7. Adjacent work: Form neat junctions and prevent damage. Keep clean all channels, kerbs, inspection covers, etc.

330 Compacting

1. General: Fully compact concrete to full depth (until air bubbles cease to appear on the surface) especially around reinforcement, cast-in accessories, into corners and at joints.
2. Poker vibrators: Do not use to make concrete flow into position. Do not allow to come into contact with fabric reinforcement.
3. Wet formed joint grooves: Rectify any irregularities by means of a vibrating float.
4. Finish: A dense, even textured surface free from laitance or excessive water.
   4.1. Excess concrete: Remove from top of groove formers.

340 Manhole cover and gully grating frames

1. General: Set frames in independent concrete slabs placed over, but slightly larger than, exterior of manhole shaft or gully pot and any concrete surround.
2. Positioning of joints in main slab: Set out so that manhole/ gully slabs are adjacent to a main transverse joint, wherever possible.
3. Joints: Separate the independent slabs from main slabs with 25 mm thick joint filler board. Set board 20 mm below top of slab to form a sealing groove.

350 Levels

1. Lines and levels of finished surface: Smooth and even, with regular falls to prevent ponding.
2. Finished surfaces: Within ±6 mm of required levels (+6 or -0 mm adjacent to gullies and manholes).

360 Surface regularity

1. General: Where appropriate in relation to the geometry of the surface, the variation in gap under a 3 m straightedge (with feet) placed anywhere on the surface to be not more than 5 mm.
2. Sudden irregularities: Not permitted.

Joints

410 Joints generally

1. Layout: All joints to be accurately located, straight and well aligned.
2. Construction joints made at end of working day: Form as contraction joints.
3. Modifications to joint design or location: Submit proposals.
4. Temporary support: Prior to concreting, set formwork, dowel bars, tie bars, joint filler boards, sealing groove fillets and the like rigidly in position and support to prevent displacement. Maintain support until concrete has set.
5. Keep clean
   5.1. Do not allow concrete to enter gaps or voids in formwork or to render movement joints ineffective.
   5.2. Do not allow concrete to impregnate or penetrate materials used as compressible joint fillers.

470 Expansion joints

1. Joint filler board
   1.1. Type: Two layers of bituminous delt for dull slab depth at 3m centres as per Engineer's details and specifications.

1.2. Standard: To Highway Agency 'Specification for Highway Works', clause 1015.

1.3. Thickness: 25 mm.

1.4. Depth: Joint filler board must extend from underside of sealing groove fillet to full depth of slab to provide complete separation of adjacent slabs.

1.5. Holes for dowel bars: Accurately bored or punched holes to form a sliding fit for dowel bars.

2. Completion: Round upper edges of slabs at joints to 5 mm radius. Do not overwork concrete.

Surface finish

530 Brushed finish

1. Direction: Generally at right angles to the longitudinal direction of the slab
2. Texture depth: Approximately 1 mm with finished surface having an overall even texture.

550 Power trowel finish

1. Preparation: Float concrete to an even surface with no ridges or steps, then immediately commence curing.
2. Surface finish: Uniform, smooth and free from trowel marks and other blemishes.
3. Completion: Resume specified curing without delay.

Curing/ protection/ finishing

660 Protection

1. Prevent damage to concrete

1.1. From rain, indentation, physical damage, dirt, staining, rust marks and other disfiguration.

1.2. From thermal shock.

1.3. In cold weather, from freezing expansion of water trapped in pockets, etc.

1.4. By use as a building platform or for storing, mixing or preparing materials.

670 Opening to traffic

3. Light vehicles: as per contractor's decision
4. Heavy vehicles: Paving not suitable for heavy vehicles

Q23 Gravel/ hoggin/ woodchip/ resin bound roads/ pavings/ overlays

To be read with Preliminaries/ General conditions.

Types of surfacing

110 Hard binding gravel

1. Description: Self-compacting gravel surface_Gravel Trim
2. Surface course: Angular gravel, free from clay, with sufficient grit to enable compaction.
   2.1. Type: Ballyslusk sourced
   2.2. Source: Ballyslusk
   2.3. Colour: Buff
   2.4. Size: dust to 10mm (max.)
   2.5. Compacted thickness: 50 mm
3. Completion: Compact to produce a firm, regular surface, stable in use.

230 Play bark mulch surfaces

1. Description: PS2 - Safety Surfacing - Playground Surface
2. Subgrade improvement layer: Submit proposals
3. Geotextile: Sheet
4. Surface course
   4.1. Manufacturer: Connaught Timber or similar
      4.1.1. Product reference: Playground Wood Chip or similar and approved
   4.2. Type: Softwood free from pests, disease, weeds, and any additives.
   4.3. Wood content (minimum): Wood fibre manufactured using 100% seasoned, recycled softwood fibres
   4.4. Thickness after at least 10% settlement and 30 days: 300mm

Laying

310 Timber edging

1. Softwood board
   1.1. Size: 175 x 38 mm.
   1.2. Fixing: Galvanized nails into softwood pegs.
2. Softwood pegs
   2.1. Size: 50 x 50 x 600 mm long
   2.2. Fixing: Drive into ground.
   2.3. Centres: 1200 mm

315 Materials

1. Compatibility: Chippings suitable for use with respective binders/ emulsions/ resin/ epoxy.

340 Laying generally

1. Channels, gullies, etc: Keep clear.
2. Finished surfaces
   2.1. Lines and levels: To prevent ponding.

2.2. Overall texture: Even.

2.3. State at completion: Clean.

350 Cold weather working

1. Frozen materials: Do not use.
2. Freezing conditions: Do not lay pavings.
3. Cold bituminous surface dressings: Do not apply when ambient temperature is below 10°C.
4. Other dressings or overlays: As manufacturers' recommendations.

360 Drainage falls

1. Sealed surfaces
   1.1. Falls and cross falls (minimum): 1:40.
   1.2. Camber (minimum): 1:50.
2. Unsealed surfaces (minimum): 1:30.

380 Laying granular surfaces in pedestrian areas and cycle tracks

1. Permissible deviation from required levels, falls and cambers (maximum): ±12 mm.
2. General: Spread and level in 100 mm maximum layers. As soon as possible, compact each layer.
3. Dry weather: Lightly water layers during compaction.

390 Protection from traffic and plant

1. Paved areas: Restrict access to prevent damage.

Q24 Interlocking brick/ block roads/ pavings

To be read with Preliminaries/ General conditions.

Types of paving

113_A UP1 Concrete block paving

1. Description: Public Spaces: Footpaths
2. Geotextile: Sheet
    2.1. Manufacturer: Contractor's choice, compliant to BS 8661.
        2.1.1. Product reference: Terram T1000
3. Laying course
    3.1. Material: In accordance with BS 7533-3.
4. Blocks: To BS EN 1338.
    4.1. Manufacturer: Kilsaran
        4.1.1. Product reference: Newgrange Block Paving
    4.2. Sizes: 3 size mix x 60mm D
    4.3. Special blocks: Edgings
    4.4. Arrises: Square Edge
    4.5. Colour/ Finish: Silver, Black detailing / Textured Granite
    4.6. Recycled content: as per manufacturer's product
5. Jointing
    5.1. Material: In accordance with BS 7533-3.
    5.2. Joint width: 2-5 mm.
6. Setting out
    6.1. Bond: Stretcher

113_B UP2 Concrete block paving

1. Description: Public Spaces: Seating Areas, Feature Spaces
2. Geotextile: Sheet
    2.1. Manufacturer: Contractor's choice, compliant to BS 8661.
        2.1.1. Product reference: Terram T1000
3. Laying course
    3.1. Material: In accordance with BS 7533-3.
4. Blocks: To BS EN 1338.
    4.1. Manufacturer: Kilsaran
        4.1.1. Product reference: Newgrange Block Paving
    4.2. Sizes: 3 size mix x 60mm D
    4.3. Special blocks: Edgings
    4.4. Arrises: Square Edge
    4.5. Colour/ Finish: Silver, Black detailing / Textured Granite
    4.6. Recycled content: as per manufacturer's product
5. Jointing
    5.1. Material: In accordance with BS 7533-3.
    5.2. Joint width: 2-5 mm.

6. Setting out
    6.1. Bond: Coursed Stretcher

115_A UP3 Permeable concrete block paving

1. Description: Car Parking Spaces - Off Curtilage
2. Laying course
    2.1. Compaction: In accordance with BS 7533-3. Determine by trial the depth of loose bedding material needed to ensure specified bedding course thickness after final compaction of paving.
    2.2. Nominal thickness after compaction: 50 mm
3. Blocks: To BS EN 1338.
    3.1. Manufacturer: Kilsaran
        3.1.1. Product reference: Climapave Slane
    3.2. Sizes: 200 x 100 x 80
    3.3. Special blocks: Edgings
    3.4. Arrises: Chamfered
    3.5. Colour/ Finish: Silver / Textured Granite
    3.6. Recycled content: as pr supplier's product standards and requirements
4. Jointing
    4.1. Material: Single size 5 mm washed aggregate
    4.2. Joint width: 6 mm
5. Setting out
    5.1. Bond: 45° herringbone

115_B UP4 Permeable concrete block paving

1. Description: Car Parking Spaces - On Curtilage
2. Laying course
    2.1. Compaction: In accordance with BS 7533-3. Determine by trial the depth of loose bedding material needed to ensure specified bedding course thickness after final compaction of paving.
    2.2. Nominal thickness after compaction: 50 mm
3. Blocks: To BS EN 1338.
    3.1. Manufacturer: Kilsaran
        3.1.1. Product reference: Climapave Newgrange
    3.2. Sizes: 3 size mix x 60mm D
    3.3. Special blocks: Edgings
    3.4. Arrises: Square Edge
    3.5. Colour/ Finish: Black / Textured Granite
    3.6. Recycled content: as pr supplier's product standards and requirements
4. Jointing
    4.1. Material: Single size 5 mm washed aggregate
    4.2. Joint width: 6 mm
5. Setting out
    5.1. Bond: Random Stretcher

Execution

200 Execution generally – concrete block and clay paver paving

1. Standard: In accordance with BS 7533-3.

220 Samples

1. General: Before ordering, submit samples of all blocks/ pavers/ setts that are representative of colour and appearance.

230 Control samples

1. General: Carry out sample area of finished work:
   1.1. Location: Site
   1.2. Size (minimum): 1.5 x 1.5 m
2. Give notice: When ready for inspection.
3. Timing: Obtain approval of appearance before proceeding.

240 Adverse weather

1. General: Do not use frozen materials or lay bedding on frozen or frost covered sub-bases.

250 Laying geotextile sheet for conventional paving

1. Location: Immediately below laying course.
2. Jointing: Lap by 300 mm
3. Laying: Fit neatly at edge restraints and other features that interrupt the sand laying course, e.g. drainage fittings, channels, manholes and kerbs.
   3.1. Edge detail: Turn sheet up to form an upstand against features.
      3.1.1. Height (minimum): Thickness of sand laying course

451 Laying geotextile sheet for permeable paving

1. Jointing: 300mm

485 Laying blocks/ pavers/ setts

1. Setting out: Start from an edge restraint.
2. Cutting: Cleanly, accurately and vertically, without spalling. Do not mark or damage visible surfaces.
3. Cut edges: Turn inwards where possible; do not position against edge restraints or other features.
4. In situ mortar or concrete infill: Do not use
5. Compaction: Vibrate to produce thoroughly interlocked paving of even overall appearance with regular joints and accurate to line, level and profile. Do not mark or damage paving units, kerbs and adjacent work.
   5.1. Concrete blocks and clay pavers: In accordance with BS 7533-3, Annex F, to site category required for laying course material.

490 Laying permeable paving

1. General: Do not fill joints with sand, except for a 300 mm strip along restraining edges and around features and the like, to hold cut blocks in place

500 Regularity of paved surfaces

1. Maximum variation in gap under a 3 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface)
   1.1. Precast concrete paving blocks and clay pavers for flexible pavements: 10 mm.
2. Difference in level between adjacent paving units (maximum): 2 mm.
3. Sudden irregularities: Not permitted.

505 Regularity of paved surfaces

1. Maximum undulations in the surface of pavings (except tactile paving surfaces) under a 1 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface): 3 mm.
2. Joints between paving units or utility access covers
   2.1. Joints flush with the surface: difference in level between adjacent units to be no more than twice the joint width (with a 5 mm max difference in level).
   2.2. Recessed, filled joints: difference in level between adjacent units to be no greater than 2 mm; the recess to be no deeper than 5 mm.
   2.3. Unfilled joints: difference in level between adjacent units to be no greater than 2 mm.
3. Sudden irregularities: Not permitted.

Completion

600 Sealer/ Stabilizer for new blocks and setts

1. Surface preparation: Random Stretcher
2. Sealer/ Stabilizer
   2.1. Manufacturer: Submit proposals
      2.1.1. Product reference: Submit proposals

615 Completion of paving

1. Final compaction of the surface course: In accordance with BS 7533-3.
2. Vacuum cleaning machines: Not allowed.

620 Slip resistance testing

4. Surfaces to be tested: All proposed surfaces
   4.1. Surface condition: Dry and wet
5. Timing: As agreed with contract administrator
6. Period of notice (minimum): 3 working days.

Q25 Slab/ brick/ sett/ cobble pavings

To be read with Preliminaries/ General conditions.

General

120_A UP5 Concrete flag paving system

1. Description: Entrance to houses / gardens / driveways
2. Subgrade improvement layer: to Eng. Specs
3. Granular sub-base: to Eng. Specs
4. Base: to Eng. Specs
5. Laying course: to Eng. Specs
6. Paving units: Concrete flags
7. Flags:: To BS EN 1339.
    7.1. Manufacturer:: Kilsaran
        7.1.1.Product reference:: Newgrange
        7.1.2.Sizes:: 600 x 400 x 50mm
        7.1.3.Colour/Finish:: Silver Granite

120_B UP6 Concrete flag paving system

1. Description: Private patios / GL terraces
2. Subgrade improvement layer: to Eng. Specs
3. Granular sub-base: to Eng. Specs
4. Base: to Eng. Specs
5. Laying course: to Eng. Specs
6. Paving units: Concrete flags
7. Flags:: To BS EN 1339.
    7.1. Manufacturer:: Kilsaran
        7.1.1.Product reference:: Newgrange
        7.1.2.Sizes:: 600 x 400 x 50mm / 400 x 400 x 50mm
        7.1.3.Colour/Finish:: Buff Granite

120_C Tactile Paving

1. Description: Tactile Paving (See drawing)
2. Subgrade improvement layer: to Eng. Specs
3. Granular sub-base: to Eng. Specs
4. Base: to Eng. Specs
5. Laying course: to Eng. Specs
6. Paving units: Tactile concrete flags
7. Flags:: To BS EN 1339.
    7.1. Manufacturer:: Kilsaran
        7.1.1.Product reference:: Corduroy
        7.1.2.Sizes:: 400x400x50mm
        7.1.3.Colour/Finish:: Buff Blister pattern

180 RG1 Plastics grass reinforcing paving system

1. Description: Fire / maintenance routes
2. Subgrade improvement layer: to Eng's Specifications
3. Geomembrane: to Eng's Specifications
4. Granular sub-base: to Eng's Specifications
5. Water collection: to Eng's Specifications
6. Laying course: Sand/ fine aggregate
7. Paving units: Plastics pavers (Ritter; Prograss - 500 x 390 x 45 mm)
   7.1. Bond: In accordance with manufacturer's recommendations
   7.2. Filling: Submit proposals

System performance

220 Design – concrete flag paving system

1. Design: Complete the design of the concrete slab paving system in accordance with BS 7533-4.
2. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

280 Design - plastics grass reinforcing paving system

1. Design: Complete the design of the plastics grass reinforcing paving system in accordance with manufacturer's instructions.
2. Proposals: Submit drawings, technical information, calculations and manufacturers' literature.

Products

305 Granular material for layer over existing bases

1. Material: to Eng. Specs

Execution

610 Material samples

1. Samples representative of colour and appearance of designated materials: Submit before placing orders.
   1.1. Designated materials: All pavings

615 Control samples

1. Sample areas: Complete as part of the finished work.
   1.1. Types of paving: Concrete slab paving
   1.2. Location: on site
   1.3. Size (minimum): 1.5 x 1.5 m
2. Approval of appearance and surface: Obtain before proceeding.

620 Adverse weather

1. General
   1.1. Temperature: Do not lay or joint paving if the temperature is below 3°C on a falling thermometer or below 1°C on a rising thermometer.

1.2. Frozen materials: Do not use. Do not lay bedding on frozen or frost covered bases.

2. Paving with mortar joints and/ or bedding
   2.1. Protect from frost damage, rapid drying out and saturation until mortar has hardened.
3. Paving laid and jointed in sand/ fine aggregate
   3.1. Stockpiled laying course sand/ fine aggregate: Protect from saturation.
   3.2. Exposed areas of unbound laying course and uncompacted areas of unbound paving: Protect from heavy rainfall.
   3.3. Saturated unbound laying course: Remove and replace, or allow to dry before proceeding.
   3.4. Laying dry sand/ fine aggregate jointed paving in damp conditions: Brush in as much jointing sand as possible. Minimize site traffic over paving. As soon as paving is dry, top up joints and complete compaction.

625 Laying pavings – general

1. Appearance: Smooth and even with regular joints and accurate to line, level and profile.
2. Falls: To prevent ponding.
3. Bedding of paving units: Firm so that rocking or subsidence does not occur or develop.
   3.1. Bedding/ Laying course: Consistently and accurately graded, spread and compacted to produce uniform thickness and support for paving units.
4. Slopes: Lay paving units upwards from the bottom of slopes.
5. Paving units: Free of mortar and sand stains.
6. Cutting: Cut units cleanly and accurately, without spalling, to give neat junctions with edgings and adjoining finishes.

630 Levels of paving

1. Permissible deviation from specified levels
   1.1. Generally: ± 6 mm.
2. Height of finished paving above features
   2.1. At gullies: +6 to +10 mm.

635 Regularity of paved surfaces

1. Maximum variation in gap under a 3 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface)
   1.1. Precast concrete paving blocks and clay pavers for flexible pavements: 10 mm.
   1.2. Precast concrete flags or natural stone slabs: 3 mm.
2. Difference in level between adjacent paving units (maximum): 2 mm.
3. Sudden irregularities: Not permitted.

637 Regularity of paved surfaces

1. Maximum undulations in the surface of pavings (except tactile paving surfaces) under a 1 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface): 3 mm.
2. Joints between paving units or utility access covers
   2.1. Joints flush with the surface: difference in level between adjacent units to be no more than twice the joint width (with a 5 mm max difference in level).

2.2. Recessed, filled joints: difference in level between adjacent units to be no greater than 2 mm; the recess to be no deeper than 5 mm.

2.3. Unfilled joints: difference in level between adjacent units to be no greater than 2 mm.

3. Sudden irregularities: Not permitted.

645 Protection

1. Cleanliness: Keep paving clean and free from mortar droppings, oil and other materials likely to cause staining.
2. Materials storage: Do not overload pavings with stacks of materials.
3. Handling: Do not damage paving unit corners, arrises, or previously laid paving.
4. Mortar bedded pavings: Keep free from traffic after laying:
   4.1. Pedestrian traffic (minimum): 4 days
   4.2. Vehicular traffic (minimum): 10 days
5. Access: Restrict access to paved areas to prevent damage from site traffic and plant.

650 Cementitious bases and sub-bases

5. General: Protect from moisture loss, if not covered by another pavement course within 2 hours of completion.

655 Condition of sub-bases/ bases before spreading laying course

1. Trenches and excavation of soft or loose spots in subgrade: Fill and thoroughly compact.
2. Granular surfaces: Lay and compact so as to be sound, clean, smooth and close-textured enough to prevent migration of bedding/ laying course materials into the sub-base during compaction and use, free from movement under compaction plant and free from compaction ridges, cracks and loose material.
3. Prepared existing and new bound bases (roadbases): Sound, clean, free from rutting or major cracking. Remove sharp stones, projections and debris.
4. Sub-base/ Roadbase level tolerances: To BS 7533-7, Annex A.
5. Levels and falls: Accurate and within the specified tolerances.
6. Drainage outlets: Within 0-10 mm of the required finished level.
7. Features in unbound paving (including mortar bedded restraints and drainage ironwork): Complete to required levels; adequately bed and haunch in mortar.
8. Sub-bases containing cement/ hydraulic binder: Cure for minimum times specified in BS 7533-4.

675 Laying geotextile sheet edging strips

1. Location: Immediately below the laying course, abutting features which interrupt the laying course, including:
   1.1. Perimeters/ Edge restraints/ Kerbs.
   1.2. Other types of paving.
   1.3. Drainage fittings, e.g. channels and manholes.
2. Edge detail: Turn sheet up to a height not less than thickness of the laying course to form an upstand fitted neatly against features.
3. Width: 4.5m
4. Jointing: Lap by 300 mm.

715 Laying flag and slab paving – mortar laying course and jointing

1. Standard generally: In accordance with BS 7533-4.
2. Flag installation and cutting: To Interpave 'Concrete flag paving'.
3. Laying course
    3.1. Nominal thickness: 25 mm after compaction

Completion

920 Completion of grassed pavings

1. Protection: Protect from traffic for 6-8 weeks or until grass can tolerate traffic.

930 Slip resistance testing

5. Surfaces to be tested: All proposed surface treatments
    5.1. Surface condition: Dry and wet
6. Timing: Two weeks prior to handover, but after initial cleaning
7. Period of notice (minimum): 3 working days.
8. Test standard: To BS 7976-2
    8.1. Testing authority: An approved laboratory
    8.2. Report: Submit.
        8.2.1.Format: As required under BS 7976

Q28 Topsoil and soil ameliorants

To be read with Preliminaries/ General conditions.

System outline - Not Used

Products

300 Preparation materials generally

1. Purity: Free of pests and disease.
2. Foreign matter: On visual inspection, free of fragments and roots of aggressive weeds, sticks, straw, subsoil, pieces of brick, concrete, glass, wire, large lumps of clay or vegetation, and the like.
3. Contamination: Do not use topsoil contaminated with subsoil, rubbish or other materials that are:
   3.1. Corrosive, explosive or flammable.
   3.2. Hazardous to human or animal life.
   3.3. Detrimental to healthy plant growth.
4. Subsoil: In areas to receive topsoil or planting media, do not use subsoil contaminated with the above materials.
5. Objectionable odour: None.
6. Give notice: If any evidence or symptoms of soil contamination are discovered on the site or in topsoil or planting media to be imported.

310 Materials not permitted

1. Materials: Products containing peat
   River and canal dredgings

315 Imported topsoil to BS 3882 (SITE WIDE)

1. Quantity: Provide as necessary to make up any deficiency of topsoil existing on site and to complete the work.
2. Standard: To BS 3882.
3. Classification: Multipurpose
   3.1. Soil textural class to BS 3882, Figure 1: Any class
4. Source: Enrich Environment Limited
   4.1. Product reference: Screened topsoil with 10% compost blend

355 Organic materials

1. Type: Bark
2. Source: Contractor's choice
   2.1. Product reference: Contractor's choice

Execution

620 Importing topsoil

1. Give notice: Before stripping topsoil for transfer to site.
   1.1. Notice period: 7 days

625 Sample loads

1. Deliver to site a sample load: of not less than 5 m³

2. Give notice: Allow inspection before making further deliveries to site. Retain for comparison with subsequent loads.
    2.1. Notice period: 5 days

630 Documentation for imported topsoil

1. Timing: Submit at handover.
2. Contents
    2.1. Full description of all soil components.
    2.2. Record of source for all soil components.
    2.3. Record drawings showing the location and depth of all soils by type and grade.
    2.4. Declaration of analysis: in accordance with BS 3882, clause 6 and Table 1.
3. Number of copies: Two

635 Documentation for compost and composted materials

1. Timing: Submit at handover.
2. Contents
    2.1. Full description of all compost components.
    2.2. Record of source for all compost components.
    2.3. Analyst's report for each test carried out.
    2.4. Declaration of compliance: in accordance with PAS 100 and BSI PD CR 13456.
    2.5. Quality Compost Protocol certification: Required
3. Number of copies: Two

650 Notice

1. Give notice before
    1.1. Setting out.
    1.2. Spreading topsoil.
    1.3. Applying herbicide.
    1.4. Applying fertilizer.
    1.5. Visiting site during maintenance period.
2. Period of notice: 3 working days

655 Mechanical tools

1. Restrictions: Do not use within 100 mm of tree and plant stems. Do not damage adjacent planting.

660 Grading subsoil for:

1. Standard: In accordance with BS 8601.
2. General: Grade to smooth flowing contours to achieve specified finished levels of topsoil.
3. Areas of thicker topsoil: Excavate locally.
4. Avoid compaction.
5. Excess subsoil: Remove.

670 Inspecting formations

1. Give notice: Before spreading topsoil for site wide.
2. Notice period: 1 week

680 Surplus topsoil to be retained

1. Generally: Spread and level on site:
   1.1. Locations: TBC
   1.2. Protected areas: Do not raise soil level within root spread of trees that are to be retained.

685 Surplus materials to be removed

1. Topsoil removal from site: Topsoil remaining after completion of all landscaping work
2. Subsoil, stones, debris, wrapping material, canes, ties, temporary labelling, rubbish, prunings and other arisings: Remove.

690 Topsoil storage heaps

1. Location: Submit proposals
2. Height (maximum): 1.5 m
3. Width (maximum): 3.0 m
   3.1. Formation: Loose tip and shape from the side only, without running machinery on the heap at any time.
4. Protection
   4.1. Do not place any other material on top of storage heaps.
   4.2. Do not allow construction plant to pass over storage heaps.
   4.3. Prevent compaction and contamination, by fencing and covering as appropriate.

700 Grading of topsoil

1. Topsoil condition: Reasonably dry and workable.
2. Contours: Smooth and flowing, with falls for adequate drainage.
   2.1. Hollows and ridges: Not permitted.
3. Give notice: If required levels cannot be achieved by movement of existing soil.

705 Handling topsoil

1. Standard: In accordance with BS 3882.
2. Aggressive weeds: Give notice and obtain instructions before moving topsoil.
3. Plant: Select and use plant to minimize disturbance, trafficking and compaction.
4. Contamination: Do not mix topsoil with:
   4.1. Subsoil, stone, hardcore, rubbish or material from demolition work.
   4.2. Other grades of topsoil.
5. Multiple handling: Keep to a minimum. Use or stockpile topsoil immediately after stripping.
6. Wet conditions: Handle topsoil in the driest condition possible. Do not handle during or after heavy rainfall, or when the moisture content is greater than the plastic limit.

710 Spreading topsoil on:

1. Standard: In accordance with BS 3882.
2. Temporary roads/ surfacing: Remove before spreading topsoil.
3. Layers
   3.1. Depth (maximum): 150 mm.
   3.2. Gently firm each layer before spreading the next.
4. Depth after firming and settlement: 450 mm

5. Crumb structure: Do not compact topsoil. Preserve a friable texture of separate visible crumbs wherever possible.

710_A Spreading topsoil on tree pits Type A

1. Standard: In accordance with BS 3882.
2. Temporary roads/ surfacing: Remove before spreading topsoil.
3. Layers
   3.1. Depth (maximum): 150 mm.
   3.2. Gently firm each layer before spreading the next.
4. Depth after firming and settlement: 1000 mm
5. Crumb structure: Do not compact topsoil. Preserve a friable texture of separate visible crumbs wherever possible.

715 Loose tipping of topsoil

1. Standard: In accordance with BS 3882.
2. General: Do not firm, consolidate, or compact topsoil when laying. Tip and grade to approximate levels in one operation with minimum of trafficking by plant.

720 Finished levels of topsoil after settlement

1. In relation to adjoining paving, kerbs or hard surfaces: 75 mm below
2. In relation to dpc of adjoining buildings: Not less than 150 mm below.
3. In relation to adjacent grass areas: 50 mm above
4. Seeded areas: Extend cultivation into existing adjacent grassed areas sufficient to ensure full marrying in of levels.
5. Sportsfields: To even levels and within the following permitted deviations:
   5.1. From levels or gradients shown on drawings: ±75 mm.
   5.2. From line between boning rods 30 m apart: ±25 mm.
6. Within root spread of existing trees and shrubs to be retained: Do not dig or cultivate.
7. Adjoining soil areas: Marry in.
8. Thickness of turf or mulch: Included.

810 Applying compost

1. Description: 10% Compost to be applied together with topsoil. 1m3 of topsoil conditioner will service an area of 20 m2 when spread to a depth of 50mm

820 Applying general fertilizer

1. Application: Spread evenly, carefully incorporating below mulch materials.
   1.1. Timing: Immediately before cultivation.
   1.2. Application rate: 10 g/m²

845 Applying loose mulch on planting beds and trees pits

1. Timing: Immediately after planting
2. Preparation: clear all weeds and soil as per proposed levels
3. Coverage of mulch (minimum)
   3.1. Planting beds (depth): 50 mm depth
   3.2. Trees: In a circular area of 500 mm radius measured from the tree stem
   3.3. Container planting: 50 mm depth

4. Finished level of mulch: 30 mm below adjacent grassed or paved areas

Completion

920 Applying mulch

3. Timing: At end of the maintenance period
4. Watering: Ensure that soil is thoroughly moistened prior to mulching, applying water where necessary.
5. Planting beds: Re-mulch.
   5.1. Depth (minimum): 50 mm
6. Trees: Remulch.
   6.1. Depth (minimum): 75 mm
7. Container planting: Remulch.
   7.1. Depth (minimum): 50 mm
   7.2. 50 mm

Q30 Seeding/ turfing

To be read with Preliminaries/ General conditions.

General information/requirements

115 Seeded and turfed areas

1. Growth and development: Healthy, vigorous grass sward, free from the visible effects of pests, weeds and disease.
2. Appearance: A closely knit, continuous ground cover of even density, height and colour.

120 Climatic conditions

1. General: Carry out the work while soil and weather conditions are suitable.

145 Watering

1. Quantity: Wet full depth of topsoil.
2. Application: Even and without displacing seed, seedlings or soil.
3. Frequency: As necessary to ensure the establishment and continued thriving of all seeding/turfing.

146 Watering

1. Quantity: Wet full depth of topsoil.
2. Application: Even and without displacing seed, seedlings or soil.
3. Frequency: a detailed programme if works will be agreed with Contractor prior to maintenance

150 Water restrictions

1. Timing: If water supply is or is likely to be restricted by emergency legislation do not carry out seeding/turfing until instructed. If seeding/turfing has been carried out, obtain instructions on watering.

160 Notice

1. Give notice before
    1.1. Setting out.
    1.2. Applying herbicide.
    1.3. Applying fertilizer.
    1.4. Preparing seed bed.
    1.5. Seeding or turfing.
    1.6. Visiting site during maintenance period.
2. Period of notice: 3 working days

170 Setting out

1. Boundaries: Mark clearly.
2. Delineation: In straight lines or smoothly flowing curves as shown on drawings.

Preparation

210 Herbicide

1. Type: Suitable for suppressing perennial weeds.
2. Timing: Allow fallow period before cultivation.

2.1. Duration: As manufacturer's recommendation

212 Seed bed cleaning before sowing

1. Operations: As seed supplier's recommendations.

Seeding

310 Grass seed at public open space

1. Mixture: 35% Chewings fescue, 35% Slender red fescue, 20% Smooth stalked meadow grass, 10% Brown top bent
2. Application rate: Supplier's recommendations

312 Wildflower seed mixture

1. Supplier: Submit proposals
   1.1. Mixture reference: Submit proposals
2. Origin of each species (as defined in Flora Locale's Code of practice for collectors, growers and suppliers of native flora): Local origin
3. Application rate: Supplier's recommendations

319 Quality of seed

1. Freshness: Produced for the current growing season.
2. Certification: Blue label certified varieties.
   2.1. Standard: EC purity and germination regulations.
   2.2. Official Seed Testing Station certificate of germination, purity and composition: Submit when requested.
3. Samples of mixtures: Submit when requested.

320 Quality of seed

1. Freshness: Produced for the current growing season.
2. Certification: Blue label certified varieties.
   2.1. Standard: EC purity and germination regulations and Department for Environment, Food and Rural Affairs Higher Voluntary Standard.
   2.2. Official Seed Testing Station certificate of germination, purity and composition: Submit when requested.
3. Samples of mixtures: Submit when requested.

322 Quality of wildflower seed

1. Standard: In accordance with Flora Locale's 'Code of practice for collectors, growers and suppliers of native flora'.
2. Samples: Submit when requested.

352 Edges to seeded areas

1. Timing: After seeded areas are well established.
2. Edges: Clean straight lines or smooth curves.
   2.1. Mulch and soil: Draw back to permit edging.
3. Arisings: Remove.

4. Completion: Respread soil and mulch.

Turfing - Not Used

Protecting/cutting

590 Cleanliness

1. Soil and arisings: Remove from hard surfaces.
2. General: Leave the works in a clean, tidy condition at Completion and after any maintenance operations.

Maintenance

610 Failures of seeding/ turfing

1. Duration: Carry out the following operations from completion of seeding/ turfing until: the end of the rectification period.
2. Defective materials or workmanship: Areas that have failed to thrive.
   2.1. Exclusions: Theft or malicious damage.
3. Method of making good: Recultivation and reseeding/ returfing.
4. Timing of making good: The next suitable planting season

Q31 External planting

To be read with Preliminaries/ General conditions.

General information/ requirements

112 Site clearance generally

1. General: Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil.
2. Contamination: Remove material containing toxins, pathogens or other extraneous substances harmful to plant, animal or human life.
3. Vegetation: Clear scrub to ground level by flail mowing and remove arisings; retain and protect trees indicated on drawings
4. Large roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.

118 Soil conditions

1. Soil for cultivating and planting: Moist, friable and (except in aquatic/ marginal planting) not waterlogged.
2. Frozen or snow covered soil: Give notice before planting. Provide additional root protection. Prevent planting pit sides and bases and backfill materials from freezing.

120 Climatic conditions

1. General: Carry out the work while soil and weather conditions are suitable.
   1.1. Strong winds: Do not plant.

125 Times of year for planting

1. Deciduous trees and shrubs: Late October to late March.
2. Conifers and evergreens: September/ October or April/ May.
3. Herbaceous plants (including marginal): September/ October or March/ April.
4. Container grown plants: At any time if ground and weather conditions are favourable.
   4.1. Watering and weed control: Provide as necessary.
5. Dried bulbs, corms and tubers: September/ October.
6. Colchicum (crocus): July/ August.
7. Green bulbs: After flowering in spring.
8. Wildflower plugs: Late August to mid November or March/ April.
9. Aquatic plants: May/ June or September/ October.

130 Mechanical tools

1. Restrictions: Do not use within 100 mm of tree and plant stems.

145 Watering

1. Quantity: Wet full depth of topsoil.
2. Application: Even and without damaging or displacing plants or soil.
3. Frequency: As necessary to ensure establishment and continued thriving of planting.

146 Watering

1. Quantity: Wet full depth of topsoil.
2. Application: Even and without damaging or displacing plants or soil.
3. Frequency: As maintenance schedule

150 Water restrictions

1. General: If water supply is or is likely to be restricted by emergency legislation, do not carry out planting until instructed. If planting has been carried out, obtain instructions on watering.

160 Notice

1. Give notice before
    1.1. Setting out.
    1.2. Applying herbicide.
    1.3. Applying fertilizer.
    1.4. Delivery of plants/ trees.
    1.5. Planting shrubs.
    1.6. Planting trees into previously dug pits.
    1.7. Watering.
    1.8. Visiting site during maintenance period.
2. Period of notice: Three working days

170 Soil requirements

1. Type
    1.1. Planted beds: Planting bed soil system, as section Q28
    1.2. Tree pits, shrub pits and other backfilling: Plant pit backfilling soil system, as section Q28
    1.3. Mulch applied after planting: Mulching and top dressing system, as section Q28

200 Plants/ Trees – general

1. Condition: Materially undamaged, sturdy, healthy and vigorous.
2. Appearance: Of good shape and without elongated shoots.
3. Hardiness: Grown in a suitable environment and hardened off.
4. Health: Free from pests, diseases, discoloration, weeds and physiological disorders.
5. Budded or grafted plants: Bottom worked.
6. Root system and condition: Balanced with branch system.
    6.1. Standard: The relevant parts of BS 3936
7. Species: True to name.
8. Origin/ Provenance: As plant schedule
9. Definition: Origin and Provenance have the meaning given in the National Plant Specification.

215 Plants/ Trees – specification criteria

1. Name, forms, dimensions, provenance and other criteria: As scheduled and defined in the National Plant Specification (available on CS Design Software Limited's website).

216 Plants/ Trees – specification criteria

1. Name, forms, dimensions and other criteria: To the relevant part of BS 3936.

225 Bulbs/ Corms/ Tubers

1. Condition: Firm, entire, not dried out or shrivelled.
2. Health: Free from pests, diseases and fungus.
3. Handling: Remove from packaging immediately.
4. Storage: Permitted only when necessary.
   4.1. Location: Well ventilated, dark, covered, rodent proof container, away from exhausts and fruit.
   4.2. Duration: Minimum period.
   4.3. Temperature: 18-21°C.

235 Container grown plants/ Trees

1. Growing medium: With adequate nutrients for plants to thrive until permanently planted.
2. Plants: Centred in containers, firmed and well watered.
3. Root growth: Substantially filling containers, but not root bound, and in a condition conducive to successful transplanting.
4. Hardiness: Grown in the open for at least two months before being supplied.
5. Containers: With holes adequate for drainage when placed on any substrate commonly used under irrigation systems.

245 Labelling and information

6. General: Provide each plant/ tree or group of plants/ trees of a single species or cultivar with supplier's labelling for delivery to site, showing:
   6.1. Full botanical name.
   6.2. Total number.
   6.3. Number of bundles.
   6.4. Part bundles.
   6.5. Supplier's name.
   6.6. Employer's name and project reference.
   6.7. Plant specification, in accordance with scheduled National Plant Specification categories.
   6.8. categories.

246 Labelling and information

1. Standard: To BS 3936.

255 Plants/ Trees reserved at supplier's premises

1. Types/ Species: As plant schedule
2. Predelivery inspection: Give notice.
3. Labelling: Identify inspected plants/ trees as reserved for use on this project.

260 Plant/ Tree substitution

1. Plants/ trees unobtainable or known to be likely to be unobtainable at time of ordering: Submit alternatives, stating:
   1.1. Price.

1.2. Difference from specified plants/ trees.

2. Approval: Obtain before making any substitution.

265 Plant handling, storage transport and planting

1. Standard: To CPSE 'Handling and establishing landscape plants'.
2. Frost: Protect plants from frost.
3. Handling: Handle plants with care. Protect from mechanical damage and do not subject to shock, e.g. by dropping from a vehicle.
4. Plant packaging: as per nursery's specifications
5. Planting: Upright or well balanced with best side to front.

280 Treatment of tree wounds

1. Cutting: Keep wounds as small as possible.
   1.1. Cut cleanly back to sound wood using sharp, clean tools.
   1.2. Leave branch collars. Do not cut flush with stem or trunk.
   1.3. Set cuts so that water will not collect on cut area.
2. Fungicide/ Sealant: Do not apply unless instructed.

285 Protection of existing grass

1. General: Protect areas affected by planting operations using boards/ tarpaulins.
   1.1. Excavated or imported material: Do not place directly on grass.
   1.2. Duration: Minimum period.

290 Surplus material

1. Subsoil, stones, debris, wrapping material, canes, ties, temporary labelling, rubbish, prunings and other arisings: Remove.

Preparation of planting beds/ planting materials

305 Weed control

1. Locations: All planting areas
2. General: Prevent weeds from seeding and perennial weeds from becoming established, in accordance with the Environment Agency 'Managing Japanese knotweed on development sites. The knotwood code of practice'.

Planting shrubs/ herbaceous plants/ bulbs

401 Regular plant layouts to shrub, ornamental grasses and perennial planting

1. Spacing: to be determined at later stage (Specifications to be provided by Landscape Architect
2. Density: As plant schedule

405 Shrub planting pits

1. Timing: Excavate 1-2 days (maximum) before planting.
2. Sizes: Wide enough to accommodate roots when fully spread and 75 mm deeper than root system
3. Pit bottom improvement Break up to a depth of 150 mm, incorporating soil ameliorant/ conditioner at 50 g/m².

420 Climbing plants

1. Planting: 150 mm clear of supporting structure (e.g. wall/ fence) with roots spread outward.
   1.1. Branches: Lightly secured to supports.
2. Climber supports: Metal climbing structure along bin stores facades Stainless steel wire trellis; Supplier: Jakob Rope Systems or similar approved

435 Climbing plants used as ground cover

1. Planting
   1.1. Canes or other supports: Remove.
   1.2. Arrangement: Spread stems.
2. Fixing: Pinned to ground to ensure good contact.

445 Planting bulbs/ Corms/ Tubers

2. Depth: Top of bulb/ corm/ tuber at a depth of approximately twice its height, base in contact with bottom of hole.
3. Backfilling: Finely broken soil. Lightly firm to existing ground level.
4. Naturalized planting in existing grassed areas
   4.1. Scattering: Random. Plant bulbs/ corms/ tubers where they fall.
   4.2. Planting: Neatly remove a plug of turf and replace after planting.
   4.3. .

470 Formal hedges

1. Shrubs for hedges: Consistent in species, cultivar and clone to ensure a uniform hedge.
2. Planting: In trenches large enough to take full spread of roots. Set out plants evenly.

471 Naturalized hedges

1. Planting: In trenches large enough to take full spread of roots. Set out plants evenly.

472 Fencing support for new hedges

1. Type: Timber post and general pattern wire mesh, as section Q40
2. Timing: Before planting hedge.
3. Support: Lightly secure hedge plants to fence wires at appropriate intervals.

480 After planting

1. Watering: Immediately after planting, thoroughly and without damaging or displacing plants or soil.
2. Firming: Lightly firm soil around plants and fork and/ or rake soil, without damaging roots, to a fine tilth with gentle cambers and no hollows.
3. Top dressing: Mulching and top dressing system, as section Q28
   3.1. Depth: 50 mm

Planting trees

500 Tree planting

1. Standard: Prepare trees and transplant in accordance with BS 4428

505 Tree pits

1. Sizes: as drawings and details
2. Sloping ground: Maintain horizontal bases and vertical sides with no less than minimum depth throughout.
3. Excavated material: Remove arisings
4. Pit bottoms: Excavate with slightly raised centre: Break up base to a depth of 150 mm.
5. Pit sides: Scarify.
6. Backfilling material: Mulching and top-dressing system, as per Q28 Topsoil and soil ameliorants

510 Tree pit root barriers

1. Locations: As drawing details
2. Manufacturer: Greenleaf
   2.1. Product reference: ReRoot200/RootStop, Ref.: RER220x1.5Ax1500mm
3. Thickness: 2.0 mm
4. Barrier depth: 1500 mm
5. Top of root barrier in relation to finished topsoil level: 50 mm below ground level
6. Installation: With sides vertical. Remove all sharp objects adjacent to barrier.

526 Underground guying for:

1. Description: Multistem tree - Rootballed Trees
2. Manufacturer: Contractor's choice
   2.1. Product reference: Contractor's choice
3. Anchoring system: Contractor's choice
4. Installation: Ensure tree is positioned correctly and vertically prior to tightening guy line tensioners.

535 Tree stakes

1. Stakes: Softwood, peeled chestnut, larch or oak, straight, free from projections and large or edge knots and with pointed lower end.
   1.1. Preservative treatment: Not required
2. Stake size (minimum): 75 mm diameter
3. Stake length (minimum): 1800 mm

550 Double staking for rootballed trees (standard)

1. Staking
   1.1. Position: Either side of tree position and perpendicular to wind direction.
   1.2. Driving: Vertically at least 300 mm into bottom of pit before planting.
   1.3. Backfilling: Consolidate material around stake.
   1.4. Firming: Sufficiently firm to prevent movement of the rootball/ rootstock.
2. Height of stakes: Cut off to approximately 600 mm above ground level
3. Horizontal bracing: Crossbar
4. Ties: Adjustable
5. Nails for fixing ties, belts and webbing: To BS 1202-1, galvanized, minimum 25 mm long and with 10 mm diameter heads.

576 Tree pit surfacing – loose fill

1. Surfacing material: as per Q28 Topsoil and soil ameliorants
2. Area: 600 mm radius circle
3. Depth: 75 mm
4. Watering: Water soil thoroughly before laying.
5. Installation: Ensure the base of the tree stem is kept free from loose filled material.

Woodland/ matrix/ buffer zone planting

600 Woodland work generally

1. Services: Check for below and above ground services, including land drainage, in the vicinity. Give notice if they may be affected and obtain instructions before proceeding.
2. Safety: Comply with Arboriculture and Forestry Advisory Group Safety leaflets.

615 Woodland work generally

1. Existing trees and seedlings: Retain.
2. Coppice shoots: Thin to 3-5 stems per stool, removing all damaged, dead or diseased shoots

617 Removing trees and hedges

1. Identification: Clearly mark trees and hedges to be removed.
2. Work near retained trees: Where canopies overlap, take down trees carefully in small sections to avoid damage to adjacent trees that are to be retained.
3. Arisings: Remove.
4. Tree stumps: Remove mechanically to a minimum depth of 300 mm below ground level

635 Notch planting in uncultivated ground

1. Notching: Make a vertical 'I', 'L', 'T' or 'H' notch.
   1.1. Depth: To accommodate full depth of roots.
2. Planting: Plant tree, close notch with root collar at ground level and firm the soil.

665 Setting out

1. Distance between trees: As drawing

680 Setting out

1. Planting density: As plant schedule
2. Layout: Random groups of no less than 3 or more than 7 of the same species, ensuring that no three plants are aligned in any one direction.

Protecting/ maintaining/ making good defects

710 Maintenance

1. Duration: Carry out the operations in the following clauses from completion of planting until the end of the rectification period.
2. Frequency of maintenance visits: In accordance with the agreed maintenance schedule

720 Failures of planting

1. Defects due to materials or workmanship not in accordance with the Contract: Plants/ trees/ shrubs that have failed to thrive.

1.1. Exclusions: Theft or malicious damage after completion.

1.2. Rectification: Replace with equivalent plants/ trees/ shrubs.

2. Replacements: To match size of adjacent or nearby plants of same species or match original specification, whichever is the greater.
3. Timing of making good: During the next suitable planting season

730 F2 Protective Fencing along existing Hedgerow

1. Fencing type: Cleft chestnut pale fencing, as section Q40
2. Erection: along existing hedgerow

740 Cleanliness

1. Soil and arisings: Remove from hard surfaces and grassed areas.
2. General: Leave the works in a clean tidy condition at completion and after any maintenance operations.

750 Planting maintenance generally

1. Weed control: Maintain weed free area around each tree and shrub.

1.1. Diameter (minimum): The larger of 1 m or the surface of original planting pit.

1.2. Keep planting beds clear of weeds: By maintaining full thickness of mulch

2. Planted areas: Fork over beds as necessary to keep soil loose, with gentle cambers and no hollows. Take care not to reduce depth or effect of mulch.
3. Precautions: Ensure that trees and shrubs are not damaged by use of mowers, nylon filament rotary cutters and similar powered tools.
4. Firming up: Gently firm loosened soil around trees/ shrubs. Straighten leaning trees/ shrubs.
5. Trees: Spray crown when in leaf during warm weather.

5.1. Timing: After dusk.

6. Tree accessories: Check condition of stakes, ties, guys, guards and irrigation and ventilation systems.

6.1. Broken or missing items: Replace.

6.2. Loose stakes: Re-firm in the ground or replace as necessary to provide support to the tree.

6.3. Loose guys: Re-firm anchor points and adjust as necessary to provide support to the tree.

6.4. Ties: Adjust to accommodate growth and prevent constriction or abrasion.

6.5. Damage to bark: Cut back neatly with sharp knife. Prevent further damage.

6.6. Frequency of checks: At each scheduled maintenance visit

7. Watering: As required for healthy establishment, depending on weather conditions

760 Planting maintenance – pruning

1. General: Prune to promote healthy growth and natural shape.

1.1. Dead, dying, diseased wood and suckers: Remove.

1.2. Timing: As appropriate to the species

1.3. Trees: Favour a single central leading shoot.

2. Arisings: Remove.

770 Woodland planting maintenance

1. Watering: Only as necessary to prevent plants wilting.

2. Loose plants: Refirm surrounding soil, without compacting.
3. Weed control: Cut down and remove weeds prior to setting seed in a 1 m diameter area around each tree.
4. Vegetation except trees and coppice shoots to be retained: Cut within the plantation area.
   4.1. Arisings: Leave between rows.
5. Mechanical, chemical or mulching methods of vegetation control: Submit proposals.
6. Ditches and drains: Keep clear.

780 Maintenance instructions

1. General: Before end of the maintenance period, submit printed instructions recommending procedures to be established by the Employer for maintenance of the planting work for one full year: Provide a schedule of any ongoing maintenance problems experienced during the rectification period.

790 Final mulching

1. Timing: At end of the maintenance period.
2. Watering: Ensure that soil is thoroughly moistened prior to remulching, applying water where necessary.
3. Planting beds: Remulch.
4. Depth (minimum): 50 mm
5. Trees: Remulch.
6. Depth (minimum): 75 mm

Q35 Landscape maintenance

To be read with Preliminaries/ General conditions.

Generally

110 Notice

1. Give notice before
   1.1. Application of herbicide.
   1.2. Application of fertilizer.
   1.3. Watering.
   1.4. Each site maintenance visit.
2. Period of notice: 7 days

130 Reinstatement

1. Damage or disturbance to soil structure, planting, grass, fencing, hard landscaping, structures or buildings: Reinstate to original condition.

155 Watering

1. Supply: Potable mains water
2. Quantity: Wet full depth of topsoil
3. Application: Do not damage or loosen plants.
4. Compacted soil: Loosen or scoop out, to direct water to rootzone.
5. Frequency: As necessary for the continued thriving of all planting

160 Water restrictions

1. General: If water supply is, or is likely to be, restricted by emergency legislation, submit proposals for an alternative suitable source of water. Obtain instructions before proceeding.

170 Disposal of arisings

1. General: Unless specified otherwise, dispose of arisings as follows:
   1.1. Biodegradable arisings: Remove to recycling facility
   1.2. Grass cuttings: Leave for two to three days after cutting and then remove
   1.3. Tree roots and stumps: Remove from site
   1.4. Shrub and tree prunings: Remove to recycling facility
   1.5. Litter and nonbiodegradable arisings: Remove from site

181 Mechanical equipment

1. General: Minimize.
2. Prohibited equipment:
3. Timing: Use of mechanical equipment allowed between the hours of 10:00 am and 4:00 pm only

190 Litter

1. Extraneous rubbish not arising from the contract work: Collect and remove from site.

195 Protection of existing grass

1. General: Protect areas affected by maintenance operations using boards/tarpaulins. Do not place excavated or imported materials directly on grass.

197 Cleanliness

1. Soil and arisings: Remove from hard surfaces.
2. General: Leave the works in a clean, tidy condition at completion and after any maintenance operations.

Grassed areas

210 Performance-based maintenance of grassed areas

1. General: Maintain turf in a manner appropriate to the intended use.
2. Soil and grass
   2.1. Condition: Maintain a healthy vigorous sward, free from disease, fungal growth, discolouration, scorch or wilt.
   2.2. Waterlogging and compaction: Prevent.
   2.3. Damage: Repair trampling, abrasion or scalping.
3. Ornamental lawns: Maintain reasonably free from moss, excessive thatch, weeds, frost heave, worm casts and mole hills.
   3.1. Edges: Neat and well defined, in clean, straight lines or smooth-flowing curves.
4. Litter and fallen leaves: Remove regularly to maintain a neat appearance.

211 Maintenance of grassed areas

1. Standard: To BS 7370-3. Carry out maintenance appropriate to each category of turf, as follows:
   1.1. Objectives: To BS 7370-3, Table 6.
   1.2. Programme: To BS 7370-3, clause 11.
   1.3. Mowing methods: To BS 7370-3, Table 3.

220 Grass cutting generally

1. Before mowing: Remove litter, rubbish and debris.
2. Finish: Neat and even, without surface rutting, compaction or damage to grass.
3. Edges: Leave neat and well defined. Neatly trim around obstructions.
4. Adjoining hard areas: Sweep clear and remove arisings.
5. Drought or wet conditions: Obtain instructions.

225 Tree stems

1. Precautions: Do not use mowing machinery closer than 100 mm to tree stems. Use nylon filament rotary cutters and other handheld mechanical tools carefully to avoid damage to bark

235 Bulbs and corms in grassed areas

1. Before flowering: Do not cut.
2. Interval between end of flowering and start of grass cutting (minimum): 6 weeks

250 Leaf removal

1. Operations: Collect fallen leaves.
2. Special requirements: None
3. Disposal: Remove from site for recycling

260 Mowing lawns

1. Grass height: 75 mm maximum
2. Arisings: Spread evenly over cut areas

273 Maintaining grassed areas with annual wildflowers

1. Preparation: Before each cut remove all litter and debris.
2. Timing of first cut: After flowers have set seed.
3. Height of first cut: 75 mm
4. Subsequent cutting: Cut as necessary, so the height of growth does not exceed 125 mm.
   4.1. Height of cut: 75 mm
5. Trimming: All edges.
   5.1. Arisings: Spread evenly over cut areas
6. Watering: Contractor's choice

309 Edges to seeded areas

1. Location: Adjacent to planting beds and around trees
2. Timing: After seeded areas are well established.
3. Method: Cut to clean straight lines or smooth curves. Draw back soil to permit edging.
4. Arisings: Remove.

345 Control of Japanese knotweed

1. Operations: Spot-treat in June and September during suitable weather conditions and when plants are growing vigorously.
2. Herbicide: In accordance with the INNSA 'Code of practice. Managing Japanese knotweed'
3. Application: In accordance with the INNSA 'Code of practice. Managing Japanese knotweed'
4. Arisings: In accordance with the INNSA 'Code of practice. Managing Japanese knotweed'

380 Reinstatement of damaged lawns

1. Damaged turf: Remove to a depth of 40 mm.
2. Preparation: Cultivate substrate to a fine tilth.
3. Reinstatement: Contractor's choice of returfing or topsoiling and reseeding:
   3.1. Returfing: Quality and appearance to match existing.
   3.2. Reseeding: Fill with fine topsoil to BS 3882 multipurpose class, free from stones, debris and weeds. Reseed with a seed mix to match existing grass in quality and appearance.
4. Protection and watering: Provide as necessary to promote successful germination and/ or establishment.

Flower beds/seasonal beddings

460 Beds of perennials or perennials and annuals

1. Gaps in planting: Refill by replanting.
2. Watering
   2.1. New plants: Before and after planting out.
   2.2. Ongoing: As necessary for the continued thriving of all planting.
3. Operations at end of growing season
   3.1. Trim: Older flowering stems of herbaceous perennials.
   3.2. Remove: Redundant plant supports, litter, debris and arisings.
   3.3. Cultivate: Fork over the soil, taking care not to cause undue disturbance to plants.

470 Flower beds generally

1. Operations
   1.1. Remove: Dead flower heads, fallen leaves, litter and debris.
   1.2. Weeds: Thoroughly hand-weed.
   1.3. Cultivate: Lightly hoe.
   1.4. Trim: Clip grass edges.

Shrubs/trees/hedges

500 Establishment of new planting

1. Duration: One year
2. Weed control
   2.1. Method: Keep planting beds clear of weeds by Use of suitable herbicides.
   2.2. Area: Maintain a weed-free area around each tree and shrub, minimum diameter the larger of 1 m or the surface of the original planting pit.
3. Soil condition: Fork over beds to keep soil loose, with gentle cambers and no hollows. Do not reduce depth or effect of mulch.
4. Watering: As schedule and when instructed

502 Establishment of new planting – fertilizer

1. Time of year: March or April.
2. Type: Organic
3. Spreading: Spread evenly.
   3.1. Application rate: As manufacturer's recommendations

510 Tree stakes and ties

1. Inspection/ maintenance times: As scheduled and immediately after strong winds
2. Stakes
   2.1. Replace loose, broken or decayed stakes to original specification.
   2.2. If longer than half of clear tree stem height, cut to this height in spring. Retie to tree firmly but not tightly with a single tie.
3. Ties: Adjust, refix or replace loose or defective ties, allowing for growth and to prevent chafing.
   3.1. Where chafing has occurred, reposition or replace ties to prevent further chafing.

4. Removal of stakes and ties: When instructed
    4.1. Fill stake holes with lightly compacted soil.

520 Refirming of trees and shrubs

1. Timing: After strong winds, frost heave and other disturbances.
2. Refirming: Tread around the base until firmly bedded.
3. Collars in soil at base of tree stems, created by tree movement: Break up by fork, avoiding damage to roots. Backfill with topsoil and refirm.

535 Tree grilles

1. Operations: Lift grilles, remove weeds, adjust levels as necessary and lightly compact. Refit grilles, refill interstices and lightly compact to correct level.

540 Pruning generally

1. Pruning: In accordance with good horticultural and arboricultural practice.
    1.1. Removing branches: Do not damage or tear the stem or bark.
    1.2. Wounds: Keep as small as possible and cut cleanly back to sound wood.
    1.3. Cutting: Make cuts above and sloping away from an outward-facing healthy bud, angled so that water will not collect on cut area.
    1.4. Larger branches: Prune neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide.
2. Appearance: Thin, trim and shape each specimen appropriately to species, location, season, and stage of growth, leaving a well-balanced natural appearance.
3. Tools: Use clean sharp secateurs, hand saws or other approved tools. Trim off ragged edges of bark or wood with a sharp knife.
4. Disease or infection: Give notice if detected.
5. Growth retardants, fungicide or pruning sealant: Do not use unless instructed.

545 Pruning of excessive overhang

1. Timing: As instructed
2. Operations: Remove growth encroaching onto grassed areas, paths, roads, signs, sightlines and road lighting luminaires.

555 Pruning trees and shrubs

1. Standard: To BS 7370-4.
2. Special requirements: Growth retardents not permitted

570 Formative pruning of young trees

1. Standard: Type and timing of pruning operations to suit the plant species.
2. Time of year: Do not prune during the late winter/ early spring sap flow period.
3. Young trees up to 4 m high
    3.1. Crown prune by removing dead branches and reducing selected side branches by one third to preserve a well-balanced head and ensure the development of a single strong leader.
    3.2. Remove duplicated branches and potentially weak or tight forks. In each case, cut back to live wood.
4. Whips or feathered trees: Do not prune.
5. Operatives: Approved specialist contractor

575 Pruning ornamental shrubs

1. General: Prune to encourage healthy and bushy growth and desirable ornamental features, e.g. flowers, fruit, autumn colour, stem colour.
2. Suckers: Remove by cutting back level with the source stem or root.

580 Pruning flowering species of shrubs and roses

1. Time of year
    1.1. Winter flowering shrubs: Spring.
    1.2. Shrubs flowering between March and July: Immediately after the flowering period.
    1.3. Shrubs flowering between July and October: Back to old wood in winter.
    1.4. Rose bushes: Early spring to encourage basal growths and a balanced, compact habit.

600 Trimming rapidly establishing hedges

1. General: Allow to reach planned height as rapidly as possible.
    1.1. Form: Trim back lateral branches moderately.

605 Trimming slowly establishing hedges

1. Operations
    1.1. Timing: Cut back hard in June and September to encourage bushy growth down to ground level.
    1.2. Form: Allow to reach planned dimensions only by gradual degrees, depending on growth rate and habit.

620 Removal of dead plant material

1. wood, and broken or damaged branches and stems.

625 Climbing plants

1. Pruning: Remove excess growth, to ensure that signs, light fittings, doors and windows are kept clear at all times.
2. Insecure growth: Attach to supporting wires or structures using Stainless steel wire.
3. Supporting structures: Check and repair as necessary.

630 Dead and diseased plants

1. Removal: As soon as possible
2. Replacement: In the next scheduled round of replacement planting

635 Reinstatement of shrub/ Herbaceous areas

1. Dead and damaged plants: Remove.
2. Mulch/ matting materials
    2.1. Carefully move to one side and dig over the soil, leaving it fit for replanting.
3. Do not disturb roots of adjacent plants.
4. Replacement plants
    4.1. Use pits and plants: To original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater.
    4.2. Additional requirements: Submit details and cost of plants before ordering
5. Dressing: Slow-release fertilizer:
    5.1. Type: Organic

5.2. Application rate: 50 g/m²

645 Weed control generally

1. Weed tolerance: At all times, weed cover less than 5% and no weed to exceed 100 mm high
2. Adjacent plants, trees and grass: Do not damage.

650 Hand weeding

1. General: Remove weeds entirely, including roots.
2. Disturbance: Remove the minimum quantity of soil, and disturb plants, bulbs and mulched surfaces as little as possible.
3. Completion: Rake area to a neat, clean condition.
4. Mulch: Reinstate to original depth.

655 Weed cutting by hand or machine

1. Undesirable grass, brambles and herbaceous growth: Cut down cleanly to a maximum height of 50 mm.
2. Herbicides: Give notice before use

657 Herbicide to kill regrowth

1. Type: Suitable foliar-acting herbicide to kill regrowth.
2. Timing: Allow recommended period for herbicide to take effect before clearing dead weeds.

665 Weed control with winter herbicide

1. Type: Suitable residual soil-acting herbicide.
2. Time of year: Unless otherwise agreed, complete before end of March.
3. Timing: Allow recommended period for herbicide to take effect before clearing dead weeds.

670 Weed control with summer herbicide

1. Type: Suitable foliar-acting herbicide.
2. Timing: Allow recommended period for herbicide to take effect before clearing dead weeds.

675 Digging over

1. General: Dig over beds. Do not damage existing plants, bulbs and roots.
   1.1. Depth of dig (minimum): 75 mm

680 Soil aeration

1. Compacted soil surfaces
   1.1. Prick up: To aerate the soil of root areas and break surface crust.
   1.2. Size of lumps: Reduce to crumb and level off.
   1.3. Damage: Do not damage plants and their roots.

685 Soil level adjustment

1. Level of soil/mulch at edges of beds: Reduce to 50 mm below adjacent grass or hard surface.
   1.1. Arisings (if any): Spread evenly over the bed.

690 Maintenance of loose mulch

1. Thickness (minimum): 50 mm
   1.1. Top up: Twice per year
2. Mulch spill on adjacent areas: Remove weeds and rubbish and return to planted area.
3. Weeding: Remove weeds growing on or in mulch by Hand-weeding.

695 Fertilizing established trees and shrubs

1. Time of year: April through July
2. Type of fertilizer: Organic
3. Application: Spread evenly.
   3.1. Rate: 60 g/m²

700 Snow removal from shrubs/ Trees

1. Standard: To BS 7370-4.
2. Plants subject to snow removal: All evergreens
3. Timing: Within 24 hours of snowfall

705 Winter leaf removal

1. Operations: Take down temporary leaf fences. Collect accumulations of drifted leaves from the vicinity and from planting beds.
2. Arisings: Remove to recycling facility

710 Woodland planting maintenance

1. Watering: In exceptional circumstances to prevent plants dying.
2. Loose plants: Refirm surrounding soil, without compacting.
3. Vegetation: Except trees and coppice shoots to be retained, cut down to 100 mm above ground level within the plantation area.
   3.1. Arisings: Leave between rows.
4. Ditches and drains: Keep clear.

Tree work

810 Tree work generally

1. Identification: Before starting work agree which trees, shrubs and hedges are to be removed or pruned.
2. Protection: Avoid damage to neighbouring trees, plants and property
3. Standard: To BS 3998.
4. Removing branches: Cut vertical branches similarly, with no more slope on the cut surface than is necessary to shed rainwater.
5. Appearance: Leave trees with a well-balanced natural appearance.
6. Chain saw work: Operatives must hold a certificate of competence.
7. Tree work: To be carried out by an approved member of the Arboricultural Association.

815 Additional work

1. Defective, diseased, unsafe or weak parts of trees additional to those scheduled for attention: Give notice if detected.

820 Prevention of wound bleeding

1. Standard: To BS 3998.

825 Prevention of disease transmission

1. Standard: To BS 3998.

830 Cleaning out and deadwooding

1. Remove
   1.1. Dead, dying or diseased wood, broken branches and stubs.
   1.2. Fungal growths and fruiting bodies.
   1.3. Rubbish, windblown or accumulated in branch forks.
   1.4. Wires, clamps, boards and metal objects, if removable without causing further damage and not part of a support structure that is to be retained.
   1.5. Other unwanted objects, e.g. tree houses, swings.

835 Cutting and pruning generally

1. Tools: Appropriate, well maintained and sharp.
2. Final pruning cuts
   2.1. Chainsaws: Do not use on branches of less than 50 mm diameter.
   2.2. Hand saws: Form a smooth cut surface.
   2.3. Anvil type secateurs: Do not use.
3. Removing branches: Do not damage or tear the stem.
4. Wounds: Keep as small as possible, cut cleanly back to sound wood leaving a smooth surface, and angled so that water will not collect on the cut area.
5. Cutting: Cut at a fork or at the main stem to avoid stumps wherever possible.
6. Large branches: Remove only with prior approval
   6.1. Remove in small sections and lower to ground with ropes and slings.
7. Dead branches and stubs: When removing, do not cut into live wood.
8. Unsafe branches: Remove epicormic shoots and potentially weak forks that could fail in adverse weather conditions.
9. Disease or fungus: Give notice if detected. Do not apply fungicide or sealant unless instructed.

840 Crown reduction/ Shaping

1. General: Cut back selectively to lateral or sublateral buds or branches to retain flowing branch lines without leaving stumps.
2. Operations: Reduce crown by 15%

845 Crown lifting

1. Clearances: Remove branch systems to give clearance.
   1.1. Height: 2.5 m above footpaths
2. Removing branches: Remove whole branches back to the stem, or cut lower portions of branches back to lateral or sublateral buds or branches. Do not leave stumps.

860 Removing trees, shrubs and hedges

1. Standard: To BS 3998.

2. Existing services: Check for below and above ground services. Give notice if they may be affected.
3. Shrubs and smaller trees: Cut down and grub up roots.
4. Tree stumps
   4.1. Removal by winching: Give notice. Do not use other trees as supports or anchors.
5. Protection: Avoid damage to neighbouring trees, plants and property
6. Work near retained trees: Where tree canopies overlap and in confined spaces generally, take down trees carefully in small sections to avoid damage to adjacent trees that are to be retained.
7. Filling holes
   7.1. Material: Use as-dug material and/ or imported soil as required.
   7.2. Finishing: Consolidate and grade to marry in with surrounding ground level.

865 Bark damage

1. Wounds
   1.1. Do not attempt to stop sap bleeding.
   1.2. Bark: Remove ragged edges using a sharp knife.
   1.3. Wood: Remove splintered wood from deep wounds.
   1.4. Size: Keep wounds as small as possible.
2. Liquid or flux oozing from apparently healthy bark: Give notice.

870 Cavities in trees

1. Investigation: Remove rubbish and rotten wood. Probe the cavity to find the extent of any decay, and give notice.
2. Water-filled cavities: Do not drain.
3. Sound wood inside cavities: Do not remove.
4. Cavity openings:

Water areas - Not Used

Hard landscape areas/fencing

900 Snow clearance

1. Clearance: On reaching a depth of 5 mm
2. De-icing: To roads and footpaths
   2.1. Material: Rock salt to BS 3247
   2.2. Timing: On snow reaching a depth of 5 mm
   2.3. Application rate: Spread evenly at a rate of As manufacturer's recommendations.

910 Hard surfaces and gravel areas

1. Herbicide: Apply a suitable foliar acting or residual herbicide. Allow recommended period for herbicide to take effect before clearing arisings.
2. Hard surfaces: Remove litter, leaves and other debris.
3. Surface gutters and channels: Remove mud, silt, and debris.
4. Drainage gullies: Empty traps and flush clean.
5. Gravel areas: Rake over. Remove weeds, litter, leaves and debris, and level off.

6. Repairs to flexible bituminous pavings: In accordance with the original paving specification or BS 7370-2, clause 4.12.
7. Stain removal: In accordance with BS 7370-2, table 4.

920 Fencing

1. Fences: Inspect and repair to maintain protection against Intruders.

Q40 Fencing

To be read with Preliminaries/ General conditions.

Fencing systems

220 W6 Steel fencing (Estate fence)

1. Description: Front Houses and Duplexes Railing
   Estate Railing with horizontal bars
2. Manufacturer: Irishfencing
   2.1. Product reference: Estate Railing
3. Standard: To BS 1722-8, type .....
4. Height: 900 mm
5. Posts and bars
   5.1. Intermediate bars/ Joiner posts: Flat
   5.2. Finish: Hot-dip galvanized to BS EN ISO 1461
      5.2.1.Colour: TBC
   5.3. Centres of posts (maximum):
   5.4. Joiner posts: 6 m.
   5.5. Intermediate posts: 1.2 m
6. Method of setting posts
   6.1. Intermediate/ Joiner posts: Driven
7. Conformity: Submit manufacturer's and installer's certificates, to BS 1722-8.

250 F1 Composite Panel System_Partitions at back to back heating pump

1. Manufacturer: Irish Fencing or similar and approved
2. Standard: To BS 1722-11.
3. Type of infill: Horizontal Composite Timber Boards
   3.1. Treatment: None
   3.2. Finish: None required
4. Height: 1600 mm
5. Posts: Composite Timber
   5.1. Treatment: None
   5.2. Finish: None
6. Method of setting posts
   6.1. Hole depth: As drawing detail
   6.2. Concrete depth: Filled to not less than half the hole depth.
7. Accessories: None
8. Conformity: Submit manufacturer's and installer's certificates, to BS 1722-11.

260 W2 Concrete post and timber panel - Rear House Garden Dividing Boundary

1. Manufacturer: TBC
   1.1. Product reference: Contractor's choice
2. Precast concrete elements: To BS EN 12839.
3. Height: 1800 mm

4. Panel types: Round Top Hit & Miss Fence Panel
   Panel: 1.8 wide x 1.5m height
   Boards: 95mm x 38mm, 50mm gap (Nom.); Sanded and Planed; pressure treated with Tanalith E.
   Rails: 75mm x 50mm, slotted into concrete posts
   1.75m x 1m, planned, mortice, and tenoned.
   Stainless steel fixings with galvanized ring latch and hinges.
5. Post spacing: 1.8 m
6. Method of setting posts: in concrete foundations to eng.'s specifications
7. Accessories: Single gate to match Fencing

320 F2 Chestnut pale fencing - Along existing Hedgerow

1. Manufacturer: Contractor's choice
   1.1. Product reference: Contractor's choice as per detail drawing
2. Height: 1.2 m
3. Posts and struts: Wood
   3.1. Treatment: To provide a 30-year service life ·
4. Centres of posts (maximum)
   4.1. Straining posts: 70 m in straight runs and at all ends, corners, changes of direction and acute variations in level.
   4.2. Intermediate posts: 2 m
5. Accessories: Three lines of barbed wire

340 W5 Steel vertical bar fencing - Apartment Courtyard Railing

1. Manufacturer: Irish Fencing
   1.1. Product reference: Solid Roundbar Railing
2. Standard: To BS 1722-9.
3. Height: 1800 mm
4. Verticals: 16 mm diameter round bar
5. Centres of verticals: 116 mm
6. Posts: 80x40 mm
7. Centres of posts (maximum): 2750 mm
8. Accessories: Single leaf pedestrian gate
9. Conformity: Submit manufacturer's and installer's certificates, to BS 1722-9.

340_A W7 Steel vertical bar fencing - Local Park Railing Type A

1. Manufacturer: Irish Fencing
   1.1. Product reference: Solid Roundbar Railing
2. Standard: To BS 1722-9.
3. Height: 1800 mm
4. Verticals: 16 mm diameter round bar
5. Centres of verticals: 116 mm
6. Posts: 80x40 mm
7. Centres of posts (maximum): 2750 mm
8. Method of setting posts/ stays/ legs: Railing to fix on top of low brick wall
9. Accessories: Single and double gates

10. Conformity: Submit manufacturer's and installer's certificates, to BS 1722-9.

440 Boundary protection materials specification

1. Minimum BRE 'Green Guide to Specification Online' rating: Contractor's choice

Accessories

635 Gate openers

1. Description: Local Park Gates
2. Type: Bifold
3. Mechanism: Electro-mechanical

Execution

710 Installation generally

1. Set out and erect
   1.1. Alignment: Straight lines or smoothly flowing curves.
   1.2. Tops of posts: Following profile of the ground.
   1.3. Setting posts: Rigid, plumb and to specified depth, or greater where necessary to ensure adequate support.
   1.4. Fixings: All components securely fixed.

715 Competence

1. Operatives: Contractors must employ competent operatives.

720 Setting posts in concrete

1. Standard: To BS 8500-2.
2. Mix: Designated concrete not less than GEN1 or Standard prescribed concrete not less than ST2.
3. Alternative mix for small quantities: 50 kg Portland cement to 150 kg fine aggregate to 250 kg 20 mm nominal maximum size coarse aggregate, medium workability.
4. Admixtures: Do not use.
5. Holes: Excavate neatly and with vertical sides.
6. Filling: Position post/ strut and fill hole with concrete to not less than the specified depth, well rammed as filling proceeds and consolidated.
7. Backfilling of holes not completely filled with concrete: Excavated material, well rammed and consolidated.

730 Exposed concrete foundations

1. Filling: Compact until air bubbles cease to appear on the upper surface.
2. Finishing: Weathered to shed water and trowelled smooth.

740 Exposed concrete foundations

1. Holes: Excavated neatly, with vertical sides and as small as practicable to allow refilling.
2. Filling: Position posts/ struts and replace excavated material, well rammed as filling proceeds.

770 Site cutting of wood

1. General: Kept to a minimum.
2. Below or near ground level: Cutting prohibited.
3. Treatment of surfaces exposed by minor cutting and drilling: Two flood coats of solution recommended for the purpose by main treatment solution manufacturer.

780 Making good galvanized surfaces

1. Treatment of minor damage (including on fasteners and fittings): Low melting point zinc alloy repair rods or powders made for this purpose, or at least two coats of zinc-rich paint to BS 4652.
2. Thickness: Apply sufficient material to provide a zinc coating at least equal in thickness to the original layer.

790 Site painting

1. Timing: Prepare surfaces and apply finishes as soon as possible after fixing.

Completion

910 Cleaning

1. General: Leave the works in a clean, tidy condition.
2. Surfaces: Clean immediately before handover.

920 Fixings

1. All components: Tighten.
   1.1. Timing: Before handover.

930 Gates

1. Hinges, latches and closers: Adjust to provide smooth operation. Lubricate where necessary.
   1.1. Timing: Before handover.

Ω End of Section

Q41 Barriers/ guardrails

To be read with Preliminaries/ General conditions.

Performance/ inspection/ testing

300 Contractor's structural design

1. Requirement
   1.1. Generally: As section B51. Submit drawings and schedules in accordance with the designated code of practice and to satisfy the performance criteria specified in section B51.
2. Member sizes and locations: As drawing

330 Verification of anchorages

1. Certification: Four weeks prior to installation, submit certificates from a United Kingdom Accreditation Service (UKAS) independent laboratory, stating that for tests in accordance with BS 5080-1, anchorages are capable of resisting
2. Tolerance: Certification must include the maximum tolerance of hole size and evidence that load can be supported when anchor is installed in holes having these tolerances.

340 Site testing anchorages in drilled holes

1. Test parapet posts: Install on site.
2. Loading tests: To BS 5080-1.
3. Anchorage loadings: Incrementally in tension to 10% above the nominal tensile load determined
   3.1. Load holding periods
      3.1.1. Incremental loads: Not less than 30 seconds.
      3.1.2. Test loads: Not less than 5 minutes.
   3.2. Readings: Take after applying load and at the end of the time intervals stated.
   3.3. Movement: Total not to exceed 1 mm during test.
      3.3.1. Any evidence of slip during loading shall constitute failure.
4. Test results: Submit prior to full parapet installation.

Installation

410 Work on or adjacent to highways

1. Requirement: Comply with the Department for Transport's 'Safety at street works and road works. A code of practice'. Retain a copy of this document on site at all times during the course of the works.

420 Alignment

6. Erection: Fences/ barriers to present a flowing alignment. Tops of posts to follow ground profile.
7. Tolerance: ±30 mm of prescribed alignment and, within any 10 m length, ±15 mm from the straight or required radius.

430 Erection generally

1. Protection: Coat all internal and external surfaces of aluminium and steel posts below and up to 150 mm above ground level, with two coats of bituminous paint to BS 6949 type 2, unless other applied surface finish is specified.

2. Prevention of electrolytic corrosion: Isolate dissimilar metals.
3. Steel components: Do not drill, cut or weld after galvanizing.

480 Concrete foundations for posts

1. Excavations: To have vertical sides. Dispose of all arisings. Blind excavation bottoms with a 50 mm layer of concrete.
2. Concrete mix: To BS 8500-2, Designated mix not less than GEN 4 or Standard mix not less than ST5. Do not use admixtures.
3. Placing concrete: Fill holes to the specified depth and fully compact. Do not backfill for at least four days.
4. Temporary support to posts: Provide for a at least four days after placing concrete.

490 Damage repair to galvanized surfaces

1. Areas of repair: Minor damage, including fixings and fittings.
   1.1. Total area of repair not to exceed 0.5% of total surface area.
   1.2. Each area not to exceed 1000 mm².
2. Renovation: Use low melting point zinc alloy repair rods or powders or at least two coats of zinc-rich paint to BS 4652.

500 Preservative treated timber

1. Surfaces exposed by minor cutting and drilling: Treat with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.

510 Preparation for site painting

1. Preparation and application: As soon as possible after installation of barriers/ guardrails.

Completion

900 Documentation

1. Contents
   1.1. General product information.
   1.2. Installation information.
   1.3. Inspection and maintenance reports.

Q50 Site/ street furniture/ equipment

To be read with Preliminaries/ General conditions.

Site and street furniture

110 Wood gate

1. Description: Single Gate to match with the proposed Timber Panel Rear house Garden Dividing Boundary
2. Manufacturer: Irish Fencing or similar
3. Standard: To BS 5709.
4. Wood: Contractor's choice
5. Treatment: As Wood Protection Association 'Industrial Wood Preservation. Specification and Practice'.
6. Adhesive: Synthetic resin to BS EN 301, type 1.
7. Method of setting posts: Concrete foundation

130 Gate

1. Description: Single and Double Gates to match the Steel Bar Railing
2. Manufacturer: Irish Fencing or similar
3. Size: As drawing
4. Posts: Steel
5. Finish as delivered: As manufactured
   5.1. Colour: TBC
6. Method of setting posts: Concrete foundation

190 Bollards

1. Description: Open Space
2. Manufacturer: Pittman
   2.1. Product reference: Semi Dome Stainless Steel Bollard (P-895766) or similar
3. Material: Stainless Steel
4. Height above ground: 1200 mm
5. Sectional size: 114 mm diameter

210 Cycle stands

1. Manufacturer: Hartecast (&/or similar and approved)
   1.1. Product reference: Sheffield stand, or similar and approved
2. Type: Single stands
3. Material: 316 grade stainless steel
4. Method of fixing: concrete foundation under the proposed surface treatment

220 Benches

1. Manufacturer: Hartecast
   1.1. Product reference: HC2033S Seat or similar and approved
2. Material: Powder coated stainless steel
   2.1. Colour: Anthracite Grey RAL 7016 or similar approved
3. Size: 1800x360x460mm

4. Accessories/ Special requirements: To include back and arm rests
5. Method of fixing: To be fixed to concrete pad

242 Bins

1. Manufacturer: Hartecast
   1.1. Product reference: HC2055 - 100 litre, or similar and approved
2. Material: cast ductile iron
   2.1. Colour: Anthracite Grey RAL 7016 or similar approved
3. Method of fixing: To be fixed to concrete pad

262 Tree grilles

1. Description: See drawing
2. Manufacturer: Castit or similar
3. Material: Cast iron
4. Size: 1200x1200mm

Installation

510 Concrete foundations generally

1. Standard: To BS 8500-2.
2. Concrete: to eng. Specs
3. Admixtures: Do not use.
4. Foundation holes: Neat vertical sides.
5. Depth of foundations, bedding, haunching: Appropriate to provide adequate support and to receive overlying soft landscape or paving finishes.

515 Setting components in concrete

1. Components: Accurately positioned and securely supported.
2. Concrete fill: Fully compacted as filling proceeds.
3. Concrete foundations exposed to view: Compacted until air bubbles cease to appear on the upper surface, then weathered to shed water and trowelled smooth.
4. Temporary component support: Maintain undisturbed for minimum 48 hours.

520 Setting in earth

1. Holes: As small as practicable.
2. Components being fixed: Accurately positioned and securely supported.
3. Buried depth (minimum): to eng. Specs
4. Earth refill: Well rammed as filling proceeds.

530 Preservative treated timber

1. Surfaces exposed by minor cutting and drilling: Treated by immersion or with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.
2. Heavily worked sections: Re-treat.

540 Building in to masonry walls

1. Components being built in: Accurately positioned and securely supported. Set in mortar and pointed neatly to match adjacent walling.

2. Temporary support: Maintain for 48 hours (minimum) and prevent disturbance.

545 Erection of timber and prefabricated structures

1. Checking: 5 days (minimum) before proposed erection date, check foundations, holding down bolts, etc.
2. Inaccuracies or defects in prepared bases or supplied structures: Report immediately. Obtain instructions before proceeding.

550 Damage to galvanized surfaces

1. Minor damage in areas up to 40 mm² (including on fixings and fittings): Make good.
   1.1. Material: Low melting point zinc alloy repair rods or powders made for this purpose or at least two coats of zinc-rich paint to BS 4652.
   1.2. Thickness: Sufficient to provide a zinc coating at least equal to the original layer.

560 Site painting

1. Timing: Prepare surfaces and apply finishes as soon as possible after fixing.

murray & associates
landscape architecture

Landscape Management Plan

November 2022

Contents:

1. Introduction

The purpose of this Landscape Management Plan is to provide guidance and specifications for the maintenance requirements of the landscape elements of the proposed development. This will cover all of the landscape typologies, both existing (hedgerows and mature trees) and proposed (trees, shrubs, hedging, etc.) on-site to ensure that all maintenance operations required for the efficient and effective management of the landscape are characterised and defined. The plan will provide a set of measurable performance standards that can be applied to evaluate landscape maintenance works carried out on the site.

2. Nature of Site

Landscape works proposed include extensive planting: specimen trees, shrubs, bare-root planting and perennials.
Hard landscape works include feature paving, ramps, steps, lighting and drainage.

3. Timeframe & Programming

The proposed development, including the landscape works, will be managed and maintained by the applicant until deemed suitable for Taking In Charge by South Dublin County Council.

A detailed programme of works will be agreed with the Contractor prior to maintenance operations commencing, in each year. A sample maintenance programme is contained at Point 8.

4. Aims & Objectives

4.1 General

Fundamentally, the aim of landscape management is to ensure that all external areas are kept in good condition, as perceived and expected by the users. The Landscape Management Plan aims to provide a manual for the maintenance requirements of the park and adjacent landscapes. It will define and specify all necessary operations for the efficient and effective management of the landscape in order to ensure that each area is appropriately and sustainably maintained.

4.2 Horticultural / Sylvicultural Objectives

Horticultural and sylvicultural aims relate to the appropriate management operations for all plants and trees. The specific horticultural objectives are as follows:

- All plants to be maintained so that they remain in good health;
- All plants to have a habit and form consistent with species type and aesthetic objectives;
- Specialist operations for particular types of plants where necessary to achieve the aesthetic or functional objectives, e.g. pruning, dead-heading of flowering plants, formative clipping, etc. are included in the plan;
- Areas surrounding plants are to be maintained in such a way that potential threats to plant viability are addressed, e.g. weed control (particularly invasive and noxious weeds);
- Recognition of planting (including trees) at the end of its viable life is important to ensure that it is removed and replaced in a timely manner to avoid eyesores.

4.3 Performance Standards

Performance Standards can be defined as follows in the context of this plan: ***written specifications of the conditions that will exist when satisfactory works are completed.*** Performance standards will be measurable against the specified outcomes required for a particular operation, within a particular area. Performance standards must be upheld by the contractor at all times and will be monitored on an ongoing basis through regular site inspections.

Performance standards are specified in section 5 of this document. All required maintenance operations are defined and detailed to provide both specifications for the landscape contractor to follow and a set of measurable outcomes to appraise and value the contractor's performance against the requirements of the contract.

4.4 Environmental Considerations

Responsible and sustainable landscape management is about balancing the performance standards with the required standard of maintenance. The following principles have guided the development of the specification:

- **Minimise use of non-renewable resources**
  - e.g. reduce lawn areas to reduce consumption of fossil fuels, reduce use of chemical inputs such as pesticides, where possible.
- **SuDS**
  - Sustainable Drainage Systems are to be included in the final design swales in landscape areas and tree pits with drainage gravel or structural soil materials for soakaway.
- **Utilise low input systems**
  - Includes measures such as: mulching instead of herbicide use, where possible.
- **On-site green waste recycling / mulching / composting**
  - Avoids excessive transportation and use of landfill
- **Use of environmentally friendly products where possible**
  - e.g. biodegradable herbicides, biodegradable tree ties, timber stakes.
- **Control of Invasive Species**
  - It is an objective of this plan to control and prevent the spread of invasive species, and in particular, Giant Hogweed, in order to protect the biodiversity of the landscape.
- **Protection of site resources**
  - Appropriate maintenance will result in the protection of existing trees, vegetation and soil resource of the site.

5. Specifications for Landscape Maintenance Operations

5.2 Shrub Planting

(i) Groundcover / Mixed Borders / Mass Shrub Plantation

Criterion	Performance Standards
Aesthetic / functional requirements	Shrub planting areas shall be kept clean at all times, with an even finish. Plants to have a healthy, lush appearance, typical for plant species and time of year.
Weed Control	Weeds shall not be allowed to cover more than 5% of the ground at any one time, neither shall weeds exceed 50mm in height. Residual herbicide permitted for established shrub areas.
Bark Mulch	Required – min. 50mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with 50g/sq.m of general-purpose fertiliser in February. (Rake back mulch prior to application.)
Pruning / Clipping	Pruning once per annum to maintain the typical size and form of the plant, for sightlines and for plant health; all clippings to be gathered at every pruning and disposed of in designated area or off-site.
Edging	Beds to be edged by hand or edging machine twice per annum to leave an even, straight edge. Shrubs or soil not to protrude past the edge by more than 50mm.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)
Dead-heading	Not required.

(ii) Specimen Shrubs

Criterion	Performance Standards
Aesthetic / functional requirements	Specimen shrub planting areas shall be kept clean at all times, with an even finish. Shrubs to have a healthy, lush appearance at all times, typical for plant species and time of year.
Weed Control	No weeds permitted in the shrub area. Established shrub areas may be treated with an approved residual herbicide to provide year round weed control.
Bark Mulch	Required – 50mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with 50-100g/sq.m of general-purpose fertiliser in February. (Rake back mulch prior to application.)
Pruning / Clipping	Regular pruning as necessary to maintain the typical size, habit and form of the plant, for health and to maintain best appearance; all clippings to be gathered at every pruning and disposed of in designated area or off-site.
Watering	Watering required to ensure consistent availability of water to plant during periods of drought (i.e. after more than 2 weeks) - minimum

(iii) Hedge – Free Growing

Criterion	Performance Standards
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Relatively informal habit acceptable.
Weed Control	No weeds permitted in the hedge area. Established hedge areas may be treated with an approved residual herbicide to provide year round weed control.
Bark Mulch	Required – 50mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with 50g/sq.m of general-purpose fertiliser in February. (Rake back mulch prior to application.)

Pruning / Clipping	Pruning once per annum as necessary to maintain the required height and width, and prevent "leggy" growth; all clippings to be gathered at every pruning and disposed of in designated area or off-site. Laying may be required for Hawthorn and Blackthorn hedges if hedge growth becomes thin at the base.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)

(iv) Hedge – Pruned (including topiary)

Criterion	Performance Standards
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Formal habit to be maintained throughout year. Formal habit of hedge to be defined and maintained at all times.
Weed Control	No weeds permitted in the shrub area. Established shrub areas may be treated with an approved residual herbicide to provide year round weed control.
Bark Mulch	Required – 75mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with 50-100g/sq.m of general-purpose fertiliser in February. (Rake back mulch prior to application.)
Pruning / Clipping	Regular pruning as necessary to maintain the required height and width of the plant, to maintain best appearance; all clippings to be gathered at every pruning and disposed of in designated area or off-site.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)

(v) Native Shrub Plantation

Criterion	Performance Standards
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Relatively informal habit acceptable.
Weed Control	Weeds shall not be allowed to cover more than 5% of the ground at any one time, neither shall weeds exceed 50mm in height. Residual herbicide permitted for established areas.
Bark Mulch	Required for high prominence areas; recommended for medium areas – 50mm deep; to be kept topped up at all times.
Fertiliser	Not required.
Pruning / Clipping	Pruning once per annum for shrubs such as Dogwood and Guelder Rose or to control height and spread when necessary.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)

(vi) Scrub - naturally occurring

No maintenance operations required, except to ensure that any edge plants are kept cut back at least 1m from road edges and tidy where visible or prominent.

5.3 Trees & Woodlands

(i) General:

- Canopies overhanging a pedestrian path to be maintained to 2.2m and canopies overhanging vehicular access to 4m.
- Limb damage caused by wind, passing traffic, etc. to be pruned resulting in a clean even wound.
- No signs, security boxes, etc. to be attached to trees.
- Surface tree roots not to cause a trip or mowing hazard. In grass areas, top up soil over roots and re-seed.
- Raised paviors or cracked/bulging walls due to root growth are to be reported to the Contract Administrator.

- Exposed roots from construction works to be kept moist by wrapping damp hessian around roots until soil is backfilled and then apply a one off generous application of water. Root damage to be pruned resulting in a clean even wound prior to backfilling / topsoiling.
- Control of ivy and suckering on the trunks of trees within falling distance of activity
- Informal monitoring of trees for change of condition or evidence of a fungal fruiting body.
-

(ii) Specimen, Solitary Trees

All trees to be maintained in accordance with requirements for species and habit to be maintained in accordance typical form for tree. Tree trunk will be kept visible for defect inspection with control of ivy and removal of suckering. Mulch 1m diameter will be maintained around all individual trees within grassed areas. Stakes and ties to be retained for a maximum period of 3 years, with tie loosened annually and both stake and tie to be removed after 3 year period. All nursery marking, bamboo and labels to be removed off all trees. Tree grilles in hard surface areas to be maintained weed free.
Any visible change in condition to be reported.

(iii) Tree Groups, Woodland, Grid, Hedgerow Trees

Such areas shall be kept free of noxious and pernicious weeds at all times. Mulch or spray rings 1m diameter will be maintained along group perimeter and around all plants in young woodland areas where canopy cover has not been achieved. Established woodland areas shall not be treated with herbicide except where necessary for the removal of noxious and invasive weeds including Ragwort, Gorse, Thistle, and Dock, hogweed, bramble and any others. Japanese knotweed shall not be allowed to establish in any woodland areas. Bramble should not exceed 20% of ground cover of any woodland. Ivy shall be controlled and shall not be allowed to establish itself on trees along the perimeter and within falling distance of activity within woodland areas. Understorey (excluding saplings) not to exceed 1m in height in order to retain visibility for user safety in areas of activity. Tree numbers not to exceed 4 per sq.m of trees with a girth of less than 250mm and numbers not to exceed 2 per sq.m for trees with a girth of over 300mm. Fallen or felled trees in woodland areas to be maintained on-site where permissible, for reasons of biodiversity and ecology which contribute to the overall health of the woodland.

5.4 Herbaceous Perennial Planting (including Ferns and Ivy)

(i) Bulbs

Watering: Ensure that bulbs have adequate water throughout growth period, up until cutting back occurs (see below).

Fertiliser: Apply approved general purpose fertiliser to all bulb areas at nominal rate of 35g/sq.m in late February.

Cutting Back: Cut back dead foliage to ground level six weeks after the end of flowering (or earlier if foliage is yellow and straw-like). Do not tie or knot the leaves.

Deadheading: *High prominence areas only.* Deadhead flowers by cutting back spent flowers to the base of the flower stalk.

Note: Herbicides may not be used in or around bulb areas.

5.5 Hard Landscape Surfaces & Signage

Hard Standing including roads, paved areas, pavements, and kerb-lines - shall be kept clean at all times, with no growth of weeds and without moss infestation. Roads and kerb lines shall be kept free of litter and build up of grit and debris through the implementation of a regular sweeping program.

(i) Weed Control

All paved areas such as footpaths, kerb lines, feature paving, gravel areas, etc., throughout the site are to be maintained weed free at all times. The application of a suitable broad-spectrum herbicide e.g. Glyphosate (*Roundup Bi-Active* or equal and approved) shall be applied 3no. times per annum to achieve this. Once per annum a suitable chemical to treat moss shall be applied where it has established on hard surfaces. An initial physical treatment, such as scraping using a spade, will be required to remove existing moss growth prior to spraying.

(ii) Sweeping

Sweeping shall mean sweeping of feature paving areas, footpaths and kerb lines along all public roads (edge of road) and removal of all grit, rubbish and leaves from these areas. Soil wash from beds on to paved areas should also be swept. This work to be executed fortnightly.

Note: Particular attention is required during the period of October/ November to deal with leaf fall.

(iii) Cleaning

Cleaning shall mean the removal of paper, plastic bags and all other rubbish. Cleaning shall be carried out as follows:

- Fine cut grass areas, all paved and hard standing areas, footpaths and kerb lines: This work to be executed prior to grass cutting on each grass cutting visit. Cleaning shall be carried out 36no. times per annum, including winter.
- Rough cut grass areas: prior to each scheduled grass cut, minimum 8no. times per annum.
- Tree groups, boundary tree areas, shrub maintenance areas, all other areas: 8no. times per annum.

Cleaning shall also include the removal of grit and rubbish from road gullies, drains, Aco drains and collapsible bollards twice per year.

(iv) Signage

All signs are to be cleaned to a high standard 4 times per year.

(v) Gullies

All roadside gullies are to be inspected monthly and if full or blocked, must be cleared out as appropriate.

5.6 Natural Areas

No maintenance operations are permitted within areas designated as natural zones. Neither is dumping of any arisings, storage of materials or any other related activity.

5.7 Vacant Plot Areas/Rough Ground Areas

These areas shall be kept free of noxious, invasive and other pernicious weeds, including ragwort, thistle, dock, gorse, hogweed, bramble and Japanese Knotweed at all times.

5.8 Weed Control

5.8.1 General

Minimal amount of herbicidal chemicals are to be utilised on the site, with non-chemical means of weed control to be preferred (mulching, mechanical control, hand weeding, etc. where feasible). Biodegradable herbicides are to be preferred where herbicide use is required. Prior to executing weed control involving the use of herbicides, details of the products to be used including a Material Safety Data Sheet (MSDS) for each product is to be provided to the Contract Administrator for each of the herbicides proposed. A sample herbicide information chart is included in Addendum A.

Where translocated herbicides are applied, spray drift should be avoided and spray guards fitted to apparatus. Where feasible, spot treatment using CDA (Controlled Droplet Applicator) or glove preferred. Use of residual herbicides shall not be used in areas of herbaceous planting, in the initial year following planting of new shrubs or over areas of bare ground within shrub beds where replacement planting is to be carried out. Hand weeding in planting beds will be required where there is a large component of herbaceous material, bulbs or prostrate groundcover plants.

5.8.2 Invasive Weeds

Invasive weeds of any kind, most particularly Japanese Knotweed, Winter Heliotrope, Giant Hogweed and Himalayan Balsam (all identified on this site) shall not be allowed to establish in any area of the site. It will be the responsibility of the contractor to be able to identify same and treat at first sign of emergence. Treatment for all except Japanese Knotweed to consist of removal of weed by mechanical means, treating any remaining plant parts with Glyphosate (e.g. *Roundup* or equal).

Recommended Treatment for Giant Hogweed

A survey of the site should be carried out in spring and summer each year to identify if Giant Hogweed is present. When identified, Giant Hogweed should immediately be treated with Glyphosate (e.g. Roundup or equal). The herbicide is to be sprayed onto the plant or liberally applied using a glove. The plant should be left in-situ until completely dead and removed carefully when entirely withered. If the first treatment does not work, a second treatment should be applied. Following removal, the infected site must be monitored on a weekly basis for signs of re-emergence. Re-emergent plants should be treated in the same way, no later than October in any given year.

6. Duties of Contractor; Evaluation & Payment Procedures

The contractor shall be required to complete a site specific maintenance programme and attend site in accordance with the program agreed with the Contract Administrator. During the course of the contract the contractor shall supply after each visit to site a record of attendance using site attendance record sheets. These should be signed by the contractor's site foreman and manager and retained in a file for use as an appendix to the payment application. A sample site attendance sheet is given in Addendum C. Failure to complete works on the prescribed date, may result in determination of the contract, except where an adjustment to program has been agreed in advance with the Contract Administrator.

At the end of every month the contract manager shall complete the monthly report sheets to clarify the completion of works for the particular month. Items of work not completed shall be noted and a timeframe for their completion indicated. The forestalled works must be attended to at the first opportunity in the month following the submission of the monthly report sheet, unless exceptional circumstances or bad weather prevent the work from being completed. In this case the work shall be attended to, as soon as is practicable, and by agreement with the Contract Administrator.

Monthly program sheets, contained in Addendum B, shall be signed by the contractor's manager and forwarded to the Contract Administrator for verification. Upon verification the document will be returned to the contractor and shall be attached at the time of payment application. If necessary, a site visit will be undertaken with the contractor to verify completion of works. The completed monthly report sheets shall be used as the basis for payment. Items of work not completed to the required standards shall be excluded from payment for that particular month. Should the Contract Administrator / Property Manager be dissatisfied with the quality of work within a particular month then a reasonable sum of money shall be withheld in proportion to the amount of incomplete work or work that is not up to standard. A minimum of 80% of work must be complete or satisfactory in order for payment to be made for a particular month.

In relation to Health and Safety, the landscape contractor will be appointed Project Supervisor for the Construction Stage under current health and safety legislation. Therefore, a safety file must be maintained by the contractor and be made available for inspection upon request. All possible precautions and risk management strategies must be in place in relation to safety of employees, personal protective equipment, use and maintenance of equipment/vehicles, signage when works are underway, procedures for closing off areas while works are in progress, traffic management, etc. as required. Any incident or accident must be reported to the Contract Administrator and recorded in the safety file.

7. Inspections by Employer

As part of the management of this contract, eight critical inspections per annum shall be arranged with the Contract Administrator in attendance. These may not be notified to the landscape contractor. The Contract Administrator will produce a report of the site visit, commenting on the appearance of the site and examining each aspect of work in detail. The Landscape Architect may also direct resources to a certain area of work, in agreement with the Property Manager. It is at such dates that standards will be reviewed, problems arising rectified and issues of dispute arising from the concerned parties will be settled.

A preliminary schedule of critical inspection dates is as follows:

1. February
2. March
3. April
4. May
5. June
6. July
7. August

8. September
9. October
10. December

8. Monthly Maintenance Operations Schedule

The following tables give an indicative outline of the required monthly maintenance operations, based on the specification outlined above.

Maintenance Program - January

Item	Description
1.1	Yearly maintenance Shrub and tree planting Tree pruning Hedge cutting
1.2	Weed free circles around trees/whips Check tree stakes and ties
1.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Road Gulley cleaning

Maintenance Program - February

Item	Description
2.1	Yearly maintenance Shrub and tree planting Tree pruning Check tree stakes and ties
2.2	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Road Gulley cleaning

Maintenance Program - March

Item	Description
3.1	Yearly maintenance Shrub and tree planting Shrub Pruning Tree pruning Hedge cutting Hedgerow cutting Hand Weeding in shrub areas Weed free circles around trees/whips
3.2	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Clean all signs

Maintenance Program - April

Item	Description
4.1	Yearly maintenance Shrub and tree planting Shrub Pruning Hedgerow cutting Herbicide application to shrub/woodland areas Hand Weeding in shrub areas Weed free circles around trees/whips Apply fertiliser
4.5	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas

Maintenance Program - May

Item	Description
5.1	Yearly maintenance Shrub and tree planting Hedge cutting Herbicide application to shrub/woodland areas Hand Weeding in shrub areas Apply fertiliser Watering
5.5	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Road/Paved area sweep 1
5.6	Watering

Maintenance Program - June

Item	Description
6.1	Yearly maintenance Shrub and tree planting Tree pruning Herbicide application to shrub/woodland areas Hand Weeding in shrub areas Weed free circles around trees/whips Apply fertiliser Watering
6.4	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Road/Paved area sweep 1 Clean all signs
6.5	Watering of all trees & shrubs

Maintenance Program - July

Item	Description
7.1	Yearly maintenance - Shrub and tree planting Hand Weeding in shrub areas Watering
7.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3
7.4	Watering of all trees & shrubs

Maintenance Program - August

Item	Description
8.1	Yearly maintenance Shrub and tree planting Shrub Pruning Hand Weeding in shrub areas Weed free circles around trees/whips Watering
8.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1
8.4	Watering of all trees & shrubs

Maintenance Program - September

Item	Description
9.1	Yearly maintenance Shrub and tree planting Shrub Pruning Hedge cutting Herbicide application to shrub/woodland areas Hand Weeding in shrub areas Weed free circles around trees/whips Apply fertiliser Watering
9.5	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Road/Paved area sweep 1 Road Gulley cleaning Clean all signs
9.6	Watering of all trees & shrubs
9.7	Attenuation Pond - cleaning, removal of detritus

Maintenance Program - October

Item	Description
10.1	Yearly maintenance Shrub and tree planting Tree pruning Hedge cutting Hedgerow cutting Herbicide application to shrub/woodland areas Hand Weeding in shrub areas Weed free circles around trees/whips Apply fertiliser
10.2	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Road/Paved area sweep 1 Road/Paved area sweep 2

Maintenance Program - November

Item	Description
11.1	Yearly maintenance Shrub and tree planting Hedgerow cutting Check tree stakes and ties
11.2	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Road/Paved area sweep 2 Road/Paved area sweep 3

Maintenance Program - December

Item	Description
12.1	Yearly maintenance Shrub and tree planting Tree pruning Check tree stakes and ties
12.2	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Clean all signs

APPENDIX 3

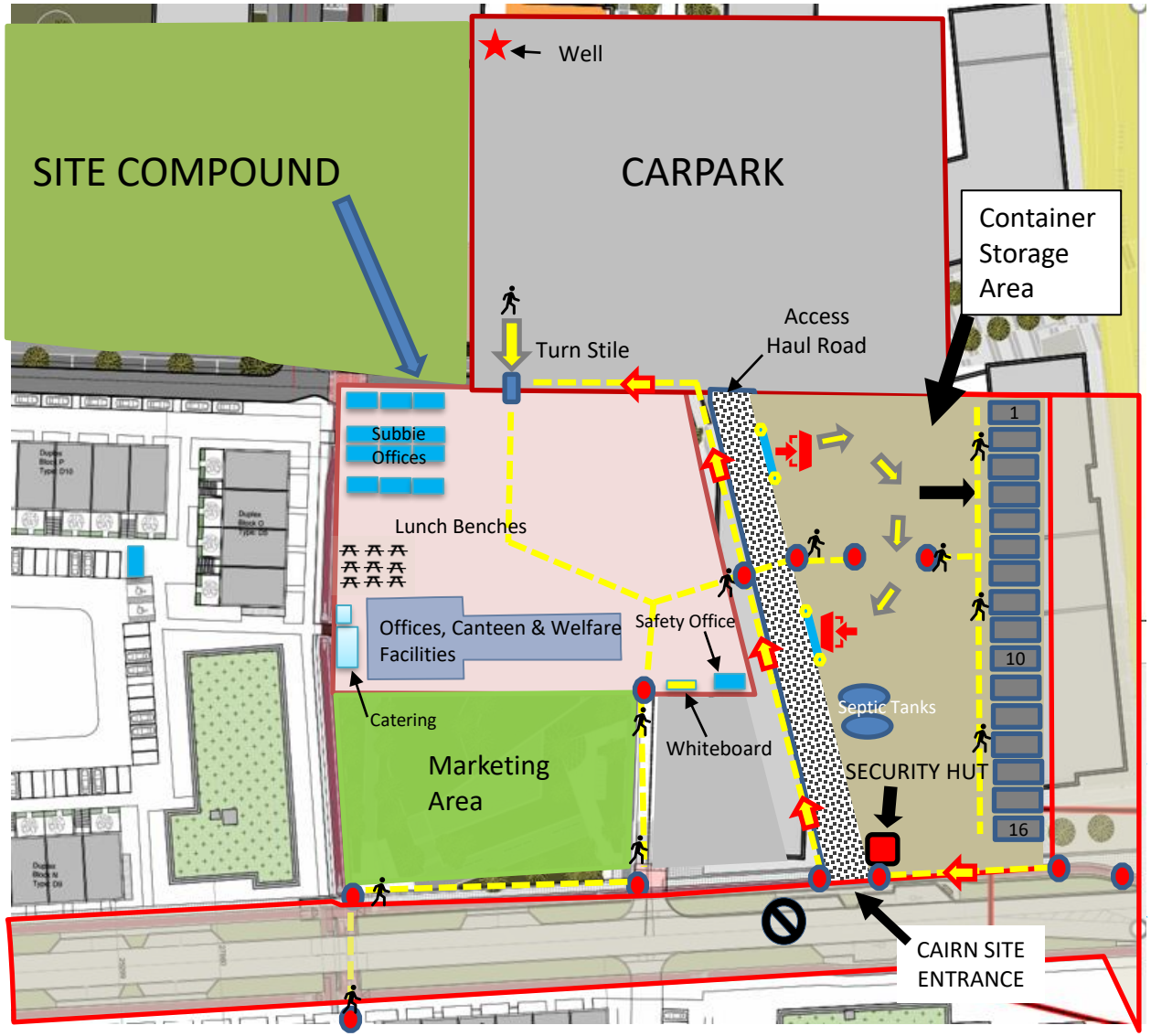
SITE COMPOUND AND LOGISTICS PLAN

CAIRN

CLONBURRIS T1

SITE COMPOUND & LOGISTICS PLAN

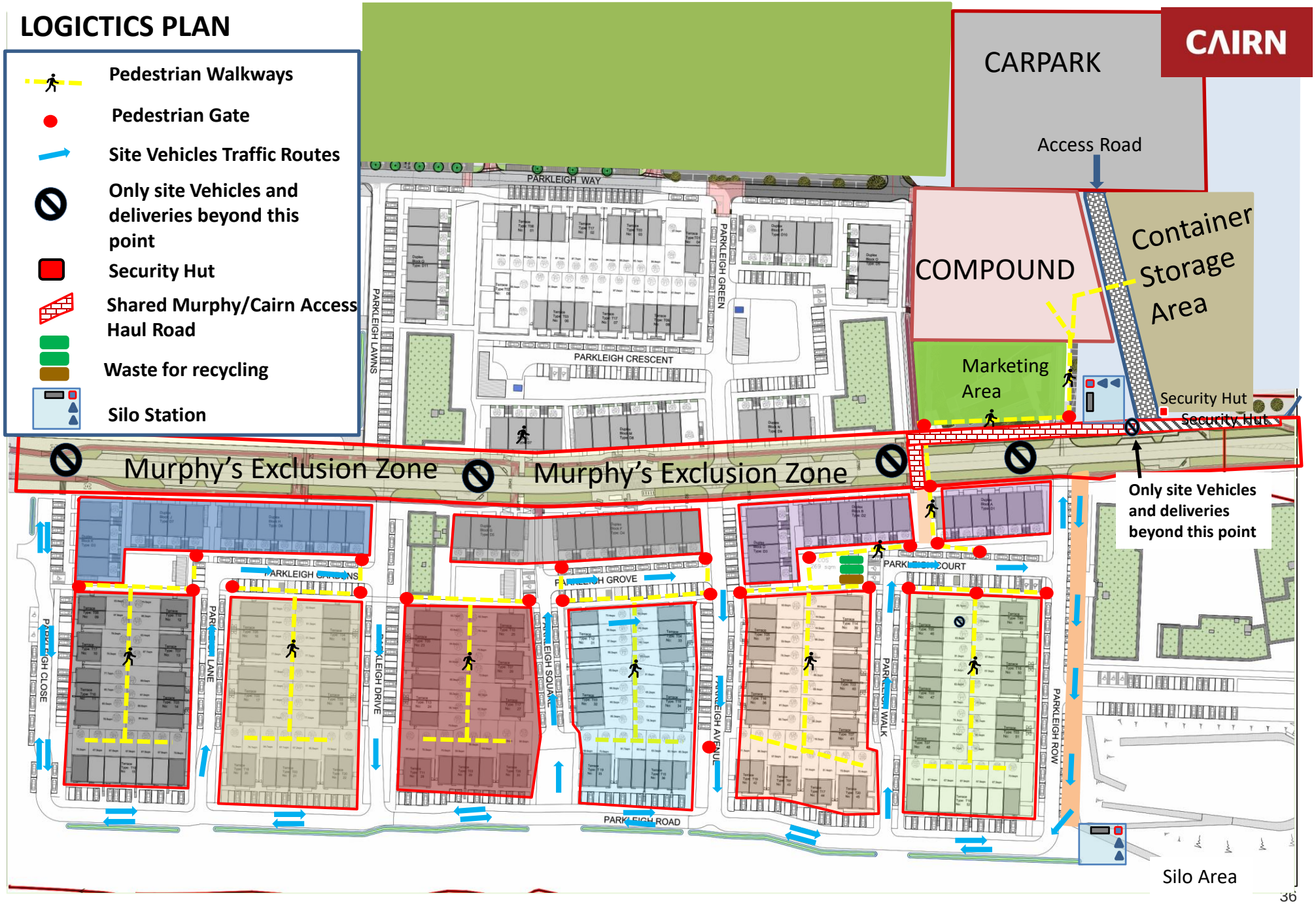
LOGISTICS PLAN FOR SITE COMPOUND



Legend

- Pedestrian Walkways
- Pedestrian Route to Compound
- Pedestrian Gates
- Entrance/Exit to Storage area
- Out door lunch area
- Well for potable water
- All Vehicles must stop at Security Hut
- Only Site Vehicles Beyond this point

LOGICTICS PLAN



PHASING PLAN CLONBURRIS T1

CAIRN

SEQUENCE OF BUILD

AREA 2

AREA 4

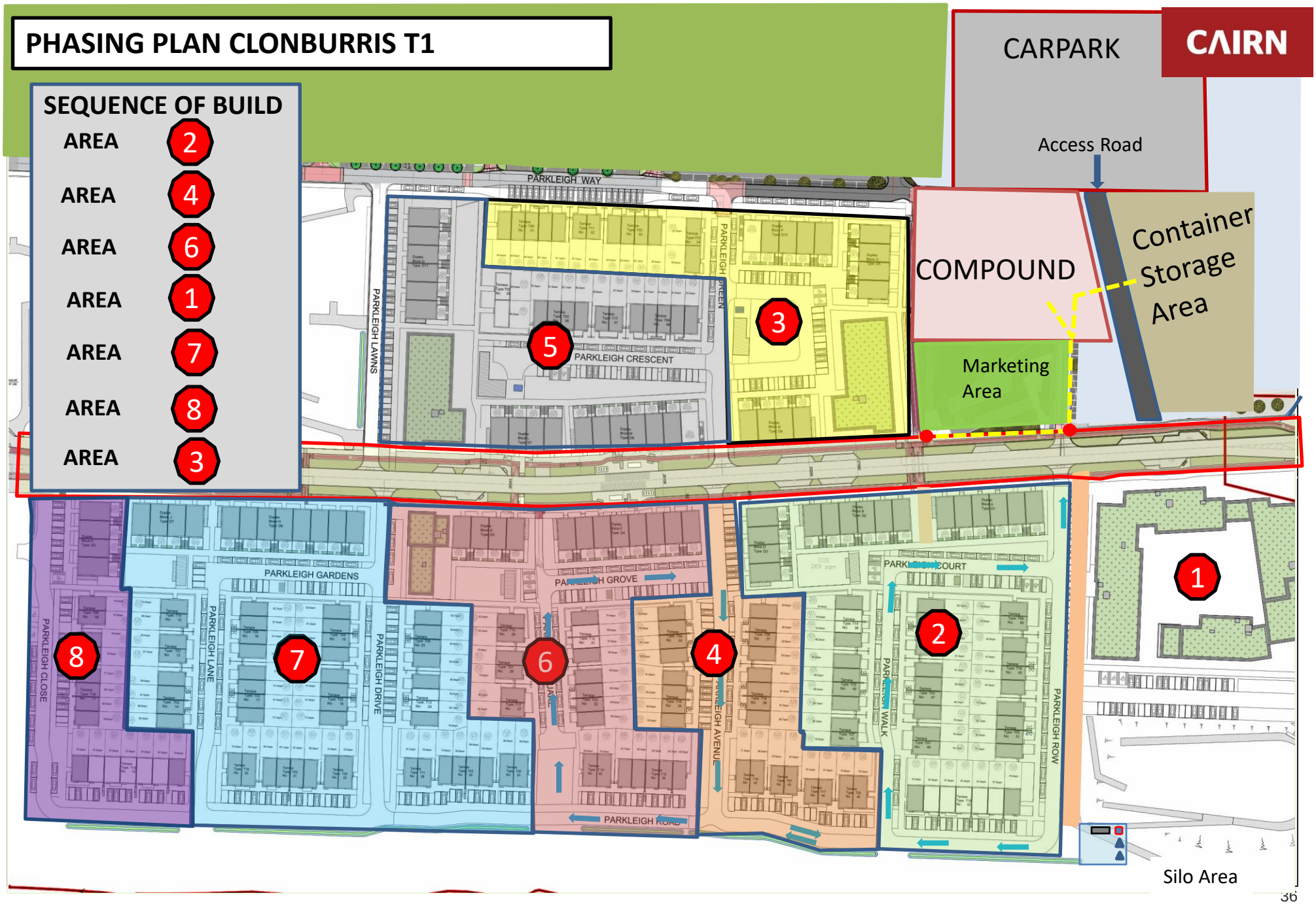
AREA 6

AREA 1

AREA 7

AREA 8

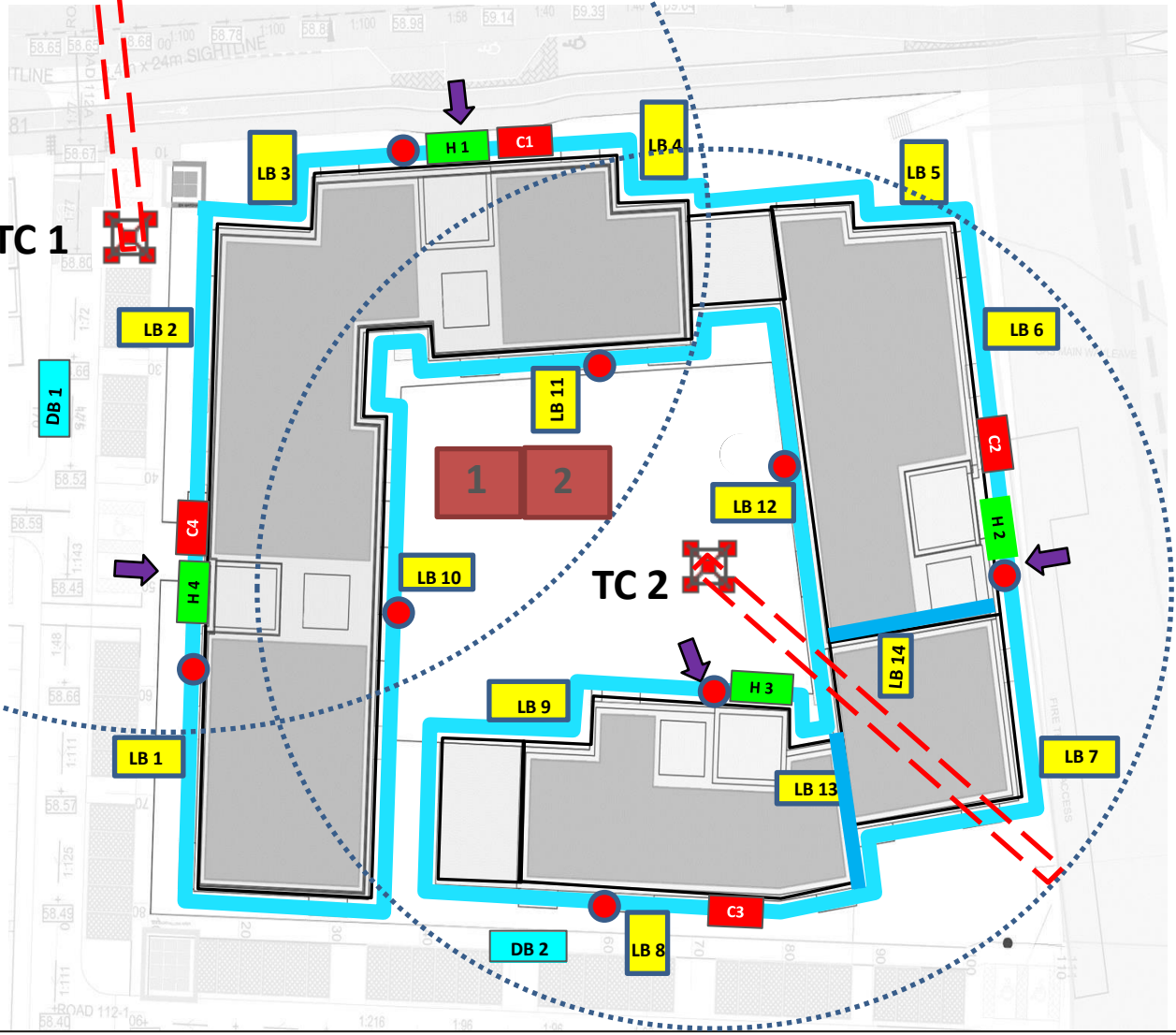
AREA 3



CLONBURRIS T1

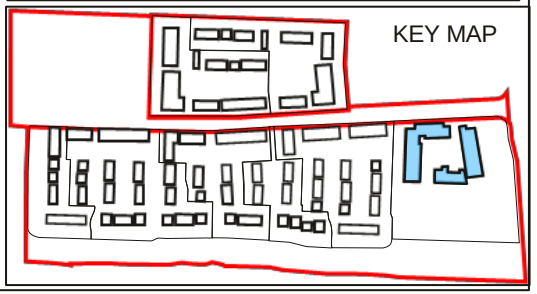
LOGISTICS PLAN

PROPOSED LOGISTIC LAYOUT – BLOCK 1

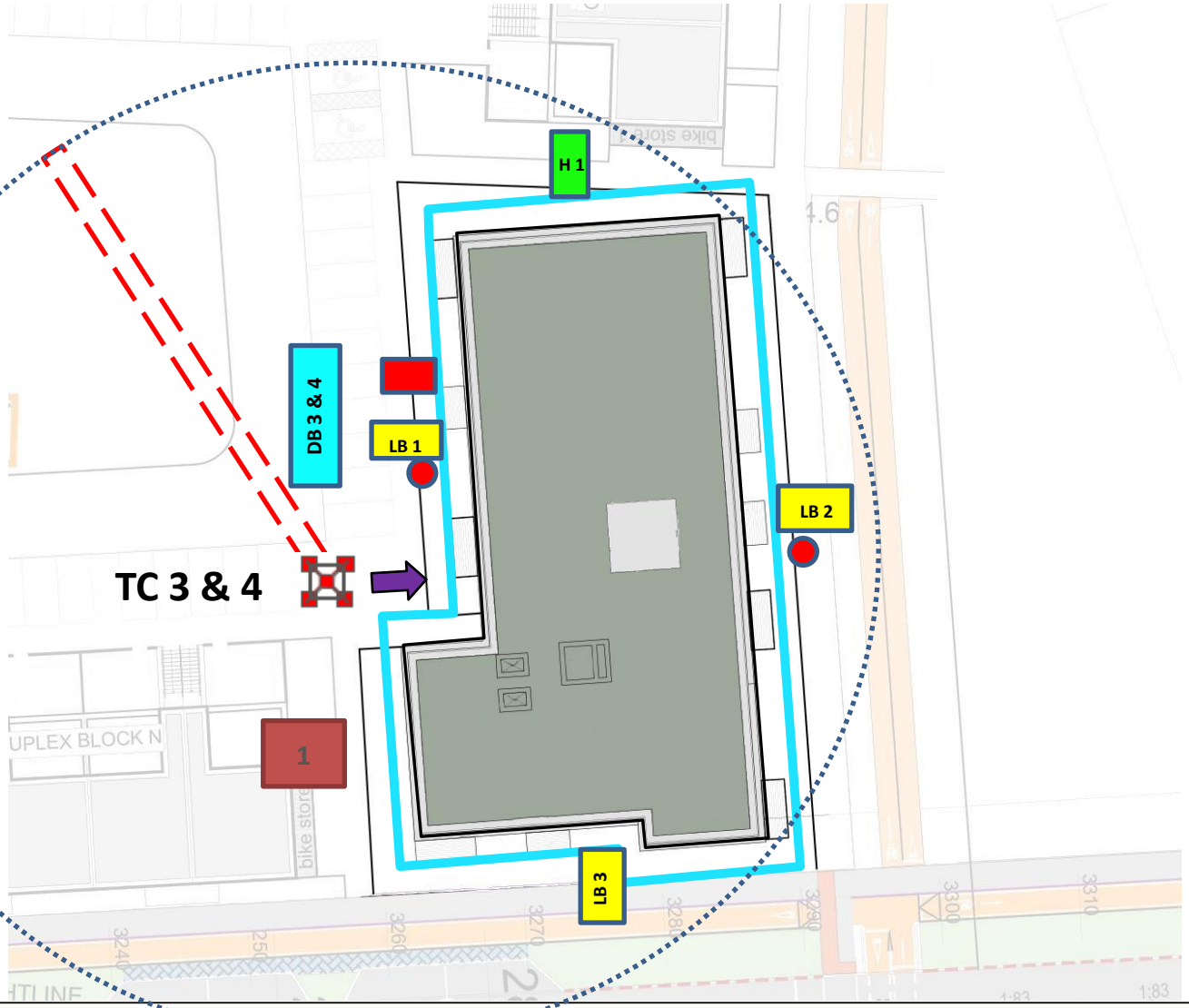


Legend:

- Stair Access to Scaffold
- LB – Loading Bay – Facade Works
- H – Hoist – At Core Windows for Loading Out Internal Finishes Materials
- C – Cantideck – Loading of Pods, Windows, SFS, Internal Part. Materials
- DB – Delivery Bay
- Tower Crane 1 [JIB 60m]
- Tower Crane 2 [JIB 45m]
- Outline of Scaffold
- 1 – Rebar/Precast Yard – Storage of Rebar and Precast
- 2 – Silo/Brick Storage – Secondary to Main Compound Area
- Pedestrian Access



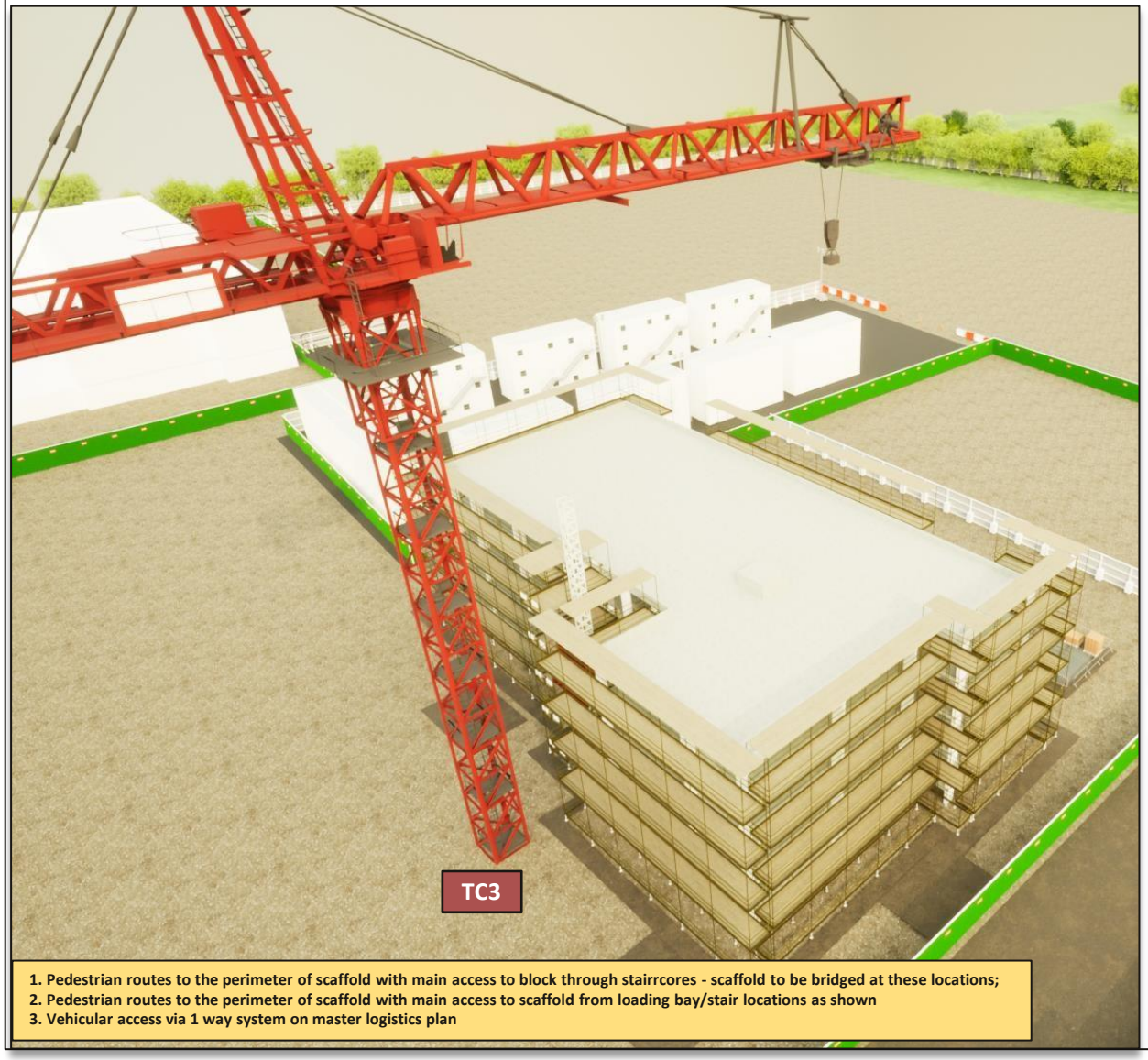
PROPOSED LOGISTIC LAYOUT – BLOCK 2 & 3



Legend:

- Stair Access to Scaffold
- LB — Loading Bays – Facade Works
- H — Hoist – At AOV windows for Loading Out Internal Finishes Materials
- C — Cantideck – Loading of Pods, Windows, SFS, Internal Part. Materials
- DB — Delivery Bay
- Tower Crane 3 & 4 [JIB 40m]
- Outline of Scaffold
- 1 — Rebar/Precast Yard – Storage of Rebar and Precast
- Pedestrian Access

3D VIEWS – BLOCK 2



1. Pedestrian routes to the perimeter of scaffold with main access to block through stairrcores - scaffold to be bridged at these locations;
2. Pedestrian routes to the perimeter of scaffold with main access to scaffold from loading bay/stair locations as shown
3. Vehicular access via 1 way system on master logistics plan

DELIVERY BAY AREA

STORAGE AREA & SILO

LOADING BAY / MATERIALS HOIST

3D VIEWS – BLOCK 3

APPENDIX 4

OUTLINE LANDSCAPE & MAINTENANCE SPECIFICATIONS REPORT

OUTLINE LANDSCAPE & MAINTENANCE SPECIFICATIONS

Clonburris 1A

for

Cairn Homes Properties Ltd

November 2021

murray & associates
landscape architecture

www.murray-associates.com

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APPENDIX A

OUTLINE LANDSCAPE & MAINTENANCE SPECIFICATION

Contents:

1. Introduction

The purpose of this Landscape Management Plan is to provide guidance and specifications for the maintenance requirements of the landscape elements of the proposed development of Tully Park. This will cover all of the landscape typologies, both existing (hedgerows and mature trees) and proposed (trees, shrubs, hedging, grass, bulbs, etc.) on-site to ensure that all maintenance operations required for the efficient and effective management of the landscape are characterised and defined. The plan will provide a set of measurable performance standards that can be applied to evaluate landscape maintenance works carried out on the site.

This specification is based on minimising inputs of chemical herbicide and fertiliser for the implementation and management of the landscape works.

In preparing the landscape proposals, and this document, reference has been made to the following publications, to ensure that the proposals are in accordance with the relevant policies:

- *South Dublin Guidelines Taking in Charge of Public Open Space*
- *South Dublin County Council – Living With Trees 2015-2020*
- *Clonburris SDZ Planning Scheme*
- *Clonburris SDZ - Parks and Landscape Strategy*

2. Nature of Site

The Clonburris area and environs, in which the proposed development is set, has a mix of landscape typologies, including areas of scrubland and agricultural land.

It should be noted that, at present, much of the agricultural lands are disused and fallow, and this is likely to continue in the short term, including the lack of management of the hedgerows adjacent to the fields. The coming years are likely to bring significant change to the landscape as a whole, in accordance with the planning scheme. It should also be noted that there will be significant construction works on-site, with the attendant traffic using the roads, so all trees will be protected from potential damage by strict conditions in contracts that will ensure trees are not damaged in the construction process.

Landscape works proposed include extensive planting: specimen trees, shrubs, meadow and grassland, woodland, bulb and amenity grass areas.

Hard landscape works include feature paving, tree grilles, lighting and drainage. There will also be asphalt footpaths, paved steps, cycle lanes and road carriageway areas to be maintained.

3. Timeframe & Programming

The proposed park, including the landscape works, will be managed and maintained by the applicant until they are deemed suitable for Taking in Charge by South Dublin Co. Council. The applicant will maintain the park from date of completion of planting works (subject to approvals, agreements, etc. with all parties involved).

A detailed programme of works will be agreed with the Contractor prior to maintenance operations commencing, in each year. A sample maintenance programme is contained in Section 8.

4. Aims & Objectives

4.1 General

Fundamentally, the aim of landscape management is to ensure that all external areas are kept in good condition, as perceived and expected by the users. The Landscape Management Plan aims to provide a manual for the maintenance requirements of the park and adjacent landscapes. It will define and specify all necessary operations for the efficient and effective management of the landscape in order to ensure that each area is appropriately and sustainably maintained.

4.2 Horticultural / Sylvicultural Objectives

Horticultural and sylvicultural aims relate to the appropriate management operations for all plants and trees. The specific horticultural objectives are as follows:

- All plants to be maintained so that they remain in good health;
- All plants to have a habit and form consistent with species type and aesthetic objectives;
- Specialist operations for particular types of plants where necessary to achieve the aesthetic or functional objectives, e.g. pruning, dead-heading of flowering plants, formative clipping, etc. are included in the plan;
- Areas surrounding plants are to be maintained in such a way that potential threats to plant viability are addressed, e.g. weed control (particularly invasive and noxious weeds);
- Recognition of planting (including trees) at the end of its viable life is important to ensure that it is removed and replaced in a timely manner to avoid eyesores.

4.3 Performance Standards

Performance Standards can be defined as follows in the context of this plan: *written specifications of the conditions that will exist when satisfactory works are completed.* Performance standards will be measurable against the specified outcomes required for a particular operation, within a particular area. Performance standards must be upheld by the contractor at all times and will be monitored on an ongoing basis through regular site inspections.

Performance standards are specified in section 5 of this document. All required maintenance operations are defined and detailed to provide both specifications for the landscape contractor to follow and a set of measurable outcomes to appraise and value the contractor's performance against the requirements of the contract.

4.4 Environmental Considerations

Responsible and sustainable landscape management is about balancing the performance standards with the required standard of maintenance. The following principles have guided the development of the specification:

- Minimise use of non-renewable resources
    - e.g. reduce lawn areas to reduce consumption of fossil fuels, avoid use of chemical inputs such as pesticides and synthetic fertilisers.
- SuDS
    - Sustainable Drainage Systems have been included in the design, including filter drains, swales and bioswales in landscape areas. Tree pits with drainage gravel or structural soil materials for soakaway are also included.
- Utilise low input systems
    - Includes measures such as: mulching instead of herbicide use; encourage rough-cut or meadow grass where appropriate to avoid regular mowing.
- On-site green waste recycling / mulching / composting
    - Avoids excessive transportation and use of landfill
- Use of environmentally friendly products where possible
    - e.g. biodegradable tree ties, timber stakes, reusable elements, recycled rabbit guards, etc.
- Avoid use of plastics in specifications, where possible
- Pollinator-Friendly Management Practices
    - to encourage bee populations by ensuring flowering plants and grasslands are optimised, hedgerows are maintained and potential nesting sites undisturbed
- Control of Invasive Species
    - It is an objective of this plan to control and prevent the spread of invasive species, and in particular, Giant Hogweed, in order to protect the biodiversity of the landscape.
- Protection of site resources
    - Appropriate maintenance will result in the protection of existing trees, vegetation and soil resource of the site.

5. Specifications for Landscape Maintenance Operations

5.1 Grass and Lawn Areas

(i) General

At all times grass to look lush, vigorous and of fine quality with a minimum weed content, and a minimum variation in height of the sward during the growing season. Cutting should take place on a regular basis. Grass cutting areas shall be cleared of litter and rubbish prior to grass-cutting taking place.

No ruts are to be caused due to poor ground conditions. During periods of poor weather, no grass is to remain lodged following cutting. In periods of prolonged wet weather or where ground is waterlogged, consult with Property Manager prior to engaging in grass cutting operations.

Noxious and competitive weeds such as Ragwort, Gorse, Thistle, Dock, Nettle, Briar, Horsetail and Dandelion shall not be allowed to establish in any grass areas.

(ii) Amenity Lawn Areas

Criterion	Performance Standards
Aesthetic / functional requirements	Amenity lawn areas are those grass areas which will be maintained for general access and amenity purposes, to create a lawn which is neat, healthy, close-cut and with minimal weed content.
Permitted mower type	Cylinder mower, Rotary mower, ride-on mower, tractor-pulled gang mower (note: subject to ground conditions; hand-mowing required in designated areas and/or where ground is soft)
Height of Cut	Minimum 20mm; maximum permissible height 50mm. At the commencement of the contract, following flowering cycle of seasonal bulbs or if grass cutting has been forestalled due to poor ground conditions resulting in the grass growing above the maximum permissible height, it shall be cut to 50mm on the initial cut, then to 25mm on the subsequent cut. Such initial long grass shall be collected and removed off site.
Frequency	Mow weekly during spring; summer and autumn; only when necessary in winter. Mowing is not permitted when ground conditions are very soft, waterlogged or frozen, or during spells of cold, drying winds or when the grass is frosty or wet.

Finish	Even finish. Vary direction/pattern of cutting every 3 months. Grass shall be trimmed from around the bases of walls and fences, back of footpaths and kerbs, litter bins, sluice valves and hydrant markers, trees, poles, signage and public lighting columns, etc., and this interface between grass and walls, fences, etc., as noted above, kept in a neat and tidy condition. This trimming shall be deemed to be included for at every grass-cutting. The Landscape Contractor is bound to comply with this instruction and herbicide application is not permitted to achieve this.
Clippings	To be gathered at every cut and disposed of in designated area or off-site. Box to be emptied regularly during cutting to avoid clumps being left on the grass.
Fertiliser	In mid-spring (late March to April), use a proprietary organic lawn fertiliser at the manufacturer's recommended rates, to be approved by the ER. Apply fertilisers when the soil is moist, or when rain is expected. If grass loses vigour and freshness between late spring and late summer (often May to August), repeat the application of lawn fertiliser.
Weed Control	Minimum weed content permitted i.e.: (1) <5% of species content; (2) <10% of total grass area. Mechanical weed control only is permitted, no synthetic herbicides permitted. Contractor to provide method statement. Noxious or invasive weeds to be treated in May, June and August and prevented from flowering.

Scarifying	Scarifying to be carried out to keep levels of thatch (old grass stems, dead moss and other debris) at an acceptable level (i.e. less than 1cm deep). To remove thatch, rake vigorously but carefully with a power-scarifier. Recommended to be carried out in autumn only.
Aeration	Spiking with holes 10-15cm (4-6in) apart and deep to be carried out once per annum.
Rolling	Amenity grass areas should be reasonably even, with no variations greater than 25mm over a 1m straight edge. In September, to repair any uneven areas of the lawn, use an edging iron to slice through the turf and roll it back. Fork over the underlying ground and add or remove soil as needed. Replace the turf, pressing the edges together, roll with lawn roller (nominally 100kg, subject to site conditions) and water thoroughly.
Edging	Lawn to be edged by hand or edging machine regularly to leave an even, straight edge and to ensure that the grass or soil does not protrude over the edge by more than 25mm.
Over-seeding	After moss or weeds have been removed, or where grass is growing sparsely, over-seeding may be necessary. (Early autumn or mid-spring). Break up the surface with a fork and rake to leave a fine, even tilth; Sow grass seed at half the recommended rate (usually 10-15g/sq.m); lightly rake to incorporate the seed into the surface; water if weather remains dry for 2-3 days following seeding.

Watering	Watering to be carried out when required. Ensure that the water reaches a depth of 10cm (4in) after each watering. Rate: max. 20 litres per square metre.

Indicators of under-performance:

Excessive weeds or weeds such as clover or moss indicate poor sward health; bare patches may indicate scalping or lack of vigour; yellowing or browning of sward may indicate drying out, under-feeding; thatch build-up greater than 1cm depth; rutting of the surface, wheel marks or poor drainage may indicate compaction of soil caused by mowing in wet weather or use of unsuitable mower type.

(iii) Rough Cut Grass Areas

Criterion	**Performance Standards**
Aesthetic / functional requirements	Rough cut grass areas are those grass areas which will not usually be accessed by users and will usually be in low priority areas, or in the background. These areas are to be maintained to create a grass area which is healthy and with minimal weed content, with grass allowed to grow relatively long between infrequent and regular cuts.
Permitted mower type	Strimmer, Rotary mower, ride-on mower, tractor-pulled gang mower (note: subject to ground conditions; strimming required in designated areas, areas of slope gradient greater than 1:3 and/or where ground is soft)
Height of Cut	Grass areas shall be cut to a height of c. 75mm
Frequency	5no. times during the growing season, at regular intervals of approximately 6 weeks
Finish	Rough cut shall mean grass of minimum height 75mm, with informal appearance
Clippings	To be gathered at every cut and disposed of in designated area or off-site.
Fertiliser	In mid-spring (late March to April), use a proprietary organic lawn fertiliser at the manufacturer's recommended rates, to be approved by the ER. Apply fertilisers when the soil is moist, or when rain is expected.
Weed Control	Minimum weed content permitted i.e.: (1) <5% of species content; (2) <15% of total grass area. Mechanical weed control only is permitted, no synthetic herbicides permitted. Contractor to provide method statement. Noxious or invasive weeds to be treated in May, June and August and prevented from flowering.
Edging	Rough-cut grass areas to be edged by hand or edging machine regularly to leave an even, straight edge and to ensure that the grass or soil does not protrude over the edge by more than 25mm

Indicators of under-performance:

Excessive weeds or occurrence of noxious or invasive weeds unacceptable; rutting of the surface, wheel marks or poor drainage

may indicate compaction of soil caused by mowing in wet weather or use of unsuitable mower type.

(iv) Meadow Grass / Wildflower Areas

Criterion	Performance Standards
Aesthetic / functional requirements	Meadow grass or wildflower areas are those areas which will not usually be accessed by users and will usually be in low priority areas, or kept for biodiversity reasons. These areas are to be maintained to create a meadow area which is healthy and with minimal noxious or invasive weed content, with grass allowed to grow relatively long between infrequent and regular cuts.
Permitted mower type	Strimmer, Rotary mower, ride-on mower, tractor-pulled gang mower (note: subject to ground conditions; strimming required in designated areas, areas of slope gradient greater than 1:3 and/or where ground is soft)
Height of Cut	Meadow grass areas shall be cut to a height of c. 75mm
Frequency	3no. times during the growing season, in May, July and September
Finish	Meadow
Clippings	To be gathered at every cut and disposed of in designated area or off-site
Weed Control	Mechanical weed control only, no synthetic herbicides permitted. Contractor to provide method statement. Noxious or invasive weeds to be treated in May, June and August and prevented from flowering.
Edging	Meadow grass areas to be edged by hand or edging machine regularly to leave an even, straight edge and to ensure that the grass or soil does not protrude over the edge by more than 25mm

Indicators of under-performance:

Occurrence of noxious or invasive weeds unacceptable.

5.2 Shrub Planting

(i) Groundcover / Mixed Borders / Mass Shrub Plantation

Criterion	Performance Standards
Aesthetic / functional requirements	Shrub planting areas shall be kept clean at all times, with an even finish. Plants to have a healthy, lush appearance, typical for plant species and time of year.

Weed Control	Weeds shall not be allowed to cover more than 5% of the ground at any one time, neither shall weeds exceed 50mm in height. Mechanical weed control or weed suppression by blanket or mulch is permitted, no synthetic herbicides permitted. Contractor to provide method statement. Noxious or invasive weeds to be treated in May, June and August and prevented from flowering.
Bark Mulch	Required – min. 50mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with general-purpose organic fertiliser in February, applied at the manufacturers' recommended rates. (Rake back mulch prior to application.)
Pruning / Clipping	Pruning once per annum to maintain the typical size and form of the plant, for sightlines and for plant health; all clippings to be gathered at every pruning and disposed of in designated area or off-site.
Edging	Beds to be edged by hand or edging machine twice per annum to leave an even, straight edge. Shrubs or soil not to protrude past the edge by more than 50mm.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)
Dead-heading	Not required.

(ii) Specimen Shrubs

Criterion	**Performance Standards**
Aesthetic / functional requirements	Specimen shrub planting areas shall be kept clean at all times, with an even finish. Shrubs to have a healthy, lush appearance at all times, typical for plant species and time of year.
Weed Control	No weeds permitted in the shrub areas. Mechanical weed control or weed suppression by blanket or mulch is permitted, no synthetic herbicides permitted. Contractor to provide method statement. Noxious or invasive weeds to be treated in May, June and August and prevented from flowering.
Bark Mulch	Required – 75mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with general-purpose organic fertiliser in February, applied at the manufacturers' recommended rates. (Rake back mulch prior to application.)
Pruning / Clipping	Regular pruning as necessary to maintain the typical size, habit and form of the plant, for health and to maintain best appearance; all clippings to be gathered at every pruning and disposed of in designated area or off-site.
Watering	Watering required to ensure consistent availability of water to plant during periods of drought (i.e. after more than 5 days) - minimum

(iii) Hedge – Free Growing

Criterion	Performance Standards
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Relatively informal habit acceptable.
Weed Control	No weeds permitted in the hedge area. Mechanical weed control or weed suppression by blanket or mulch is permitted, no synthetic herbicides permitted. Contractor to provide method statement. Noxious or invasive weeds to be treated in May, June and August and prevented from flowering.
Bark Mulch	Required – 50mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with general-purpose organic fertiliser in February, applied at the manufacturers' recommended rates. (Rake back mulch prior to application.)
Pruning / Clipping	Pruning once per annum as necessary to maintain the required height and width, and prevent "leggy" growth; all clippings to be gathered at every pruning and disposed of in designated area or off-site. Laying may be required for Hawthorn and Blackthorn hedges if hedge growth becomes thin at the base.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)

(iv) Hedge – Pruned (including topiary)

Criterion	Performance Standards
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Formal habit to be maintained throughout year. Formal habit of hedge to be defined and maintained at all times.
Weed Control	No weeds permitted in the hedge area. Mechanical weed control or weed suppression by blanket or mulch is permitted, no synthetic herbicides permitted. Contractor to provide method statement. Noxious or invasive weeds to be treated in May, June and August and prevented from flowering.
Bark Mulch	Required – 75mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with general-purpose organic fertiliser in February, applied at the manufacturers' recommended rates. (Rake back mulch prior to application.)
Pruning / Clipping	Regular pruning as necessary to maintain the required height and width of the plant, to maintain best appearance; all clippings to be gathered at every pruning and disposed of in designated area or off-site.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)

(v) Native Shrub Plantation

Criterion	Performance Standards
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Relatively informal habit acceptable.
Weed Control	Weed free circle of 250mm radius to be maintained around each plant until established. Mechanical weed control or weed suppression by blanket or mulch is permitted, no synthetic herbicides permitted. Contractor to provide method statement. Noxious or invasive weeds to be treated in May, June and August and prevented from flowering.
Bark Mulch	Required for high prominence areas; recommended for medium areas – 50mm deep; to be kept topped up at all times.
Fertiliser	Not required.
Pruning / Clipping	Pruning once per annum for shrubs such as Dogwood and Guelder Rose or to control height and spread when necessary.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)

(vi) Scrub - naturally occurring

No maintenance operations required, except to ensure that any edge plants are kept cut back at least 1m from road edges and tidy where visible or prominent.

5.3 Trees & Woodlands

(i) General:

- Canopies overhanging a pedestrian path to be maintained to 2.2m and canopies overhanging vehicular access to 4m.
- Limb damage caused by wind, passing traffic, etc. to be pruned resulting in a clean even wound.
- No signs, security boxes, etc. to be attached to trees.
- Surface tree roots not to cause a trip or mowing hazard. In grass areas, top up soil over roots and re-seed.
- Raised paviors or cracked/bulging walls due to root growth are to be reported to the Contract Administrator.
- Exposed roots from construction works to be kept moist by wrapping damp hessian around roots until soil is backfilled and then apply a one off generous application of water. Root damage to be pruned resulting in a clean even wound prior to backfilling / topsoiling.
- Control of ivy and suckering on the trunks of trees within falling distance of activity
- Informal monitoring of trees for change of condition or evidence of a fungal fruiting body.

(ii) Specimen, Solitary Trees

All trees to be maintained in accordance with requirements for species and habit to be maintained in accordance typical form for tree. Tree trunk will be kept visible for defect inspection with control of ivy and removal of suckering. Mulch 1m diameter will be maintained around all individual trees within grassed areas. Stakes and ties to be retained for a maximum period of 3 years, with tie loosened annually and both stake and tie to be removed after 3 year period. All nursery marking, bamboo and labels to be removed off all trees. Tree grilles in hard surface areas to be maintained weed free.

Any visible change in condition to be reported.

(iii) Tree Groups, Woodland, Grid, Hedgerow Trees

Such areas shall be kept free of noxious and pernicious weeds at all times. Mulch or spray rings 1m diameter will be maintained along group perimeter and around all plants in young woodland areas where canopy cover has not been achieved. Established woodland areas shall not be treated with herbicide – mechanical control only where necessary for the removal of noxious and invasive weeds including Ragwort, Gorse, Thistle, and Dock, hogweed, bramble and any others. Japanese Knotweed, Giant Hogweed or any invasive species shall not be allowed to establish in any woodland areas. Bramble should not exceed 20% of ground cover of any woodland. Ivy shall be controlled and shall not be allowed to establish itself on trees along the perimeter and within falling distance of activity within woodland areas. Understorey (excluding saplings) not to exceed 1m in height in order to retain visibility for user safety in areas of activity. Tree numbers not to exceed 4 per sq.m of trees with a girth of less than 250mm and numbers not to exceed 2 per sq.m for trees with a girth of over 300mm. Fallen or felled trees in woodland areas to be maintained on-site where permissible, for reasons of biodiversity and ecology which contribute to the overall health of the woodland.

5.4 Herbaceous Perennial Planting (including Ferns and Ivy)

(i) Bulbs

Watering: Ensure that bulbs have adequate water throughout growth period, up until cutting back occurs (see below).

Fertiliser: Annual feeding with general-purpose organic fertiliser in February, applied at the manufacturers' recommended rates. (Rake back mulch prior to application.)

Cutting Back: Cut back dead foliage to ground level six weeks after the end of flowering (or earlier if foliage is yellow and straw-like). Do not tie or knot the leaves.

Deadheading:*High prominence areas only*. Deadhead flowers by cutting back spent flowers to the base of the flower stalk.

Note: Herbicides may not be used in or around bulb areas.

5.5 Hard Landscape Surfaces & Signage

Hard Standing including roads, paved areas, pavements, and kerb-lines - shall be kept clean at all times, with no growth of weeds and without moss infestation. Roads and kerb lines shall be kept free of litter and build up of grit and debris through the implementation of a regular sweeping program.

(i) Weed Control

All paved areas such as footpaths, kerb lines, feature paving, gravel areas, etc., throughout the site are to be maintained weed-, algae- and moss-free free at all times. Mechanical weed control only is permitted, no synthetic herbicides permitted. Contractor to provide method statement. Noxious or invasive weeds to be treated in May, June and August and prevented from flowering.

(ii) Sweeping

Sweeping shall mean sweeping of feature paving areas, footpaths and kerb lines along all public roads (edge of road) and removal of all grit, rubbish and leaves from these areas. Soil wash from beds on to paved areas should also be swept. This work to be executed fortnightly.

Note: Particular attention is required during the period of October/ November to deal with leaf fall.

(iii) Cleaning

Cleaning shall mean the removal of paper, plastic bags and all other rubbish. Cleaning shall be carried out as follows:

- Fine cut grass areas, all paved and hard standing areas, footpaths and kerb lines: This work to be executed prior to grass cutting on each grass cutting visit. Cleaning shall be carried out 36no. times per annum, including winter.
- Rough cut grass areas: prior to each scheduled grass cut, minimum 8no. times per annum.
- Tree groups, boundary tree areas, shrub maintenance areas, all other areas: 8no. times per annum.

Cleaning shall also include the removal of grit and rubbish from road gullies, drains, Aco drains and collapsible bollards twice per year.

(iv) Signage

All signs are to be cleaned to a high standard 4 times per year.

(v) Gullies

All roadside gullies are to be inspected monthly and if full or blocked, must be cleared out as appropriate.

5.6 Natural Areas

No maintenance operations are permitted within areas designated as natural zones. Neither is dumping of any arisings, storage of materials or any other related activity.

5.7 Vacant Plot Areas/Rough Ground Areas

These areas shall be kept free of noxious, invasive and other pernicious weeds, including ragwort, thistle, dock, gorse, hogweed, bramble and any invasive species at all times.

5.8 Weed Control

5.8.1 General

No herbicidal chemicals are to be utilised on the site, with non-chemical means of weed control to be used in all areas (mulching,

mechanical control, hand weeding, etc. as feasible and as suited to the environment).

Landscape Maintenance Contractor to submit a method statement for weed control.

5.8.2 Invasive Weeds

Invasive weeds of any kind, most particularly Japanese Knotweed, Winter Heliotrope, Giant Hogweed and Himalayan Balsam shall not be allowed to establish in any area of the site. It will be the responsibility of the contractor to be able to identify same and control at first sign of emergence. Treatment for all except Japanese Knotweed to consist of removal of weed by mechanical means.

In certain limited circumstances, weed control by herbicide may be unavoidable or represent the best course of action. Such chemicals may only be used in exceptional circumstances on a once-off basis and may not be used in the general maintenance operations. Any such pesticide application must be approved by a Pesticide Advisor registered with the Dept. of Agriculture. Contractor may be requested to furnish proof that such advice has been received.

Recommended Treatment for Giant Hogweed

Giant Hogweed is a dangerous invasive weed. To prevent the spread of this dangerous and invasive weed, a survey of the site should be carried out in spring and summer each year to identify if Giant Hogweed is present. When identified, Giant Hogweed should immediately be treated with an approved herbicide, as advised and approved by a Pesticide Advisor registered with the Dept. of Agriculture. The herbicide is to be sprayed onto the plant or liberally applied using a glove or weed wiper. The plant should be left in-situ and fenced off from the public until completely dead and removed carefully when entirely withered. If the first treatment does not work, a second treatment should be applied. Following removal, the infected site must be monitored on a weekly basis for signs of re-emergence. Re-emergent plants should be treated in the same way, no later than October in any given year.

Note that this plant is dangerous and contact with the sap of the plant is to be avoided as it can cause dangerous blistering and skin disorders. All operatives must wear appropriate PPE and be trained on working with dangerous plants.

6. Duties of Contractor

The contractor shall be required to complete a site specific maintenance programme and attend site in accordance with the program agreed with the Contract Administrator. During the course of the contract the contractor shall supply after each visit to site a record of attendance using site attendance record sheets. These should be signed by the contractor's site foreman and manager and retained in a file for use as an appendix to the payment application. Failure to complete works on the prescribed date, may result in determination of the contract, except where an adjustment to program has been agreed in advance with the Contract Administrator.

At the end of every month the contract manager shall complete the monthly report sheets to clarify the completion of works for the particular month. Items of work not completed shall be noted and a timeframe for their completion indicated. The forestalled works must be attended to at the first opportunity in the month following the submission of the monthly report sheet, unless exceptional circumstances or bad weather prevent the work from being

completed. In this case the work shall be attended to, as soon as is practicable, and by agreement with the Contract Administrator.

Monthly program sheets (See Section 8) shall be signed by the contractor's manager and forwarded to the Contract Administrator for verification. Upon verification the document will be returned to the contractor and shall be attached at the time of payment application. If necessary, a site visit will be undertaken with the contractor to verify completion of works. The completed monthly report sheets shall be used as the basis for payment.

In relation to Health and Safety, the landscape contractor will be required to maintain a safety file and this must be made available for inspection upon request. All possible precautions and risk management strategies must be in place in relation to safety of employees, personal protective equipment, use and maintenance of equipment/vehicles, signage when works are underway, procedures for closing off areas while works are in progress, traffic management, etc. as required. Any incident or accident must be reported to the Contract Administrator and recorded in the safety file.

7. Inspections by Employer

As part of the management of this contract, eight critical inspections per annum shall be arranged with the Contract Administrator in attendance. These may not be notified to the landscape contractor. The Contract Administrator will produce a report of the site visit, commenting on the appearance of the site and examining each aspect of work in detail. The Landscape Architect may also direct resources to a certain area of work, in agreement with the Property Manager. It is at such dates that standards will be reviewed, problems arising rectified and issues of dispute arising from the concerned parties will be settled.

A preliminary schedule of critical inspection dates is as follows:

1. February
2. March
3. April
4. May
5. June
6. July
7. August
8. September
9. October
10. December

8. Monthly Maintenance Operations Schedule

The following tables give an indicative outline of the required monthly maintenance operations, based on the specification outlined above.

Maintenance Program – January

Item	Description
1.1	Yearly maintenance Shrub and tree planting Tree pruning Hedge cutting
1.2	Weed free circles around trees/whips Check tree stakes and ties
1.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Road Gulley cleaning

Maintenance Program - February

Item	Description
2.1	Yearly maintenance Shrub and tree planting Tree pruning Check tree stakes and ties
2.2	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Road Gulley cleaning

Maintenance Program - March

Item	Description
3.1	Yearly maintenance Shrub and tree planting Shrub Pruning Tree pruning Hedge cutting Hedgerow cutting Hand Weeding in shrub areas Weed free circles around trees/whips
3.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Grass trimming Grass edging Weed control to rough cut/rough ground areas
3.3	Grass reinstatement
3.4	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Clean all signs

Maintenance Program - April

Item	Description
4.1	Yearly maintenance Shrub and tree planting Shrub Pruning Hedgerow cutting Weed control to shrub/woodland areas Hand Weeding in shrub areas Weed free circles around trees/whips Apply fertiliser
4.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming Grass edging Weed/Moss Control Fertiliser Application
4.3	Grassed areas – Rough Cutting Weed control to rough cut/rough ground areas Grass reinstatement
4.4	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas

Maintenance Program - May

Item	Description
5.1	Yearly maintenance Shrub and tree planting Hedge cutting Weed control to shrub/woodland areas Hand Weeding in shrub areas Apply fertiliser Watering
5.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming 1 Grass trimming 2 Weed/Moss Control Fertiliser Application
5.3	Grassed areas – Rough Cutting Weed control to rough cut/rough ground areas
5.4	Grass reinstatement
5.5	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Road/Paved area sweep 1
5.6	Watering

Maintenance Program - June

Item	Description
6.1	Yearly maintenance Shrub and tree planting Tree pruning Weed control to shrub/woodland areas Hand Weeding in shrub areas Weed free circles around trees/whips Apply fertiliser Watering
6.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming Weed/Moss Control
6.3	Grassed areas – Rough Cutting Weed control to rough cut/rough ground areas
6.4	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Weed/Moss control to hard landscape areas Road/Paved area sweep 1 Clean all signs
6.5	Watering of all trees & shrubs

Maintenance Program - July

Item	Description
7.1	Yearly maintenance - Shrub and tree planting Hand Weeding in shrub areas Watering
7.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming 1 Grass trimming 2 Grass edging
7.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3
7.4	Watering of all trees & shrubs

Maintenance Program - August

Item	Description
8.1	Yearly maintenance Shrub and tree planting Shrub Pruning Hand Weeding in shrub areas Weed free circles around trees/whips Watering
8.2	Grassed areas – Fine Cutting Cut 1 Cut 2 Cut 3 Cut 4 Grass trimming
8.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1
8.4	Watering of all trees & shrubs

Maintenance Program - September

Item	Description
9.1	Yearly maintenance Shrub and tree planting
	Shrub Pruning
	Hedge cutting
	Weed control to shrub/woodland areas
	Hand Weeding in shrub areas
	Weed free circles around trees/whips
	Apply fertiliser
	Watering
9.2	Grassed areas – Fine Cutting
	Cut 1
	Cut 2
	Cut 3
	Cut 4
	Grass trimming 1 as per clause 3.3 (c)
	Grass trimming 2 as per clause 3.3 (c)
	Weed/Moss Control
	Fertiliser Application
9.2	Grassed areas – Rough Cutting
	Weed control to rough cut/rough ground areas
9.4	Grass reinstatement
9.5	Hard Standing Maintenance and Cleaning
	Litter pick 1
	Litter pick 2
	Litter pick 3
	Weed/Moss control to hard landscape areas
	Road/Paved area sweep 1
	Road Gulley cleaning
	Clean all signs
9.6	Watering of all trees & shrubs
9.7	Attenuation Pond - cleaning, removal of detritus

Maintenance Program - October

Item	Description
10.1	Yearly maintenance Shrub and tree planting
	Tree pruning
	Hedge cutting
	Hedgerow cutting
	Weed control to shrub/woodland areas
	Hand Weeding in shrub areas
	Weed free circles around trees/whips
	Apply fertiliser
10.2	Grassed areas – Fine Cutting
	Cut 1
	Cut 2
	Grass trimming
	Grass edging
10.3	Grassed areas – Rough Cutting
	Weed control to rough cut/rough ground areas
10.4	Grass reinstatement
10.5	Hard Standing Maintenance and Cleaning
	Litter pick 1
	Litter pick 2
	Litter pick 3
	Weed/Moss control to hard landscape areas
	Road/Paved area sweep 1
	Road/Paved area sweep 2

Maintenance Program - November

Item	Description
11.1	Yearly maintenance Shrub and tree planting Hedgerow cutting Check tree stakes and ties
11.2	Grassed areas – Fine Cutting Cut 1 Cut 2
11.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Road/Paved area sweep 2 Road/Paved area sweep 3

Item	Description
12.1	Yearly maintenance Shrub and tree planting Tree pruning Check tree stakes and ties
12.2	Grassed areas – Fine Cutting Cut 1 Grass trimming as per clause 3.3 (c)
12.3	Hard Standing Maintenance and Cleaning Litter pick 1 Litter pick 2 Litter pick 3 Road/Paved area sweep 1 Clean all signs

Maintenance Program - December

OUTLINE LANDSCAPE SPECIFICATION

Specifications for Supply of Nursery Stock

Supply of nursery stock:

The nursery stock material will be delivered following consultation between the employer's representative, landscape Contractor and the selected nursery. It is intended to serve notice of delivery by means of phased orders at least two months prior to commencement of the dormant season in November of that year. Delivery will be at all times by means of covered vehicles, and all plant material will be clearly labelled. The source of origin must be from the selected nursery, as no other additional stock from other nurseries will be permitted without prior inspection and approval

Nursery stock:

All plant material shall be good quality nursery stock, free from fungal, bacterial or viral infection, aphids, red spider or other insect pests and any physical damage. It shall comply with the requirements of B.S. 3936: Parts 1-10: 1965 Specification for Nursery Stock, where applicable.

All plants shall have been nursery grown in accordance with good practice and shall be supplied through the normal channels of the wholesale nursery trade. They shall have the habit of growth that is normal for the species. Country of origin must be shown in all cases for species grown from seed.

Unless otherwise stated, the plant materials shall be supplied in accordance with the following codes where stated:

1+0 1 Year old seedling

1+1 1 Year old seedling lined out for 1 year

1+2 1 Year old seedling lined out for 2 years

1+1+1 1 Year old seedling lined out for 1 year, lifted and lined out for one further year

2+2 2 Year old seedling lined out for 2 years

0/1 1 Year old Hardwood cutting

0/2 2 Year old Hardwood cutting

2X Twice transplanted tree

3X Three times transplanted tree

4X Four times transplanted tree

P9 Containerised plant in 9cm pot

CG / c/g Containerised plant

gt. Girth

ht. Height

RB / r/bRootball

BR / b/rBareroot

MS Multi-stemmed

Ftd Feathered trees

Species:

All plants supplied shall be exactly true to name as shown in the plant schedules. Unless stipulated, varieties with variegated and/or coloured leaves will not be accepted, and any plant found to be of this type upon leafing out shall be replaced by the contractor at his/her own expense.

Bundles of plants shall be marked in conformity with B.S. 3936: Part 1: 1965 and B.S. 3936: part 4: 1966. The nursery supplier shall replace any plants which, on leafing out, are found not to conform to the labels. Definitions of all terms used are in accordance with the following British Standards: -

B.S. No. 3936: Part 1: 1992 entitled "Nursery Stock- Trees and Shrubs"

B.S. No. 3936: Part 4: 1984 entitled "Nursery Stock- Forest Trees"

B.S. No. 3936: 1992 entitled "Specification for Nursery Stock"

Tree and Shrub Specifications:

Trees shall have a sturdy, reasonably straight stem, and a well-defined straight and upright central leader, with branches growing out of the stem with reasonable symmetry. The crown and root systems shall be well formed. Roots shall be in reasonable balance with the crown and shall be conductive to successful transplantation. All trees shall be clearly labelled.

Root-Balled Trees

Trees shall have a clear stem from ground level to the lowest branch and a total height as appropriate to the girth size, and the minimum girth as specified shall be measured at 1.0m above ground level– all as required under BS3936: Part 1. Trees shall be well furnished with lateral fibrous roots, and shall be lifted without severance of major roots. All nursery stock trees shall have been undercut and provided with a rootball of min. diameter appropriate to girth and height. All rootballs shall be wire and hessian-wrapped.

Multistem Trees - Rootballed

Multistem trees shall have a minimum of 3no. stems originating from or near ground level (<0.3m) and be of reasonable bushiness and health, with a well grown root system and a total height as specified on the drawings and schedules. Trees shall be well furnished with lateral fibrous roots, and shall be lifted without severance of major roots. All rootballs shall be wire and hessian-wrapped. All multistem trees stock trees shall have been undercut a minimum of 3no. times and provided with a rootball of sufficient size and diameter to enable healthy transplanting and successful establishment and growth. All rootballs shall be wire and hessian-wrapped.

Container grown Shrubs, Ferns, Grasses, Perennials, Bamboo, Hedging

Containerised Shrubs and Climbers shall be of the size specified in the schedules, with several stems originating from or near ground level and of reasonable bushiness, healthy, vigorous and with a sound root system. Pots or containers shall be appropriate to the size of shrub supplied and clearly labelled. Shrubs shall not be pot bound or with girdled or restricted roots. Shoots and aerial parts shall be free of disease, and/or damaged leaves or shoots.

Hedging Stock – Bare-Root

Hedging stock shall be of size specified in the schedules, with several stems originating from or near ground level, with reasonable bushiness, healthy, vigorous and with a sound root system. Shoots, roots and aerial parts shall be free of disease, and/or damaged leaves or shoots. Transplants shall be not less than one year old. Trees of species not listed in B.S. 3936: Part 4: shall be sturdy, with a

balanced root and shoot development. Size shall conform to the schedules. Trees shall be well furnished with lateral fibrous roots, and shall be lifted without severance of major roots. Roots shall be of the habit normal for the species, without deformation. Transplants shall be clearly labelled and wrapped in polythene from the time of lifting until planting to conserve moisture. Shoots, roots and aerial parts shall be free of disease, and/or damaged leaves or shoots.

Hedging Stock – Rootballed

Hedging stock shall be of size specified in the schedules, with several stems originating from or near ground level, with reasonable bushiness, healthy, vigorous and with a sound root system. Shoots, roots and aerial parts shall be free of disease, and/or damaged leaves or shoots. Such hedging shall be provided with a rootball of sufficient size and diameter to enable healthy transplanting and successful establishment and growth. Rootballs shall be hessian-wrapped only for any plant under 1m in height.

Specifications for Care of Nursery Stock

Protection:

The interval between the lifting of stock at the nursery and planting on site is to be kept to an absolute minimum. Plants shall be protected from drying out and from damage in transport. All stock awaiting transport shall be protected from the wind and frost and from drying out.

Damage

On completion of lifting of plants in the nursery, any broken shoots or severed roots shall be pruned, areas of damaged bark neatly pared back to sound tissue.

Inspections

The Employer's representative will inspect the hardy nursery stock during the execution of the works. **Only plants selected and approved in the landscape contractors selected nursery will be accepted on the site**.

Delivery and heeling in

All plants will be delivered on a phased basis as called up in advance in agreement with the Employer's representative and the appointed Landscape Contractor. In the event of the Employer's representative being dissatisfied with the care and attention given to the stocks, following heeling-in or arrival on site, he shall notify the Landscape Contractor who shall take steps to ensure careful heeling-in procedures. Any damaged plants must be replaced by the Landscape Contractor entirely at his own expense.

The preparation of the heeling-in area and its subsequent maintenance is the sole responsibility of the Landscape contractor. No responsibility for the maintenance of stock delivered to site will attach to the employer whilst stock is protected on site, even if the stock requires protection beyond the normal planting season.

Specifications for Site Operations

Setting out:

Setting out shall be in accordance with site meetings with the Employer's Representative, and the drawings listed in the preliminaries. No planting works shall take place when the soil /fill is in a waterlogged condition or the ground is frozen. Transplants in mixtures shall be planted in staggered rows. Species shall be planted in groups, as indicated in the planting drawings. No planting shall take place until all planting holes (with ameliorants) have been inspected and approved by the Employer's Representative, or a person appointed by him as a representative, to ensure accordance with the specifications. No planting shall take place when ground conditions are frozen or waterlogged. All planting holes shall be opened and closed on the same day.

Earthworks, Soil and Grading

Stripping and storage of existing soil on-site

All soil removed during grading works is to be placed in storage bunds on-site. Topsoil must be stripped separately from subsoil for re-use in landscape works and must be fit for purpose. Topsoil would be defined as soil that has a high content of organic material, usually corresponding to the 'O' and/or 'A' horizon of the soil profile. Subsoil would be all mineral soils that do not have a substantial organic component. Where the difference between topsoil and subsoil is unclear, consult the Employer's Representative.

Subsoil that is excess to fill requirements is to be stored on-site in a designated location, to be agreed with the Employer's Representative. Subsoil shall be stored in stable mounds with side slopes of gradient no more than 1:2 and an overall height of no more than 2m. Mounds to be seeded with wildflower seed as per clause 3.3.3.

Topsoil shall be stripped using a tracked vehicle to avoid subsoil compaction. Avoid tracking over or compaction of the topsoil. Topsoil should be stripped and dumped to form the berms using the dump and back-actor method. Double handling of topsoil is to be avoided. Topsoil that has been compacted shall be removed off site and replaced at the contractor's expense.

Topsoil shall be stored in stockpiles of dimensions no greater than 10m long x 5m wide x 0.5m high, such that a long, narrow and low berm is created to preserve the intrinsic qualities (structure and soil life) of the topsoil whilst in storage. The topsoil shall be loose tipped to create the berm and lightly compacted with the back of a digger bucket to create a degree of compaction suitable for storage, with side slopes of gradient no more than 1:2. No machinery shall be run over the soil berm. Berms shall be seeded with grass seed as per clause 3.3.2.

Subsoil

(a) Supply of Subsoil

Existing subsoil shall be used for all grading works.

Imported subsoil – if required - shall be sourced from a reputable source and be free of waste, chemicals, large stones, builder's rubble and any other detritus.

(b) Formation of Slopes/Mounds

Subsoil to be used to form even slopes or mounding to contours shown on drawings. Subsoil to be formed to smooth contours to 150mm below finished levels indicated on drawings, where the area is to be grassed or 300mm.

(c) Formation of Grassed Areas

Subsoil to be graded accurately to contours / levels / falls / crossfalls shown on drawings.

Topsoil

(a) Supply of Topsoil

Existing topsoil may be used for all grading and planting works, if it complies with the following specification, which would also apply to imported topsoil, as required. It is expected that imported topsoil will be required for all planting areas.

Topsoil shall be sourced from a reputable source and be free of waste, chemicals, large stones, builder's rubble and any other detritus. Topsoil shall have good structure, be friable, fresh and free-draining with at least 20% organic content. Imported topsoil shall comply with BS3882: 1994, and shall be free draining sandy loam, clay or other approved. It shall be free of stones over 40 mm diameter, and stones over 10 mm diameter shall not exceed 5% by weight. It shall be free from subsoil, sods, roots of trees and shrubs, and rubbish. Topsoil shall be from the original surface layer of grassland or cultivated land, to a maximum depth of 200 mm. Soils from woodland, heathland, bog or contaminated land will not be acceptable.

(b) Removal of topsoil:

In areas to be regraded, all topsoil should be stripped and stored as per following clauses.

(c) Weather and Soil Conditions

All work involving topsoil shall not be carried out, unless the Employer's Representative permits otherwise:

Where areas have been exposed to a cumulative rainfall exceeding 60mm over the preceding 28 days measured at a point approved by the Employer's Representative; or

- Where soil moisture content is wetter than the Plastic Limit (PL) of the soil less 3%. The PL of the soil can be assessed in the field as the minimum moisture content at which the soil can be rolled and moulded into a thin thread approximately 3mm in diameter without breaking or cracking and in a laboratory according to BS 1377:Part 2.
- When heavy rain is falling;
- During periods of severe frost when the soil is frozen. Handling frozen soil will cause damage to the soil structure.

(d) Topsoil Spreading

Topsoil shall be moved and spread only in dry weather. Before topsoiling, remove all stones, rubble and rubbish over 75mm diameter from the surface of the subsoil formation. Dig out any areas polluted by oil or chemicals and make up with clean soil. Loaders shall load from the base of the soil storage berm only. Placement of soil should be carried out using a tracked vehicle to avoid subsoil compaction. Reinstated areas of topsoil shall not to be tracked over. The topsoil shall be allowed to settle to a thickness of 300mm and the contractor shall make full allowance for such settlement in applying the topsoil. Uneven areas shall be topped up as necessary.

(e) Topsoil Depths & Provision

The following depths should be provided for topsoiled areas:

(i) Grassed Areas:	150mm
(ii) Bare-root planting:	300mm
(iii) Shrub planting:	450mm

(iv) Tree planting: Pit to specified size, depending on size of tree (see relevant Clauses)

(f) Grading

Topsoil to be graded accurately to contours / levels / falls / crossfalls shown on drawings. Glazed / compacted areas of subsoil to be roughened or ripped as necessary. (Drainage to be installed where necessary to Engineer's specification.) Any compacted areas to be ripped after placing of soil.

(g) Compacted areas

Any areas identified as compacted following completion shall be deep ripped and re-graded or re-soiled as necessary, to ensure a free-draining soil gradient and to avoid anaerobic conditions developing in the topsoil.

Structural Soil / Tree Pits

Cornell University (CU) Structural Soil to consist of the following, in the proportions determined by the manufacturer:

- uniformly graded 15-35mm (3/4"-1 1/2") angular crushed stone
- heavy clay loam or loam, with a minimum of 20% clay
- organic matter content ranging from 2%-5%
- Gelscape® hydrogel, in addition to stone and soil components.

The structural soil shall be placed to the line and graded as shown on the plans or as directed by the Landscape Architect / Engineer.

- Install CU-soil in 150mm (6") lifts and compact each lift. Compact all materials to 90-95% compaction from a standard AASHTO Compaction Curve (AASHTO T 99). Adequate compaction can be achieved with the use of a standard pedestrian plate compactor.
- No placement or compaction shall occur when moisture content exceeds 2% above the optimum compaction moisture content as determined by AASHTO T 99 (ASTM D698).
- Protect CU Soil during delays in compaction with plastic or plywood as directed by the Engineer.
- Field tested permeability shall be within 12 - 25mm (0.5" and 1") per hour.

Engineering specifications for pavement installation call for a high degree of compaction which is generally specified as 95% Proctor or peak density, to ensure that pavements would not subside, crack, or fail. When CU-Structural Soil is correctly installed and compacted to 95% - 100% Proctor Density, it has a CBR (California Bearing Ratio) of 50 or greater.

Surface cultivation

Surface cultivation will consist of ploughing or rotovating the topsoil to a minimum depth of 450mm over shrub areas or 150mm over grass areas. Care to be taken to ensure that the subsoil is not brought to the surface. It shall then be worked to reduce the topsoil to a fine tilth. After cultivation, all debris, perennial weeds and stones over 25mm in any dimension are to be removed off site.

Final grading is to be carried out to ensure the true specified level and slope and to avoid minor ridges, dishing or other depressions where water may collect.

Unless otherwise stated, finished levels of grass and shrub planting areas will be 50mm above adjoining paving or kerbs, retaining wall copings, manhole covers etc. and levels will be arranged to give

gentle falls for drainage and to avoid ponding hollows. Any area unduly compacted during the work of grading will be loosened by forking or harrowing. The use of heavy rollers to roll out mounds will not be permitted.

Unless otherwise stated, finished levels of topsoil, after settlement, to be:

1. 50mm above adjoining pavements and kerbs

2. 300mm higher for shrubs than for adjoining grass areas

3. married in with adjoining soil areas

4. all stones above 50mm diameter to be removed off site by the landscape contractor.

Seeding:

Amenity Grass Areas

Fine cut areas to be sown with Coburns 'Greenlawn' Grass Seed Mixture as detailed below or equal at a rate of 40g/sq.m together with organic fertiliser, applied at the manufacturers' recommended rates.

15% Dwarf Perennial Ryegrass

15% Dwarf Perennial Ryegrass

20% Dwarf Perennial Ryegrass

25% Strong Creeping Red Fescue

20% Chewings Fescue

5% Browntop Bentgrass

Specifications for Planting Operations

Tree Support:

Where specified, trees shall be anchored by means of root ball guying. Rootball is anchored by a timber frame (or equivalent support system – e.g. Platipus system) located around the top surface of the rootball, which is fastened by wires (4mm galvanised cable guying wire) to 'dead man' anchors, kerbstones or timber beams located below the rootball.

Stakes:

Round stakes shall be of peeled larch, pine or Douglas fir, preserved with a water-borne copper chrome arsenic composition in accordance with I.S. 131. All trees to be double staked with crossbar 100x25mm securely attached to uprights with galvanised nails. Stakes shall be round, 1.8m long, 75mm in diameter. Stakes shall be pointed at the butt end. Set stakes vertically in the pit and drive before planting. Drive stake with a wooden maul or cast-iron headed drive. Sledgehammer should not be used. Stakes shall be driven into the excavated planting pit to a depth of 1000mm.

Tree ties:

Tree ties shall be of rubber, PVC or proprietary fabric laminate composition and shall be strong and durable enough to hold the tree securely in all weather conditions for a period of three years. They shall be flexible enough to allow proper tightening of the tie. Ties shall

be min. 25mm wide for 120cms – 150cm height trees and min. 38mm for larger sizes. They shall be fitted with a simple collar spacer to prevent chafing. Two ties per tree shall be applied to standards; for staked transplants, one tie per tree is required.

Protection:

The interval between the lifting of stock at the heeling-in area and planting on site is to be kept to an absolute minimum. Plants shall be protected from drying out and from damage in transport. All stock awaiting planting on site shall be stored in a sheltered place ***protected from the wind and frost and from drying out.***

All transplants shall be wrapped in polythene from the time of lifting to conserve moisture. Except when heeled-in, they shall be protected in polythene at all times until planted into their final position on site.

Damage:

On completion of planting any broken branches shall be pruned, areas of damaged bark neatly pared back to sound tissue.

Watering / Fertilisers:

All trees and shrubs shall be soaked in water for one hour prior to planting. Organic fertilisers / composts only permitted. Fertiliser must be mixed through and incorporated into the base of the planting hole and covered with soil in order to avoid roots of plants coming in direct contact. Follow manufacturer's instructions for all chemical products.

Tree planting:

Trees shall be planted at the same depth as in the nursery, indicated by the soil mark on the stem of the tree. They shall be planted in the centre of the planting pit and planted upright. Stones or other rubbish over 75mm shall be removed. Supply and install the staking / guying system as per clauses 4.1-4.4. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position. Upon completion of planting, all pits shall be raked over lightly to leave an even surface and neat appearance. All stones greater than 25mm dia. to be removed. Provision should be made for the watering of root-balled trees in the first year following planting.

Specimen Trees

Excavate tree pits to 1200mm x 1200mm x 1000mm deep. Farmyard manure 80mm deep and 100g of 0.10.20 shall be applied to each tree pit prior to planting. Farmyard manure shall consist predominantly of faecal matter and shall be free of loose, dry straw and undigested hay. It shall be free of surplus liquid effluent. Install tree support system as per clause 4.1. Fill planting hole with topsoil as per clause 3.2.2, and remove all stones and debris, firming plant into position.

Small Trees / Large Shrubs

Excavate tree pits to 750mm x 750mm x 750mm deep. Farmyard manure 60mm deep and 100g of 0.10.20 shall be applied to each tree pit prior to planting. Farmyard manure shall consist predominantly of faecal matter and shall be free of loose, dry straw and undigested hay. It shall be free of surplus liquid effluent. Install tree support system as per clause 4.1. Fill planting hole with topsoil as per clause 3.2.2, and remove all stones and debris, firming plant into position.

Container Grown Shrubs, Grasses, Ferns, Perennials P9 / 20-30 / 30-40cm

Excavate planting hole to a depth of 300mm x 300mm x 300mm deep; the base to be broken to a depth of 50mm and glazed sides roughened. Apply FYM to base of hole to a depth of 150mm and 30g of 0:10:20 per planting pit. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position.

Containerised Shrubs, 40-60cm

Excavate planting hole to a depth of 500mm x 500mm x 500mm deep; the base to be broken to a depth of 50mm and glazed sides roughened. Apply FYM to base of hole to a depth of 150mm and 50g of 0:10:20 per planting pit. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plant into position.

Hedging 25-30cm, 40-60cm

Excavate trench to a depth of 300mm x 300mm wide; the base to be broken to a depth of 50mm and glazed sides roughened. Incorporate 200mm depth of well-rotted FYM into base and cover with 150mm soil min. Apply 100g 0:10:20 per metre into backfill. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plants into position.

Hedging 90-120cm

Excavate trench to a depth of 500mm x 500mm wide; the base to be broken to a depth of 50mm and glazed sides roughened. Incorporate 200mm depth of well-rotted FYM into base and cover with 150mm soil min. Apply 100g 0:10:20 per Sq.m into backfill. Backfill planting hole with excavated topsoil, and remove all stones and debris, firming plants into position.

Ground finish:

Upon completion of planting, all ground finish shall include for the removal of stones greater than 25mm excavated during the course of the digging for planting purposes. All soil surfaces should be even and free of mounds, rutting or hollows.

Spraying:

Following planting, weed free circles to be maintained around individual plants, as directed throughout the duration of the contract. The contractor shall be responsible for keeping the ground (1m diameter circle) around all planted material weed free by means of mechanical control only. Weeds to be removed include grasses, broad-leaved annual and perennial weeds and all noxious weeds.

Weed control fabric

The weed control fabric shall be 105gsm and shall suppress weeds whilst allowing water, air and nutrients to pass through. Mypex™, Plantex® or equal woven fabric product acceptable. Cut with a scissors or knife. All sharp objects should be removed from the surface soil prior to laying the weed suppressing geotextile. Overlap adjacent rolls by at least 10cm. Membrane to be pegged to ground using proprietary plastic pegs.

When planting into the geotextile membrane an 'X' shaped notch should be cut into the membrane for each individual plant, to allow for excavation. Planting should resume as per species specification. Excavated material should not be stored on geotextile and the membrane area should be thoroughly swept of any residual material prior to application of finished aggregate or mulch.

Membrane to be applied to all planting and gravel areas.

Bark mulch

Bark Mulch to be 'Golden Pine Bark' by Growise or equal and approved. The product shall consist of matured Conifer Bark with an even nominal particle size distribution of 5-75mm with less than 5% dust and fines and less than 15% wood content. The pH to be between 4.5 and 5.5. The product shall be pest, disease and weed free and not have been treated with Methyl Bromide or any additives. The product shall have been tested in accordance with the requirements of BS 4790:1987, for fire resistance.

The natural heat treatment maturing process shall have been sufficient to ensure that excess volatile substances are driven from the product. During the process, temperatures within the product heaps must exceed 50°C for a minimum 14 day period, followed by a further period of stabilisation.

Lay Bark Mulch to a finished depth of 75mm allowing at least 10% for settlement after 30 days. All such mulch of good quality from an approved source will be inspected by the Employer's representative prior to delivery. All product volumes to be calculated using The Bulk Density method, as set out in BS EN 12579:2000 and BS EN 12580:2000.

APPENDIX 5

BAT BOX INSTALLATION

Bat Conservation Trust
www.bats.org.uk

Bat Box Information Pack

Bats are amazing animals that are important to ecosystems in the UK and worldwide. We have 18 species of bat in the UK, all of which are protected under European law. Bat populations in the UK have declined dramatically over the past century due to persecution and habitat loss. However, some UK bat species have recently shown some signs of increasing so there is hope.


© Andrew Dumbleton

Bat boxes are artificial roosts designed to provide bats with alternative resting places or to encourage bats into areas where there are few existing suitable roost sites. There are various designs of bat box; wooden boxes that you can make yourself, ready-assembled external boxes for buildings and trees, and even integrated bat boxes that can be built into walls.

Providing bat boxes can increase opportunities for roosting bats but it can take a while for bat boxes to be used regularly, particularly where a number of suitable alternative roost sites exist. Bat boxes can have an important additional function in encouraging interest and educating members of the public about bat conservation. The correct design and placement of boxes will help increase the likelihood of their uptake by bats.

Bat roost preferences

Bat boxes are now available from many outlets, and in a range of shapes and sizes, so some knowledge of what bat species are in your local area and their preferences will help you choose the best possible box. Some species such as horseshoe bats and grey long-eared bats do not use bat boxes.

Microclimate within a new roost is a very important factor in terms of increasing the chance of successful uptake by bats. In general, they prefer warm spaces in the summer for rearing young and cooler spaces in the winter for hibernation. The box should be draught proof and made from a thermally stable material such as untreated wood, ecostyrocrete, woodcrete, brick or stone. If possible, it's better to provide several internal chambers so that the bats can move around.


©Hugh Clark

Orientation and location

Structures for summer roosting should be positioned where they are sheltered from the wind but unshaded for most of the day. Summer maternity roosts (in the northern hemisphere) should be on a south-easterly to south-westerly aspect. It is always best to provide a number of different options for bats so that they can choose the most appropriate temperature based on their needs. This can be achieved by grouping a number of bat boxes each with a different aspect; two or three boxes is preferable to one, although a single box still has a chance of being used depending on the bat species that use the local area. Three boxes can be arranged around the trunk of larger trees – see below for details about putting up bat boxes.


© Fern Alder

Bat boxes are more likely to succeed in areas where there is a good mixture of foraging habitat, including trees, and a source of water (most maternity roosts are located within a short distance of permanent fresh water such as a stream, pond, river or lake). Bat boxes in areas with few other roosting opportunities are also likely to be more successful.

Bat boxes should also be located close to unlit linear features, such as lines of trees or hedgerows. Bat species use these features for navigation between their roosting sites and feeding grounds and to avoid flying in open and exposed areas. Ensure the bats approach to the box is not impeded, for example by branches – clear away underneath the box so the bats can land easily before crawling up into the box.

Size of the bat box

The most frequently used bat boxes are small and only suitable for crevice-dwelling bat species.

Access

Crevice dwelling bats crawl into their roosts via small gaps around 15-20mm high. Roughened vertical surfaces or landing areas allow better access (by landing and crawling), although horizontal landing perches should be avoided as these are not necessary, may even deter bats and encourage birds to nest within the bat box.


© John Altringham

Other considerations

Bats are nocturnal and adapted to low light conditions. Artificial light sources should not be directed onto bat boxes or flight paths as most bat species find artificial lighting very disturbing.

If possible, make or purchase bat boxes with an entrance slit along the bottom so that accumulated bat waste can drop out of the box or be pushed out as bats emerge. This will also help stop birds nesting in the box and blocking the entrance, which can happen with bat boxes that have entrance holes in the middle.

Boxes that may accumulate bat droppings will also need to be cleaned regularly by a licensed bat worker. It is important to remember that bat boxes must not be opened by anyone except a licensed bat worker (see 'monitoring bat boxes' below for more details on licences). In addition, nesting birds must not be disturbed so leave the area immediately upon finding an active nest in a box, and there is the potential for dormice to be found in some woodland boxes, in which case the box must only be checked by a licensed ecologist

Types of bat boxes

Bat boxes come in many forms depending on their materials, function and location. Simple bat boxes are available commercially or can even be home-made. Bat boxes can be divided into the following categories: self-made external bat boxes, ready-made external bat boxes, integrated bat boxes and free standing bat boxes. Advanced forms of artificial roost creation include bat houses, bat barns and internal bat lofts (if you are interested in these please refer to the websites and publications listed at the end of this document).

Self-made external bat boxes

Self-made wooden bat boxes are usually located on trees or the outside walls of buildings. These boxes are usually cubic or rectangular, with a grooved 'bat ladder' and a narrow entrance slit at the bottom. These will last for approximately ten years and can either be bought in kit form, or you can make your own from scratch (there are instructions for the 'The Kent bat box' pictured below in the Appendix at the end of this document – these boxes are also available commercially).

They come in a variety of shapes but key requirements are:


Kent Bat Box

- The wood should be rough sawn for grip and untreated.
- Bats do not like draughts; the entrance slit should be no more than 15-20mm wide and there should be no gaps where the sides and top join - the box should be well put together.
- A box that cannot be opened is best - it will lessen the chances of the bats being harmed through becoming trapped under the opened lid, or disturbed by people opening the top.
- To increase longevity of the box, use screws rather than nails.
- Any screws, hardware or staples used must be exterior grade (galvanized, coated, stainless, etc).

Ready-made external bat boxes

There are a number of ready made external bat boxes suitable for buildings and trees that can be purchased. These boxes can be made from wood, however there are an increasing number of more durable options, such as eostyrocrete (pictured right). These types of boxes can come in a range of finishes to blend into the buildings façade or indeed to highlight their presence!

Integrated bat boxes

Integral or integrated bat boxes can be built into the walls or masonry of houses and other buildings. The boxes can be embedded such that they do not impair the air-tightness of the building. Many designs are available including some that have bespoke coverings that can match the building façade and / or highlight the boxes presence (see boxes left and below from **Habibat**). The same principles for size, location and access apply.

Ready-made free standing boxes

American style bat houses (larger, multi-chambered boxes) have been successfully used for bat conservation in North America and elsewhere. These large multi-chambered boxes are increasingly being used in the UK for sites where there are few suitable features (such as trees or buildings) for boxes to be attached to, as they can be put up on poles:

http://www.batcon.org/files/RocketBoxPlans.pdf

Commercial designs are now available, such as the 'rocket box' from Habibat (pictured right).

Habibat

Habibat is a partnership between the Bat Conservation Trust, Ecosurv, their partnership bat box companies and Habibats customers. Their aim is to provide bat boxes that work for bats and buildings. A portion of the profits from each Habibat partner company bat box sold is reinvested into the Habibat scheme to improve accommodation for bats in the long run with an aim to implement monitoring and research. The scheme aims to improve knowledge of integrated bat box use and design,and give customers guidance on installation.

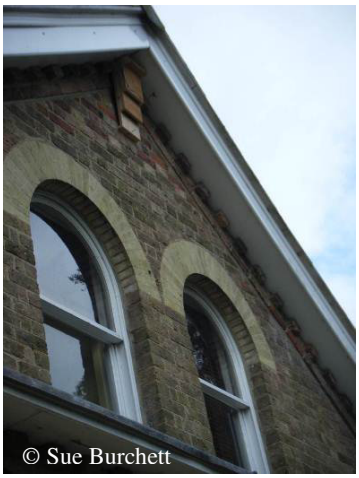
habibat

If you would like further information on the products and partnership companies, visit the Habibat website: www.habibat.co.uk.

Putting up bat boxes

Most bat species will use higher positioned boxes (around 4m up); assess the risk of working at height when undertaking the installation, then place the box as high as it is safe to do so. This will also help protect bats from vandalism and falling prey to cats. If working in the public realm, try to locate boxes so they are not above public walkways.

Ensure the boxes are appropriately fitted, to avoid the risk of them falling off. The boxes should be checked at least annually and after high winds to ensure they are still securely in place.


© Sue Burchett

On buildings

Place the boxes high up by the eaves on a building, which can also help shelter the box from the weather. As detailed above, the aspect of the box should capture sun for part of the day if the intention is to attract maternity colonies.

Gazebos, garden walls and sheds have been suggested as sites for bat boxes. However, the main danger is that the boxes are not high enough above the ground, the structures may not be robust enough to support the box in high winds and the boxes are too visible to predators or vandals.

On trees

Consideration should be given to tree growth and boxes may need rehanging over time, regularly check boxes to assess this. Use headless or domed nails not fully hammered home to allow the tree growth, again regular checks will ensure that this allowance can be made while still being securely fitted. Iron nails can be used on trees with no commercial value. Copper nails can be used on conifers, but aluminium alloy nails are less likely to damage saws and chipping machinery.

Monitoring bat boxes

Making and putting up bat boxes is a great conservation action but what is even more useful is to know whether they are being used, when and by which species.

How long before bats will use the box?

Sometimes it can take several years for bats to find a new box. Be patient! Slow (or no) uptake may be due to the availability of other roosts locally. Sometimes, however, bats move in within months or even weeks!

How will I know if the box has been successful?

To check if the box is being used, look out for droppings and urine-staining on the vertical 'bat ladder' below the box and listen for 'chattering' during the day, especially during the summer months. You can also watch the box for an hour either side of sunset to observe any bats leaving to feed, or around dawn to see any bats returning to their roost. Bats may be observed by looking up into the box from below, however no light should be used as this may disturbany bats that are present.

Licensing and the law

You can undertake the non-invasive checks above without needing a licence. However, if the box needs to be opened to check it then there must be a suitably licensed bat worker present. Anyone wishing to undertake bat box checks should obtain training in bat handling and identification before applying for a licence. You can find out more about licensing and bats on the Bat Conservation Trust website at: www.bats.org.uk/pages/licensing.html

All bats and their roosts are protected by law and it is an offence to deliberately disturb, handle or kill bats. The relevant legislation in England & Wales is the Wildlife and Countryside Act 1981 and Conservation of Habitats & Species Regulations 2010 (as amended). In Scotland it is the Conservation (Natural Habitats, etc.) Regulations 1994 and in Northern Ireland the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995.

A bed without breakfast?

Bats often use features such as hedgerows, tree lines and watercourses as commuting pathways between roosts and foraging areas. This type of habitat also provides shelter, allowing insects to gather and therefore supports foraging bats. The highest densities of bats occur where insects are most plentiful.

Make sure you maintain or create good foraging habitats for bats by planting a wide range of plants such as flowers that vary not only in colour and fragrance, but also in shape. See BCT's 'Encouraging Bats' leaflet for more information (www.bats.org.uk\publications).

Other useful websites

Bat Conservation Trust www.bats.org.uk
The Bat Conservation Trust (BCT) is working towards a world where bats and people thrive in harmony, to ensure they are around for future generations to enjoy. BCT is the only organisation solely devoted to bat conservation in the UK.

Bat Conservation International www.batcon.org
Bat Conservation International's mission is to conserve the world's bats and their ecosystems to ensure a healthy planet. Based in Austin, Texas, BCI is devoted to conservation, education and research initiatives involving bats and the ecosystems they serve.

Roost roost.bats.org.uk
Roost is a resource developed by the Bat Conservation Trust (BCT) to aid in the gathering of information on bat roost mitigation, compensation and enhancement techniques. The aim is for this site to provide accessible information to support everyone involved in bat conservation and development.

Vincent Wildlife Trust www.vwt.org.uk
The Vincent Wildlife Trust (VWT) is an independent charitable body founded by Vincent Weir in 1975 and has been supporting wildlife conservation ever since. They conserve a range of endangered mammals through management of their own reserves, undertake pioneering research and provide expert advice to others through practical demonstration.

Publications

Gunnell, K., Murphy, B. and Williams, C. (2013) Designing for biodiversity: a technical guide for new and existing buildings (2nd ed.)

Gunnell, K., Grant, G. and Williams C. (2012) Landscape and urban design for bats and biodiversity

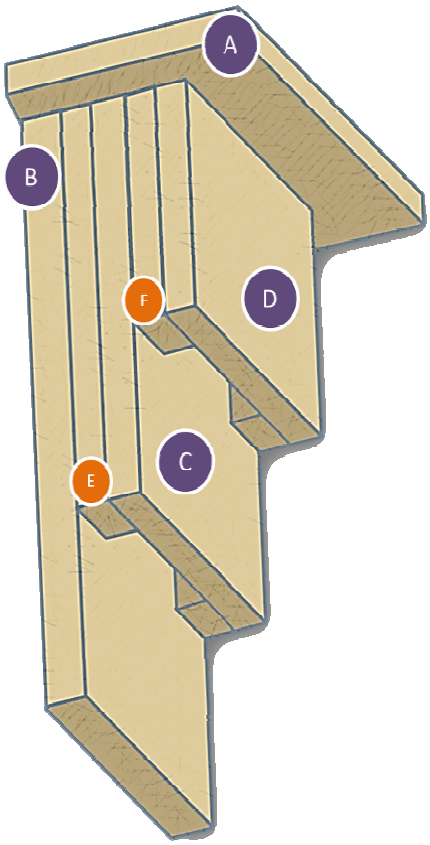
Mitchell-Jones, A.J (2004) Bat mitigation guidelines

Mitchell-Jones, A.J. and McLeish, A.P. (2004) Bat workers' manual (3rd edition)

Tuttle, M.D., Kiser M. and Kiser S (2004) The Bat House Builder's Handbook

Appendix: The Kent bat box (D.I.Y. instructions)

Design and measurements



Simple to construct, self-cleaning and low maintenance, the Kent bat box (designed by the Kent Bat Group) is a great way to encourage bats in your garden or your green space. The box should be rainproof and draught-free.

The only critical measurement is the width of the crevices: between 15-25mm. Other measurements are approximate. Timber should be approximately 20mm thick.

Measurements for one Kent bat box kit would be as follows:

Part	Quantity	Size (mm)
Roof (A)	1	250 x 160 x 20
Back (B)	1	450 x 200 x 20
Centre (C)	1	330 x 200 x 20
Front (D)	1	210 x 200 x 20
Centre Rails (E)	2	330 x 20 x 20
Front Rails (F)	2	210 x 15 x 15
Stand-offs (optional)	2	200 x 20 x 20

Material and Tools

This kit requires approximately 1.6m of rough wood and 25 screws (8 x 1 ½ inches) to assemble. You can rough it up by scraping with a suitable tool – possibly a saw blade or even a screwdriver but make sure you use untreated wood as some preservative chemicals can kill bats.

Pre-drill the holes to prevent the wood splitting. Alternatively you can assemble your bat box kit with nails although they tend to be less robust than boxes made with screws.

The hanging screws may either be at the edges of the front panel or in the side centre block (not in the rails!). Fixing may be by use of brackets, durable nylon cord or wires.

When installing the box, assess the risks of working at height, use the appropriate fittings and assess where the box will be located, in relation to any public access. Regular checks should be made to ensure the box remains securely fitted, especially after high winds.

Photos and illustrations in this document by the Bat Conservation Trust unless otherwise stated.

APPENDIX 6

TREE HEDGEROW PROTECTION & MANAGEMENT PLAN

murray & associates
landscape architecture

TREE/HEDGEROW PROTECTION & MANAGEMENT PLAN

At

CLONBURRIS SDZ
REGISTER REFERENCE: SDZ21A/0022

FOR

CAIRN HOMES LIMITED

Murray & Associates
Landscape Architecture

16 The Seapoint Building
44-45 Clontarf Road, Dublin 3
Tel: +353 (0)1 8540090
Fax: +353 (0)1 8540095
mail@murray-associates.com
www.murray-associates.com

Member of the Irish Landscape Institute

Contents

Issue Sheet

Rev. No.	Issue Status	Date	Prepared By	Checked By
1	For Issue	17-11-22	FT/IS/JW	JW

1.0 Introduction & Terms of Reference

The trees and hedgerows at the subject site at Clonburris SDZ are the subject of a number of planning conditions, as set out below. We have indicated next to each paragraph of the particular condition the relevant measure/drawing which addresses each part of the conditions.

2.0 Tree and Hedgerow Protection conditions compliance

Condition 8

Prior to the submission of the Commencement Notice within the meaning of Part II of the Building Control Regulations 1997 and prior to the commencement of any works on site including any related construction activity or tree felling:

i) The developer shall engage the services of a qualified arborist as an arboricultural consultant, for the entire period of construction activity and shall notify the planning authority of that appointment in writing. This is to ensure the protection of trees and hedgerows to be retained within and adjacent the site.

A letter confirming our appointment is appended to this report

ii) The applicant shall implement all the recommendations pertaining to tree retention, tree protection and tree works, as detailed in The Tree File Ltd drawing titled Clonburris Tree Impacts/Protection Plan EAST, dated June 2022 and Arboricultural Report as submitted on November 2021.

See sections of the report relating to inventory, protection measures, and future management, and drawings numbered :

1738_PLC_P_00 for Masterplan;
1738_PLC_P_01.1 for Masterplan - 01/02;
1738_PLC_P_01.2 for Masterplan - 02/02;
1738_PLC_P_02.1 for Boundary Treatment Plan & Details | Residential Boundaries;
1738_PLC_P_02.2 for Boundary Treatment Plan & Details | Open Space Boundaries;
1738_PLC_P_03 for Play Areas;
1738_PLC_P_04.1 for Soft Landscape Plan - 01/02;
1738_PLC_P_04.2 for Soft Landscape Plan - 02/02;
1738_PLC_P_05 for Removed/Retained/Compensatory Planting Plan;
1738_PLC_D_01 for Soft Landscape and SuDS | Details;

1738_PLC_TPP_01 for Hedgerow & Tree Protection Plan;
1738_PLC_TPP_01.1 for Hedgerow & Tree Protection Plan Zoom Area;
1738_PLC_ExViews_01 for Pre Development Photos and Location Map.

iii) A tree and hedgerow protection strategy including a Construction Stage Tree Protection Plan and Construction Stage Arboricultural Method Statement, prepared by a qualified arborist as recommended within the Tree File Ltd, Arboricultural Report in accordance with the Arboricultural Method Statement. The strategy shall include all land within the 30m buffer zone and the Fonthill Road embankment.

See report and also to be read with drawings numbered
1738_PLC_TPP_01 for Hedgerow & Tree Protection Plan;
1738_PLC_TPP_01.1 for Hedgerow & Tree Protection Plan Zoom Area;

ii) Pre Development Photo's: the applicant shall submit photographs and confirmation that fencing for retained trees/hedgerows meets BS5837:2012. 'Trees in Relation to Design, Demolition and Construction – Recommendations' for the written agreement of the Public Realm Section. This shall include a location map of where each picture was taken from.

See drawing *1738_PLC_ExViews_01*

iii) All land within the 30m buffer zone is to be fenced off to protect it. Such an area is very sensitive to development, it should not be used for stockpiling soils or material or for any other storage function. It should not be dug up or the ground otherwise disturbed.
Areas of vegetation, hedgerows and individual trees to be protected with fencing to be as BS5837: Trees in relation to design, demolition, and construction.

See drawing *1738_PLC_TPP_01*

iv) All works on retained trees shall comply with proper arboricultural techniques conforming to BS 3998:2010 Tree Work – Recommendations. The clearance of any vegetation including trees and scrub shall be carried out outside the bird-breeding season (1st day of March to the 31st day of August inclusive) or as stipulated under the Wildlife Acts 1976 and 2000.

This is detailed in the hedgerow and tree management section.

v) The arborist shall carry out a post construction tree survey and assessment on the condition of the retained trees. A completion certificate is to be signed off by the arborist when all permitted development works are completed and in line with the recommendations of the tree report. The certificate shall be submitted to the planning authority for written agreement upon completion of the works.
REASON: To ensure the protection, safety, prudent retention and long term viability of trees to be retained on and immediately adjacent to the route.

We confirm that we will inspect the protection at regular intervals and will issue the certificate on completion of the works.

Tree and Hedgerow Retention
Condition 10
Prior to the submission of Commencement Notice within the meaning of Part II of the Building Control Regulations 1997 and prior to the commencement of any works on site, the applicant, owner or developer shall have lodged with the Planning Authority for agreement by Public Realm, a hedgerow management plan that shows the amount of hedgerow being removed (mapped and linear metres) and the amount of compensatory/replacement hedgerow being planted (mapped and linear metres) as part of the proposals.
REASON: In the interests of adequate GI provision and compliance with the Planning Scheme in relation to monitoring of hedgerow removal.

See hedgerow management plan and :
1738_PLC_TPP_01 for Hedgerow & Tree Protection Plan;
1738_PLC_TPP_01.1 for Hedgerow & Tree Protection Plan Zoom Area;

660 lin.m of existing hedgerows are to be retained, and there will be 815 lin.m of new hedgerow established per the compliance drawings.

This report sets out the procedures and details that will be implemented in order to satisfy the conditions of planning. The following drawings are listed for reference:

1738_PLC_P_00 for Masterplan;
1738_PLC_P_01.1 for Masterplan - 01/02;
1738_PLC_P_01.2 for Masterplan - 02/02;
1738_PLC_P_02.1 for Boundary Treatment Plan & Details | Residential Boundaries;
1738_PLC_P_02.2 for Boundary Treatment Plan & Details | Open Space Boundaries;
1738_PLC_P_03 for Play Areas;
1738_PLC_P_04.1 for Soft Landscape Plan - 01/02;
1738_PLC_P_04.2 for Soft Landscape Plan - 02/02;
1738_PLC_P_05 for Removed/Retained/Compensatory Planting Plan;
1738_PLC_D_01 for Soft Landscape and SuDS | Details;
1738_PLC_TPP_01 for Hedgerow & Tree Protection Plan;
1738_PLC_TPP_01.1 for Hedgerow & Tree Protection Plan Zoom Area;
1738_PLC_ExViews_01 for Pre Development Photos and Location Map.

Methodology Employed

The drawings and documents contained in the planning application from 'The Tree File' and the tree survey dated November 2021 was uploaded into 'treeplotter' GIS and a database of all the existing trees on the subject site was created. On the 7th, 15th and 22nd October all of the trees were re-surveyed and accurately positioned on drawings numbered 1738_PLC_TPP_01. The GIS based system allows for the recording of all inspections over the course of the construction monitoring program.

The areas were also photographed on the survey date pre commencement of construction. A record of this is located on drawings 1738_PLC_ExViews_01.

The confirmed locations are on drawings 1738_PLC_TPP_01, and TPP_01.1 The tree schedule is contained in appendix 1 and hedgerow schedule is contained in appendix 2. The works are divided into two principal sections, namely tree protection during construction and tree/hedgerow management post construction.

3.0 Tree and Hedgerow management plan

3.1 Aims & objectives

Management of hedgerows aims to put in place the appropriate management operations to maximise the value of the site's hedgerows. The specific objectives are as follows:

- Mature hedgerows should be allowed to grow freely and naturally;
- New hedgerows should be managed to enable them to develop into;
- All plants to be maintained so that they remain in good health;
- All plants to have a habit and form consistent with species type and aesthetic objectives;
- Areas surrounding hedgerows are to be maintained in such a way that potential threats to hedgerow viability are addressed, e.g. weed control (particularly invasive weeds);
- Appropriate control of ivy;
- Enable recognition of site vegetation (including trees) at the end of its viable life is important to ensure that it is removed and replaced in a timely manner to avoid dangers to park users.
- Where Ash trees fail and are structurally unstable they should be made safe. Use shall be made of standing deadwood and where appropriate deadwood should be left to naturally decay back into the soil.
- Broadleaf replanting shall take place at the earliest opportunity using light standard trees utilising native tree species to establish a cover of trees in advance of the ultimate decline of the Ash.

3.2 Environmental considerations

Responsible and sustainable hedgerow management is about balancing the performance standards with the required standard of maintenance. The following principles have guided the development of the specification:

- Minimise use of non-renewable resources
    - e.g. reduce use of chemical inputs such as pesticides, utilise manual tools where possible and safe.
- Utilise low input systems
    - Includes measures such as: mulching instead of herbicide use, where possible.
- On-site green waste recycling / mulching / composting
    - Avoids excessive transportation and use of landfill.

- Use of environmentally friendly products where possible
    - e.g. biodegradable herbicides, biodegradable tree ties, timber stakes.
- Biodiversity & Nature Conservation
    - Project ecologist will be consulted for any replacement planting or operations that could disturb wildlife in order to comply with best practice; All works involving tree surgery or removal of trees / hedgerows will be carried out outside the nesting season (unless required for health and safety or is unavoidable).
- Pollinator-Friendly Management Practices
    - to encourage bee and insect populations by managing appropriately.
- Control of Invasive Species
    - It is an objective of this plan to control and prevent the spread of invasive species, in order to protect the biodiversity of the landscape. Note that a plan is in place to deal with Three-Cornered Leek, which was identified on Heronford Lane by Scott Cawley Ecologists.
- Protection of site resources
    - Appropriate maintenance will result in the protection of existing trees, hedgerow vegetation and soil resource of the site.

4.0 Post construction management operations

4.1 General

New and existing hedgerows will have different maintenance regimes until the new hedgerows become established. Following is general guidance for maintenance of hedgerows:

- Carry out hedgerow maintenance between September 1st and the last day of February to avoid the bird nesting season, in accordance with Wildlife Act.
- Prior to carrying out maintenance operations, the hedgerow should be inspected to identify trees and other wildlife features, as well as any obstacles or hazards that may be present.
- Retain old trees and standing dead trees within the hedgerow, where it is safe to do so. Dead standing trees should be pruned of side branches and ivy to minimise hazard to park users.
- Hedgerows should be cut once every three years.
- Consider carrying out maintenance in rotation, so that not all hedgerows are pruned at once. If possible, one side of a hedge should be trimmed in a season, and the other side in the following year.
- In cutting hedgerows, a triangular-shaped profile with bushy structure is preferred to encourage the development of a dense hedge with good wind resistance.
- Cut different hedges to different heights to vary the habitat value.
- Finger bar cutters with a pair of reciprocating blades should be used for trimming young growth.
- Flail cutters may be used on soft growth, and not on woody growth. If woody growth is inadvertently damaged, any ripped or ragged ends should be pruned back to the next branch junction.
- Where feasible, hedge trimmings should be piled in an agreed location on-site to provide habitat.
- Maintain 2m wide (minimum) buffer strips containing long grassland immediately adjacent to hedgerows, in accordance with Parks Biodiversity Plan.
- There is a large number of Ash within the hedgerows which will ultimately fai over the next 5-7 years. These should be replaced by a mix of broadleaf tree species including Oak, Lime, Birch and Hazel.

4.2 Specifications for Tree and Hedgerow Works

Works to hedgerows are to be carried out as per the following tables.

4.2.1 New Hedgerows – First three years

Criterion	Specifications
Aesthetic / functional requirements	Even, clean finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Relatively informal habit acceptable.
Weed Control	No weeds permitted in the hedge area. May be mulched or treated with an approved residual herbicide to provide year round weed control.
Bark Mulch	Recommended – 50mm deep; to be kept topped up at all times.
Fertiliser	Annual feeding with 50g/sq.m of general-purpose fertiliser in February. (Rake back mulch prior to application.)
Pruning	Pruning once per annum for the first three years to encourage development of bushy form; all clippings to be gathered at every pruning and disposed of in designated area.
Watering	Watering required only in periods of prolonged drought (i.e. after more than 2 weeks)

4.2.2 Mature Hedgerows

Criterion	Performance Standards
Aesthetic / functional requirements	Natural finish to ground plane. Hedge to have a healthy, lush appearance, typical for plant species and time of year. Informal habit acceptable.
Weed Control	Native weeds permitted in the hedge area as natural for the species. Noxious and invasive weeds to be treated appropriately.
Bark Mulch	Not required.
Fertiliser	None
Cutting	Cutting once every three years as necessary to maintain the required height and width, and prevent “leggy” growth; all clippings to be gathered at every cutting and disposed of in designated area for habitat.
Watering	Not required.

Results of management measures should be reviewed on a regular basis and adjusted as necessary in order to maintain the hedgerows in optimal condition. Only structurally essential works should be carried out to the existing trees.

BS5837:2012 Table 2 – Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see [BS5837:2012]* ***4.5.7****.*			
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefit	Trees with no material conservation or other cultural value	

Appendix 1 – Tree Schedule

Tag no.	Latin Name	Common Name	Dbh [mm]	Ht [m]	Crown spread (m) (N)	(E)	(S)	(W)	Life Stage	Structural Condition		Cat.	RPA	Comments	Recommendations
1	Fraxinus excelsior	Common Ash	306	6	2.5	3	3	1.5	Semi-mature	Fair	Fair	C2	3.67	Suppressed and distorted, arising naturally from within hedgerow thicket. Is multi-stem from low level raising concerns regarding mechanical integrity.	Review regularly
	Fraxinus excelsior	Common Ash	223	7	1.5	2.5	2.5	1.5	Semi-mature	Fair	Fair	C2	2.68	Arising naturally from hedgerow thicket. Comprises element of natural regeneration.	
3	Fraxinus excelsior	Common Ash	261	7	2.5	3	2	2.5	Semi-mature	Fair	Fair	C2	3.13	Young and vigorous, arising from hedge thickets.	

4	Fraxinus excelsior	Common Ash	175	5	1	1	1.5	1	Semi-mature	Fair	Fair	C2	2.1	Bark damaged and naturally arising from waterlogged hedge thicket.
5	Fraxinus excelsior	Common Ash	185	5	1.5	2	1.5	1.5	Semi-mature	Fair	Good	C2	2.22	Young and vigorous arising from southern side of waterlogged ditch scenario
6	Fraxinus excelsior	Common Ash	379	7	2.5	3.5	3	3	Semi-mature	Poor	Fair	C2	4.55	A multi-stemmed group wholly enveloped with Ivy cover the prevents detailed visual review. Of poor-quality specimen arising from northern bank of flooded ditch.
7	Fraxinus excelsior	Common Ash	185	5	1	1.5	1	1	Semi-mature	Good	Fair	B2	2.22	Young and vigorous
8	Fraxinus excelsior	Common Ash	261	7	2	2.5	2	2	Semi-mature	Fair	Fair	C2	3.13	Young and vigorous arising from southern side of ditch.

9	Ulmus glabra	Wych Elm	185	5	1	1	2	1	Semi-mature	Poor	Dead	U	2.22	Completely dead, killed by Dutch Elm disease.	
10	Salix fragilis	Crack Willow	783	9	5	4	4.5	4	Mature	Poor	Poor	U	9.4	Multi-stemmed, decayed and splitting at 2.00 m. Offers no realistic sustainability.	
11	Salix caprea	Goat Willow	229	4	0	2	4	1.5	Early-mature	Fair	Fair	C2	2.75	Heavily unbalanced to south. Arises from area of boggy ground.	
12	Salix caprea	Goat Willow	341	4	2.5	4	4	3	Mature	Fair	Fair	C2	4.09	Arises from position close to the northern edge of ditch.	
13	Fraxinus excelsior	Common Ash	261	6	2	4	2.5	2.5	Semi-mature	Poor	Poor	U	3.13	Previously damaged and in a state of decline	Remove

14	Fraxinus excelsior	Common Ash	258	5	2.5	2	2	2.5	Semi-mature	Good	Fair	C2	3.1	Young and vigorous, arising naturally from within hedgerow thicket.	
15	Fraxinus excelsior	Common Ash	207	6	1.5	1	1	1.5	Semi-mature	Poor	Poor	U	2.48	Instate of chronic decline.	Remove.
16	Fraxinus excelsior	Common Ash	239	6	2	1.5	1.5	1	Semi-mature	Poor	Poor	U	2.87	Instate of chronic decline.	Remove.
17	Fraxinus excelsior	Common Ash	204	5	1.5	1.5	1.5	1	Semi-mature	Fair	Good	B2	2.45	Young and vigorous.	Review regularly.
22	Fraxinus excelsior	Common Ash	194	8	1	1.5	2	2.5	Semi-mature	Poor	Poor	U	2.33	In a state of ongoing decline.	Remove.
23	Ulmus glabra	Wych Elm	197	9	2	4.5	2	0	Semi-mature	Poor	Dead	U	2.36	Unbalance and dead.	Remove.

24	Fraxinus excelsior	Common Ash	325	7	1	4	3	3	Semi-mature	Poor	Fair	U	3.9	Triple stemmed but some stems have been cut. Unsuitable for retention.	Remove.
25	Fraxinus excelsior	Common Ash	290	7	3	3	2	3	Early-mature	Fair	Fair	B2	3.48	Young and vigorous, arising from western bank of ditch.	
26	Fraxinus excelsior	Common Ash	347	6	3	4.5	3	2	Semi-mature	Poor	Fair	U	4.16	Distorted suckering group arising from decaying stump of previous tree. Unsuitable for retention.	Remove.
27	Fraxinus excelsior	Common Ash	688	10	4	3.5	4	3	Early-mature	Fair	Fair	C2	8.26	Divided from low level. Arises from position close to confluence of ditches. Vigour and vitality are fair though crown support notable deadwood.	
28	Fraxinus excelsior	Common Ash	398	6	4	4	4	2.5	Early-mature	Poor	Poor	U	4.78	Squat, distorted and affected by Polyporus. Unsuitable for retention	Remove.

29	Fraxinus excelsior	Common Ash	274	5	3	2.5	2.5	2.5	Early-mature	Poor	Poor	U	3.29	A relic a once larger tree having suffered extensive collapse.	Remove.
30	Fraxinus excelsior	Common Ash	175	6	3	2.5	2.5	2.5	Semi-mature	Fair	Fair	B2	2.1	Young and vigorous, arising from hedgerow thicket.	
31	Fraxinus excelsior	Common Ash	306	5	2.5	1	2	2	Semi-mature	Fair	Fair	C2	3.67	Suppressed and distorted, arising from southern bank of substantial ditch.	
32	Fraxinus excelsior	Common Ash	229	6	4	2.5	2	4	Semi-mature	Fair	Fair	C2	2.75	Heavily distorted multi-stem from low level. A poor-quality specimen arising from southern bank of ditch.	
33	Fraxinus excelsior	Common Ash	401	6	4.5	3.5	2	1	Semi-mature	Fair	Poor	C2	4.81	Multi-stemmed and heavily cut in past. Is heavily distorted and ill-suited to retention.	

34	Tilia x europea	Common Lime	716	13	4.5	5	4.5	4.5	Early-mature	Fair	Good	C2	8.59	Large, particularly multi-stemmed specimen. Configurations suggests early life decapitation and subsequent re-suckering. Buttress region has been subject to erosion and root exposure. General vigour and vitality remain good.	Review regarding retention context.
35	Ulmus glabra	Wych Elm	357	13	4	3.5	2.5	3	Early-mature	Poor	Dead	U	4.28	Completely dead and in need of removal.	
36	Ulmus glabra	Wych Elm	229	7	1.5	2.5	2	2	Semi-mature	Poor	Dead	U	2.75	Completely dead and in need of removal.	Remove.
37	Ulmus glabra	Wych Elm	306	7	2	5	1	2	Semi-mature	Poor	Dead	U	3.67	Distorted and completely dead.	Remove.
38	Fraxinus excelsior	Common Ash	748	10	4	5	3.5	3	Early-mature	Poor	Poor	U	8.98	Once larger tree has been crudely decapitated	Remove.

													with current crown comprising sucker regeneration. Is unsuitable for retention.	
39	Ulmus glabra	Wych Elm	226	7	0	2	3	2	Semi-mature	Poor	Dead	U	2.71	Completely dead and in need of removal.	
40	Ulmus glabra	Wych Elm	751	9	3	3	2	3	Early-mature	Poor	Dead	U	9.01	Tree is completely dead and appears to have lost much of early crown.	
41	Acer pseudoplatanus	Sycamore	226	7	1	2.5	2	3	Semi-mature	Fair	Fair	C2	2.71	Distorted and suppressed but remains vigorous.	
42	Acer pseudoplatanus	Sycamore	220	8	1	2	3	3	Semi-mature	Fair	Fair	C2	2.64	Distorted and suppressed but remains vigorous.	
43	Fraxinus excelsior	Common Ash	283	10	2.5	4	3.5	3.5	Early-mature	Fair	Good	B2	3.4	Young and vigorous. Arises from on top of partial eroded ditch embankment.	Review regarding retention context.

44	Fraxinus excelsior	Common Ash	433	10	5	4.5	5	5	Early-mature	Fair	Fair	C2	5.2	Multi-stemmed and sprawling having developed spreading crown supported on heavily divided stem. Tree arises from eastern side of eroded ditch scenario.	Review regarding retention context.
45	Fraxinus excelsior	Common Ash	344	6	3	3.5	4	3	Semi-mature	Poor	Fair	U	4.13	Distorted and previously cut. Arises from demolition spoil is unlikely to prove retainable.	
46	Fraxinus excelsior	Common Ash	248	5	3	3	3	3	Semi-mature	Fair	Fair	B2	2.98	Young and still vigorous. Arises from position west of mounded spoil and demolition rubble.	Review regarding retention context.
47	Acer pseudoplatanus	Sycamore	369	7	1.5	2	3	3	Semi-mature	Poor	Fair	C2	4.43	Young and vigorous but arising from demolition rubble. Is unlikely to prove retainable.	

48	Fraxinus excelsior	Common Ash	302	5	3.5	3	1.5	4	Semi-mature	Poor	Fair	C2	3.62	Young and vigorous but arising from demolition rubble. Is unlikely to prove retainable.	
49	Fraxinus excelsior	Common Ash	229	5	2.5	2	1	2	Semi-mature	Poor	Poor	U	2.75	Young and vigorous but arising from demolition rubble. Is unlikely to prove retainable.	Remove.
50	Acer pseudoplatanus	Sycamore	398	8	3	2	2	2	Semi-mature	Poor	Poor	U	4.78	Comprises an element of sucker regeneration subsequent to prior cutting. Is unsuitable for retention.	Remove.
51	Ulmus glabra	Wych Elm	376	10	4	4	3.5	4	Early-mature	Poor	Dead	U	4.51	Remove immediately.	Remove.
52	Fraxinus excelsior	Common Ash	248	8	4	3	0	3	Semi-mature	Poor	Fair	U	2.98	In state of decline with substantial dieback noted.	Remove.

													Unsuitable for retention.	
53	Fraxinus excelsior	Common Ash	328	7	4	5.5	2	1	Semi-mature	Poor	Fair	C2	3.94	Heavily unbalanced to east, arising from western side of ditch but overhanging western bank.	Review regarding retention context.
54	Acer pseudoplatanus	Sycamore	325	5	0	5	2	1	Semi-mature	Poor	Fair	U	3.9	Heavily distorted with lower stem procurement and supported on derelict masonry.	Remove.
55	Ulmus glabra	Wych Elm	207	5	2.5	2	1.5	2.5	Semi-mature	Poor	Dead	U	2.48	Completely dead.	Remove.
56	Ulmus glabra	Wych Elm	398	7	3	3	3	3	Semi-mature	Poor	Dead	U	4.78	Completely dead, Dutch Elm disease.	Remove.
57	Fraxinus excelsior	Common Ash	229	5	1.5	3.5	2.5	0	Semi-mature	Poor	Fair	U	2.75	Heavily distorted, arising from western side of ditch. Is of particularly poor quality and is ill	Consider early removal.

													suited to retention.	
58	Fraxinus excelsior	Common Ash	306	8	3	2.5	1.5	2	Semi-mature	Poor	Fair	C2	3.67	Distorted a multi-stemmed, arising from western bank of dilapidated ditch.	
60	Fraxinus excelsior	Common Ash	271	7	3	2.5	2	2	Semi-mature	Poor	Fair	C2	3.25	Poor quality multi-stemmed.	Review regarding retention context.
62	Fraxinus excelsior	Common Ash	271	8	2	2.5	3	2.5	Semi-mature	Poor	Fair	U	3.25	Multi-stem from low level suggesting sucker regeneration from previous stump. Arises from eastern embankment of dilapidated ditch and particularly waterlogged area. Tree offers minimal sustainability.	

63	Fraxinus excelsior	Common Ash	255	8	4	3.5	3	4	Semi-mature	Poor	Fair	U	3.06	Multi-stem from low level suggesting sucker regeneration from previous stump. Arises from eastern embankment of dilapidated ditch and particularly waterlogged area. Tree offers minimal sustainability.	
64	Fraxinus excelsior	Common Ash	302	6	2.5	2.5	2.5	2.5	Semi-mature	Poor	Poor	U	3.62	Multi-stemmed comprising coppice like regeneration subsequent to prior cutting. Is of poor quality and offers minimal sustainability.	
65	Fraxinus excelsior	Common Ash	388	6	3	1.5	1.5	3	Semi-mature	Poor	Poor	U	4.66	Comprises sucker regeneration from a decayed coppice like base. Is Unsuitable for retention.	Remove.

66	Fraxinus excelsior	Common Ash	388	6	3.5	3.5	2.5	2	Semi-mature	Poor	Poor	U	4.66	Comprises sucker regeneration from a decayed coppice like base. Is Unsuitable for retention.	
67	Fraxinus excelsior	Common Ash	376	7	3.5	4	2	2	Semi-mature	Poor	Fair	C2	4.51	Has suffered substantial stem and crown damage to west. Tree arises from partial eroded embankment on western side of substantial di	
68	Fraxinus excelsior	Common Ash	341	6	3	3.5	2	1	Semi-mature	Poor	Fair	C2	4.09	Heavily unbalanced to east, arising from western side of partial eroded ditch embankment. Is of dubious sustainability	
69	Fraxinus excelsior	Common Ash	325	7	2.5	3	1.5	3	Semi-mature	Poor	Fair	C2	3.9	One-sided and arising from western side of ditch. Ground conditions eroded in vicinity of stem.	Review regularly.

70	Fraxinus excelsior	Common Ash	306	7	2.5	5	3	3.5	Semi-mature	Poor	Fair	C2	3.67	Heavily distorted and multi-stemmed, poor quality specimen arising from western side of eroded ditch. Is of questionable sustainability.
71	Fraxinus excelsior	Common Ash	322	7	2	4.5	4.5	4.5	Semi-mature	Poor	Fair	C2	3.86	Wholly one-sided and obscure by dense Ivy cover. Tree appears to offer minimal sustainability.
72	Fraxinus excelsior	Common Ash	360	7	4.5	4.5	3.5	3.5	Semi-mature	Poor	Fair	C2	4.32	Multi-stemmed and routing arising from eroded western bank of dilapidated ditch
73	Fraxinus excelsior	Common Ash	229	6	2.5	3	3	4.5	Semi-mature	Poor	Fair	C2	2.75	Twin stemmed from low level. A poor quality and suppressed specimen arising from dilapidated hedge line

74	Fraxinus excelsior	Common Ash	232	7	1.5	2.5	3	3	Semi-mature	Poor	Fair	C2	2.78	Distorted and arising from western side of dilapidated ditch. Tree offers limited sustainability.	
75	Fraxinus excelsior	Common Ash	398	10	4	3.5	3.5	3	Semi-mature	Poor	Fair	C2	4.78	Multi-stemmed from ground level raising questions regarding structural integrity. Tree group arises from disturbed western bank of dilapidated ditch	Review regarding retention context.
76	Fraxinus excelsior	Common Ash	185	5	1	1.5	1.5	1.5	Semi-mature	Poor	Fair	C2	2.22	A young whip arising from western side of dilapidated ditch and waterlogged area	Review regarding retention context.
77	Fraxinus excelsior	Common Ash	191	5	1.5	1.5	1.5	1.5	Semi-mature	Poor	Fair	C2	2.29	A young whip arising from western side of dilapidated ditch and waterlogged area	Review regarding retention context.

78	Fraxinus excelsior	Common Ash	188	5	1.5	1.5	1.5	1.5	Semi-mature	Poor	Fair	C2	2.26	A young whip arising from western side of dilapidated ditch and waterlogged area	Review regarding retention context.
79	Fraxinus excelsior	Common Ash	185	5	1.5	1.5	1.5	1.5	Semi-mature	Poor	Fair	C2	2.22	A young whip arising from western side of dilapidated ditch and waterlogged area	Review regarding retention context.
81	Fraxinus excelsior	Common Ash	341	7	4	2.5	2.5	2.5	Semi-mature	Poor	Fair	C2	4.09	Distorted and arising from northern edge of stream. Is of poor quality.	
82	Salix alba	White Willow	271	6	5	5	3	0	Semi-mature	Poor	Fair	C2	3.25	Arising to north of site boundary. Is heavily unbalanced to east.	Review regarding retention context.

82a	Salix fragilis	Crack Willow	668	12	7	7	5	6	Early-mature	Fair	Fair	C2	8.02	Large, multi-stemmed and disbursed group to create a singular crown form. Group is in state of ongoing dilapidation and involved stems both the north and south of the ditch and stream. There is much evidence of ongoing/prior failure and collapse.	Review with regard to retention context and management issues arising.
83	Fraxinus excelsior	Common Ash	344	7	4	2.5	4	4	Semi-mature	Poor	Fair	C2	4.13	Multi-stem from ground level. Naturally arising from rubble and spoil.	
84	Acer pseudoplatanus	Sycamore	334	7	4	3.5	3	1	Semi-mature	Fair	Fair	C2	4.01	Twin-stemmed group, heavily suppressed by proximity of near neighbour. Arises from demolition spoil.	

85	Acer pseudoplatanus	Sycamore	302	7	4	4	4	4	Semi-mature	Fair	Fair	B2	3.62	Young and vigorous, arising from dilapidated and demolished structures	Review regarding retention context.
86	Acer pseudoplatanus	Sycamore	360	9	5	4.5	4	4	Semi-mature	Fair	Fair	B2	4.32	Young and vigorous though supporting extensive Ivy cover.	Cut Ivy and rereview.
87	Acer pseudoplatanus	Sycamore	274	5	3	2	1.5	2	Semi-mature	Poor	Poor	U	3.29	Comprises sucker regeneration from stump of previous tree.	
88	Acer pseudoplatanus	Sycamore	844	13	6	5	6	6	Early-mature	Poor	Fair	C2	10.13	Apparently older specimen possibly decapitated in past. Lower stem is subject to ongoing fire damage extensive bark dieback and localise decay. Tree is not sustainable.	
89	Acer pseudoplatanus	Sycamore	261	6	4.5	3	1	2.5	Semi-mature	Poor	Fair	U	3.13	Strangle by wire and arising from demolition spoil. Ill-suited to retention.	

90	Acer pseudoplatanus	Sycamore	325	11	4	2	4	3	Early-mature	Poor	Fair	C2	3.9	Naturally arising from partially demolished masonry.	
91	Acer pseudoplatanus	Sycamore	306	11	3	2	2	1	Early-mature	Poor	Fair	C2	3.67	Naturally arising from partially demolished masonry.	
92	Ulmus glabra	Wych Elm	271	10	4.5	4	2	3	Semi-mature	Poor	Dead	U	3.25	Completely dead and in need of removal.	Remove.
93	Salix alba	White Willow	637	14	8	8	6	6	Early-mature	Poor	Fair	C2	7.64	Large sprawling's multi-stemmed group in a state of ongoing and progressive failure. Tree arises from position east of area of demolition rubble and apparent pond and. Suitability of retention would require substantial further review	

94	Acer pseudoplatanus	Sycamore	379	8	3.5	3	4	4	Semi-mature	Fair	Fair	B2	4.55	Young and vigorous but obscure by dense Ivy cover.	Cut Ivy and rereview.
95	Acer pseudoplatanus	Sycamore	401	13	5	4.5	5	5	Early-mature	Fair	Fair	C2	4.81	Quality is undermined by bark included fork though general vigour and vitality is good	Review regarding retention context.
96	Fraxinus excelsior	Common Ash	493	11	5	3	4	3.5	Early-mature	Poor	Fair	C2	5.92	Of variable condition with evidence of prior mid crown damage. Tree arises from hi embankment abovecanal levelling ditch.	Re-review.
97	Fraxinus excelsior	Common Ash	525	11	4.5	5	3.5	1.5	Early-mature	Poor	Fair	C2	6.3	Is heavily Ivy clad preventing detailed appraisal. Tree arises from hi embankment above canal levelling stream. Crown supports deadwood possibly indicative of	

													pathological issues	
98	Fraxinus excelsior	Common Ash	493	10	5	6.5	4	5	Early-mature	Poor	Fair	C2	5.92	Arises from embankment above levelling canal levelling ditch. General vigour and vitality appear good however, entire crown is wholly enveloped in Ivy cover preventing detailed review at this time.	Cut Ivy and rereview.
101	Acer pseudoplatanus	Sycamore	548	11	5	5	4	5	Mature	Fair	Fair	C2	6.58	Tree arises from lower-level adjoining canal balancing stream. General vigour and vitality are good, though much of crown is obscure by dense Ivy cover	

102	Ulmus glabra	Wych Elm	239	6	2	2.5	2	1	Semi-mature	Poor	Dead	U	2.87	Completely dead, killed by Dutch Elm disease.	Remove.
103	Ulmus glabra	Wych Elm	220	6	1.5	2.5	2.5	1	Semi-mature	Poor	Dead	U	2.64	Completely dead, killed by Dutch Elm disease.	Remove.
104	Ulmus glabra	Wych Elm	271	6	1	2	2.5	2.5	Semi-mature	Poor	Dead	U	3.25	Completely dead, killed by Dutch Elm disease.	Remove.
105	Fagus sylvatica	Common Beech	589	13	6.5	6.5	6.5	6.5	Early-mature	Fair	Good	B2	7.07	A relatively young but vigorous group, multi-stemmed from low level. Multiple stems combined to create a singular canopy form.	
106	Ulmus glabra	Wych Elm	337	6	4.5	5	5	3	Semi-mature	Poor	Dead	U	4.04	Completely dead, killed by Dutch Elm disease.	Remove.
106	Ulmus glabra	Wych Elm	337	12	4.5	5	5	3	Early-mature	Poor	Dead	U	4.04	Completely dead, killed by Dutch Elm disease.	Remove.

107	Fraxinus excelsior	Common Ash	274	9	3	4	3	2.5	Semi-mature	Poor	Fair	C2	3.29	Slightly unbalanced to east. Vigour is impaired with twiggy decline in evidence about higher crown	Review annually regarding Chalara canker
109	Fraxinus excelsior	Common Ash	229	7	2.5	2.5	2.5	2.5	Semi-mature	Fair	Good	B2	2.75	Slightly unbalanced to east. Vigour is impaired with twiggy decline in evidence about higher crown	Review annually regarding Chalara canker.
115	Fraxinus excelsior	Common Ash	269	11	3	3	3	2	Semi-mature	Poor	Poor	U	3.23	Exhibiting widespread evidence of higher crown decline. Appears ill-suited for retention	Remove.
116	Fraxinus excelsior	Common Ash	347	10	3	3.5	3.5	2.5	Semi-mature	Fair	Good	B2	4.16	Appears be keeping reasonable vigour and vitality but is adjoined by other Ash showing signs of decline.	re-review, summer 2022.

117	Fraxinus excelsior	Common Ash	239	10	2.5	2.5	2.5	2.5	Semi-mature	Fair	Good	B2	2.87	Currently shows no signs of decline but should be reviewed in summer 2022.	re-review, summer 2022.
118	Fraxinus excelsior	Common Ash	350	12	3	3	3	3	Semi-mature	Poor	Poor	U	4.2	Exhibiting classic signs of decline and deterioration associated with Chalara canker	Consider early removal.
119	Fraxinus excelsior	Common Ash	239	10	2.5	2.5	2.5	2.5	Semi-mature	Fair	Good	B2	2.87	Currently shows no signs of decline but should be reviewed in summer 2022.	
120	Ulmus glabra	Wych Elm	229	8	2	2	2	2	Semi-mature	Poor	Dead	U	2.75	Killed by Dutch Elm disease.	
121	Fraxinus excelsior	Common Ash	337	9	3.5	3.5	3.5	3.5	Semi-mature	Poor	Fair	C2	4.04	Twin stems adjoined to create singular crown form. Crown vigour and vitality is reduced suggesting possible onset of disease. Tree appears to offer	rereview summer 2022.

													limited sustainability	
122	Fraxinus excelsior	Common Ash	462	12	4	6	3	4	Early-mature	Poor	Fair	C2	5.54	Large multi-stemmed group heavily obscured by dense Ivy cover. Vigour and vitality are reduced suggesting possible onset of Ash decline.	rereview summer 2022.
1001	Fraxinus excelsior	Common Ash	250	10	3	3	5	5	Early-mature	Fair	Fair	C2	3	Ash dieback Multi stem 7	Review
1002	Fraxinus excelsior	Common Ash	550	15	4	4	4	4	Early-mature	Fair	Fair	C2	6.6		
1003	Fraxinus excelsior	Common Ash	550	15	4	4	4	5	Early-mature	Fair	Fair	C2	6.6		
WG1	Salix alba	White Willow	637	17	6	6.5	5	5	Mature	Poor	Fair	C2	7.64	A dispersed and multi-stemmed group arising over notable area adjoining balancing pond	

														to canal. Evidence suggests an original tree probably subject to a suckering and possible layering. Condition is highly variable with evidence of ongoing mechanical failure and limb loss suggesting sustainability will be context dependent. Notwithstanding this, group remains vigorous however much of crown is heavily obscured by dense Ivy growth.	
WG2	Salix alba	White Willow	637	16	7	6	3	2	Mature	Poor	Fair	C2	7.64	Multi-stemmed group slightly unbalanced to east. Group raises similar concerns as to	Review with regard retention context.

													those discussed in respect Willow group 1 inasmuch as crown and Entire tree will be subject to impromptu storm damage.
WG3	Salix alba	White Willow	525	16	12	5	5	7	Mature	Poor	Fair	C2	6.3	A multi-stemmed and disbursed group of poor quality with evidence of decline within upper crown. Group includes satellite gracious smaller previously cut satellite group to east.
WG3a	Salix alba	White Willow	525	10	2	2	2	2	Early-mature	Poor	Fair	C2	6.3	Appears to comprise sucker regeneration from the stump of a previous large tree.
WG4	Salix alba	White Willow	637	12	6	6	5	6	Early-mature	Poor	Fair	C2	7.64	Appears to be somewhat younger but is equally mechanically poor. Crown

													comprises heavily diverging stems with lower central portion not visible because of undergrowth. Concerns exist that tree has been subject to prior collapse.	
WG5	Salix alba	White Willow	748	15	7	6	6	5	Early-mature	Poor	Fair	C2	8.98	See general comments above.	Review regularly.
WG6	Salix alba	White Willow	796	15	6	8	6	5	Early-mature	Poor	Fair	C2	9.55	Multi-stemmed and already in a state of ongoing mechanical failure with recent loss of major limbs	Review regularly.
WG7	Salix alba	White Willow	462	12	4	5	5	3	Early-mature	Poor	Fair	C2	5.54	Multi-stem from ground level. Potentially is mechanically poor and may be subject to failure	Review regularly.

WG8	Salix alba	White Willow	637	16	10	12	6	5	Mature	Poor	Fair	C2	7.64	See general comments above.	Review regularly.

Appendix 2 – Hedgerow Schedule

No.	Common Name	Life Stage	Condition	Estimated Remaining Contribution	Quality Category	Comments
1a	Common ash, Common hawthorn, Dog rose, Elder, Wych elm	Mature	Mixed	Medium (20 to 40 years)	C2	Hedge has undergone substantial clearance of sprawling Bramble-based thicket, particularly to east of hedge. Hedge remains overgrown with many trees chronically enveloped with Ivy. Substantial number of original hawthorns remain but only at intermittent positions. The alignment supports a number of emergent ash and elm however many of the elms appear to be dead as result of Dutch Elm disease. Hedge is associated with substantial ditch and embankment feature. A majority of the thorn-based material arises from the eastern bank of the ditch however general scrub and thicket development to the west is noted but is variable. Area supports a number of sporadic sapling trees and Thorn elements.
1b	Blackthorn, Common hawthorn, Dog rose, Sycamore	Mature	Mixed	Short (10 to 20 years)	C2	A relic of prior hedge being substantially discontinuous. Recent clearance works of spurious Bramble thicket have left wholly denuded hedge line comprising a small number of relic Hawthorn together with some Elder and Sycamore. Hedge line arises from the southern bank of a substantial ditch.
1c	Blackthorn, Common hawthorn, Dog rose, Elder, Goat willow, Wych elm	Mature	Mixed	Short (10 to 20 years)	C2	The original hedge alignment arises from the north-eastern side of a substantial ditch alignment descending to circa 1.50 m below field levels and whilst much thicket development has occurred to the north-west, this shows no evidence of deliberate planting and typically comprises Bramble thicket with intermittent Thorn and Elder

						development. Continuity in the hedge is relatively poor with numerous gaps exceeding 20.00 m whereby the hedge profile is provided by low level Bramble dominated thicket only. This section of the hedge is noted to support circa 8 completely dead Wych Elm. These trees, as with elsewhere on the site, have been lost to Dutch Elm disease and are indicative of the disease's prevalence within the broader area. Note is made that whilst the general profile of the original hedge rarely exceeds 6.00 – 8.00 m, the broader thicket development to both the north-east and south-west often extends this profile by in excess of 20 m. Such material is however of poor quality and offers minimal potential for retention within a developed context.
1d	Common beech, Common hawthorn, Dog rose, Elder	Mature	Mixed	Short (10 to 20 years)	C2	Another dilapidated section of hedgerow supporting only a small number of original Hawthorn. Broader continuity is provided at lower levels by Bramble thicket and intermittent Elder. The alignment supports at least for completely dead Wych Elm, indicative of the prevalence of Dutch Elm disease within the broader area. Note is made that circa 60 m south of the northern end of this hedge, there is a substantial Beech. This tree is broadly accessible at this time however, its overall condition would appear good in respect of its general vigour and vitality. It will be advised this tree is reviewed in detail once access is available. As with the remainder of the "1" group hedges, or significant material associated with this hedge arises from the north-eastern edge of a substantial

						drainage ditch. However, note is made of extensive thicket development progressing in a south westerly direction from the ditch and typically comprising Hawthorne, Bramble and elder scrub. Whilst providing a significant block of vegetation, it is unlikely that this material could be retained into and new urban landscape.
1e	Blackthorn, Common ash, Elder	Mature	Mixed	Short (10 to 20 years)	C2	Effectively comprising a dense Bramble thicket supporting 2 emergent groups of elder. Offers minimal sustainability.
1f	Blackthorn, Common hawthorn, Elder	Mature	Mixed	Short (10 to 20 years)	C2	Appears to comprise an intermittent and highly variable thorn-based alignment close to palisade boundary. The south of this, there is an erratic and variable Bramble thicket with emergent and Thorn and Elder.
1g	Blackthorn, Common hawthorn, Elder, Goat willow, Gorse, Sycamore, Wych elm	Mature	Mixed	Short (10 to 20 years)	C2	Alignment comprises an almost continuous thorn-based alignment close to palisade rails boundary. The south of this, there is a mixed and variable population of scrub thicket including Goat Willow, Bramble and Sycamore. Review with regard to retention context.
2	Blackthorn, Common ash, Common hawthorn, Elder, Sycamore, Wych elm	Mature	Mixed	Short (10 to 20 years)	C2	A broadly continuous hedge alignment with only a singular centrally located gap. Continuity appears good however, it is best at the north-eastern end of the alignment and is reduced to the south-west where continuity is in part provided by Bramble thicket. The alignment supports a small number of typically small but dead Wych Elm, indicative of the prevalence of Dutch Elm disease within the broader area. The south-western portion of the hedge supports a small element of emergent Ash that appear young and vigorous and thus are likely to assert immense potential for growth over time. The alignment arises wholly

						from the north-western upper edge of a substantial ditch profile.
3a	Blackthorn, Common ash, Common hawthorn, Dog rose, Elder, Sycamore	Mature	Mixed	Short (10 to 20 years)	C2	Exhibiting evidence of once having comprised a typical Hawthorne based agricultural field boundary. The alignment it still retains a substantial proportion of the hawthorns however, these are becoming outcompeted by more invasive species including elder, Blackthorn and Ash. The bulk of the mature material arises from the western side of substantial ditch profile however the vegetative profile is substantially exaggerated, particularly to the East by extensive secondary thicket development typically dominated by Bramble and elder and Blackthorn. This alignment supports several completely dead Elm, most notable towards the centre of the line with some having already collapsed. Note is also made of substantial contribution to the profile played by emergent Ash. Was most of these trees tend to be drawn up, distorted or multistemmed, most appear to be maintaining good vigour and vitality at this time and accordingly would appear to offer some degree of sustainability. Nonetheless and regarding larger trees, it would be advised that once access is improved by way of scrub eradication that any such trees intended for retention would be reviewed on an individual basis.
3b	Blackthorn, Common ash, Common hawthorn, Dog rose, Elder, Sycamore	Mature	Mixed	Short (10 to 20 years)	C2	This element of hedging effectively comprises an extension to hedge 3a continuing up and to the southern boundary hedge of the site area. In many respects, it mimics hedge 3a however, the proportion of Hawthorne remaining in this area is diminished with it greater degree of apparent

						suppression and competition from broader thicket development. In such instances, the eradication of the broader thicket would leave little of the original hedge structure. As with previous comments. The significant material associated with this thicket arises from the western edge of a substantial ditch notwithstanding the fact that there has been substantial scrub development typically dominated by Bramble thicket, to both sides of the original alignment.
3c	Blackthorn, Common ash, Common hawthorn, Elder	Mature	Mixed	Short (10 to 20 years)	C2	Exhibits evidence to suggest once having comprised a Hawthorne hedge however, at this time it comprises more a broad swathe of regenerative vegetation in association with demolition spoil rubble and masonry. The material is of small stature, poor quality and offers minimal potential for retention.
4	Blackthorn, Common ash, Common hawthorn, Crack willow, Dog rose, Elder, Goat willow, Wych elm	Mature	Poor	Short (10 to 20 years)	C2	A sprawling and dilapidated hedge of highly variable condition. The hedge appears to be based on the upper northern edge of a substantial ditch alignment however, to further complicate issues, surrounding vegetation is highly suggestive of particularly poor drainage and potentially waterlogged conditions. The condition of the hedge is highly variable not only supporting several dead Elms, presumed have been killed by Dutch Elm disease but also other species exhibiting classic signs of decline are possibly attributable to periodic waterlogging. The originally intended Hawthorne element of the hedgerow is now quite vestigial with the broader hedge profile been provided by a combination thicket, often dominated by Blackthorn, Bramble, and Ivy with intermittent emergent Ash. As with previously

						described hedges, note is made of the substantial expansion of the original hedge profile by continuous thicket development to the north and south of the primary alignment.
5a	Blackthorn, Common ash, Elder, Wych elm	Mature	Poor	Short (10 to 20 years)	C2	A particularly dilapidated and disjointed hedge alignment apparently arising from the southern side of a now heavily eroded and dilapidated ditch. The hedge lacks continuity and retains only a small number of the original Hawthorn.
5b	Blackthorn, Dog rose, Wych elm	Mature	Poor	Short (10 to 20 years)	C2	A broadly continuous element of hedge notwithstanding suppression and competition at lower levels. In this instance, the primary Hawthorne remains dominant but early signs of competition exist with substantial thicket development to both the south-east and north-west of the primary alignment. Note is made that the primary alignment appears to be rooted on the upper edge of the north-western side of a substantial ditch feature. Though small in numbers, this hedge section supports some Wych Elm, the majority of these are dead however one was encountered that remains alive however this specimen is already exhibiting symptoms of the disease and thus is unlikely to survive beyond the immediate shortterm.
5c	Blackthorn, Elder, Wych elm	Mature	Poor	Short (10 to 20 years)	C2	As with 5B excepting that all Elms are dead.
6	Blackthorn, Common ash, Elder, Wych elm	Mature	Poor	Short (10 to 20 years)	C2	Widely dilapidated section of hedge that whilst still supporting a small number of the original Hawthorns is now more an alignment of mixed species, often dominated by Blackthorn and Bramble. Many specimens in this area exhibit evidence of decline a factor that may be related to localised changes in ground flora that suggest wetter ground conditions and possible periodic

						flooding. This section of hedge is considered such as to provide particularly minimal potential for retention.
6b	Blackthorn, Common ash, Common hawthorn, Elder, Goat willow, Wych elm	Mature	Poor	Short (10 to 20 years)	C2	A wholly dilapidated element of hedge that whilst illustrating elements of prior Hawthorne hedge is now wholly intermittent and discontinuous. With reference to the southernmost end of the hedge, ground flora suggests a particularly wet conditions including dominance by reeds and sedges. This is likely to be the cause of some of the decline noted within the hedge. Note is however made that the hedge supports several Elms apparently lost to Dutch Elm disease. The southern end of the hedge supports several young Ash. Many of these trees remain vigorous at present however, such specimen should be reviewed considering environmental changes including drainage as may occur in this area through development. Other than the ash, this section of hedging offers little potential for retention.
7	Blackthorn, Common ash, Common hawthorn, Elder	Mature	Poor	Short (10 to 20 years)	C2	A broadly variable hedge alignment where Hawthorne still retains a substantial proportion of the overall population however, it is now often suppressed and has lost its dominance. The broader alignment now comprises a more thicket like and mixed profile including a notable population of emergent ash. The original and dominant vegetation arises from the northern side of a substantial ditch profile. This vegetation is added to both the north and south of the original profile and ditch by spurious thicket development, typically dominated by goat willow and Bramble. The alignment remains strong and except for a small

						number of specific punctuations is broadly continuous. Eradication of invasive species appears likely to allow for the retention of a still broadly contiguous alignment. Note is made that several Elms located at the north-western end of the alignment are already in poor condition with all exhibiting evidence of early Dutch Elm disease attack. Accordingly, such material is considered unsustainable. Though none of the emergent Ash from this alignment have been deliberately planted, a clear majority appear to be in broadly good condition and might offer some degree of sustainability. This is particularly the case in respect of 7b where in comparison to 7a, the Ash becomes progressively more and more dominant in respect of the broader alignment.
8	Blackthorn, Common ash, Common hawthorn, Common hazel, Elder, Pedunculate oak, Sycamore	Mature	Poor	Short (10 to 20 years)	C2	This alignment differs greatly from previous alignments in that it supports and obviously more mature tree population. The underlying Hawthorn hedge appears quite like others noted elsewhere upon the site and will be typical of agricultural field boundaries. The hedge as with all significant vegetation in this area is located arising from the eastern side of a substantial drainage ditch, descending to circa 1.50 metres below field levels. The Hawthorn is becoming recessive with continuity within the lowerlevel hedge being provided more by a combination of species as opposed to a true Hawthorne alignment. In this respect, there are substantial variability with some elements of the hedge comprising little more than Bramble and elder thicket. The biggest difference in this instance relates the tree

						population including a number of significant Ash, Sycamore and, towards the north-western end of the alignment, and Oak. The age profile of these trees is significantly different from any others noted elsewhere on the site (exempting Beech at northern end of hedge 1d) thus suggesting a different context and history. The paragraph the trees vary greatly in condition. The larger Sycamore exhibits classic signs of decline and stag heading as do adjoining trees including some ash towards the centre of the alignment. Other tree is a pity maintaining reasonable vigour and vitality. The underlying hedge profile is of questionable suitability for attention in light of its variability and the fact that the eradication of invasive scrub thicket species would greatly undermine any degree of continuity. Similar comment would apply to the trees however, proportion of the trees would appear suitable for retention.
9	Common ash, Common hawthorn, Elder, Spindle, Sycamore	Mature	Poor	Short (10 to 20 years)	C2	A broadly continuous hedge alignment where dominant vegetation appears to arise from the south-eastern side of significant field hedge however, there is additional evidence to suggest possible planted population to the north-west of the same ditch. The Hawthorn element of the population remains significant though is beginning to lose dominance particularly with the development of emergent ash. Thicket development tends to be somewhat limited suggesting that the eradication of more invasive species may still allow for the retention of significant hedge alignment. Note is made that the alignment supports several elms, all dead because of Dutch Elm

						disease. Is also supports several young Ash and Sycamore that appear to be of good general health.
27	Blackthorn, Common ash, Common hawthorn, Dog rose, Elder, Spindle, Sycamore	Mature	Poor	Short (10 to 20 years)	C2	A broad, sprawling, and ill-defined alignment that may or may not have been a hedge profile. There is a shallow but substantially eroded potential ditch alignment that appears to follow the online however, this is at best ill-defined by vegetation. The vegetation associated with the area is particularly poor with very few original Hawthorn is and the vegetation at best being sporadic and displaced from any alignment centre. The quality material is poor with several Elms already either dead or dying because of Dutch Elm disease. The remainder of the material is particularly spurious dominated by intermittent elder and thus is considered unsuitable for retention.
28	Blackthorn, Common ash, Common hawthorn, Dog rose, Elder, Spindle, Sycamore	Mature	Poor	Short (10 to 20 years)	C2	A highly variable hedge profile defined by a reduced number of large mature Hawthorn. While these remain dominant within the line they are not contiguous or continuous. At lower levels, the hedge profile continuity is best preserved by Bramble and Blackthorn thickets. The overall Hawthorn population where it exists, remains a reasonably good health notwithstanding suppression at lower levels. The original profile is contributed to by substantial thicket development was typically dominated by Blackthorn and Bramble. The alignment supports several emergent trees including Ash, Sycamore and Elm. All Elm is either dead or approaching death and thus cannot be retained. Towards the middle of the alignment, the ash of particularly poor condition suggesting notable

						sustainability issues. Note is however made that as one progresses to the south-west, the emergent tree population appears to become better and thus the degree of sustainability at that position may be improved. Note should be made that any curtailment of low-level scrub thicket on either side of the hedge will have a substantial effect on hedge continuity and cover levels.
29a	Blackthorn, Common ash, Common hawthorn, Elder, Sycamore, Wych elm	Mature	Poor	Short (10 to 20 years)	C2	A broadly continuous thicket-affect however, the underlying hedge is of highly variable quality with only a small proportion of the original Hawthorn hedge remaining. Much of the hedge has been suppressed by an emergent ash and Elm population however, the elms, because of Dutch Elm disease are now dead. At lower levels, widespread thicket development dominated by Bramble and Blackthorn has caused equal suppression. Any curtailment in spread by reducing the spurious thicket development will have a massive effect on hedge continuity and would quickly isolate what is only a small number of remaining Hawthorne's. Accordingly, the suitability of retaining this alignment is considered dubious at best.
T59	Common ash, Wych elm	Semi-mature	Fair	Medium (20 to 40 years)	C2	A combined a close-knit group arising from particularly boggy and flooded ground. Elm is completely dead and Ash as a poor quality offering no realistic sustainability.
T61	Ash species	Semi-mature	Fair	Very Short (<10 years)	U	Close-knit group of poor-quality specimens arising from waterlogged ground on edge of dilapidated ditch. Trees offer minimal sustainability.Consider early removal.

TL1	Common ash, Sycamore, Wych elm	Early-mature	Fair	Medium (20 to 40 years)	C2	A broadly continuous line and dominated by Ash arising from the southern side of dilapidated and eroded field ditch. A small number of trees arise from the southern side of the ditch (site side) this is a particularly small proportion of the overall population. All Elms reviewed exhibit evidence of Dutch Elm disease and offers no realistic sustainability Even where individuals remain alive. Similar concerns relate to the ash and relate in respect of the risks of Chalara canker attack. Accordingly it must be appreciated that these trees could readily be lost over coming years. Additionally, consideration should be given to the nature and form of the tree line. All trees, particularly the older specimens are multi-stem suggesting early life intervention and attempted cutting. Such multi-stemmed formats are mechanically weaker than single stem trees with evidence existing throughout the line of ongoing mechanical failure, stem splitting and limb loss. Notwithstanding the pathological issues mentioned above, combining this with mechanical issues then these trees should be regarded as suitable for limited retention and that retention will be dependent

						upon the context within which they would be retained. If retained, it is advised that the limited sustainability be addressed by new planting and augmenting the existing population thereby accounting for natural loss as well as safety management required loss over time.
WT1	Blackthorn, Common ash, Common hawthorn, Sycamore, Wych elm	Early-mature	Fair	Medium (20 to 40 years)	C2	A dense and highly variable thicket like development with no evidence of planting regime or pattern. Area supports numerous semimature trees including ash Sycamore and Elm however, most of the Elms encountered were dead as result of Dutch Elm disease. The area is subject to substantial ponding and waterlogging throughout and suitability for retaining material will be subject to long term management intentions. Consideration should also be given to the proportion of the population comprising ash as this may offer limited sustainability in light of Chalara canker issues.
WT2	Common ash, Elder	Early-mature	Fair	Medium (20 to 40 years)	C2	Group 3, Ash, Bramble, Ivy, Elder, and intermittent and variable group of ash that appeared to be associated with a now partially filled and dilapidated hedge with evidence of widespread earthworks and ground disturbance. The entries a multistemmed raising some concern with regard to sustainability and

						mechanical integrity however most currently appear to be of reasonably good health. Notwithstanding this, due consideration must be given to the potential for issues arising from Chalara canker the possibility that any or all of these trees could be lost to the disease in the near future.
WT3	Common ash, Elder, Goat willow, Sycamore	Early-mature	Fair	Medium (20 to 40 years)	C2	An area comprising natural regeneration. There is much competition and suppression across this generally continuous and thicket like area. Young Elm are subject to Dutch Elm disease and concern revolves about the sustainability of the Ash in light of Chalara canker.

Disclaimers

This report is intended solely for the benefit of the parties to whom it is addressed, and no responsibility is extended to any third party for the whole or any part of its contents. The conclusions and recommendations in this report are only valid for a period of one year. This period of validity may be reduced in the case of any change in conditions to or in proximity to the tree. In the event of adverse weather conditions, there is the possibility of any tree despite good report surveys, falling over.

In the event of a falling tree causing damage to residential or non-residential buildings in their proximity, no liability will attach to this firm, in the event of damage by such trees, to any person, any building public or private, or any mechanical vehicle or otherwise. Recommendations made in this report are subject to the knowledge and expertise of the qualified Arborist that carried out the above inspections.

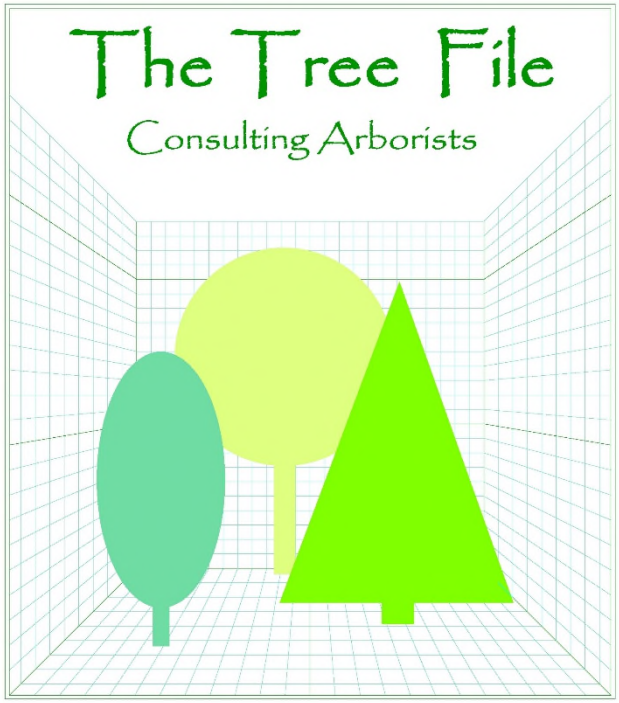
Signed John Ward

Dated: November 2022
John Ward

ISA Certified Arborist

APPENDIX 7

ARBORICULTURAL REPORT



Arboricultural Report
Proposed Development
Clonburris Phase 1A
Dublin 22

November 2021

The Tree File Ltd
Consulting Arborists
Ashgrove House
26 Foxrock Court
Dublin 18
D18 R2K1
086-3819011

Contents

Associated Drawings

This report must be read in conjunction with the drawings noted below

	Drawing Title	Drawing Subject
1)	**Clonburris Tree Constraints Plan (Over three sheets)**	**Tree Constraints Plan** A plan depicting the predevelopment location, size, calculated constraints, and simplified tree quality category system
2)	**Clonburris Tree Impacts Plan (Over three sheets)**	**Tree Impacts Plan** This plan represents the effects of the proposed development works on the above tree population and depicts trees to be retained and removed.

1 Report Summary

1.1 The tree survey found a diverse tree population. The trees can be regarded as forming three principal groups including-

- Thorn hedges relating to the original agricultural field hedge systems
- Emergent trees arising from the thorn-based hedge systems
- Areas of natural regeneration, thicket, and young tree development

1.2 The site's tree population is dominated by young, naturally arising trees, often emerging from a dilapidated agricultural field boundary hedge system. These populations are based on an original but overwhelmed Hawthorn hedge system. This is now combined with species including Blackthorn, Bramble, Dog Rose, Spindle, Privet, Ash, Sycamore, Wych Elm and Goat Willow among others.

1.3 The site's hedges are often derelict, not having received any management for many years. In some cases, the original thorn alignment has been overwhelmed and what was a hedge now consists of a broad corridor of mixed material. Many hedges are adjoined by additional growth, sometimes extending the vegetation corridor hugely, often to 10 or 20 metres, or more. Such extensions to these corridors tend to comprise two principal species, these being Blackthorn and Bramble.

1.4 All larger Elms identified on the site were dead because of Dutch Elm disease. Many Ash exhibit symptoms suggestive of Ash Dieback attack. Many of the remaining trees, typically Sycamore, are distorted emergent specimens arising from hedge remnants. Considering the noted pathological issues and the often poor-quality of the remaining population, then the potential for sustainable tree retention is significantly impaired and will, in the case of the Ash, be subject to regular re-review.

1.5 It appears that the vegetation and trees associated with the site offer greater value on an ecological basis than they do on a purely Arboricultural basis. In this respect and regarding the southern edge of the site, note is made of the "proposed Natural Heritage Area" (pHNA No. 002104) designation, that affords an ecological protection and objectives that relate to the conservation of the area and its vegetation and wildlife.

1.6 Most vegetation associated with the agricultural context hedge system is associated with "S" profile earthworks, involving a ditch and embankment features. The townland boundaries sometimes involve double ditches forming a raised causeway effect between. The vegetation often sits on top of the bank, or the upper edge of the ditch bank. All such vegetation is intrinsically linked with these earthworks and thier hydrology. Accordingly, the diversion or drainage of ditches or the modification of the earthworks is likely to affect the vegetation these features support.

1.7 Of the trees described above, all that sits within the development area, or the proposed construction access road will be removed. This relates to the nature and extent of the proposed works are large-scale, will need the use of large vehicles, plant, and

equipment, that in turn require access to various point of the works zone. It is assumed that a majority of the site space will undergo conversion or disturbance of an extent that would not allow for sustainable tree retention.

1.8 It must be noted that the subject development is part of the broader Clonburris SDZ are which remains to be developed. Therefore, further tree and vegetation losses will occur in line with future and adjoining developments. An example of this is well illustrated by the proposed east-west link road (SDZ20A/0021) that will eventually service the western area of the site. This road, shown currently in a truncated form, will continue in a westerly direction in line with and will eventually provide access to additional developments to the north and south of the road. Equally, the space between the development as shown and the railway cutting to the north is being considered for development.

1.9 In summary, the proposed works will either directly or indirectly require the loss of all material within the development area. Notwithstanding this, it is appreciated that many of the individual specimens reviewed offer either no or little sustainability, regardless of development impacts. It is equally noted that a large proportion of the trees, particularly those arising from the overgrown agricultural landscape are relatively small, in line with their typically young age. Accordingly, the potential for their replacement with similar nursery produced stock cannot be ignored, thereby questioning the extent to which they should be regarded as a constraint to development. It is for this reason that a large proportion has been categorised as “C” grade trees.

1.10 Considering this development proposal in isolation does not allow for the development of a tree protection plan. It is advised that this development is considered in conjunction with adjoining and future developments, so that a realistic understanding of sustainable tree retention can be developed. With such knowledge, an achievable tree protection plan can be developed. Notwithstanding this, it is appreciated that the “Canal Corridor” associated with the “Proposed Natural Heritage Area” (pHNA No. 002104” is designated for retention. In this respect, tree protection will affectively comprise a principal of construction exclusion. This will be accomplished by the use of “construction exclusion fencing” erected prior to the commencement of construction works. Such construction exclusion must appreciate that extensive “landscaping” and “access” works are called up at positions adjoining tree and thicket areas. It is envisaged that some degree of scrub clearance will be required, but that the extent of this will require that the various features (e.g. paths) will need to be “pegged out” to better identify extents of clearance.

1.11 It is advised that such a full tree protection plan, in accordance with the “Arboricultural method Statement” at “Appendix 1” to this document, is developed prior to the commencement of any development related works.

Introduction

2.1 This report was commissioned by-
Cairn Homes

This report has been prepared by-
Andy Worsnop Tech Arbor A, NCH Arb (PTI LANTRA)
The Tree File Ltd
Ashgrove House
Kill Avenue
Dun Laoghaire
Co Dublin

Report Brief

2.2 An Arboricultural report has been requested in respect of the proposed development. As "BS5837: 2012 Trees in Relation to Design, Demolition and Construction – Recommendations" is the accepted frameworks for such reports, then its composition, inclusions and recommendations have been followed as a general basis for such reporting.

Report Context

2.3 This report comprises an Arboricultural review of the proposed infrastructure project. The report deals specifically with the infrastructure and does not deal with or consider the broader development of the Clonburris lands. This includes an assessment of the sites existing tree population within its current context. It is also an assessment of their potential for sustainable retention in the post-development scenario, and the likely effects and repercussions of the development and construction process upon those trees. It also provides information regarding the necessary tree protection and the avoidance of damage to trees during the construction process, necessary to achieve sustainable tree retention.

2.4 This assessment summarises the Arborists findings and recommendations, arrived at after reviewing the proposed project details as provided, and after an evaluation of trees as defined and described in the tree survey at "Appendix 2". This report also includes a preliminary "Arboricultural Method Statement" that describes the requisite conservation and protection methodologies necessary to maintain tree sustainability. This report is not intended as a critique of the proposed development. However, it is an impartial assessment of the development implications relating to the sustainable retention of trees, whether that be any, some, or all trees. This report is for planning purposes only and may be deficient for construction phase use.

Report Limitations

2.5 This report relates the Arborists interpretation of information provided to him before the report compilation and gained by him during the undertaking of the site review and tree survey. The site review data is subject to the limitations as set out under "Inspection and Evaluation Limitations and Disclaimers" in "Appendix 2" of this report. The findings and recommendations made within this report are compiled, based upon the knowledge and expertise of the inspecting Arborist.

2.6 The "Implication Assessment" element of the report builds on assumptions and estimates, particularly in respect of how construction works might proceed on a day-to-day basis and appreciates the "design" stage of the project, as opposed to "detail design" or "construction" detail.

2.7 Many elements of the "Arboricultural Method Statement" are deliberately broad and generic. They will require review, amendment and consolidation at the construction stage. For example in respect of the size and nature of the equipment, plant and machinery that might be utilised by any potential building contractor and any details as may change at "detail design" or "construction detail" stages.

2.8 Accordingly, this assessment is premised on all its elements/recommendations, and the omission or alteration of any part of it, particularly the application of tree protection methodologies, can radically alter outcomes in respect of sustainable tree retention.

3 Site Description

3.1 The site area is broadly rectangular in shape, extending from the Lucan-Newlands Road to the east, to the lock Road/Newcastle Road to the west. The site area exists within the corridor defined by the Grand Canal to the south, and the Dublin/Sligo rail line to the north. The site is defined by the R113 towards the east of the site, and the R136 Outer Ring Road, to the west of the site.

3.2 The site area spans three townlands. The eastern site forms the Cappagh townland, with Clonburris Little to the centre and Kishoge to the west of the site.

3.3 The land appears broadly flat. There are local topographical features; for example, those associated with earthworks such as ditches, the largest found when associated with townland boundaries. Much of the site appears well-drained. There are some areas, mostly to the south, near the canal, or where historic ditched have been blocked, where ground conditions are wet.

3.4 The site is broadly agricultural in context. The greater proportion of vegetation found relates to the historical field and townland boundaries. Therefore, much of the site is dominated by Hawthorn-based hedges, many of which are now unmanaged, overgrown, and defunct.

4 Pre-Development Arboricultural Scenario

4.1 The site is dominated by a historic agricultural format and a large proportion of the vegetation reviewed relates to Thorn based hedges. These are presumed to have been installed to create stock-proof barriers for a historic farmed context. The location of these hedges often coincides with a drainage system ditches, embankments or other contextual boundaries such as townland boundaries.

4.2 Much of the vegetation across the site is associated with specific ground features. The most encountered features are ditch and embankment profiles. Much of the site's vegetation is associated with the edge of, or the raised embankment adjoining a ditch or drainage feature. All such plant material is intrinsically linked with these ground features, and the sustainability of the plants will be linked with the conservation and preservation of such features.

4.3 In respect of design and the consideration of tree impacts, topographical and ground features may have acted as physiological barriers to root development. An example of this would relate to trees or shrubbery arising from embankment adjoined by a ditch. Where the ditch has historically, persistently and is currently supporting an active watercourse, then it is unlikely that tree roots will pass beneath such a feature. Such features commonly distort root growth pattern, limiting root material to the side of the feature upon which they arise. This issue will have occurred to many of the hedge alignments reviewed. It is appreciated that latterly and particularly within the last decade or two, many of the drainage systems appear to have been disturbed and are currently defunct and dry. In such instances, there may have been some redevelopment of root material,

4.4 Across the site, the historically dominant material would have been Hawthorn hedges. These hedges have been invaded by other, more modern recent additions. Many hedges have been usurped and are being dominated by emergent thicket and tree growth. Regarding the typical field boundary hedges, the Thorn populations are now joined with Bramble, Blackthorn, Ivy, Elder, Hazel, Spindle, Privet and Dog Rose amongst other species. In many areas, the bulk and continuity relate as much if not more to these invading species. Equally, it should be appreciated that many hedge profiles have been dramatically widened by adjoining thicket development. Such material has often suppressed the original thorn hedges, creating a scenario whereby the hedge base consists of new thicket as opposed to the original hedge. Therefore and should that thicket be removed/cleared, many hedges will be elevated above ground and would provide no ground levels cover, an issue that may undermine ecological value.

4.5 Such species not planted might be regarded as desirable and would regularly occur naturally in many hedges. In addition to these, we find substantial influx of emergent trees typically including Ash, Sycamore, Goat Willow and Wych Elm. The size potential for Ash, Sycamore and Elm outstrips the growth potential of Hawthorn and

therefore many hedges have become suppressed. This issue is one that repeats at numerous locations across the site.

4.6 Regarding the ex-agricultural lands, much of the tree population is formed of naturally arising and unplanted trees, emerging from the original hedge corridors. Such material typically includes Ash, Sycamore and Wych Elm. These emergent trees tend to be young. Many specimens are less than 30 years old, suggesting a change, hiatus, or cessation in land management. Many of these trees are of poor mechanical form. Many have been affected by the competitive environment from which they arise, while others show signs of early life cutting, as part of historic hedge cutting processes.

4.7 Whilst many of the Sycamore remain healthy, there are obvious issues with the Ash and Elm populations. All but a few sapling Wych Elm found on the site are dead or affected by Dutch Elm disease. This issue is widespread across the east coast region at present. It is unreasonable to expect the survival of any of the Elms, and their retention is unlikely to prove sustainable.

4.8 A similar issue appears to be developing in respect of the site's Ash population. Many trees show signs of ill-health, early discolouration, decline and dieback. These symptoms are highly suggestive of Ash Dieback (*Hymenoscyphus fraxineus*), a virulent pathogen currently affecting many Ash trees across the country. Throughout the survey, many trees have been recommended for re-review during the 2022 growing season to better evaluate their sustainability. However, it is advised that there is a large risk that many, if not all Ash across this and neighbouring site could be lost to Ash Dieback in the coming years (Teagasc 2021)(Woodland Trust 2021).

4.9 The site area supports a small number of more mature trees and trees of more diverse species. These are typically limited to historical townland boundaries including the north-east and north-western boundaries of the Clonburris Little townland. Here, not was made of species including Oak, as well as an obviously older age profile.

5 Planning Scenario in Respect of Tree

5.1 In respect of trees as they relate to planning within the **South Dublin County Council** area, note is made of two areas of guidance including - **The South Dublin County Council Development Plan 2016-2022** and **South Dublin County Council's Tree Management Policy 'Living with Trees'.**

5.2 **South Dublin County Council's Tree Management Policy 'Living with Trees'** "and the Amendments to Tree Management Policy 2015-2020 'Living with Trees' (as well as an interim internal review in February 2019) that incudes substantial amounts of information in respect of tree management, planting and pertinent to this application, information pertaining to trees on development sites as outlined in Section 7, Trees and Development.

5.3 Within the **South Dublin County Council Development Plan 2016-2022**, trees and tree issues are dealt with regularly, including **Chapter 4, Economic Development and Tourism,** section 4.3.3, ET3 Objective 5 calling for the retention of trees on commercial development sites. Under Chapter 6, Transport and Mobility notes that the design of urban roads and street should incorporate tree planting.

5.4 As expected, trees are mentioned widely in **Chapter 8, Green Infrastructure**, with objectives to protect, and preserve trees and woodlands as per G2 Objective 9 and G6 Objective 1 and well as to include new tree planting as per Objective G2 Objective 11.

5.5 Also, **Chapter 10, Heritage, Conservation and Landscapes**, mentions trees, particularly HCL10 Objective 3, HCL11 Objective 5, HCL15 Objective 3 and HCL17 Objective 1. Within Chapter 10, trees are also mentioned specifically in respect of Section 9.2.4 GRAND CANAL where trees are considered an integral part of the canal landscape.

5.6 Specifically, **Chapter 10, Heritage, Conservation and Landscapes**, includes Section 9.5.0 Tree Preservation Orders, including their application as well as defining the 4 existing orders located at, St. Brigid's (now Newlands Garden Centre), New Road, Clondalkin, Beaufort Downs, Rathfarnham, Townland of Quarryvale and Brooklawn, Palmerstown and Newcastle Road, Lucan.

5.7 In **Chapter 11, Implementation** and under "Masterplan Considerations", "Open Space and Landscape" and particularly "Section 11.5.5 Landscape" again mentions the importance of retaining trees and hedges

5.8 review of the The South Dublin County Council Development Plan 2016-2022, shows that the site area supports no trees that are the subject of a tree preservation order, or any other "map based" objective in respect of trees or woodlands.

5.9 Note is made that the area to the south of the site and adjoining the Grand canal is the subject of a "proposed Natural Heritage Area" (pNHA No. 002104). This designation affords a number of ecological protection and objectives that relate to the conservation of the area and its vegetation and wildlife.

6 Construction Works and Trees

6.1 Tree retention is costly in respect of available space, and there is a substantial difference

between physically retaining a tree in situ and gaining any realist expectation of it surviving into the future and remaining safe.

6.2 Trees are living organisms and are highly reliant upon continuity of environmental factors, the changing of which can easily undermine health and sustainability. As a perennial plant, a trees nature is to necessarily become larger on an annual basis. The survival of the plant and its funding of continued growth requires a minimum import of

water and various nutrients, a large proportion of which are provided by the soil in which the tree is rooted.

6.3 A tree is highly dependent upon the ground from which it arises, the nature of that ground and continuity of conditions and provisions that that ground provides. Any change extending beyond the short-term has the potential to affect a tree's metabolism, health, and sustainability.

6.4 Development works typically result in the loss, changing or denaturing of this ground and thereby is contrary to sustainable tree retention. Critically, a tree is fundamentally reliant on the nature and environment of the ground that supports it. Any action that affects or denatures the existing soil environment in respect of gas flux, hydrology or soil strength can quickly make a soil incapable of supporting plant function. Therefore, these effects must be avoided in the areas upon which a tree is reliant.

6.5 BS 5837:2012: Trees in relation to design, demolition, and construction - Recommendations, is a standard referred to and recommended by many authorities. It sets out guidelines and parameters by which we can assess impacts to and protect trees from damage, thereby providing some degree of realistic expectation regarding sustainable tree retention. BS 5837:2012 sets out a procedure and calculation whereby a minimum amount of ground space can be defined in respect of the requirement for the maintenance of a tree of any particular size. This calculation is based primarily on tree size considering issues of hydrological capacity, nutrient availability, and anchorage. The standard generates a "root protection area" (RPA) intended to define a minimum zone of conservation and preservation centred about the tree. This area is typically expressed in a symmetrical fashion and most commonly as a circle about the tree, however, it is appreciated that physiological issues can have a bearing upon this and can radically alter what might otherwise be a symmetrical rooting pattern. Examples of "RPA" distortion include physical features such as bedrock and its extent above and below ground level thus comprising a physical barrier to natural root development, rivers or watercourses extending to depths beneath normal root development depths and comprising soil conditions beneath their course that would be inhospitable to tree root growth or areas where materials or soil composition is beyond that capable of being exploited by trees, for example, compressed and compacted areas such as hardcore and sub-bases to existing roads or areas where substantial or historic trafficking has caused soil compaction, high soil strength or a high CBR's (California Bearing Ratio)

6.6 In respect of the above, the tree survey information provided, intends to show the areas of minimum conservation associated with the sustainable retention of trees within the scope of a development project. In the case of the proposed development, these minimum areas are often exceeded, thus creating a scenario whereby it is reasonable to assume that the development works will have no direct effect or repercussions on tree health.

6.7 In other instances, obvious conflicts exist either total and direct whereby the tree's location will be wholly consumed by the position of a new building or structure or, partial whereby there is an encroachment upon this protection zone, meaning the minimum RPA cannot be achieved.

6.8 This latter issue occurs to varying degrees at various positions across the site. Where it occurs to a minor extent then consideration might be given to clause 5.3.1, a) and b) whereupon minor encroachments may be considered allowable and potentially inconsequential. Nonetheless, there are larger encroachments that would exceed this consideration and may constitute an impact harmful to tree health and sustainability. Such issues do not necessarily require the immediate removal of the tree, and oftentimes construction works can be achieved without their removal. However, the impact may well lead to deterioration in tree health, limited sustainability, and early death.

6.9 Such issues must be considered in two forms. Firstly, its effects on sustainability and long-term retention. Such issues might still consider the benefits of interim and short-term retention, for example, during the establishment of new plantings. Secondly, however, it must also appreciate that direct physical effect on tree root systems can also affect stability and safety, and therefore considerations might be given to site safety factors.

6.10 In light of the above, we must be appreciated that any benefits gained by short to medium term retention, will be subject to ongoing and regular review, with regard to any developing symptoms of ill-health. In this respect, short to medium term retention might be achieved either with or without other management input.

6.11 In respect of the above, tree health-related effects and issues typically manifest themselves over time, and only the most severe impact generates immediate effects. Tree damage relating to environmental change and disturbance can often result in a slow deterioration and decline, only becoming apparent after some years (2 – 5 years) with a slow deterioration where death may not occur for anything between 3 and 15 years. Understanding the timescale of possible interim benefits must appreciate the fact that its full extent or rate cannot be quantified at an early stage.

6.12 The Arboricultural report has identified many tree specimens that are considered wholly suitable for retention. Notwithstanding the natural and expected deterioration of an ageing tree population, many would offer a substantial degree of sustainability over time.

Construction Specific Issues

6.13 The new structures and particularly their foundations require the excavation of ground space. Foundation digs are often substantially larger than the finished structure footprint, with depth often requiring safety-related battering or benching of the excavation edges to avoid collapse. This issue will apply to this site; however, some

critical areas have adopted the use of retaining structures and methodologies such as secant piling, that affectively limits excavation to the pile structure.

6.14 Similarly, roads typically include excavation for foundations, but additionally, often require that the ground beneath is compacted to provide necessary bearing ratios. The combination of these typically results in the loss or denaturing of the soil volume that a tree would be reliant upon.

6.15 Underground services require excavation and trenching, with the added complication that gravity led systems can often require the modification of ground levels to achieve necessary gradients and minimum overburdens, a factor that can often influence the finished levels of both the roads and building noted above.

6.16 Achieving the above typically involves the use of large plant, equipment, and vehicles. The movement and activity of such machinery quickly denature the ground, destroying the soil profile and structure, rendering them inhospitable and of no use the to the supported trees.

6.17 Though beyond the scope of this report, consideration might be given the broader changes to the ground environment, for example relating to possible hydrological changes about the development area.

6.18 To date, no information is available regarding how the works will progress regarding works space, access, material storage, and works compounds. Equally, works phasing may affect the use of space. The most significant issue relates to the collateral use/consumption of space adjoining the immediate works area, thereby questioning the viability of retaining some trees that do not appear to be impacted by the immediate works.

Contextual Issues

6.19 Many of the designated tree losses are of limited concern because of poor-quality, ill-health or ongoing deterioration, where the potential for and longevity of keeping such trees would be limited regardless of any site development. This related, particularly to the many dead Elms, noted on the site, as well as the many poor-quality trees that would not be suitable for retention within an urbanised context.

6.20 The nature of the proposals as they relate to road development means that the site's current "occupation and use" context will be changed from its current "near-zero" value to one of a persistent "24-7" context that applies to any public highway. Such changes may result in repercussions that require further scrutiny after first site clearance and felling works. Some trees may require specific attention, including structural pruning, improve their safety status within the changed context as well as to deal with issues of exposure and shelter loss. These considerations must address the fact that any trees retained will, by the nature of the project, be retained adjoining a new highway or its infrastructure.

6.21 Tree canopy cover varies by species and can change by season. Therefore, their relationship with the post-development site must be considered in respect of additions issues, including shadow-cast and light admission and littering.

6.22 While the retention of trees within a development is commendable, tree retention close to buildings must consider the blockage of views and light, and the possible effects on daylight analysis. Trees can have a material effect on these issues and can lead to post-development request for more tree removal, for example, based on a requirement for artificial light during daylight hours. While not necessarily relevant to the roadway, such issues may develop in respect of land use beside the road alignments.

6.23 Deciduous tree shed leaves each autumn that can be subject to local wind patterns, creating local drifts and accumulations. Such issues may require management and can lead to drainage issues, including the blockage of drains and gullies.

6.24 Many of the trees reviewed are young, and still small when compared to their growth potential. Therefore it will be necessary to consider any trees potential for growth before any realistic understanding of sustainability can be gained.

7 Project Works and Likely Impacts

7.1 The development will consist of the construction of 569 dwellings, a creche, innovation hub and open space in the Clonburris South West Development Area of the Clonburris SDZ Planning Scheme 2019 as follows:

A) 173 no. houses comprising 8 no. 2 bedroom houses, 153 no. 3 bedroom houses and 12 no. 4 bedroom houses (147 no. dwellings in CSW-S4 consisting of 8 no. 2 bedroom houses, 127 no. 3 bedroom houses & 12 no. 4 bedroom houses & 26 no. 3 bedroom dwellings in CSW-S3); all 2 no. storey comprising semi-detached, terraced, end terrace units (with parking and private open space);

B) 148 no. duplex apartments/apartments (88 no. in CSW-S4 & 60 no. in CSW-S3) comprising 74 no. 2 bedroom units and 74 no. 3 bedroom units, in 16 no. 3 no. storey buildings. In CSW-S4 Duplex Blocks A,B,C,D,E,F,G,J,K, comprise 8 no. units (4 no. 2 bed & 4 no. 3 bed units), Duplex Block H comprises 16 no. units (8 no. 2 bed & 8 no. 3 bed units); In CSW-S3 Blocks L, N & O comprise 8 no. units (4 no. 2 bed & 4 no. 3 bed units), Block M comprises 14 no. units (7 no. 2 bed & 7 no. 3 bed units), Block P comprises 10 no. units (5 no. 2 bed & 5 no. 3 bed units), Block Q comprises 12 no. units (6 no. 2 bed & 6 no. 3 bed units), all to have terraces;

C) 396 no. apartments as follows: within CSW-S4, Block 1 consists of 172 no. apartments (76 no. 1 bedroom, 91 no. 2 bedroom and 5 no. 3 bedroom apartments), in a 2-building arrangement both 6 no. storeys in height. Within CSW-S3, Block 2 (4 storeys) comprises 16 no. 1 bedroom apartments and 22 no. 2 bedroom apartments, Block 3 (4 storeys) comprises 16 no. 1 bedroom

apartments and 22 no. 2 bedroom apartments (all apartments to have terrace or balcony).

D) Provision of an innovation hub (626 sq. m) and creche (c. 547 sq. m) in a part 3/4 storey 'local node' building in CSW-S4;

E) Vehicular access will be from the permitted Clonburris Southern Link Street and R113 to the east (along with provision of internal haul routes (for construction) to connect to the R136 to the west);

F) Public Open Space/landscaping of c. 4.1 hectares (to include Local Park and MUGA in CSW-S3, Grand Canal Park, along the southern and eastern boundaries of the site to connect to existing Grand Canal towpath) as well as a series of communal open spaces to serve apartments and duplex units (c. 0.39 ha).

G) All ancillary development works including footpaths, landscaping boundary treatments, public, private open space areas, car parking (656 no. spaces) and bicycle parking (672 no. spaces), single storey ESB substations/bike/bin stores, and all ancillary site development/construction works;

H) Permission is also sought for revisions to attenuation permitted under SDZ20A/0021 (Surface water attenuation measures and underground attenuation systems) as well as connection to water supply, and provision of foul drainage infrastructure.

7.2 Considering the scope and scale of the proposed development, it is considered likely that most of the issues dealt with at "Construction Works and Trees" above, will apply at various points and particularly regarding-

a) Direct conflict with proposed structures, thus requiring tree removal.
b) A partial conflict where the "Root Protection Area" is encroached upon by works or ground amendments and cannot be preserved/protected in full.
c) Environmental damage e.g. compaction, capping, sealing – changing the existing ground environment to one that can no longer support tree root function.
d) Construction activity and the use of large plant and machinery that can denature the ground.
e) A change in site context or a change in occupation or use that makes a tree unsuitable for retention.

7.4 While many of the construction issues cannot be avoided the development proposals might include features and structures that could be accommodated within the nominal root protection areas associated with trees to be retained. Examples of this include various elements of landscaping, including suitable boundary treatments and the accommodation of native ground levels within open spaces.

8 Identification of Development Impacts to Trees

8.1 The expected tree impacts have been represented graphically on the tree impacts drawing "**Clonburris Tree Impacts Plan"** (over three sheets), as well as within the narrative of this report. This drawing combines the tree constraints plan information with the current stage development details including the architectural and services layouts below, thereby allowing for simple direct comparisons to be made between the existing site context and the development proposals in respect of new structures.

8.2 In this drawing, trees and vegetation denoted with "Broken Pink" crown outlines and "Pink Hatching" are to be removed as a result of the proposed works and those denoted with "Continuous Green" crown outlines are to be retained.

8.3 Further trees have been depicted with "Blue" outlines and hatching. This represents trees and vegetation to be removed as a result of the proposed "Infrastructural Works" as permitted under "SDZ20A/0021".

8.4 Trees currently shown for retention, and particularly those to the north and west of the proposed development, remain of unknown retention status. This report is aware that further development works, in line with the broader Clonburris SDZ development plan will affect additional trees, but that the detail of those impacts are not yet known.

8.5 Detail of the development proposals where gained from drawings provided by Murray & Associates, Landscape Architects, overlaid with the masterplan details.

8.6 The evaluation is primarily based on minimum protection ranges as defined paragraphs 4.6.1, 4.6.2 and 4.6.3 of BS 5837:2012. Any structure, action or apparent need to enter or otherwise disturb/convert the "root protection area" of a site tree has been considered likely to have a negative impact, with the potential to render a tree wholly unsuitable for retention, unsafe or unsustainable.

8.7 The broader assessment attempts to consider both direct and indirect implications, based on perceived construction requirements, as well as how a tree will interact with the development in respect of growth, hazard development.

9 Design Iterations and Arboricultural Considerations

9.1 This report relates to clause 4.4.2.1 of BS5837-2012 in that its finding relates to a predefined concept that was issued for review. Therefore the report assesses Arboricultural implications and impacts of the proposals, making recommendations in respect of tree protection relating to those trees that might be retained and as outlined below.

9.2 Though this report relates specifically to the assumed effects of the proposed development works, it appreciated that these works relate to the broader development of the Clonburris lands.

9.3 The assumed arboricultural impacts outlined in this report will be added to by future and adjoining works and the ultimate sustainability of trees might relate to issues relating to future development works not know or considered during the compilation in this report.

10 Tree Retention and Loss

10.1 The tree survey is limited to the larger emergent specimens from within an immense quantum of vegetation. does not provide any realistic numerical evaluation. Equally, individually numbered trees offer a limited l understanding of impacts because of the arbitrary minimum stem size cut-off of circa 150mm. This means that across the site, the impacts may relate to many hundreds of additional and uncounted sapling trees that comprise part of the site's extensive thicket areas. Similar issues relate to the smaller vegetation, especially when considering the extended nature of hedge corridors and the cumulative extent of broader scrub regeneration across the site.

10.2 To facilitate a reasonable understanding of likely impacts, reference should be made to the drawing sequence "Clonburris Tree Impacts Plan" that illustrates the site extent, spread over 3No. A1 sheets. The composite drawing comprises the tree survey drawings overlaid by the development drawings, thus providing a graphic representation of the relationship between tree constraints and the development elements. In this drawing, an estimation of trees and/or extents of hedging/thicket to be removed, are highlighted in "pink dashed" outlines. This estimation will require review at construction stage.

10.3 As noted within the survey data, the "red line" area supports many more individual plant specimens than individually described trees. This number is augmented by the number of groups, areas, and lines. Therefore, the individually recorded trees do not reflect the true number of trees or extent of vegetation on site, or the extent to which it will be affected by the works, as many items related to groups or lines of trees, some of which include tens or hundreds of individual stems.

10.4 In generalised terms, no trees or other vegetation will be retained within the development "red line" area. At present, trees and other vegetation is shown for retention to the north and west of the development area, but such retention is subject to the review of the future development of these areas. The area of primary tree retention relates to the "Canal Corridor" associated with the Grand Canal pHNA. This area is generally designated for retention and other than the provision of access and other open space facilities, will be retained.

11 Tree Protection within the Scope of a Development

11.1 The design and management recommendations as set out in "BS5837:2012" are considered as "best practice" regarding the selection, retention, protection, and management of tree within the scope of new developments.

11.2 In respect of tree protection, whether vertical or horizontal, all must conform or equate to the recommendations of Section 6, BS5837: 2012, must be fit for purpose and commensurate with the nature of development and the expected day-to-day activities of the site works.

11.3 This report provides a "Preliminary Arboricultural Method Statement" at "Appendix 1" to this report.

11.4 This report is not accompanied by any tree protection plan. This relates to the fact that tree protection will be dependent on a greater understanding of the development of lands adjoining the red line of the site area. This report does appreciate that a greater extent of clearance will occur than relates specifically to the development under scrutiny in this report.

12 Preliminary Management Recommendations

12.1 Within the "red line" area, it is note expected that any existing vegetation will be retained and that the only retained vegetation will be outside of the "red line" area and may be subject to other developments. Accordingly. Tree maangement needs may or may not apply to that material.

12.2 Provided in the tree survey table (Table 1) are "Preliminary Management Recommendations". These recommendations relate to the trees as they existed at the time of the tree review. Therefore and in line with the changing context of the site, such recommendations may no longer apply. Examples include where the felling of trees or other specific works are necessary to facilitate development requirements.

12.3 Many of the concerns raised in the tree survey relate to evidence suggesting mechanical failure to trees, ill-health, or contextual issues. These may continue to a point where a tree's suitability for retention may change over time.

12.4 Additionally, any development related loss of trees can result in exposure and shelter loss issues. Therefore all retained trees must be reviewed immediately after the primary site clearance works. This will allow for the updating and amending the "preliminary management recommendations" of the primary survey. Such amendments would address such issues as may arise and may include additional structural pruning works. Regular reviews of all retained trees must be maintained, so that early and prompt intervention and action can be applied as required.

A1 Appendix 1 - Arboricultural Method Statement

Method Statement Outline

A1.1 This method statement intends to provide guidance in respect of tree protection on a development site. This is a broad and prescriptive method statement, intended to provide general advice and guidance in respect of trees and tree protection on a typical development site, dealing with issues known at planning stage.

A1.2 Any inability to conform to the recommendations of this method statement or an associated tree protection plan could readily change the sustainability of trees and/or their suitability for retention.

A1.3 This method statement addresses, amongst others, two primary issues, those being –

a) The avoidance/prevention of physical damage to a tree to be retained.

b) The avoidance/prevention of physical damage or disturbance to the ground/earth upon which a tree is reliant.

Drawings

A1.4 This Arboricultural Method Statement will require the development of "Tree Protection Plan" drawing. The drawing will need to account for works both within and other works as may adjoin the site area.

Method Statement Use

A1.5 This Method Statement should be used under the direct guidance of the project Arborist. As limited "construction stage" detail was available at planning stage, it may require amendment and adjustment to address construction stage issues.

Amendments and Modifications to a Tree Protection Plan

A1.6 Any amendment to a tree protection plan must be agreed with the project Arborist, including the adoption of specific methodologies and/or procedures and structures for access into/use of certain parts of the above defined "Construction Exclusion Zones". Such procedures, including the provision of suitable ground protection may allow for the relocation of the "Construction Exclusion Fencing" to provide access to and across the previously protected areas.

Works Related Impacts

A1.7 In respect of any necessary and unavoidable structures/works required within or entry into the "RPA" zone, all efforts must be made to minimise impacts. Aerial issues may

require “access facilitation pruning” or clearance pruning. Subterranean works that require excavation must, by design, location, and action, minimise impacts to trees.

Tree Works Specification Updates

A1.8 Many of the tree management recommendations stipulated within the “Preliminary Management Recommendation” section of the primary tree survey, relate to the “as was” site scenario. Because of changing site contexts, these may no longer apply and may require modification to account for the changes that the built project will cause.

General Method Statement

1.0) Overview and Implementation

1.1 **Prior to any site works, this method statement will be addressed and discussed by all member of the construction team management, prior to any site works or construction/demolition related works or access**.

1.2 The project Arborist or another suitably qualified person will oversee the application of all tree protection measures and any necessary modifications to this Method Statement (any issues as may have arisen in respect of planning conditions or details as may have changed between the design stage) to provide a basis upon which tree protection will be managed on the construction site.

1.3 Any situation that requires entry into the “root protection zones” of a tree intended for retention must be brought to the attention of the Project Arborist regarding the adoption/amendment of suitable tree protection measures.

1.4 As unforeseen tree losses may compromise project planning permissions, it is imperative that issues relating to tree protection and/or tree damage be brought to the immediate attention of the project Arborist for review and possible discussion with the relevant planning authority.

2.0) Works Sequence

2.1 No construction related works or mechanised site access will occur until the agreed level of tree protection, in accordance with any “Tree Protection Plan”, is completed.

2.2 The only exception to the above will relate to the undertaking of tree works and felling as defined in the Arboricultural report and/or grant of permission.

2.3 On completion of tree felling/site clearance works, the tree management plan will be reviewed, accounting for (if necessary) the updating of the “preliminary Management Recommendations” stipulated in the original Tree Survey.

2.4 Any revised pruning/cutting works will be agreed with the local authority and applied at the earliest possible opportunity.

2.5 After the completion of primary tree clearance, but prior to the commencement of construction works, all “Construction Exclusion” and “Protective” fencing must be erected and “signed-off” as complete, by the Project Arborist.

2.6 Only on completion of all construction works will any/all tree protective measures be removed, and only then in a manner, that does not compromise the "Protection Zones". Such works must be agreed and overseen by Project Arborist.

2.7 At construction works completion stage, all retained trees will be reviewed regarding their condition and longer-term management recommendations and regarding site hand-over.

3.0) Tree Protection

3.1 All tree protection measures and locations must be agreed, overseen, and verified by the Project Arborist prior to works commencement.

3.2 All construction, works or access areas must be enclosed and defined by protective fencing, this comprising the "Construction Exclusion Zone" as would be defined on a tree protection plan (to be developed).

3.3 Unless specifically stipulated by the project Arborist, the default minimum range of the protective fencing from a tree is the range stipulated for that tree within the "RPA" (root protection area) column of the original survey.

3.4 Such a fence must be fit for purpose and commensurate with the nature of activity expected upon the site and should comply with "Section 6.2" of BS5837: 2012.

3.5 The fence should be affixed with notification signs such as "TREE PROTECTION AREA - KEEP OUT"

3.6 Structures such as "lock-ups", offices or other temporary site building, not requiring excavation or underground ducting, might be positioned such as to comprise part of the "Construction Exclusion Zone" fencing. All remaining fencing must be continuous with such features and effectively prevents access to protected ground.

3.7 If entry into the "RPA" (Root Protection Area) zones becomes unavoidable, ground protection systems agreed with the project Arborist, will be utilised.

3.8 No amendment, alteration, relocation, or removal of the tree protection fencing shall occur without prior liaison and approval from the Project Arborist.

4.0) Provision of Ground Protection (If Required)

4.1 No vehicular/mechanised access whatsoever will be allowed onto unprotected "Construction Exclusion Area" ground.

4.2 Ground protection can comprise the use of proprietary materials/structures (installed to manufacturer's specifications and recommendations) or procedures that avoid ground damage/disturbance/compaction, or the use of procedures that avoid such effects e.g. manual/pedestrian installation procedures.

4.3 Any system utilised must effectively spread load-weight, avoid compaction, maintain drainage/percolation/aeration, and be installed in a manner that avoids these issues.

4.4 Newly provided access will be strictly limited to the area of the new protection structure.

4.6 Protection installation will require a progressive laying down of ground protection, with previously laid material providing vehicular access to the next zone will be accepted as

an approved methodology.

5.0) Works within "RPA" Zone

5.1 Only works and construction practices, agreed with the Project Arborist prior to commencement, will be allowed in the "RPA" area.

5.2 All works will be undertaken under the supervision and guidance of the Project Arborist who will have the authority to stop works if activities are considered such as to have the potential to damage trees.

5.3 Preference must be given to manual labour and techniques within the fenced "RPA" zone.

5.4 On completion of the required works, the area will be inspected by the Project Arborist regarding the reinstatement of the original protection and the relocation of the protective fencing to a position relating to the original "RPA" area.

6.0) Service Installation

6.1 The "Project Arborist" must be consulted for advice and procedural recommendations, in respect of any installation of services within or requiring entry into the "Root Protection Area" of any tree intended for retention.

6.2 Any such works found to be unavoidable, must be undertaken with special care, incorporating the recommendations of both "BS5837: 2012 and the National joint utility groups, guidelines for the planning, installation and maintenance of utility services in proximity to trees (NJUG 10)

6.3 Preference must be given to trench-less techniques including Mole-piping, Directional-drilling manual hydro-trenching (high-pressure water), "Air-Spade" or broken-trench techniques.

7.0) Tree Management and Works

7.1 All tree works should be undertaken under the guidance of the project Arborist

7.2 The primary site clearance and felling should be undertaken at the earliest stage of the overall development works, to enable the re-assessment of all ostensibly retainable trees and the updating of the "Preliminary Management Recommendations" to account for context changes and construction access and/or other issues coming to light.

7.3 All Tree Works must adopt safe work procedures and must be undertaken by staff suitably trained for the purpose at hand and compliant with all legislative, safety and insurance requirements.

7.5 All additional works will be agreed with the local authority and/or other stakeholders and applied at the earliest possible opportunity.

7.6 On completion of site works, the retained tree population will be reviewed and re-evaluated regarding its ongoing condition and the likely requirements of any ongoing or future monitoring or management needs.

8.0) Demolition

8.1 All demolition procedures must be agreed and overseen by the Project Arborist or other suitably skilled staff to monitor for damage and to protect exposed roots/cut-trim exposed roots/oversee backfilling of exposed roots.

8.2 Where access into unprotected "RPA" zone becomes unavoidable then suitable ground protection, provided in accordance with an engineer's direction and agreed with the Project Arborist will be installed.

8.3 Care will be taken to avoid damage to soil volumes beneath and adjoining demolished structures that may contain tree root material.

8.4 Whilst existing foundations/structures may provide temporary protected access to areas within the "RPA" zone, preference must be given to the location of demolition plant outside of the "RPA" zone.

8.5 Where tree(s) exist near a structure to be demolished then the demolition should be undertaken inwards within the footprint of the existing building (top down, pull back).

8.6 Underground structures (services etc.) within the "RPA" zone should be reviewed with regards to decommissioning and retention in situ in the interest of avoiding tree damage.

8.7 Preference should be given to the retention existing sub-bases where hard surfaces are removed, particularly if the hard surface is to be replaced.

9.0) Ancillary Precautions

9.1 The methodologies as set out in this document apply to all undertakers of work upon or adjoining the site as may require access to the "Construction Exclusion Zone" or the "RPA" area of any tree.

9.2 This document will be disseminated to all persons requiring access to the work site, with all persons undertaking works either before or after the principal development (site investigation works, Landscape Contractors) are subject to the above requirements

9.3 Works outside the "Construction Exclusion Zone" must be controlled to create no potential secondary hazard to tree health.

9.4 Large loads accessing the site must be reviewed regarding clearance and potential tree damage.

9.5 Care must be taken regarding materials that may contaminate the ground. No concrete mixings, diesel or fuel, washings or any other liquid material may be discharged within 10 metres of a tree.

9.6 No fires can be lit within 5 metres of any tree canopy extent.

9.7 No tree will be used for support regarding cables, signs etc.

9.8 The trees should be reviewed on a regular basis throughout the development process and on completion. At that time, additional recommendations regarding tree management may be required.

9.9 Any issue that has the potential to affect site trees must be brought to the attention of the Project Arborist for review and comment.

9.10 Any circumstances that become known whilst the development project is ongoing that either involves trees or access to/works within the construction exclusion zone must be brought to the attention of the Project Arborist for evaluation and advice regarding approach and methodology.

9.11 It is possible that liaison/agreement will be required with the Local Planning Authority regarding compliance with, as well as the verification of the required tree protection measures.

A2 Appendix 2 - Tree Survey

Nature of Survey

A2.1 The criteria put forward in "BS5837:2012 – Trees in Relation to Design, Demolition and Construction – Recommendations" have provided a basis for this report.

A2.2 The data collected has been represented in table form as "Table 1" within "Appendix 1" to this report. This appendix includes a Survey Methodology, Survey Key, Survey Abbreviations, Condition Category Definitions, and a brief resume of the typical application of Tree Protection measures as defined within the above standard and as relates to the "RPA" zones defined both within the survey table and on the "TCP" drawing.

A2.3 The survey, its findings and management recommendations relate to the site and the conditions thereon at the time of the survey. It relates to a "do nothing" or "as is" scenario and intends to provide an impartial representation of the site's tree population, regardless of any possible development works. It is likely that changes in site usage, development or other environmental changes will require an amendment of any tree's potential retention status and its preliminary management recommendations, and in some instances, may require the re-classification of a tree's suitability for retention.

Drawing References

A2.4 The survey must be read with the "Tree Constraints Plan" drawing "Clonburris Tree Constraints Plan" regarding the representation of tree positions, crown forms, "RPA" extents and colour reference to category systems. Trees omitted from the supplied drawing may be "sketched in" to "Clonburris Tree Constraints Plan". Any such trees should be located and plotted by professional means to identify the constraints such trees have upon the site.

A2.5 A green coloured outline represents each tree crown. It is scaled to represent the north, east, south, and west crown radii as denoted in the survey table. Each tree (categories A-green, B-blue, and C-grey only) have been apportioned a "Root Protection Area" (RPA see below) denoted as a dashed orange circle.

A2.6 The development of a Tree Constraints Plan (TCP) provides a design tool regarding tree retention. Such a plan combines the topographical land survey drawing with additional information as provided by the tree survey. The aspects of the tree's existence recorded on the "TCP" are, firstly, the tree canopies, represented by the four cardinal compass point radii (Sp: R in survey Table 1). Secondly, and following paragraphs 4.6.1, 4.6.2 and 4.6.3 of BS5837: 2012, we represent each tree's "Root Protection Area" (RPA). For design purposes, it approximates the position of the tree protection fencing

to be erected before the commencement of any site works, thus excluding all site activities other than those dealt with by way of the "Arboricultural Implication Assessment" and "Arboricultural Method Statement".

A2.7 The "Tree Constraints Plan" (TCP) depicts the extent and location of constraints, placed upon the site by the trees. The "TCP" represents both the true canopy form (north, east, south, and west radii) but also the "RPA" as defined above. These constraints are provided to advise regarding the design and layout of a proposed development.

Survey Intent and Context

A2.8 This document intends to highlight the extent and nature of the material of Arboricultural interest on the site in question.

Survey Data Collection and Methodology

The Survey

A2.9 The original survey was carried out in January and February of 2020. This survey portion of the overall report is not an Implication Assessment though but provided some of the basic information regarding its compilation. The compilation of this survey was guided by the recommendations of BS 5837: 2012. This survey typically includes trees of stem diameters exceeding 150mm at approximately 1.50 metres from ground level. The survey relates to current site conditions, setting and context.

A2.10 Each tree in the survey has a consecutive number that relates directly to the survey text. Measurements are metric and defined in metres and millimetres. All trees referred to in the survey text have been measured to provide information regarding canopy height and canopy spread (north, east, south, and west radii), level of canopy base and stem diameter at 1.50 meters from ground level. The dimensions provided are intended to provide a reasonable representation of a tree's size and form. While efforts are made to maintain accuracy, visual obstruction, especially regarding trees in groups, requires that some tree dimensions be estimated only.

Inspection and Evaluation Limitations and Disclaimers

A2.11 The information set out in this report relates to the review of a tree population on the site in question. As such, the information provided is based on a general review of trees and does not constitute a detailed review of any one of the individual specimens. Such an evaluation (tree report) would require the gathering of substantially more information than that dealt with in this survey.

A2.12 The survey is not a safety assessment and the parameters reviewed within this survey context would be substantially deficient in extent to provide for a reliable safety assessment. The survey is intended to provide a general and qualitative review to assist

in gauging the suitability of an individual tree for retention within a development context. All trees are subject to impromptu failure and damage. The assessment of risk as may be presented by a tree requires the review of numerous factors more than those noted herein and as such, remains outside the scope of this document and any attempt to use the information herein for such proposes will render the information invalid.

A2.13 A competent and experienced Arborist has completed all inspection and tree assessment. The inspection involves visual assessment only, which has been carried out from ground level. No below ground, internal, invasive, or aerial (climbing) inspection has been carried out.

A2.14 Trees are living organisms whose health, condition and safety can change rapidly. All trees should be re-evaluated regarding their condition on an annual basis or after substantial trauma such a storm event, other damage, or injury. The results and recommendations of this survey will require review and reassessment after one year from the date of execution. This survey does not constitute a review of tree or site safety. Attempts to use the contents herein for such purposes will render the contents invalid.

A2.15 Throughout the undertaking of the survey, several factors acted against the inspectors, contriving to reduce the accuracy of the survey.

Seasonality

A2.16 The original survey was carried out during the winter periods. Some of the signs, typically symptomatic of ill-health or defect within a tree, may not have been available to view at the time of the survey or may have been obscured by seasonality related factors. Some of the fruiting bodies of various fungi, parasitic upon or causing decay or disease in trees, may have been out of season and unavailable to view. This survey can only comment upon symptoms of ill-health or defects visible at the time of the inspection.

Survey Key

Species	Refers to the specific tree species
Age	Referred to in generalized categories including: -
Y - Young	A young and typically small tree specimen.
S/M - Semi-Mature	A young tree, having attained dimensions that allow it to be regarded independently of its neighbours but typically, would be less than 50% of its ultimate size.
E/M - Early-Mature	A specimen, typically 50% - 100% of ultimate dimensions but with substantial capacity for mass and dimensional increase remaining.
M - Mature	A specimen of dimensions typical of a full-grown specimen of its species. Future growth would tend to be extremely slow with little if any dimensional increase.

O/M - Over-Mature	An old specimen of a species having already attained or exceeded its naturally expected longevity.
V - Veteran	An extremely old, veteran specimen of a species, usually of low vigour and typically subject to rapid decline and deterioration or of very limited future longevity.
Tree Dimensions	All dimensions are in meters. See notes regarding limitation of accuracy.
Ht.	Tree Height
CH	Lowest canopy height
N, E, S, W	Tree Canopy Spread measured by radii at north, east, south, and west
Dia.	Stem diameter at approx. 1.50m from ground level.
RPA	Root Protection Area, as a radius measured from the tree's stem centre.
Con	Physical Condition
G Good	A specimen of generally good form and health
G/F Good/Fair	
F Fair	A specimen with defects or ill health that can be either rectified or managed typically allowing for retention
F/P Fair/Poor	
P Poor	A specimen whom through defect, disease attack or reduced vigour has limited longevity or maybe un-safe
D Dead	A dead tree
Structural Condition	Information on structural form, defects, damage, injury, or disease supported by the tree
PMR – Preliminary Management Recommendations	Recommendation for Arboricultural actions or works considered necessary at the time of the inspection and relating to the existing site context and tree condition. Works considered as urgent will be noted.
Retention Period	
S – Short	Typically, 0 -10 years
M – Medium	Typically, 10 -20 years
L – Long	Typically, 20 – 40 years
L+	Typically, more than 40 years
Category System	The Category System is intended to quantify a tree regarding its Arboricultural value as well as a combination of its structural and physical health.
Category A	A typically a good quality specimen, which is considered to make a substantial Arboricultural contribution
Category B	Typically including trees regarded as being of moderate quality
Category C	Typically including generally poor-quality trees that may be of only limited value.
	The above categories are further subdivided regarding the nature of their values or qualities.
Sub-Category 1	Values such as species interest, species context, landscape design or prominent aspect.

Sub-Category 2	Mainly cumulative landscape values such as woods, groups, avenues, lines.
Sub-Category 3	Mainly cultural values such as conservation, commemorative or historical links.

Table 1 – Tree Data Table

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
1	Ash *(Fraxinus excelsior)*	S/M	F	6.00	1.00	2.50	3.00	3.00	1.50	4	306	3.67	Suppressed and distorted, arising naturally from within hedgerow thicket. Is multi-stem from low level raising concerns regarding mechanical integrity.	Review regularly.	L	C2
2	Ash *(Fraxinus excelsior)*	S/M	F	7.00	1.25	1.50	2.50	2.50	1.50	1	223	2.67	Arising naturally from hedgerow thicket. Comprises element of natural regeneration.		L	C2
3	Ash *(Fraxinus excelsior)*	S/M	F	7.00	1.00	2.50	3.00	2.00	2.50	1	261	3.13	Young and vigorous, arising from hedge thickets.		L	C2
4	Ash *(Fraxinus excelsior)*	S/M	F	5.50	1.00	1.00	1.00	1.50	1.00	1	175	2.10	Bark damaged and naturally arising from waterlogged hedge thicket.		M	C2
5	Ash *(Fraxinus excelsior)*	S/M	G/F	5.50	2.00	1.50	2.00	1.50	1.50	1	185	2.22	Young and vigorous arising from southern side of waterlogged ditch scenario.		M	C2
6	Ash Group *(Fraxinus excelsior)*	S/M	F/P	7.00	0.00	2.50	3.50	3.00	3.00	5	379	4.55	A multi-stemmed group wholly enveloped with Ivy cover the prevents detailed visual review. Of poor-quality specimen arising from northern bank of flooded ditch.		M	C2
7	Ash *(Fraxinus excelsior)*	S	F	5.00	2.00	1.00	1.50	1.00	1.00	1	185	2.22	Young and vigorous.		L	B2
8	Ash *(Fraxinus excelsior)*	S/M	F	7.50	1.50	2.00	2.50	2.00	2.00	1	261	3.13	and vigorous arising from southern side of ditch.		M	C2
9	Wych Elm *(Ulmus glabra)*	S/M	D	5.50	2.00	1.00	1.00	2.00	1.00	1	185	2.22	Completely dead, killed by Dutch Elm disease.		N/A	U

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
10	Crack Willow *(Salix fragilis)*	M	P	9.00	1.00	5.00	4.00	4.50	4.00	1	783	9.40	Multi-stemmed, decayed and splitting at 2.00 m. Offers no realistic sustainability.		N/A	U
11	Goat Willow *(Salix caprea)*	E/M	F	4.00	0.00	0.00	2.00	4.00	1.50	1	229	2.75	Heavily unbalanced to south. Arises from area of boggy ground.		M	C2
12	Goat Willow *(Salix caprea)*	M	F	4.50	0.00	2.50	4.00	4.00	3.00	1	341	4.09	Arises from position close to the northern edge of ditch.		M	C2
13	Ash *(Fraxinus excelsior)*	S/M	P	6.00	2.50	2.00	4.00	2.50	2.50	1	261	3.13	Previously damaged and in a state of decline.	Remove.	N/A	U
14	Ash *(Fraxinus excelsior)*	S/M	F	5.00	0.00	2.50	2.00	2.00	2.50	3	258	3.09	Young and vigorous, arising naturally from within hedgerow thicket.		L	C2
15	Ash *(Fraxinus excelsior)*	S/M	P	6.00	0.00	1.50	1.00	1.00	1.50	11	207	2.48	In state of chronic decline.	Remove.	N/A	U
16	Ash *(Fraxinus excelsior)*	S/M	P	6.50	0.00	2.00	1.50	1.50	1.00	1	239	2.86	In a state of chronic decline.	Remove.	N/A	U
17	Ash *(Fraxinus excelsior)*	S/M	G/F	5.50	2.50	1.50	1.50	1.50	1.00	1	204	2.44	Young and vigorous.	Review regularly.	L	B2
18	Ash *(Fraxinus excelsior)*	E/M	F	12.00	2.00	3.50	4.00	2.50	3.00	2	357	4.28	Heavily divided from near ground level. Apparently vigorous at present arising from western bank of substantial ditch.		M	C2
19	Ash Group *(Fraxinus excelsior)*	S/M	F/P	10.00	1.50	3.00	4.00	2.50	2.50	1	207	2.48	A multi-stemmed group already exhibiting evidence of decline and dieback possibly attributable to Chalara canker attack.		N/A	U
20	Wych Elm *(Ulmus glabra)*	E/M	D	10.00	1.50	2.00	4.00	4.00	2.50	1	341	4.09	Completely dead, killed by Dutch Elm disease.	Remove.	N/A	U

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
21	Sycamore *(Acer pseudoplatanus)*	S/M	F	10.00	2.00	2.00	2.50	1.50	1.50	1	229	2.75	Suppressed and arising from eastern edge of the ditch.	Review regularly.	M	C2
22	Ash *(Fraxinus excelsior)*	S/M	P	8.00	2.50	1.00	1.50	2.00	2.50	1	194	2.33	In a state of ongoing decline.	Remove.	N/A	U
23	Wych Elm *(Ulmus glabra)*	S/M	D	9.00	2.50	2.00	4.50	2.00	0.00	1	197	2.37	Unbalance and dead.	Remove.	N/A	U
24	Ash *(Fraxinus excelsior)*	S/M	F/P	7.50	1.50	1.00	4.00	3.00	3.00	3	325	3.90	Triple stemmed but some stems have been cut. Unsuitable for retention.	Remove.	N/A	U
25	Ash *(Fraxinus excelsior)*	E/M	F	7.00	2.50	3.00	3.00	2.00	3.00	1	290	3.48	Young and vigorous, arising from western bank of ditch.		M	B2
26	Ash *(Fraxinus excelsior)*	S/M	F/P	6.00	0.00	3.00	4.50	3.00	2.00	1	347	4.16	Distorted suckering group arising from decaying stump of previous tree. Unsuitable for retention.	Remove.	N/A	U
27	Ash *(Fraxinus excelsior)*	E/M	F	10.00	2.50	4.00	3.50	4.00	3.00	1	688	8.25	Divided from low level. Arises from position close to confluence of ditches. Vigour and vitality are fair though crown support notable deadwood.		M	C2
28	Ash *(Fraxinus excelsior)*	E/M	P	6.50	1.00	4.00	4.00	4.00	2.50	1	398	4.77	Squat, distorted and affected by Polyporus. Unsuitable for retention.	Remove.	N/A	U
29	Ash *(Fraxinus excelsior)*	E/M	P	5.00	0.50	3.00	2.50	2.50	2.50	4	274	3.29	A relic a once larger tree having suffered extensive collapse.	Remove.	N/A	U
30	Ash *(Fraxinus excelsior)*	S/M		6.00	1.50	3.00	2.50	2.50	2.50	1	175	2.10	Young and vigorous, arising from hedgerow thicket.		M	B2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
31	Ash *(Fraxinus excelsior)*	S/M	F	5.00	2.00	2.50	1.00	2.00	2.00	2	306	3.67	Suppressed and distorted, arising from southern bank of substantial ditch.		M	C2
32	Ash *(Fraxinus excelsior)*	S/M	F	6.00	1.00	4.00	2.50	2.00	4.00	1	229	2.75	Heavily distorted multi-stem from low level. A poor-quality specimen arising from southern bank of ditch.		S	C2
33	Ash *(Fraxinus excelsior)*	S/M	P	7.00	1.50	4.50	3.50	2.00	1.00	3	401	4.81	Multi-stemmed and heavily cut in past. Is heavily distorted and ill-suited to retention.		S	C2
34	Lime *(Tilia europea)*	E/M	G/F	13.00	1.00	4.50	5.00	4.50	4.50	1	716	8.59	Large, particularly multi-stemmed specimen. Configurations suggests early life decapitation and subsequent re-suckering. Buttress region has been subject to erosion and root exposure. General vigour and vitality remain good.	Review regarding retention context.	L	C2
35	Wych Elm *(Ulmus glabra)*	E/M	D	13.00	4.00	4.00	3.50	2.50	3.00	1	357	4.28	Completely dead and in need of removal.		N/A	U
36	Wych Elm *(Ulmus glabra)*	S/M	D	7.00	2.00	1.50	2.50	2.00	2.00	1	229	2.75	Completely dead and in need of removal.	Remove.	N/A	U
37	Wych Elm *(Ulmus glabra)*	S/M	D	7.50	1.00	2.00	5.00	1.00	2.00	1	306	3.67	Distorted and completely dead.	Remove.	N/A	U
38	Ash *(Fraxinus excelsior)*	E/M	P	10.00	0.00	4.00	5.00	3.50	3.00	1	748	8.98	Once larger tree has been crudely decapitated with current crown comprising sucker regeneration. Is unsuitable for retention.	Remove.	N/A	U
39	Wych Elm *(Ulmus glabra)*	S/M	D	7.00	2.50	0.00	2.00	3.00	2.00	1	226	2.71	Completely dead and in need of removal.		N/A	U
40	Wych Elm *(Ulmus glabra)*	E/M	D	9.00	0.00	3.00	3.00	2.00	3.00	2	751	9.01	Tree is completely dead and appears to have lost much of early crown.	Remove	N/A	U

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
41	Sycamore *(Acer pseudoplatanus)*	S/M	F	7.50	1.75	1.00	2.50	2.00	3.00	1	226	2.71	Distorted and suppressed but remains vigorous.		M	C2
42	Sycamore *(Acer pseudoplatanus)*	S/M	F	8.00	2.00	1.00	2.00	3.00	3.00	1	220	2.64	Suppressed and distorted. Remains vigorous.		L	C2
43	Ash *(Fraxinus excelsior)*	E/M	G/F	10.00	1.00	2.50	4.00	3.50	3.50	1	283	3.40	Young and vigorous. Arises from on top of partial eroded ditch embankment.	Review regarding retention context.	L	B2
44	Ash *(Fraxinus excelsior)*	E/M	F	10.00	1.50	5.00	4.50	5.00	5.00	2	433	5.19	Multi-stemmed and sprawling having developed spreading crown supported on heavily divided stem. Tree arises from eastern side of eroded ditch scenario.	Review regarding retention context.	M	C2
45	Ash *(Fraxinus excelsior)*	S/M	F	5.50	2.00	3.00	3.00	3.00	3.00	1	248	2.98	Young and still vigorous. Arises from position west of mounded spoil and demolition rubble.	Review regarding retention context.	M	B2
46	Ash *(Fraxinus excelsior)*	S/M	F/P	6.00	0.00	3.00	3.50	4.00	3.00	1	344	4.13	Distorted and previously cut. Arises from demolition spoil is unlikely to prove retainable.		N/A	U
47	Sycamore *(Acer pseudoplatanus)*	S/M	F/P	7.00	0.00	1.50	2.00	3.00	3.00	1	369	4.43	Young and vigorous but arising from demolition rubble. Is unlikely to prove retainable.		S	C2
48	Ash *(Fraxinus excelsior)*	S/M	F/P	7.00	2.00	3.50	3.00	1.50	4.00	1	302	3.63	Young and vigorous but arising from demolition rubble. Is unlikely to prove retainable.		S	C2
49	Ash *(Fraxinus excelsior)*	S	P	5.00	0.00	2.50	2.00	1.00	2.00	1	229	2.75	Young and vigorous but multi-stemmed and arising from Demolition spoil. Unsuitable for retention.	Remove.	N/A	U
50	Sycamore *(Acer pseudoplatanus)*	S/M	P	8.00	0.00	3.00	2.00	2.00	2.00	10	398	4.77	Comprises an element of sucker regeneration subsequent to prior cutting. Is unsuitable for retention.	Remove.	N/A	U

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
51	Wych Elm *(Ulmus glabra)*	E/M	D	10.00	3.00	4.00	4.00	3.50	4.00	3	376	4.51	Remove immediately.	Remove.	N/A	U
52	Ash *(Fraxinus excelsior)*	S/M	F/P	8.00	1.50	4.00	3.00	0.00	3.00	1	248	2.98	In state of decline with substantial dieback noted. Unsuitable for retention.	Remove.	N/A	U
53	Ash *(Fraxinus excelsior)*	S/M	F	7.00	2.00	4.00	5.50	2.00	1.00	1	328	3.93	Heavily unbalanced to east, arising from western side of ditch but overhanging western bank.	Review regarding retention context.	M	C
54	Sycamore *(Acer pseudoplatanus)*	S/M	F/P	5.00	1.25	0.00	5.00	5.00	2.00	1	325	3.90	Heavily distorted with lower stem procurement and supported on derelict masonry.	Remove.	N/A	U
55	Wych Elm *(Ulmus glabra)*	S/M	D	5.00	2.00	2.50	2.00	1.50	2.50	1	207	2.48	Completely dead.	Remove.	N/A	U
56	Wych Elm *(Ulmus glabra)*	S/M	D	7.00	2.00	3.00	3.00	3.00	3.00	3	398	4.77	Completely dead, Dutch Elm disease..	Remove.	N/A	U
57	Ash *(Fraxinus excelsior)*	S/M	F	5.00	1.25	1.50	3.50	2.50	0.00	1	229	2.75	Heavily distorted, arising from western side of ditch. Is of particularly poor quality and is ill suited to retention.	Consider early removal.	N/A	U
58	Ash Group *(Fraxinus excelsior)*	S/M	F	8.00	1.25	3.00	2.50	1.50	2.00	3	306	3.67	Distorted a multi-stemmed, arising from western bank of dilapidated ditch.		S	C2
59	Ash/Elm Group *(Fraxinus excelsior)* Wych Elm *(Ulmus glabra)*	S/M	P	7.00	0.00	3.00	2.50	1.50	2.50	1	302	3.63	A combined a close-knit group arising from particularly boggy and flooded ground. Elm is completely dead and Ash as a poor quality offering no realistic sustainability.		N/A	U
60	Ash *(Fraxinus excelsior)*	S/M	F/P	7.00	1.50	3.00	2.50	2.00	2.00	3	271	3.25	Poor quality multi-stemmed.	Review regarding retention context.	M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
61	Ash Group *(Fraxinus excelsior)*	S/M	F/P	7.00-8.00	0.00	6.00	3.00	6.00	3.00	1	306	3.67	Close-knit group of poor-quality specimens arising from waterlogged ground on edge of dilapidated ditch. Trees offer minimal sustainability.	Consider early removal.	N/A	U
62	Ash *(Fraxinus excelsior)*	S/M	F/P	8.00	0.00	2.00	2.50	3.00	2.50	1	271	3.25	Multi-stem from low level suggesting sucker regeneration from previous stump. Arises from eastern embankment of dilapidated ditch and particularly waterlogged area. Tree offers minimal sustainability.		N/A	U
63	Ash *(Fraxinus excelsior)*	S/M	F/P	8.00	0.00	4.00	3.50	3.00	4.00	1	255	3.06	Multi-stem from low level suggesting sucker regeneration from previous stump. Arises from eastern embankment of dilapidated ditch and particularly waterlogged area. Tree offers minimal sustainability.		N/A	U
64	Ash Group *(Fraxinus excelsior)*	S/M	P	6.00	0.00	2.50	2.50	2.50	2.50	6	302	3.63	Multi-stemmed comprising coppice like regeneration subsequent to prior cutting. Is of poor quality and offers minimal sustainability.		N/A	U
65	Ash *(Fraxinus excelsior)*	S/M	P	6.00	0.00	3.00	1.50	1.50	3.00	3	388	4.66	Comprises sucker regeneration from a decayed coppice like base. Is Unsuitable for retention.	Remove.	N/A	U
66	Ash *(Fraxinus excelsior)*	S/M	P	6.00	0.00	3.50	3.50	2.50	2.00	3	388	4.66	Comprises sucker regeneration from a decayed coppice like base. Is Unsuitable for retention.		N/A	U
67	Ash *(Fraxinus excelsior)*	S/M	F/P	7.00	2.25	3.50	4.00	2.00	2.00	1	376	4.51	Has suffered substantial stem and crown damage to west. Tree arises from partial eroded embankment on western side of substantial ditch.		S	C2
68	Ash *(Fraxinus excelsior)*	S/M	F/P	6.50	1.00	3.00	3.50	2.00	1.00	2	341	4.09	Heavily unbalanced to east, arising from western side of partial eroded ditch embankment. Is of dubious sustainability.		S	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
69	Ash *(Fraxinus excelsior)*	S/M		7.50	3.00	2.50	3.00	1.50	3.00	1	325	3.90	One-sided and arising from western side of ditch. Ground conditions eroded in vicinity of stem.	Review regularly.	S	C2
70	Ash *(Fraxinus excelsior)*	S/M	F	7.50	3.00	2.50	5.00	3.00	3.50	1	306	3.67	Heavily distorted and multi-stemmed, poor quality specimen arising from western side of eroded ditch. Is of questionable sustainability.		S	C2
71	Ash *(Fraxinus excelsior)*	S/M	F/P	7.50	2.00	2.00	4.50	4.50	4.50	1	322	3.86	Wholly one-sided and obscure by dense Ivy cover. Tree appears to offer minimal sustainability.		S	C2
72	Ash *(Fraxinus excelsior)*	S/M	F	7.00	2.00	4.50	4.50	3.50	3.50	2	360	4.32	Multi-stemmed and routing arising from eroded western bank of dilapidated ditch.		S	C2
73	Ash *(Fraxinus excelsior)*	S/M	F	6.00	2.00	2.50	3.00	3.00	4.50	1	229	2.75	Twin stemmed from low level. A poor quality and suppressed specimen arising from dilapidated hedge line.		S	C2
74	Ash *(Fraxinus excelsior)*	S/M	F	7.00	2.00	1.50	2.50	3.00	3.00	1	232	2.79	Distorted and arising from western side of dilapidated ditch. Tree offers limited sustainability.		S	C2
75	Ash Group *(Fraxinus excelsior)*	S/M	F	10.00	2.50	4.00	3.50	3.50	3.00	6	398	4.77	Multi-stemmed from ground level raising questions regarding structural integrity. Tree group arises from disturbed western bank of dilapidated ditch.	Review regarding retention context.	S	C2
76	Ash *(Fraxinus excelsior)*	S/M	F	5.50	2.25	1.00	1.50	1.50	1.50	1	185	2.22	A young whip arising from western side of dilapidated ditch and waterlogged area.	Review regarding retention context.	M	C2
77	Ash *(Fraxinus excelsior)*	S/M	F	5.50	1.50	1.50	1.50	1.50	1.50	1	191	2.29	A young whip arising from western side of dilapidated ditch and waterlogged area.	Review regarding retention context.	M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
78	Ash *(Fraxinus excelsior)*	S/M	F	5.50	1.50	1.50	1.50	1.50	1.50	1	188	2.25	A young whip arising from western side of dilapidated ditch and waterlogged area.	Review regarding retention context.	M	C2
79	Ash *(Fraxinus excelsior)*	S/M	F	5.50	1.50	1.50	1.50	1.50	1.50	1	185	2.22	A young whip arising from western side of dilapidated ditch and waterlogged area.	Review regarding retention context.	M	C2
82	Crack Willow *(Salix fragilis)*	E/M	F	12.00	0.00	7.00	7.00	5.00	6.00	1	668	8.02	Large, multi-stemmed and disbursed group to create a singular crown form. Group is in state of ongoing dilapidation and involved stems both the north and south of the ditch and stream. There is much evidence of ongoing/prior failure and collapse.	Review with regard to retention context and management issues arising.	M	C2
81	Ash *(Fraxinus excelsior)*	S/M	F/P	7.00	1.50	4.00	2.50	2.50	2.50	1	341	4.09	Distorted and arising from northern edge of stream. Is of poor quality.		S	C2
82	White Willow *(Salix alba)*	S/M	F	6.00	0.00	5.00	5.00	3.00	0.00	1	271	3.25	Arising to north of site boundary. Is heavily unbalanced to east.	Review regarding retention context.	M	C2
83	Ash *(Fraxinus excelsior)*	S/M	F	7.00	0.00	4.00	2.50	4.00	4.00	1	344	4.13	Multi-stem from ground level. Naturally arising from rubble and spoil.		M	C2
84	Sycamore *(Acer pseudoplatanus)*	S/M	F	7.00	0.00	4.00	3.50	3.00	1.00	1	334	4.01	Twin-stemmed group, heavily suppressed by proximity of near neighbour. Arises from demolition spoil.		M	C2
85	Sycamore *(Acer pseudoplatanus)*	S.M	F	7.00	2.00	4.00	4.00	4.00	4.00	1	302	3.63	Young and vigorous, arising from dilapidated and demolished structures.	Review regarding retention context.	M	B2
86	Sycamore *(Acer pseudoplatanus)*	S/M	F	9.00	1.00	5.00	4.50	4.00	4.00	1	360	4.32	Young and vigorous though supporting extensive Ivy cover.	Cut Ivy and rereview.	L	B2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
87	Sycamore *(Acer pseudoplatanus)*	S/M	P	5.00	0.00	3.00	2.00	1.50	2.00	1	274	3.29	Comprises sucker regeneration from stump of previous tree.		N/A	U
88	Sycamore *(Acer pseudoplatanus)*	E/M	F/P	13.00	2.00	6.00	5.00	6.00	6.00	1	844	10.12	Apparently older specimen possibly decapitated in past. Lower stem is subject to ongoing fire damage extensive bark dieback and localise decay. Tree is not sustainable.		S	C2
89	Sycamore *(Acer pseudoplatanus)*	S.M	F	6.50	2.00	4.50	3.00	1.00	2.50	1	261	3.13	Strangle by wire and arising from demolition spoil. Ill-suited to retention.		N/A	U
90	Sycamore *(Acer pseudoplatanus)*	E/M	F	11.00	1.00	4.00	2.00	4.00	3.00	1	325	3.90	Naturally arising from partially demolished masonry.		S	C2
91	Sycamore *(Acer pseudoplatanus)*	E/M	F	11.00	1.00	3.00	2.00	2.00	1.00	1	306	3.67	Naturally arising from partially demolished masonry.		S	C2
92	Wych Elm *(Ulmus glabra)*	S/M	D	10.00	1.50	4.50	4.00	2.00	3.00	1	271	3.25	Completely dead and in need of removal.	Remove.	N/A	U
93	White Willow *(Salix alba)*	E/M	F/P	14.00	0.00	8.00	8.00	6.00	6.00	1	637	7.64	Large sprawling's multi-stemmed group in a state of ongoing and progressive failure. Tree arises from position east of area of demolition rubble and apparent pond and. Suitability of retention would require substantial further review.		M	C2
94	Sycamore *(Acer pseudoplatanus)*	S/M	F	8.00	2.00	3.50	3.00	4.00	4.00	1	379	4.55	Young and vigorous but obscure by dense Ivy cover.	Cut Ivy and rereview.	M	B2
95	Sycamore *(Acer pseudoplatanus)*	E/M	F	13.00	2.00	5.00	4.50	5.00	5.00	2	401	4.81	Quality is undermined by bark included fork though general vigour and vitality is good.	Review regarding retention context.	M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
96	Ash *(Fraxinus excelsior)*	E/M	F	11.00	0.00	4.50	5.00	3.50	1.50	1	525	6.30	Is heavily Ivy clad preventing detailed appraisal. Tree arises from hi embankment above canal levelling stream. Crown supports deadwood possibly indicative of pathological issues.	Re-review.	M	C2
97	Ash *(Fraxinus excelsior)*	E/M	F	11.00	0.00	5.00	3.00	4.00	3.50	1	493	5.92	Of variable condition with evidence of prior mid crown damage. Tree arises from hi embankment above canal levelling ditch.		S	C2
98	Ash *(Fraxinus excelsior)*	E/M	F	10.00	1.50	5.00	6.50	4.00	5.00	1	493	5.92	Arises from embankment above levelling canal levelling ditch. General vigour and vitality appear good however, entire crown is wholly enveloped in Ivy cover preventing detailed review at this time.	Cut Ivy and rereview.	M	C2
101	Sycamore Group *(Acer pseudoplatanus)*	M	F	11.00	1.50	5.00	5.00	4.00	5.00	5	548	6.57	Tree arises from lower-level adjoining canal balancing stream. General vigour and vitality are good, though much of crown is obscure by dense Ivy cover. Willow group 2 with already dealt with. General note, 808, as in cash harshly cut in past with major wound at 0.50 m and evidence of undermining and decay at ground level. Category are for remove.		L	C2
102	Wych Elm *(Ulmus glabra)*	S/M	D	6.00	1.50	2.00	2.50	2.00	1.00	1	239	2.86	Completely dead, killed by Dutch Elm disease.	Remove.	N/A	U

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
103	Wych Elm *(Ulmus glabra)*	S/M	D	6.00	1.50	1.50	2.50	2.50	1.00	1	220	2.64	Completely dead. Killed by Dutch Elm disease.	Remove.	N/A	U
104	Wych Elm *(Ulmus glabra)*	S/M	D	7.50	3.00	1.00	2.00	2.50	2.50	1	271	3.25	An Elm killed by Dutch Elm disease. Remove.		N/A	U
105	Beech *(Fagus sylvatica)*	E/M	G/F	13.00	1.50	6.50	6.50	6.50	6.50	1	589	7.07	A relatively young but vigorous group, multi-stemmed from low level. Multiple stems combined to create a singular canopy form.		L	B2
106	Wych Elm *(Ulmus glabra)*	E/M	D	12.00	2.00	4.50	5.00	5.00	3.00	1	337	4.05	Completely dead, killed by Dutch Elm disease.	Remove.	N/A	U
107	Ash *(Fraxinus excelsior)*	S/M	F/P	9.00	1.50	3.00	4.00	3.00	2.50	1	274	3.29	Slightly unbalanced to east. Vigour is impaired with twiggy decline in evidence about higher crown.	Review annually regarding Chalara canker.	M	C2
108	Wych Elm *(Ulmus glabra)*	S/M	D	7.00	2.50	2.00	2.00	2.00	2.00	1	242	2.90	Completely dead, killed by Dutch Elm disease.	Remove.	N/A	U
109	Ash *(Fraxinus excelsior)*	S/M	G/F	7.00	2.50	2.50	2.50	2.50	2.50	1	229	2.75	Tree is currently in good condition though evidence of Chalara canker elsewhere about site suggests dubious sustainability.	Review regularly.	L	B2
110	Beech Group *(Fagus sylvatica)*	S/M	F/P	6.00	2.50	2.50	2.50	2.50	2.50	1	175	2.10	Comprises part of the hedge thicket as opposed to an individual tree.		L	C2
111	Wych Elm *(Ulmus glabra)*	S/M	F	8.00	3.50	1.00	1.50	2.00	2.00	1	197	2.37	Maintaining good vigour but has suffered chronic prior damage with evidence of higher crown dieback. Exhibit evidence of higher crown dieback.	Remove.	N/A	U
112	Ash *(Fraxinus excelsior)*	S/M	P	8.00	3.00	2.50	2.50	2.50	2.50	1	204	2.44	Higher crown shows evidence of decline that suggest minimal sustainability.		S	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
113	Ash *(Fraxinus excelsior)*	S/M	F	9.00	2.00	2.50	2.50	2.50	1.50	1	261	3.13	Still vigorous but is adjoined by ash exhibiting evidence of decline.	Review annually.	M	C2
114	Ash *(Fraxinus excelsior)*	S/M	F/P	11.00	2.00	3.00	4.00	3.50	3.00	3	398	4.77	Mostly vigorous but is already showing evidence of twiggy decline about higher crown.	Re-review summer 2022.	M	C2
115	Ash *(Fraxinus excelsior)*	S/M	P	11.00	2.50	3.00	3.00	3.00	2.00	1	296	3.55	Exhibiting widespread evidence of higher crown decline. Appears ill-suited for retention.	Remove.	N/A	U
116	Ash *(Fraxinus excelsior)*	S/M	G/F	10.00	3.00	3.00	3.50	3.50	2.50	1	347	4.16	Appears be keeping reasonable vigour and vitality but is adjoined by other Ash showing signs of decline.	Re-review, summer 2022.	M	B2
117	Ash *(Fraxinus excelsior)*	S/M	G/F	10.00	3.00	2.50	2.50	2.50	2.50	1	239	2.86	Currently shows no signs of decline but should be reviewed in summer 2022.		M	B2
118	Ash *(Fraxinus excelsior)*	S/M	P	12.00	2.00	3.00	3.00	3.00	3.00	1	350	4.20	Exhibiting classic signs of decline and deterioration associated with Chalara canker.	Consider early removal.	N/A	U
119	Ash *(Fraxinus excelsior)*	S/M	G/F	10.00	3.00	2.50	2.50	2.50	2.50	1	239	2.86	Currently shows no signs of decline but should be reviewed in summer 2022.		M	B2
120	Wych Elm *(Ulmus glabra)*	S/M	D	8.00	1.75	2.00	2.00	2.00	2.00	1	229	2.75	Killed by Dutch Elm disease.	Remove.	N/A	U
121	Ash Group *(Fraxinus excelsior)*	S/M	F	9.00	1.50	3.50	3.50	3.50	3.50	1	337	4.05	Twin stems adjoined to create singular crown form. Crown vigour and vitality is reduced suggesting possible onset of disease. Tree appears to offer limited sustainability.		M	C2
122	Ash Group *(Fraxinus excelsior)*	E/M	F	12.00	2.00	4.00	6.00	3.00	4.00	3	462	5.54	Large multi-stemmed group heavily obscured by dense Ivy cover. Vigour and vitality are reduced suggesting possible onset of Ash decline.	rereview summer 2022.	M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
WG1	Willow Group 1 White Willow *(Salix alba)*	M	F/P	17.00	0.00	6.00	6.50	5.00	5.00	m/s	637	7.64	A dispersed and multi-stemmed group arising over notable area adjoining balancing pond to canal. Evidence suggests an original tree probably subject to a suckering and possible layering. Condition is highly variable with evidence of ongoing mechanical failure and limb loss suggesting sustainability will be context dependent. Notwithstanding this, group remains vigorous however much of crown is heavily obscured by dense Ivy growth.		M	C2
WG2	Willow Group 2 White Willow *(Salix alba)*	M	F/P	16.00	0.00	7.00	6.00	3.00	2.00	m/s	637	7.64	Multi-stemmed group slightly unbalanced to east. Group raises similar concerns as to those discussed in respect Willow group 1 inasmuch as crown and Entire tree will be subject to impromptu storm damage.	Review with regard retention context.	M	C2
WG3	Willow Group 3 White Willow *(Salix alba)*	M	F/P	16.00	0.00	12.00	5.00	5.00	7.00	1	525	6.30	A multi-stemmed and disbursed group of poor quality with evidence of decline within upper crown. Group includes satellite gracious smaller previously cut satellite group to east.		M	C2
WG3a	Willow Group 3a White Willow *(Salix alba)*	E/M	F/P	10.00	0.00	2.00	2.00	2.00	2.00	1	525	6.30	Appears to comprise sucker regeneration from the stump of a previous large tree.	Review regularly.	M	C2
WG4	Willow Group 4 White Willow *(Salix alba)*	E/M	F/P	12.00	0.00	6.00	6.00	5.00	6.00	m/s	637	7.64	Appears to be somewhat younger but is equally mechanically poor. Crown comprises heavily diverging stems with lower central portion not visible because of undergrowth. Concerns exist that tree has been subject to prior collapse.	Review regularly.	M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
WG5	Willow Group 5 White Willow *(Salix alba)*	E/M	F/P	15.00	1.00	7.00	6.00	6.00	5.00	m/s	748	8.98	See general comments above.	Review regularly.	M	C2
WG6	Willow Group 6 White Willow *(Salix alba)*	E/M	F/P	15.00	0.00	6.00	8.00	6.00	5.00	m/s	796	9.55	Multi-stemmed and already in a state of ongoing mechanical failure with recent loss of major limbs.	Review regularly.	M	C2
WG7	Willow Group 7 White Willow *(Salix alba)*	E/M	F	12.00	0.00	4.00	5.00	5.00	3.00	m/s	462	5.54	Multi-stem from ground level. Potentially is mechanically poor and may be subject to failure.	Review regularly.	M	C2
WG8	Willow Group 8 White Willow *(Salix alba)*	M	F	16.00	0.00	10.00	12.00	6.00	5.00	m/s	637	7.64	See general comments above.	Review regularly.	M	C2
840	Horse Chestnut (Aesculus hippocastanum)	E/M	F	9.00	1.00	3.50	5.50	5.00	4.00	2	748	8.98	A distorted specimen having suffered early life decapitation. Much of crown comprises sucker regeneration. Tree arises from large embankment on northern side of substantial, water bearing ditch.		M	C2
841	Beech Stump (Fagus sylvatica)	M	D	5.00	1.50	0.50	0.50	0.50	0.50	1	780	9.36	A large but completely dead stump.		N/A	U
842	Ash (Fraxinus excelsior)	S/M	F/P	7.00	3.50	2.00	1.50	2.00	2.00	1	197	2.37	slightly unbalanced to west. Is of variable Crown vigour. Review during growing season 2021.		M	C2
843	Wych Elm (Ulmus glabra)	S/M	F	6.00	1.50	1.50	1.50	1.50	1.50	1	175	2.10	Completely dead, killed by Dutch Elm disease.		N/A	U
844	Wych Elm (Ulmus glabra)	S/M	G	7.00	1.50	2.25	2.25	2.25	2.25	1	185	2.22	Completely dead, killed by Dutch Elm disease.		N/A	U
845	Ash (Fraxinus excelsior)	S	F	5.00	2.25	1.00	1.00	1.00	1.00	1	153	1.83	Young and still vigorous though slightly distorted. Arises from embankment on northern edge of substantial body of water.		M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
846	Wych Elm (Ulmus glabra)	S/M	D	5.50	1.50	1.50	1.50	1.50	1.50	1	143	1.72	Completely dead, killed by Dutch Elm disease.		N/A	U
847	Wych Elm (Ulmus glabra)	E/M	D	5.00	0.00	5.00	5.00	0.00	0.00	1	334	4.01	Completely dead and collapsed in north-easterly direction.		N/A	U
847a	Sycamore (Acer pseudoplatanus)	S/M	F	10.00	1.00	2,25	2,25	2,25	2,25	3	385	4.62	Young and vigorous but potentially compromised multi-stem stature	Review regarding retention context.	M	C2
848	Ash (Fraxinus excelsior)	S/M	F/P	6.00	2.00	1.25	1.25	1.25	1.25		185	2.22	A young specimen exhibiting evidence of twiggy decline possibly attributable to canker attack.	Re-review in growing season of 2021	S	C2
849	Ash (Fraxinus excelsior)	S/M	F	9.00	2.25	2.00	2.00	2.00	2.00		261	3.13	A young specimen having suffered early defoliation.	Re-review in growing season of 2021	M	C2
850	Sycamore (Acer pseudoplatanus)	S/M	F	8.00	0.00	4.00	4.50	4.00	4.00		407	4.89	A young and vigorous specimen arising from western bank of substantial ditch.	Review regarding retention context.	L	B2
851	Ash (Fraxinus excelsior)	S/M	F	10.00	2.00	3.50	3.50	3.50	3.50	3	462	5.54	A young specimen the becomes heavily multi-stemmed at low level suggesting early life decapitation. Middle crown is obscured by Ivy. Tree decline within crown raises concern regarding possible Chalara attack.	Rereview during growing season 2021.	S	C2
852	Ash (Fraxinus excelsior)	S/M	F	5.50	2.25	1.50	1.50	1.50	1.50	1	156	1.87	Young specimen suffering twiggy decline about crown periphery.	Rereview during growing season of 2021.	S	C2
853	Sycamore (Acer pseudoplatanus)	S/M	F/P	5.50	0.00	1.75	1.75	1.75	1.75	1	216	2.60	A young specimen arising as natural thicket development from within the hedge profile.		M	C2
854	Ash (Fraxinus excelsior)	S/M	P	6.00	1.75	2.00	2.00	1.00	1.00	1	204	2.44	Has suffered widespread defoliation, likely attributable to Chalara canker attack..	Remove	N/A	U

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
855	Ash (Fraxinus excelsior)	S/M	F	9.00	1.75	2.50	3.50	2.50	3.00	1	264	3.17	A young specimen showing signs of twiggy decline about crown periphery.	Review during growing season 2021.	S	C2
856	Wych Elm (Ulmus glabra)	S/M	F	6.00	0.00	3.00	4.00	1.00	0.00	1	226	2.71	Dead and partially uprooted	Remove	N/A	U
857	Sycamore (Acer pseudoplatanus)	S/M	F	5.50	1.50	2.00	2.00	2.00	2.00	1	194	2.33	Young and vigorous, arising as natural element of thicket development.		M	C2
858	Wych Elm (Ulmus glabra)	E/M	D	7.00	0.00	6.00	3.00	0.00	2.00	1	239	2.86	Partially collapsed in a northerly direction.	Remove	N/A	U
859	Ash (Fraxinus excelsior)	S/M	F	9.00	2.00	2.50	2.00	4.50	5.00	1	293	3.51	A vigorous but heavily distorted specimen, unbalance to southwest	Review regarding retention context.	S	C2
860	Ash (Fraxinus excelsior)	S/M	F	5.50	2.00	4.50	1.00	0.00	4.00	1	197	2.37	Heavily distorted whip arising from eastern side of ditch. Is of poor quality.		S	C2
861	Wych Elm (Ulmus glabra)	S/M	D	5.00	1.25	1.00	1.00	1.00	1.00	1	153	1.83	Completely dead, killed by Dutch Elm disease	Remove	N/A	U
862	Wych Elm (Ulmus glabra)	S/M	D	5.00	1.25	1.00	1.00	1.00	1.00	1	153	1.83	Completely dead, killed by Dutch Elm disease	Remove	N/A	U
863	Sycamore (Acer pseudoplatanus)	S/M	F	8.00	0.00	2.50	2.00	2.00	3.00	3	242	2.90	Multi-stemmed and distorted specimen arising from western bank of large ditch.		M	C2
864	Sycamore (Acer pseudoplatanus)	S/M	F	7.50	1.50	2.50	2.50	2.50	2.50	5	328	3.93	Young and vigorous but multi-stemmed from 1.00 m suggesting early life to. Arises from western side of large ditch.		M	C2
865	Ash (Fraxinus excelsior)	S/M	F	7.00	1.50	2.00	2.00	2.00	2.00	1	248	2.98	Badly distorted and arising from broader hedgerow thicket.		M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
866	Sycamore (Acer pseudoplatanus)	S/M	F/P	6.00	2.00	1.75	1.75	1.75	1.75	2	271	3.25	Young and still vigorous, arising from northern bank of large ditch.		M	C2
867	Ash (Fraxinus excelsior)	S/M	P	9.00	4.50	2.00	2.00	1.50	0.50		197	2.37	Tall and drawn up. Is defoliated at an early stage suggesting pathological issues.	Rereview growing season 2021.	S	C2
868	Ash (Fraxinus excelsior)	S/M	F	9.00	1.00	3.00	3.00	3.00	3.00	2	344	4.13	North-eastern crown appears defoliated suggesting pathological issues.	Rereview season 2021	S	C2
869	Ash (Fraxinus excelsior)	S/M	P	8.00	1.00	3.00	4.50	4.00	2.00	2	341	4.09	Heavily divided from ground level and heavily distorted. Higher crown to north-east is defoliated suggesting pathological issues.	Rereview, growing season of 2021	S	C2
870	Sycamore (Acer pseudoplatanus)	S/M	P	7.00	1.50	3.00	3.00	1.50	2.00	3	306	3.67	In a state of decline with western canopy already dead.	Remove	N/A	U
871	Ash (Fraxinus excelsior)	S/M	F/P	6.50	2.00	2.00	2.50	2.50	2.50	1	207	2.48	is suffering early defoliation suggesting pathological issues.	Rereview growing season 2021.	S	C2
872	Ash (Fraxinus excelsior)	S/M	F/P	7.00	3.00	3.00	2.00	1.00	1.00	1	191	2.29	heavily distorted arising from northern edge of different ditch. Is partially defoliated suggesting possible pathological issues.	Rereview growing season 2021.	S	C2
873	Ash (Fraxinus excelsior)	S/M	P	8.00	2.00	3.50	3.00	4.00	4.00	2	286	3.44	Comprises 2 adjoining stems combined to create profile vigour is variable with evidence of early defoliation.	Rereview growing season 2021 short-term.	S	C2
874	Sycamore (Acer pseudoplatanus)	S/M	F	6.50	2.50	2.00	2.00	2.00	2.50	2	274	3.29	Young and vigorous though heavily level.	Review regarding retention context.	M	C2
879	Sycamore Group (Acer pseudoplatanus)	S	F/P	5.00	0.00	2.00	2.00	2.00	2.00		159	1.91	A close-knit group of Sycamore arising naturally from a pile of demolition spoil. Unsuitable for retention.	Remove.	N/A	U

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
880	Sycamore (Acer pseudoplatanus)	S/M	F	7.00	1.00	3.00	3.00	3.00	3.00	4	385	4.62	Young and vigorous but compromised by multi-stem stature and arising from extent of demolition rubble.		S	C2
881	Sycamore (Acer pseudoplatanus)	S/M	F	5.50	1.00	2.00	1.00	2.00	2.00	4	226	2.71	Young and vigorous, arising from demolition spoil. Unsuitable for retention.		S	C2
882	Wych Elm (Ulmus glabra)	S/M	D	4.50	1.00	2.00	1.50	4.50	2.00	1	153	1.83	completely dead, killed by Dutch Elm disease.	Remove	N/A	U
883	Sycamore (Acer pseudoplatanus)	S/M	F/P	4.50	1.25	1.00	1.00	1.00	1.00	1	121	1.45	Close-knit group of natural arising sycamores, emerging from area of demolition spoil. Unsuitable for retention.		S	C2
884	Sycamore (Acer pseudoplatanus)	S/M	P	5.00	0.00	1.50	1.50	1.50	1.50	5	207	2.48	Close-knit group of natural arising sycamores, emerging from area of demolition spoil. Unsuitable for retention.			C2
885	Wych Elm (Ulmus glabra)	S/M	D	6.00	1.50	2.50	2.50	2.50	2.50	1	197	2.37	Completely dead, killed by Dutch.	Remove	N/A	U
886	Sycamore Group (Acer pseudoplatanus)	S/M	F/P	5.00	0.00	2.00	2.00	2.00	2.00	5	191	2.29	A close-knit group of multi-stem specimen arising from demolition rubble. Considered ill-suited to retention.		N/A	U
887	Sycamore Group (Acer pseudoplatanus)	S/M	F/P	5.00	0.00	2.00	2.00	2.00	2.00	5	191	2.29	A close-knit group of multi-stem specimen arising from demolition rubble. Considered ill-suited to retention.		N/A	U
888	Sycamore Group (Acer pseudoplatanus)	S/M	F/P	4.50	0.00	2.00	2.00	2.00	2.00	5	191	2.29	A close-knit group of multi-stem specimen arising from demolition rubble. Considered ill-suited to retention.		N/A	U

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
889	Sycamore Group (Acer pseudoplatanus)	S/M	F/P	4.50	0.00	2.00	2.00	2.00	2.00	5	191	2.29	A close-knit group of multi-stem specimen arising from demolition rubble. Considered ill-suited to retention.		N/A	U
890	Sycamore (Acer pseudoplatanus)	S	P	4.00	0.00	1.50	1.50	1.50	1.50	5	143	1.72	Comprises element of thicket development from demolition spoil.		S	C2
891	Sycamore (Acer pseudoplatanus)	S	P	4.00	0.00	1.50	1.50	1.50	1.50	5	143	1.72	Comprises element of thicket development from demolition spoil.		S	C2
892	Elder (Sambucus nigra)	S/M	F	5.50	0.00	3.00	3.00	3.00	3.00	5	385	4.62	Typically regarded as a weed species.		M	C2
893	Sycamore (Acer pseudoplatanus)	S	F	6.50	2.00	1.00	0.50	0.50	1.00	1	153	1.83	Whiplike specimen arising from demolition rubble. Is of dubious retention merit.		S	C2
894	Wych Elm (Ulmus glabra)	E/M	D	9.00	2.00	2.50	2.50	2.50	2.50	1	306	3.67	Completely dead, killed by Dutch Elm disease.		N/A	U
895	Ash (Fraxinus excelsior)	S/M	F	9.00	2.50	3.00	3.50	3.50	2.50	1	283	3.40	Vigour appears reasonable, with only minor tree decline evident within crown arise from derelict thicket. Tree appears to be associated with raised earthen mounds.	review regarding retention context and during growing season 2021.	S	C2
896	Sycamore (Acer pseudoplatanus)	S/M	P	5.50	0.00	2.00	2.50	2.00	1.00	6	293	3.51	Distorted and multi-stemmed, arising as part of hedgerow thicket from bank of ditch.		S	C2
897	Ash (Fraxinus excelsior)	S/M	F	5.50	2.00	2.50	4.00	3.50	1.50	1	248	2.98	Of variable crown vigour. Tree arises from eroded bank associated with ditch with substantial prior damage and root exposure noted. Tree is heavily considered to be of poor quality.	reviewed regard retention context.	S	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
898	Ash (Fraxinus excelsior)	S/M	F	7.00	1.50	2.50	2.50	2.50	2.50	1	229	2.75	Minor twiggy decline evident about crown periphery.	Review growing season 2021.	S	C2
899	Ash (Fraxinus excelsior)	S/M	F	6.00	1.50	2.50	2.00	2.00	2.50	1	194	2.33	Young specimen heavily divided at 1.50 m. General vigour appears reasonable. Trees associated with large ditch and bank meant scenario.		M	C2
900	Ash (Fraxinus excelsior)	S/M	F	5.50	2.00	3.00	2.50	2.50	3.00	1	204	2.44	Distorted and unbalanced to north-west. Vigour and vitality are reasonable at present.	Review during growing season 2021.	M	C2
901	White Willow (Salix alba)	E/M	F	12.00	2.00	5.00	1.00	0.00	4.00	1	325	3.90	An independent whip set-aside from broader willow growth. May prove to be layer from larger adjoining plans. Arises from north-western bank of large water bearing ditch.		M	C2
902	White Willow Group (Salix alba)	M	F	12.00	0.00	6.00	6.00	5.00	5.50	6	844	10.12	Large, sprawling multi-stemmed group that has been subject to prior mechanical damage. Arises from north-western bank of substantial, water bearing ditch.	Review regarding retention context.	M	C2
903	White Willow Group (Salix alba)	E/M	F	7.00	1.00	5.00	5.00	3.00	4.50	5	420	5.04	Suppressed distorted and arising from embankment over substantial body of water.	Review regarding retention context.	M	C2
904	White Willow (Salix alba)	M	F	11.00	0.00	5.00	7.00	4.50	4.50	5	748	8.98	Large multi-stem specimen arising from embankment above large body of water. Trees been subject to prior mechanical damage and failure.		M	C2
905	White Willow (Salix alba)	E/M	P	5.00	0.00	4.50	4.00	2.50	5.00	1	430	5.16	Partially collapsed remnant of a prior tree. Is of dubious retention merit.		S	C2
906	Goat Willow (Salix caprea)	M	F	4.50	0.00	2.00	2.00	2.00	2.00	4	229	2.75	Comprises an element of naturally arising thicket development.		M	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
907	Ash Group (Fraxinus excelsior)	E/M	F/P	11.00	0.00	4.00	3.00	5.00	3.00	6	430	5.16	A multi-stemmed group possibly arising as sucker regeneration from stump of previous tree. Is of poor quality and is mechanically poor. Is of dubious sustainability regarding proximity to rail corridor.		M	C2
908	Ash (Fraxinus excelsior)	E/M	F/P	11.00	1.50	4.50	3.00	4.50	2.50	5	407	4.89	Multi-stem from ground level raising concerns regarding mechanical integrity impossible predisposition towards failure. Proximity to rail corridor raises concerns.		M	C2
909	Ash (Fraxinus excelsior)	E/M	P	8.00	1.00	3.00	1.00	2.50	1.50	5	420	5.04	Of poor quality, being multi-stemmed from ground level. Is of dubious retention merit adjoining rail corridor		S	C2
910	Ash (Fraxinus excelsior)	E/M	F/P	9.00	1.00	5.00	1.50	4.00	3.00	3	430	5.16	Distorted and multi-stemmed. Is of dubious retention merit adjoining rail corridor.		S	C2
911	Ash (Fraxinus excelsior)	E/M	F/P	12.00	0.00	5.00	4.00	4.00	3.50	5	525	6.30	A large multi-stemmed group showing visible evidence of harsh cutting in past. Crown comprises sucker regeneration from stump of earlier tree. Tree is of dubious retention merit adjoining rail corridor.		S	C2
912	Ash Group (Fraxinus excelsior)	E/M	F/P	11.00	0.00	4.00	7.00	3.50	7.00	5	398	4.77	A dispersed and multi-stemmed group extending over circa 10m of ditch embankment. Is of poor quality, apparently comprising sucker regeneration from stumps of previous trees. Group shows evidence of variable leaf loss, suggesting possible pathological issues. Is of dubious retention merit adjoining rail corridor.		S	C2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
913	Sycamore (Acer pseudoplatanus)	S/M	F	6.00	0.00	2.50	2.50	2.50	2.50	2	261	3.13	Young and vigorous arising from ditch bank to east of substantial watercourse. Is naturally arising with substantial sucker. Is naturally arising and multi-stem.		M	C2
914	Oak (Quercus robur)	M	G/F	17.00	5.00	4.00	5.50	5.50	4.00	1	716	8.59	Is of apparently good vigour though much of middle crown principal stem is obscured from by dense Ivy cover. Tree arises from high banking above large water bearing ditch.	Cut Ivy and rereview.	L	B2
915	Sycamore (Acer pseudoplatanus)	S/M	F	8.50	2.00	3.00	3.00	3.00	3.00	1	290	3.48	Young and vigorous arising from position high on bank above large ditch.		L	B2
916	Sycamore Group (Acer pseudoplatanus)	M	P	14.00	2.00	5.00	6.50	5.50	5.00	1	910	10.92	A large multi-stemmed specimen where entire stems are subject to decline and dieback. Cause of decline is not apparent.		N/A	U
917	Sycamore (Acer pseudoplatanus)	E/M	F/P	13.00	2.25	4.50	4.50	3.50	4.00	1	465	5.58	A young specimen showing Twiggy decline about crown apex.	Review growing season 2021.	M	C2
918	Ash (Fraxinus excelsior)	E/M	F/P	13.00	2.00	3.00	5.00	3.00	4.50	1	592	7.10	A once larger tree has been decapitated with current crown comprising pole wood emerging from circa 2.25 m. Middle crown is partially obscured by Ivy cover. Concerns exist regarding shell error canker attack and mechanical integrity.	Cut Ivy and rereview.	M	C2
919	Sycamore (Acer pseudoplatanus)	M	F	15.00	1.75	5.00	5.00	3.50	4.50	1	579	6.95	Apparently vigorous, supporting minor imbalance to north. Middle crown and primary stem are obscure by dense Ivy cover.	Cut Ivy and rereview.	L	B2

No.	Species	Age	Con	Ht	CH	N	E	S	W	Stm	Dia	RPA	Structural Condition	PMR	Yrs	Cat
920	Ash (Fraxinus excelsior)	E/M	P	13.00	3.00	3.00	3.50	3.00	3.00	1	411	4.93	A relatively young tree showing classic signs of decline deterioration and dieback about higher crown. Is unsuitable for attention.	Remove.	N/A	U
921	Ash (Fraxinus excelsior)	S/M	F/P	7.00	2.00	1.00	1.50	2.00	2.00	1	185	2.22	A young but distorted specimen arising from hedgerow thicket.		M	C2
922	Sycamore Group (Acer pseudoplatanus)	S/M	F	7.00	2.00	3.50	3.50	2.00	2.00	4	271	3.25	A close-knit group of young saplings arising naturally as part of thicket development.		M	C2
923	Sycamore (Acer pseudoplatanus)	S/M	F	6.50	2.25	2.00	2.50	2.00	2.00	1	197	2.37	Naturally arising from hedge thickets.		M	C2
924	Ash (Fraxinus excelsior)	E/M	F	14.00	1.50	4.50	5.00	5.00	5.00	3	548	6.57	Multi-stem from ground level raising some concern regarding mechanical integrity. Current vigour appears reasonable though concerns exist over Chalara canker attack.	Rereview, some are 2021.	M	B2
925	Ash (Fraxinus excelsior)	S/M	F	8.00	1.50	1.50	2.00	3.00	3.00	1	207	2.48	Naturally arising from hedge thickets.		M	C2

No.	Species	Age	Con	Ht	CH	Spread	Stm	Dia	RPA	Structural Condition	Yrs	Cat
TL1	Tree Line 1 Ash *(Fraxinus excelsior)* Wych Elm *(Ulmus glabra)* Sycamore *(Acer pseudoplatanus)*	S/M-M	F/P	12.00-17.00	0.00-4.00	Spread Contiguous	m/s	780	9.36	A broadly continuous line and dominated by Ash arising from the southern side of dilapidated and eroded field ditch. A small number of trees arise from the southern side of the ditch (site side) this is a particularly small proportion of the overall population. All Elms reviewed exhibit evidence of Dutch Elm disease and offers no realistic sustainability Even where individuals remain alive. Similar concerns relate to the ash and relate in respect of the risks of Chalara canker attack. Accordingly it must be appreciated that these trees could readily be lost over coming years. Additionally, consideration should be given to the nature and form of the tree line. All trees, particularly the older specimens are multi-stem suggesting early life intervention and attempted cutting. Such multi-stemmed formats are mechanically weaker than single stem trees with evidence existing throughout the line of ongoing mechanical failure, stem splitting and limb loss. Notwithstanding the pathological issues mentioned above, combining this with mechanical issues then these trees should be regarded as suitable for limited retention and that retention will be dependent upon the context within which they would be retained. If retained, it is advised that the limited sustainability be addressed by new planting and augmenting the existing population thereby accounting for natural loss as well as safety management required loss over time.	M	C2

WT1	Wood Thicket 1 Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Sycamore *(Acer pseudoplatanus)* Wych Elm *(Ulmus glabra)* *Ash (Fraxinus excelsior)*	S/M-E/M	F/P	2.00-7.00	0.00	Spread Contiguous	m/s	N/A	N/A	A dense and highly variable thicket like development with no evidence of planting regime or pattern. Area supports numerous semimature trees including ash Sycamore and Elm however, most of the Elms encountered were dead as result of Dutch Elm disease. The area is subject to substantial ponding and waterlogging throughout and suitability for retaining material will be subject to long term management intentions. Consideration should also be given to the proportion of the population comprising ash as this may offer limited sustainability in light of Chalara canker issues.		M	C2
WT2	Wood Thicket 2 Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Elder *(Sambucus nigra)*	S/M-E/M	F/P	2.00-8.00	0.00	Spread Contiguous	m/s	N/A	N/A	Group 3, Ash, Bramble, Ivy, Elder, and intermittent and variable group of ash that appeared to be associated with a now partially filled and dilapidated hedge with evidence of widespread earthworks and ground disturbance. The entries a multi-stemmed raising some concern with regard to sustainability and mechanical integrity however most currently appear to be of reasonably good health. Notwithstanding this, due consideration must be given to the potential for issues arising from Chalara canker the possibility that any or all of these trees could be lost to the disease in the near future.		M	C2

WT3	Wood Thicket 3 Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Elder *(Sambucus nigra)* Goat Willow *(Salix caprea)* Sycamore *(Acer pseudoplatanus)*	S/M-E/M	F/P	2.00-8.00	0.00	Spread Contiguous	m/s	N/A	N/A	An area comprising natural regeneration. There is much competition and suppression across this generally continuous and thicket like area. Young Elm are subject to Dutch Elm disease and concern revolves about the sustainability of the Ash in light of Chalara canker.		M	C2

Tree Lines and Hedges

No.	Species	Age	Con	Ht	CH	Description	Yrs	Cat
1a	Hawthorn *(Crataegus monogyna)* Ash *(Fraxinus excelsior)* Wych Elm *(Ulmus glabra)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Blackthorn *(Prunus spinosa)* Dog Rose *(Rosa canina)* Ivy *(Hedera helix)*	M	F/P	3.00-6.00 (Trees to 14.00m)	4.00-8.00m	Hedge has undergone substantial clearance of sprawling Bramble-based thicket, particularly to east of hedge. Hedge remains overgrown with many trees chronically enveloped with Ivy. Substantial number of original hawthorns remain but only at intermittent positions. The alignment supports a number of emergent ash and elm however many of the elms appear to be dead as result of Dutch Elm disease. Hedge is associated with substantial ditch and embankment feature. A majority of the thorn-based material arises from the eastern bank of the ditch however general scrub and thicket development to the west is noted but is variable. Area supports a number of sporadic sapling trees and Thorn elements.	n/a	C2
1b	Hawthorn *(Crataegus monogyna)* Sycamore *(Acer pseudoplatanus)* Bramble *(Rubus fruticosus)* Blackthorn *(Prunus spinosa)* Dog Rose *(Rosa canina)* Ivy *(Hedera helix)*	M	P	2.50-5.50	4.00-7.00m	A relic of prior hedge being substantially discontinuous. Recent clearance works of spurious Bramble thicket have left wholly denuded hedge line comprising a small number of relic Hawthorn together with some Elder and Sycamore. Hedge line arises from the southern bank of a substantial ditch.	n/a	C2

1c	Hawthorn *(Crataegus monogyna)* Wych Elm *(Ulmus glabra)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Blackthorn *(Prunus spinosa)* Dog Rose *(Rosa canina)* Ivy *(Hedera helix)* Goat Willow *(Salix caprea)*	M	F/P	2.50-6.00 (Trees to 12.00m)	4.00-8.00m	The original hedge alignment arises from the north-eastern side of a substantial ditch alignment descending to circa 1.50 m below field levels and whilst much thicket development has occurred to the north-west, this shows no evidence of deliberate planting and typically comprises Bramble thicket with intermittent Thorn and Elder development. Continuity in the hedge is relatively poor with numerous gaps exceeding 20.00 m whereby the hedge profile is provided by low level Bramble dominated thicket only. This section of the hedge is noted to support circa 8 completely dead Wych Elm. These trees, as with elsewhere on the site, have been lost to Dutch Elm disease and are indicative of the disease's prevalence within the broader area. Note is made that whilst the general profile of the original hedge rarely exceeds 6.00 – 8.00 m, the broader thicket development to both the north-east and south-west often extends this profile by in excess of 20 m. Such material is however of poor quality and offers minimal potential for retention within a developed context.	n/a	C2
1d	Hawthorn *(Crataegus monogyna)* Beech *(Fagus sylvatica)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Dog Rose *(Rosa canina)* Ivy *(Hedera helix)*	M	F/P	4.00-7.50 (Trees to 19.00m)	4.00-8.00m	Another dilapidated section of hedgerow supporting only a small number of original Hawthorn. Broader continuity is provided at lower levels by Bramble thicket and intermittent Elder. The alignment supports at least for completely dead Wych Elm, indicative of the prevalence of Dutch Elm disease within the broader area. Note is made that circa 60 m south of the northern end of this hedge, there is a substantial Beech. This tree is broadly accessible at this time however, its overall condition would appear good in respect of its general vigour and vitality. It will be advised this tree is reviewed in detail once access is available. As with the remainder of the "1" group hedges, or significant material associated with this hedge arises from the north-eastern edge of a substantial drainage ditch. However, note is made of extensive thicket development progressing in a south westerly direction from the ditch and typically comprising Hawthorne, Bramble and elder scrub. Whilst providing a significant block of vegetation, it is unlikely that this material could be retained into and new urban landscape.	n/a	C2

1e	Bramble *(Rubus fruticosus)* Elder *(Sambucus nigra)* Blackthorn *(Prunus spinosa)* Ash *(Fraxinus excelsior)*	M	F/P	1.50-4.50	5.00-7.00	Effectively comprising a dense Bramble thicket supporting 2 emergent groups of elder. Offers minimal sustainability.	n/a	C2
1f	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)*	M	F/P	1.50-4.50	5.00-7.00	Appears to comprise an intermittent and highly variable thorn-based alignment close to palisade boundary. The south of this, there is an erratic and variable Bramble thicket with emergent and Thorn and Elder.	n/a	C2
1g	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Sycamore *(Acer pseudoplatanus)* Goat Willow *(Salix caprea)* Gorse *(Ulex europaeus)* Bramble *(Rubus fruticosus)* Elder *(Sambucus nigra)* Wych Elm *(Ulmus glabra)*	M	F/P	2.00-5.00	5.00-7.00	Alignment comprises an almost continuous thorn-based alignment close to palisade rails boundary. The south of this, there is a mixed and variable population of scrub thicket including Goat Willow, Bramble and Sycamore. Review with regard to retention context.	n/a	C2

2	Hawthorn *(Crataegus monogyna)* Wych Elm *(Ulmus glabra)* Ash *(Fraxinus excelsior)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Blackthorn *(Prunus spinosa)* Dog Rose *(Rosa canina)* Ivy *(Hedera helix)* Hazel *(Corylus avellana)*	M	F/P	3.00-6.00	5.00-8.00m	A broadly continuous hedge alignment with only a singular centrally located gap. Continuity appears good however, it is best at the north-eastern end of the alignment and is reduced to the south-west where continuity is in part provided by Bramble thicket. The alignment supports a small number of typically small but dead Wych Elm, indicative of the prevalence of Dutch Elm disease within the broader area. The south-western portion of the hedge supports a small element of emergent Ash that appear young and vigorous and thus are likely to assert immense potential for growth over time. The alignment arises wholly from the north-western upper edge of a substantial ditch profile.	n/a	C2
3a	Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Blackthorn *(Prunus spinosa)* Sycamore *(Acer pseudoplatanus)* Ash *(Fraxinus excelsior)* Dog Rose *(Rosa canina)* Ivy *(Hedera helix)*	M	F/P	2.50-6.00 (Trees to 11.00m)	4.00-8.00m	Exhibiting evidence of once having comprised a typical Hawthorne based agricultural field boundary. The alignment it still retains a substantial proportion of the hawthorns however, these are becoming outcompeted by more invasive species including elder, Blackthorn and Ash. The bulk of the mature material arises from the western side of substantial ditch profile however the vegetative profile is substantially exaggerated, particularly to the East by extensive secondary thicket development typically dominated by Bramble and elder and Blackthorn. This alignment supports several completely dead Elm, most notable towards the centre of the line with some having already collapsed. Note is also made of substantial contribution to the profile played by emergent Ash. Was most of these trees tend to be drawn up, distorted or multi-stemmed, most appear to be maintaining good vigour and vitality at this time and accordingly would appear to offer some degree of sustainability. Nonetheless and regarding larger trees, it would be advised that once access is improved by way of scrub eradication that any such trees intended for retention would be reviewed on an individual basis.	n/a	C2

3b	Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Blackthorn *(Prunus spinosa)* Sycamore *(Acer pseudoplatanus)* Ash *(Fraxinus excelsior)* Dog Rose *(Rosa canina)* Ivy *(Hedera helix)*	M	F/P	2.50-6.00	4.00-7.00m	This element of hedging effectively comprises an extension to hedge 3a continuing up and to the southern boundary hedge of the site area. In many respects, it mimics hedge 3a however, the proportion of Hawthorne remaining in this area is diminished with it greater degree of apparent suppression and competition from broader thicket development. In such instances, the eradication of the broader thicket would leave little of the original hedge structure. As with previous comments. The significant material associated with this thicket arises from the western edge of a substantial ditch notwithstanding the fact that there has been substantial scrub development typically dominated by Bramble thicket, to both sides of the original alignment.	n/a	C2
3c	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Ash *(Fraxinus excelsior)* Elder *(Sambucus nigra)*	M	F/P	2.50-6.00	4.00-7.00m	Exhibits evidence to suggest once having comprised a Hawthorne hedge however, at this time it comprises more a broad swathe of regenerative vegetation in association with demolition spoil rubble and masonry. The material is of small stature, poor quality and offers minimal potential for retention.	n/a	C2

4	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Dog Rose *(Rosa canina)* Ash *(Fraxinus excelsior)* Ivy *(Hedera helix)* Wych Elm *(Ulmus glabra)* Guelder Rose *(Viburnam opulus)* Crack Willow *(Salix fragilis)* Goat Willow *(Salix caprea)*	M	P	2.50-6.00	6.00-8.00m	A sprawling and dilapidated hedge of highly variable condition. The hedge appears to be based on the upper northern edge of a substantial ditch alignment however, to further complicate issues, surrounding vegetation is highly suggestive of particularly poor drainage and potentially waterlogged conditions. The condition of the hedge is highly variable not only supporting several dead Elms, presumed have been killed by Dutch Elm disease but also other species exhibiting classic signs of decline are possibly attributable to periodic waterlogging. The originally intended Hawthorne element of the hedgerow is now quite vestigial with the broader hedge profile been provided by a combination thicket, often dominated by Blackthorn, Bramble, and Ivy with intermittent emergent Ash. As with previously described hedges, note is made of the substantial expansion of the original hedge profile by continuous thicket development to the north and south of the primary alignment.	n/a	C2
5a	Blackthorn *(Prunus spinosa)* Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Guelder Rose *(Viburnam opulus)* Elder *(Sambucus nigra)* Wych Elm *(Ulmus glabra)*	M	p	5.00-8.00 (Trees to10.00m)	6.00-8.00m	A particularly dilapidated and disjointed hedge alignment apparently arising from the southern side of a now heavily eroded and dilapidated ditch. The hedge lacks continuity and retains only a small number of the original Hawthorn.	n/a	C2

5b	Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Wych Elm *(Ulmus glabra)* Dog Rose *(Rosa canina)*	M	F/P	5.00-8.00 (Trees to13.00m)	6.00-8.00m	A broadly continuous element of hedge notwithstanding suppression and competition at lower levels. In this instance, the primary Hawthorne remains dominant but early signs of competition exist with substantial thicket development to both the south-east and north-west of the primary alignment. Note is made that the primary alignment appears to be rooted on the upper edge of the north-western side of a substantial ditch feature. Though small in numbers, this hedge section supports some Wych Elm, the majority of these are dead however one was encountered that remains alive however this specimen is already exhibiting symptoms of the disease and thus is unlikely to survive beyond the immediate short-term.	n/a	C2
5c	Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Wych Elm *(Ulmus glabra)* Dog Rose *(Rosa canina)*	M	F/P	5.00-8.00	6.00-8.00m	As with 5B excepting that all Elms are dead.	n/a	C2
6	Hawthorn *(Crataegus monogyna)* Ash *(Fraxinus excelsior)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Elder *(Sambucus nigra)*	M	F/P	5.00-8.00	6.00-9.00m	Widely dilapidated section of hedge that whilst still supporting a small number of the original Hawthorns is now more an alignment of mixed species, often dominated by Blackthorn and Bramble. Many specimens in this area exhibit evidence of decline a factor that may be related to localised changes in ground flora that suggest wetter ground conditions and possible periodic flooding. This section of hedge is considered such as to provide particularly minimal potential for retention.	n/a	C2

6b	Hawthorn *(Crataegus monogyna)* Ash *(Fraxinus excelsior)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Goat Willow *(Salix caprea)* Wych Elm *(Ulmus glabra)*	M	P	4.99-7.00 (Trees to11.00m)	6.00-8.00m	A wholly dilapidated element of hedge that whilst illustrating elements of prior Hawthorne hedge is now wholly intermittent and discontinuous. With reference to the southernmost end of the hedge, ground flora suggests a particularly wet conditions including dominance by reeds and sedges. This is likely to be the cause of some of the decline noted within the hedge. Note is however made that the hedge supports several Elms apparently lost to Dutch Elm disease. The southern end of the hedge supports several young Ash. Many of these trees remain vigorous at present however, such specimen should be reviewed considering environmental changes including drainage as may occur in this area through development. Other than the ash, this section of hedging offers little potential for retention.	n/a	C2
7	Hawthorn *(Crataegus monogyna)* Ash *(Fraxinus excelsior)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Elder *(Sambucus nigra)*	M	F/P	6.00-8.00 (Trees to 18.00m)	6.00-8.00m	A broadly variable hedge alignment where Hawthorne still retains a substantial proportion of the overall population however, it is now often suppressed and has lost its dominance. The broader alignment now comprises a more thicket like and mixed profile including a notable population of emergent ash. The original and dominant vegetation arises from the northern side of a substantial ditch profile. This vegetation is added to both the north and south of the original profile and ditch by spurious thicket development, typically dominated by goat willow and Bramble. The alignment remains strong and except for a small number of specific punctuations is broadly continuous. Eradication of invasive species appears likely to allow for the retention of a still broadly contiguous alignment. Note is made that several Elms located at the north-western end of the alignment are already in poor condition with all exhibiting evidence of early Dutch Elm disease attack. Accordingly, such material is considered unsustainable. Though none of the emergent Ash from this alignment have been deliberately planted, a clear majority appear to be in broadly good condition and might offer some degree of sustainability. This is particularly the case in respect of 7b where in comparison to 7a, the Ash becomes progressively more and more dominant in respect of the broader alignment.	n/a	C2

8	Hawthorn *(Crataegus monogyna)* Oak *(Quercus robur)* Wych Elm *(Ulmus glabra)* Ash *(Fraxinus excelsior)* Sycamore *(Acer pseudoplatanus)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Elder *(Sambucus nigra)* Guelder Rose *(Viburnam opulus)* Hazel *(Corylus avellana)*	M	F/P	5.00-8.00 (Trees to 18.00m)	6.00-8.00m	This alignment differs greatly from previous alignments in that it supports and obviously more mature tree population. The underlying Hawthorn hedge appears quite like others noted elsewhere upon the site and will be typical of agricultural field boundaries. The hedge as with all significant vegetation in this area is located arising from the eastern side of a substantial drainage ditch, descending to circa 1.50 metres below field levels. The Hawthorn is becoming recessive with continuity within the lower-level hedge being provided more by a combination of species as opposed to a true Hawthorne alignment. In this respect, there are substantial variability with some elements of the hedge comprising little more than Bramble and elder thicket. The biggest difference in this instance relates the tree population including a number of significant Ash, Sycamore and, towards the north-western end of the alignment, and Oak. The age profile of these trees is significantly different from any others noted elsewhere on the site (exempting Beech at northern end of hedge 1d) thus suggesting a different context and history. The paragraph the trees vary greatly in condition. The larger Sycamore exhibits classic signs of decline and stag heading as do adjoining trees including some ash towards the centre of the alignment. Other tree is a pity maintaining reasonable vigour and vitality. The underlying hedge profile is of questionable suitability for attention in light of its variability and the fact that the eradication of invasive scrub thicket species would greatly undermine any degree of continuity. Similar comment would apply to the trees however, proportion of the trees would appear suitable for retention.	n/a	C2

9	Hawthorn *(Crataegus monogyna)* Ash *(Fraxinus excelsior)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Sycamore *(Acer pseudoplatanus)* Spindle *(Euonymus europaeus)*	M	F/P	5.00-8.00 (Trees to 10.00m)	6.00-8.00m	A broadly continuous hedge alignment where dominant vegetation appears to arise from the south-eastern side of significant field hedge however, there is additional evidence to suggest possible planted population to the north-west of the same ditch. The Hawthorn element of the population remains significant though is beginning to lose dominance particularly with the development of emergent ash. Thicket development tends to be somewhat limited suggesting that the eradication of more invasive species may still allow for the retention of significant hedge alignment. Note is made that the alignment supports several elms, all dead because of Dutch Elm disease. Is also supports several young Ash and Sycamore that appear to be of good general health.	n/a	C2
10	Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Ash *(Fraxinus excelsior)* Sycamore *(Acer pseudoplatanus)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)*	M	F	5.00-7.00 (Trees to 12.00m)	5.00-8.00m	Another significant hedge alignment where most of the mature and apparently original hedging arises from the north-eastern side of a substantial field drainage ditch. The original Hawthorn is now substantially vestigial with the overall underlying hedge alignment been provided by a sprawling combination of Bramble, Elder, Blackthorn and Hazel. Eradication of more invasive species would effectively lose any semblance of continuity within the hedge. The hedge supports several emergent trees the majority of which appear to be of reasonable health. Nonetheless, the true health status is unavailable at present through a lack of access relating to extensive thicket development. In respect of the above, the central hedge profile is noted to be greatly exaggerated at many points, particularly relating to the expansive development of Bramble thicket.	n/a	C2

11	Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Ash *(Fraxinus excelsior)* Sycamore *(Acer pseudoplatanus)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Blackthorn *(Prunus spinosa)* Dog Rose *(Rosa canina)*	M	F/P	5.00-7.00 (Trees to 12.00m)	5.00-10.00m	A broadly dilapidated section of hedgerow where the original Thorn alignment is now almost wholly overwhelmed by Blackthorn and Bramble thicket and only retains its dominance in a small number of positions. Additionally, to complicate this issue, the emergent Ash and Sycamore are adding further suppression at higher levels, a factor that will only become worse considering their young age and current small stature. Note is made of the expansive extent of Bramble - related thicket located on either side of the alignment, the removal of which would have a substantial effect on any hedge continuity.	n/a	C2
12	Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Blackthorn *(Prunus spinosa)*	M	F/P	6.00-7.00 (Trees to 13.00m)	5.00-9.00m	Another poor-quality element of hedging where the original Hawthorn is becoming overwhelmed by low level Bramble thicket and higher-level emergent Ash populations. The original hedge appears to arise from the western side of a substantial ditch where additional thicket development is noted to extend the broader hedge profile. It is felt that the eradication of the underlying thicket and spurious material will greatly diminish any degree of continuity within the original hedge line. The alignment does support a small number of emergent trees including both Sycamore and Ash. Though access is not available at present, these trees would appear to be in broadly good condition at present and thus may offer some degree of sustainability.		

13	Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Sycamore *(Acer pseudoplatanus)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Blackthorn *(Prunus spinosa)*	M	F/P	6.00-8.00 (Trees to 11.00m)	5.00-8.00m	Whilst providing a broadly continuous thicket affect, the original Hawthorn within the alignment is now vestigial, being overwhelmed by emergent Ash and Sycamore. All dominant material appears to arise from the eastern edge of a substantial drainage ditch and in Association with a notable embankment. The emergent trees appear to be of reasonable condition and might offer some degree of sustainability however, eradication of lower-level competitive species will see a dramatic diminution in any hedge continuity.		
13a	Hawthorn *(Crataegus monogyna)* Elder *(Sambucus nigra)* Ash *(Fraxinus excelsior)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Blackthorn *(Prunus spinosa)*	M	F/P	4.00-6.00 (Trees to 12.00m)	5.00-8.00m	An almost wholly overwhelmed element of hedging that whilst maintaining broad continuity has seen the widespread domination of the original Hawthorn hedge. At present, the hedge is best defined by a high-level emergent ash population typically ascending to 12.00 m. Such trees appear to be in reasonably good condition and thus may offer some degree of sustainability. The underlying hedge, considering how little now remains other than a broad sprawling thicket, offers little potential for retention. In respect of the original and intended alignment, note is made of a substantial ditch and embankment scenario with much of the original Hawthorn hedge apparently arising from the eastern side of his however, a substantial portion of the emergent trees now arising from the west. Regarding the west and extent, massive sprawling extensions the hedge now exist in light of the development of broad Blackthorn and Bramble thicket. Such tickets would be considered wholly unsuitable for retention however, their removal will effectively remove any continuity within the hedge profile.		

14a	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Ash *(Fraxinus excelsior)* Dog Rose *(Rosa canina)*	M	P	4.00-7.00 (Trees to 12.00m)	6.00-8.00m	A broadly dilapidated hedgerow that still retains substantial continuity however, that continuity comprises a mix of species. Whilst Hawthorn remains broadly dominant within the alignment, it is becoming substantially suppressed and will become further suppressed over time. Eradication of competitive and invasive species such as Bramble and Blackthorn will result in a substantial diminution in continuity and compared to what is seen at present. The alignment supports only a small number of emergent trees that are noted to be of variable vigour and vitality, thus questioning their potential sustainability.		
14b	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Ash *(Fraxinus excelsior)* Dog Rose *(Rosa canina)*	M	F/P	4.00-7.00 (Trees to 12.00m)	6.00-8.00m	This hedge is substantially more broken and by comparison provide less continuity than 14a. In this respect, note is made of substantial gaps where any vegetative alignment as provided by no more than low level Bramble thicket together with elements of Blackthorn and dog rose. Accordingly, hedge 14b offers minimal potential for conservation and retention however, it is noted that this area of the alignment supports several emergent Ash that are ostensibly suitable for attention considering their apparently good vigour and vitality.		

15	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Ash *(Fraxinus excelsior)* Dog Rose *(Rosa canina)*	M	F/P	4.00-7.00 (Trees to 12.00m)	6.00-8.00m	In many respects, hedge 15 is like hedge 14, though in this instance, there appears to be little evidence of substantial ditch however trees do appear to arise from a notable embankment. This alignment is also noted to support several young but nonetheless dead elms, having been killed by Dutch Elm disease.		
16	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Goat Willow *(Salix caprea)*	M	F/P	5.00-9.00	8.00-12.00m	A particularly broad and generally contiguous alignment apparently comprising a double row planting on either side of substantial ditch feature. Review vegetation finds Hawthorn's to both the east and west of the ditch however, there continuity varies greatly between the 2 sides and over the length of the hedge. In many instances, the Hawthorn has been usurped by substantial thicket development comprising either Blackthorn, Bramble or quite significantly, Goat Willow. The health status of this hedge is quite variable with some plants exhibiting evidence of decline suggestive of possible environmental change such as possible drainage issues. Nonetheless, and overall the alignment still provides a significant feature that might be considered for retention. Some concern exists regarding the extension to the original hedge profile by way of thicket development typically dominated by Blackthorn goat willow and Bramble. The removal of these species will likely have a significant effect on appearance and visual continuity, particularly at lower levels.		
17	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Ivy *(Hedera helix)* Bramble *(Rubus fruticosus)* Dog Rose *(Rosa canina)*	M	F/P	6.00-9.00	12.00-16.00m	A particularly broad, double row configuration with evidence to suggest twin Hawthorn rows on either side of substantial ditch profile. Continuity is imperfect but remains reasonable with a large proportion of the original Hawthorn is remaining intact and a significant landscape feature. General review suggests that the majority of his be maintaining good vigour and vitality and thus offer some degree of sustainability. The alignment is broken in places and has seen Bramble thicket development to provide some degree of continuity. Note should be made that eradication of curtailment of the low-level thicket development typically comprising Bramble and Blackthorn will have a diminishing effect on cover, particularly at lower hedge levels.		

18	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)*	M	F/P	5.00-7.00	4.00-8.00m	This hedge remains broadly continuous and still dominated by the original Hawthorn. Nonetheless, or invasive species, particularly Blackthorn and Bramble are becoming notable, particularly at lower levels. Nonetheless, general good health and broad continuity would appear to offer substantial degrees of sustainability. All significant arterial associated with this alignment arises from the west of a substantial ditch alignment.		
19a	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Dog Rose *(Rosa canina)*	M	F/P	5.00-6.50	5.00-7.00m	A broadly continuous and contiguous section of hedging where at higher levels, the Hawthorn remains broadly continuous and dominant. At lower levels, note is made of broad suppression by Bramble and invasion by Blackthorn, most notable at the northernmost end of the alignment. Nonetheless, in comparison to many hedges noted upon this site, this hedge would appear manageable and potentially retainable. All significant material associated with this hedge arises from the north-eastern side of a substantial field demarcation ditch.		
19b	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)*	M	F/P	5.00-6.50	5.00-7.00m	This section of hedge in many respects mimics section 19a in that it effectively comprises an extension to that hedge. Nonetheless, one primary difference is the extensive development of scrub thicket, typically dominated by Blackthorn development arising to the west of the original hedge and its ditch alignment. Notwithstanding this and suppression it will contributed to the broader hedge, the overall hedge is generally continuous and would appear to offer some degree of sustainability.		

19c	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Crack Willow *(Salix fragilis)*	M	F/P	3.00-5.00 (trees 13.00)	6.00-8.00m	This short alignment of trees sees a wholescale domination of the original Hawthorn hedge by several poor-quality Crack Willow. Most trees remaining have collapsed but remain in suckering fashion, still growing. Their quality and suitability for attention would be highly questionable considering the extent of decay and damage they have suffered. Is considered unlikely that either the Willows or the underlying hedge could be retained.		
20a	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Elder *(Sambucus nigra)* Dog Rose *(Rosa canina)*	M	F/P	3.00-6.00	4.00-7.00m	A notably variable section of hedge that is intermittent and broken. Whilst a substantial number of the original Hawthorns remain, they are no longer dominant within the alignment nor is the alignment truly contiguous. What a large proportion of the individual Hawthorn is noted remain of good health, note is made of some recent failures potentially because of fire damage. Note is also made of the contribution played by invasive species including Elder and Bramble. Should this material be removed there will be a substantial diminution in cover and continuity. In comparison to many hedge sections noted upon this site, this hedge does not appear to arise in conjunction with any historical ditch or embankment profile but indeed arises from broadly level ground. Note is made of the fact that there has been a more recent be activated ditch in positions east of the hedge.		
20b	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Elder *(Sambucus nigra)* Dog Rose *(Rosa canina)*	M	F/P	3.00-6.00	4.00-7.00m	In this instance, continuity appears better than at 20a however, it is noted that continuity is provided substantially by infill resulting from Blackthorn invasion of a hitherto Hawthorne alignment. Therefore, and whilst continuity is reasonable along the length it is mixed, arguably still dominated by Hawthorn but comprising a substantial proportion of Blackthorn as well as Elder. At lower levels, note is made that continuity is provided as much by Bramble thicket as it is by the original hedge. Once more, this hedge arises from what appears to be broadly level ground with no significant evidence to suggest a ditch or embankment scenario.		

21a	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Crack Willow *(Salix fragilis)* Ash *(Fraxinus excelsior)*	M	F/P	6.00-8.00 (trees 15.00)	6.00-8.00m	This short section of apparent hedge has been wholly suppressed at its Western end by an alignment of crack willow. Whilst either side of the Willows there is evidence to suggest that once having been Hawthorn-based alignment, it is now wholly missing from beneath the Willows. The rulers themselves remain of reasonable health but are of poor form, many being affected by structural issues. The remaining hedge, to the east and west of the Willows is of highly variable condition and suitability for attention being almost wholly outcompeted by invasive species such as Bramble and Ivy. Accordingly, the removal of invasive species would see a dramatic loss of continuity.		
21b	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Dog Rose *(Rosa canina)*	M	F/P	5.00-7.00	6.00-8.00m	A generally continuous section of hedge however continuity is provided by a collection of varying species as opposed to the original Hawthorn. Note is made of the part played by Blackthorn in the provision of general continuity. At lower levels, Bramble and climbing rose add greatly to the thicket development and density suggesting that should such invasive species be removed then the hedge appearance and continuity will be substantively changed. Nonetheless and notwithstanding competition to the original Hawthorn, it is noted that a general form-based alignment still remains and might prove sustainable. Note is made that at the southern end of the alignment there are several emergent Ash is contributing greatly to hedge suppression and accordingly, the hedge profile in position beneath the canopy of these trees is substantially diminished in comparing Harrison to areas about the centre and north of the alignment.		

22	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Ash *(Fraxinus excelsior)* Dog Rose *(Rosa canina)*	M	F/P	4.00-6.00	3.00-7.00m	A broadly contiguous section of hedge existing as a combination of Hawthorn and Blackthorn. The large proportions of its length, hedge quality is poor with notable degrees of decline and dieback noted within the Thorn population suggesting possible environmental change and or drainage issues. Similar issues have been noted in respect of some of the emergent Ash raising substantial concern regarding the degree of sustainability this hedge might offer. As with any other hedges on site, the hedge arises from the western side of a substantial ditch profile. The eastern side of the hedge has extended greatly by the natural development of Blackthorn thicket. Overall, this hedge profile is of poor quality and dubious sustainability.		
23a	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Ash *(Fraxinus excelsior)* Wych Elm *(Ulmus glabra)*	M	F/P	6.00-8.00	6.00-14.00m	A somewhat outgrown hedge arising on the raised ground to the west of a substantial ditch profile. Whilst elements of the original Hawthorns remain, they are no longer dominant within the hedgerow with the broader shrubby profile combining a combination of Hawthorn and Blackthorn. The Blackthorn element has served to accentuate the hedge profile with a substantial brawling mass developing to the west. The alignment supports a notable emergent ash population the majority of which are relatively young and appear healthy. There potential for continued growth is considered immense. Note is made of at least one Elm within the alignment the notwithstanding its having suffered substantial ground erosion of root damage appears to be of reduced vigour suggestive of Dutch Elm disease attack. Nonetheless and notwithstanding the invasion by Blackthorn, much of this alignment provides good continuity and thus constitutes a notable visual feature in the landscape. It should be noted that control of some of the more invasive material will likely result in a diminution of cover, particularly at lower levels.		

23b	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Ash *(Fraxinus excelsior)* Wych Elm *(Ulmus glabra)*	M	F/P	6.00-8.00	6.00-14.00m	Effectively a continuation of 23a and mimicking much of its condition and format. Arguably the hedge profile here is slightly lower by circa 1.00 m and the Blackthorn thicket may have accentuated lateral spread even further. Nonetheless and in broad terms, the same general issues and qualities arise and thus offering some degree of sustainability.		
24	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Ash *(Fraxinus excelsior)*	M	F/P	3.00-7.00	8.00-12.00m	This hedge like alignment appears to comprise 2 parallel alignments arising to both the North and South of a substantial ditch embankment feature. The narrowness of the corridor however provides for a singular alignment effect. Continuity along the alignment remains reasonable however, that continuity relates not just to the Originally planted Hawthorn but more as a combination of more in space invasive species, particularly Blackthorn. Note is made of the emergent tree population the majority of which appear to be of broadly good health however, their emergence has led to suppression of the underlying hedge. Nonetheless, the overall combined hedge effect remains a significant landscape feature and as most specimens appear to be of reasonable health then the alignment may offer some degree of sustainability.		

25	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Ash *(Fraxinus excelsior)* Sycamore *(Acer pseudoplatanus)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Dog Rose *(Rosa canina)* Goat Willow *(Salix caprea)* Elder *(Sambucus nigra)*	M	F/P	1.50-5.50	4.00-7.00 (Trees to 13.00m)	A broad and ill-defined area of spurious thicket growth. The area supports numerous Hawthorn, Blackthorn and Elder however, there is no discernible pattern to suggest an original ditch line or field demarcation. At many positions the hedge profile would extend to more than 50 metres deep. The area supports several emergent trees, most notably Goat Willow, Sycamore and Ash particularly about the middle and southern end of the group. These trees however appear to arise from broadly flat ground again providing no hint or reasoning as to their location other than natural arise or through dereliction or disuse. In many respects, the constituent plants many individuals arising from this area appeared to be of good quality would offer some degree of sustainability.		

26	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Ash *(Fraxinus excelsior)* Sycamore *(Acer pseudoplatanus)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Elder *(Sambucus nigra) berberis*	M	F/P	4.00-7.00 (Trees to 13.00m)	6.00-8.00m	This alignment appears to comprise a hedge associated with a shallow and possibly eroded ditch embankment profile. The hedge material arises from the northern side of a shallow ditch and is of variable continuity. Health tends to be reasonable however continuity is best provided by an extension to the broader thicket development arising to the south of the original alignment and typically including Bramble and Blackthorn. The alignment supports several emergent trees including Sycamore Ash and Elm. The Sycamore and Ash appear to be of reasonable condition, the Elm is typically located towards the eastern end of the alignment are of poor with one being completely dead and the other exhibiting early signs of Dutch Elm disease attack.		
27	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Wych Elm *(Ulmus glabra)* Sycamore *(Acer pseudoplatanus)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Dog Rose *(Rosa canina)*	M	F/P	4.00-7.00 (Trees to 13.00m)	Variable	A broad, sprawling, and ill-defined alignment that may or may not have been a hedge profile. There is a shallow but substantially eroded potential ditch alignment that appears to follow the online however, this is at best ill-defined by vegetation. The vegetation associated with the area is particularly poor with very few original Hawthorn is and the vegetation at best being sporadic and displaced from any alignment centre. The quality material is poor with several Elms already either dead or dying because of Dutch Elm disease. The remainder of the material is particularly spurious dominated by intermittent elder and thus is considered unsuitable for retention.		

28	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Ash *(Fraxinus excelsior)* Elder *(Sambucus nigra)* Spindle *(Euonymus europaeus)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Dog Rose *(Rosa canina)*	M	F/P	5.00-9.00 (trees 14.00)	8.00-12.00m	A highly variable hedge profile defined by a reduced number of large mature Hawthorn. While these remain dominant within the line they are not contiguous or continuous. At lower levels, the hedge profile continuity is best preserved by Bramble and Blackthorn thickets. The overall Hawthorn population where it exists, remains a reasonably good health notwithstanding suppression at lower levels. The original profile is contributed to by substantial thicket development was typically dominated by Blackthorn and Bramble. The alignment supports several emergent trees including Ash, Sycamore and Elm. All Elm is either dead or approaching death and thus cannot be retained. Towards the middle of the alignment, the ash of particularly poor condition suggesting notable sustainability issues. Note is however made that as one progresses to the south-west, the emergent tree population appears to become better and thus the degree of sustainability at that position may be improved. Note should be made that any curtailment of low-level scrub thicket on either side of the hedge will have a substantial effect on hedge continuity and cover levels.	n/a	C2
29a	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Ash *(Fraxinus excelsior)* Sycamore *(Acer pseudoplatanus)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Dog Rose *(Rosa canina)*	M	F/P	4.00-7.00 (Trees to 13.00m)	10.00-12.00m	A broadly continuous thicket-affect however, the underlying hedge is of highly variable quality with only a small proportion of the original Hawthorn hedge remaining. Much of the hedge has been suppressed by an emergent ash and Elm population however, the elms, because of Dutch Elm disease are now dead. At lower levels, widespread thicket development dominated by Bramble and Blackthorn has caused equal suppression. Any curtailment in spread by reducing the spurious thicket development will have a massive effect on hedge continuity and would quickly isolate what is only a small number of remaining Hawthorne's. Accordingly, the suitability of retaining this alignment is considered dubious at best.	n/a	C2

29b	Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Ash *(Fraxinus excelsior)* Sycamore *(Acer pseudoplatanus)* Bramble *(Rubus fruticosus)* Ivy *(Hedera helix)* Dog Rose *(Rosa canina)*	M	P	4.00-7.00 (Trees to 13.00m)	10.00-12.00m	The original Hawthorn element of this hedge is now substantially swamped by emergent growth, dominated high levels by ash and at lower levels by Bramble and Blackthorn. Accordingly, only a small proportion of the original Thorn alignment now remains. The alignment does support substantial number of emergent trees however, these are of variable health and thus sustainability. The alignment is noted to support several Elms some of which are completely dead, and others are exhibiting evidence of disease attack. Much of this hedge profile is grossly exaggerated by broad thicket development, particularly to its eastern side. Accordingly, the original hedge alignment is ill-defined at best. In respect of potential for retention, this hedge is of poor quality and dubious sustainability.	n/a	C2

	Canal Boundary Ash *(Fraxinus excelsior)* Sycamore *(Acer pseudoplatanus)* Hawthorn *(Crataegus monogyna)* Blackthorn *(Prunus spinosa)* Bramble *(Rubus fruticosus)* Dog Rose *(Rosa canina)*	E/M M	F	6.00-20.00	Variable	This area of the site is complicated by substantial earthworks associated with drainage and balancing streams as well as towpaths associated with the adjoining canal. Nonetheless, there is a substantial element of vegetation arising from the banks associated with this topography not least of which effectively creation is a generalised hedgerow that defines the southern edge of the broader review site. At its western end, this boundary still supports a large proportion of its original Hawthorn hedge, much of which arises from the upper edge on the northern side of the subs then shall ditch profile. Overall, hedge continuity appears good however close review reveals that the original Hawthorn is somewhat intermittent and that the hedge profile continuity is best provided by combination of the original Hawthorn and particularly at lower levels by more invasive species including Blackthorn, Bramble and Dog Rose. Therefore, and notwithstanding a highly variable apparent hedge height, there is a general continuity of growth at lower levels. One issues will arise relates to any need to cut back the ground level thicket development as this will have a substantial bearing on the lower-level continuity of the hedge. The hedge is noted to support a substantial emergent tree population. This is broadly dominated by ash however other species have been noted including willow and poplar. For the most part, these trees would appear to be of good health however, because of their natural and competitive arising, many are distorted, multi-stemmed or support type forks. Accordingly, their structural condition may not be as good as their health. Overall, the alignment would appear to offer notable degrees of sustainability and the potential to retain a substantial landscape feature however should this prove to be required or intended, it would be advised that the individual large trees within the group be reviewed more closely. Add another note for the middle section of the canal boundary. The boundary belt is noted to be substantially variable. Towards the centre of the site and where drainage of waterlogging issues is suspected, many trees appear to be of poorer health, often exhibiting evidence of decline and dieback. Nonetheless, and for the most part, most trees appear to be of good health notwithstanding the cross-site loss of elms to Dutch Elm disease.	n/a	B2
A1	Area 1 Sycamore *(Acer pseudoplatanus)* Elder *(Sambucus nigra)* Bramble *(Rubus fruticosus)*	S/M E/M	F/P	2.50-9.00	Variable	This area the site appears to relate to a previous use dwelling or farmyard scenario and appears to support the foundation remains of demolished buildings. The entire area is now wholly overgrown, typically dominated by elder or Sycamore at higher levels and Bramble beneath. This material is of particularly poor quality offering no tangible value by way of retention since any proposed development is likely going to require further disturbance of the now derelict building foundations that will in turn disturb the redeveloping vegetation.	n/a	C2

APPENDIX 8

GREEN ROOF MAINTENANCE

ESTABLISHMENT, INSPECTION & MAINTENANCE OF MOY EXTENSIVE GREEN ROOF SYSTEMS.

Owner Inspection *&* Maintenance Recommendations:

Inspect the roof at least twice yearly, in spring and autumn, and inspect all roofs after any severe storm. Make frequent inspections on buildings that house manufacturing facilities that evacuate exhaust debris onto the roof. Clean roof drains of debris. Remove leaves, twigs, cans, balls, etc. which could plug roof drains. Bag and remove all debris from the roof since debris on the roof surface will be quickly swept into drains by heavy rains and drainage problems may occur.

Notify the roofing contractor immediately if a roof leak occurs. If possible, note conditions resulting in leakage. Heavy or light rain, wind direction, temperature and the time of year that the leak occurs are all important clues to tracing roof leaks. Note whether the leaks stop shortly after each rain or continue to drip until the roof is dry. If the owner is prepared with facts, the diagnosis and repair of roof problems can proceed more rapidly.

File all job records, plans and specifications for future reference. Set up a maintenance schedule. Record maintenance procedures as they occur. Log all access times and parties working on the roof in case damage should occur.

Do not allow foot traffic on the roof in very cold or very hot temperatures as damage can result. Do not allow the installation of television and radio antennae or mechanical equipment without notifying the roofing contractor and consulting with him about the methods and details for these installations.

One of the keys to avoiding roof damage is the key to the padlock on the roof hatch! Allow only authorised personnel on the roof.

In emergency situations, patch leaks to minimise property loss.

Except for emergency situations, do not attempt owner-performed roof repairs. The puncturing of a blister or the spreading of a coating or mastic only covers up evidence the roofing contractor needs to ascertain the problem. Do not consider using maintenance coatings, "recovery sprays” or "miracle" products without consulting a qualified roofing contractor.

Roofing Contractor Maintenance Recommendations

After completion, each roof is subjected to various weathering conditions. Roofs do not wear uniformly since certain areas may be affected more severely than others.

Equalising wear by upgrading worn areas is the secret to prolonged roof life. To equalise wear, the maintenance and repair of these areas should be done by a qualified roofing contractor.

Maintenance may be as simple as re-gravelling a windswept corner, or more complex, such as correcting a water Ponding problem, but maintenance is a necessary part of good roofing practice.

Maintenance of Diasafe safety systems must be carried out annually by the installing contractor, in accordance with the Diasafe Maintenance Manual. Each system must be re-certified annually upon inspection.

Diasafe Safety System Post.

ESTABLISHMENT OF THE EXTENSIVE (SEDUM) GREEN ROOF.

Sedum roofs require care and attention in the weeks following their installation.

Please ensure the roof has a plentiful supply of water and is not allowed to become dried out. Do not rely on ambient rainfall to irrigate the newly installed roof.

Sedum blanket must be unrolled onto the growing media within 24 hours of delivery to site. Water the blanket at 2 litres per M2 using a hose and sprinkler nozzle. Do not use pressure washers or high power hose as damage to the plants can occur.

It is preferred to avoid the installation of sedum roofs during very warm dry periods. If it is necessary to do so, monitor the roof during that warm / dry period to ensure that drying out of the growing substrate (soil layer) does not occur.

Once the sedum blanket (or plug plants) have been installed, no persons should be allowed to work or walk upon the roof. Doing so may cause damage to plants.

After a period of 6 to 8 weeks during the growing season, the edges of the sedum blankets will knit together and the roots of the sedum plants will extend into the growing media.

All sedum roofs must be carefully monitored through their first summer flowering cycle.

MAINTENANCE RECOMMENDATIONS FOR EXTENSIVE GREEN ROOFS.

By their nature, extensive type green roofs are **low** maintenance. Once established they will continue to develop and create a self sustaining plant community on the roof that will also provide habitat for invertebrate and bird species.

Certain procedures are recommended, particularly in the first year, to ensure the long-term success of the plants.

As a general guide, it is recommended that maintenance be carried out three times in the first year and twice per year in each subsequent year but this depends on the type of system installed and the rate of plant cover.

The following are general procedures related to the planted element of the roof only. Not all the procedures will be appropriate to every roof.

Watering

The extensive green roof is quite resistant to drought. If an extended period of dry weather should occur (14 or more dry days), periodic checks should be made of the roof to examine the reservoir and drainage board to determine if all the water contained has been used by the plant layer.

Apply water using a sprinkler attachment until the substrate is thoroughly saturated and the reservoir cups are filled.

Safe access

Appropriate measures should be taken at both design and construction stages to ensure safe access and passage over the planted roof areas for maintenance personnel. To facilitate this a proprietary Diasafe or similar safety / fall-arrest system should be installed as part of the roof works.

Trafficking of the plant layer

Trafficking of the planted roof on the basis of 2-3 times a year will have no detrimental effect on the plant layer. If works are to be carried out on the roof surface or to adjacent structures care should be taken to minimise damage to the plant layer resulting from repeated trafficking. We would advise that should this be required access routes to the works are closely defined to ensure damage is minimized. If the plant material is damaged re growth normally occurs. However, the speed of recovery will be dependent upon the level of damage and the duration of the trafficking period.

Removal of undesirable plant material

The Sedum and other species planted at the time of installation are well adapted to life on the roof and quickly become established, however, a few other native species may intrude. Some people welcome the colonisation of so-called ‘weeds’ to promote biodiversity. However, you may prefer them to be removed. Dependent upon material and site requirements, this can be done by hand or by

a point application of herbicide using a weed wipe device to target individual plants. The use of sprayers to apply herbicide is not advisable.

Pests and diseases

Sedums are generally pest and disease resistant but, like many plants, can suffer from aphids or vine weevil. The care we take in production of our plants and the formulation of our Sedum Mat product discourages such problems but, if they occur, they can be controlled by environmentally friendly means. Advise Moy Materials Ltd. if an outbreak of pests or disease should occur. We can then advise on remedial measures appropriate to the problem.

Application of nutrient and soil conditioner

The correct level of nutrients in the growing medium is important. Levels of previously applied fertiliser, season and location together with the nature and condition of the plant material and growing medium determine the procedure to be carried out. Extensive Roofs guidelines – 35g/M2 Osmocote Exact in March / Early April.

Checking of gutters and Outlets

This should be carried out routinely during any maintenance check to ensure drainage is not impeded. All rainwater outlets should be protected within an outlet inspection box with a lockable cover. Open the cover with a coin or screwdriver and ensure leaf grate is in position and that no debris blocks the outlet. Lock the lid on completion.

Removal of flower heads after flowering

This depends on the individual aesthetic requirements of the client. Dead flowers will eventually disintegrate but the heads may be removed in late summer or early autumn if required by careful clipping.

Removal of leaf litter

The ideal position for a green roof is in full sun. In certain situations, adjacent trees could shed leaves onto the roof surface. Depending on quantity, these may need to be removed with a leaf-blowing machine. This would be a seasonal requirement.

Making Openings in the Green Roof

The extensive green roof has a very shallow layer of growth media (soil) generally not exceeding 75mm. Where openings must be made to accommodate ducts or pipe work from within the building, the installing roofing contractor must be engaged to weather the opening and trim the green roof elements around any such penetrations.

Use of Edged Tools.

The maintenance of the extensive green roof does not require the use of any sharp edged tools. The use of shovels, spades, edging tools, rakes, hoes etc. are not required and should not be used in the maintenance of the extensive green roof.

Notes Page:

Roofing System Supplier

Moy Materials Ltd.
Unit K, South City Business Park, Whitestown Way, Tallaght, Dublin 24.
Tel: 01 451 9077
Fax: 01 450 0033
Email: info@moymaterials.com
URL: www.moymaterials.com

Roofing Contractor

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Specifier / Designer

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Building Contractor

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