

CLYDE SHANKS

Planning Development



Hightown Quarry, Boghill Road, County Antrim:
Residual Waste Treatment Project

Landscape and Biodiversity Management Plan

March 2014 (Revised September 2014)



Landscape and Biodiversity Management Strategy

Residual Waste Project Hightown Quarry, Ballyutoag

Prepared on behalf of Becon Consortium

August 2014



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1.0 INTRODUCTION

Background to the Management Strategy

- 1.1 This Landscape and Biodiversity Management Strategy (LBMS) has been prepared by Barton Willmore Landscape Planning and Design (BWLPD) to accompany a full application for the proposed redevelopment of Hightown Quarry, a disused quarry site in Ballyutoag, Northern Ireland (the 'application site') to a waste management facility (the 'proposed development'), on behalf of Becon Consortium.
- 1.2 This LBMS has been prepared to encompass the application site. It provides a comprehensive approach to the management of retained existing features, hard and soft landscape proposals and the newly created habitats including trees, woodland mixes, hedgerow, meadow grassland, and areas of scrub. It is based on the **Landscape Proposals Plans Sheets 1 - 9 (within Appendix 2)** submitted as part of the Application.
- 1.3 On a national level, the DoE Planning sets out its policy for nature conservation for the whole of Northern Ireland in 'Planning Policy Statement 2 Natural Heritage', 2013. PPS2 is guided by Government policy on nature conservation and by the statutory framework. Relevant objectives include:
- ***“to further sustainable development by ensuring that biological and geological diversity are conserved and enhanced as an integral part of social, economic and environmental development”***
 - ***“to protect and enhance biodiversity, geodiversity and the environment.”***

- 1.4 On a regional level, the Regional Development Strategy (RDS), 2010 contains one policy relevant to ecology and nature conservation, Policy RG11. This policy aims to conserve, protect and, where possible, enhance the built heritage and natural environment. In relation to nature conservation, relevant objectives include sustaining and enhancing biodiversity, protecting ecological networks, and recognising and promoting the conservation of local identity and distinctive landscape character.
- 1.5 On a local level, the Antrim Area Plan (AAP), 1989, states that conservation and enhancement of the natural environment will be promoted, with Areas of Special Scientific Interest (ASSIs), National Nature Reserves (NNRs), and Nature Reserves (NRs) protected. It states that development likely to adversely affect these or other sites of nature conservation will not normally be permitted. It also states that the need to protect wildlife interests will be taken into account when considering development proposals.
- 1.6 Relevant policies from Newtownabbey Borough Council's local plan include:
- i. Policy RA 2 which seeks to conserve important natural habitats and physical features within the Borough;
 - ii. RA3 which refers to trees and woodlands, and notes the importance of tree planting within new developments;
 - iii. Policy N1 relates to nature conservation and encourages the conservation and enhancement of the natural environment, with existing and future designated areas of nature conservation value to be protected; and
 - iv. Policy N2 notes that development which would be likely to damage the scientific interest or essential character of sites will be carefully considered weighing up the benefits of development against the decrease in nature conservation value.
- 1.7 In the production of this strategy, reference has been made to the work of ecology consultancy Ecology Solutions Ltd and arboricultural consultant Dr Philip Blackstock, to ensure appropriate species, habitats and management strategies have been included in this document. In addition, reference has been made to Northern Ireland Priority Habitats, detailed within Northern Ireland Habitat Action Plans.

Scope and Purpose

- 1.8 In summary, this LBMS facilitates the adoption of a coherent and integrated approach to the management and maintenance of the landscape and ecological aspects of the application site, in accordance with the principles of the detailed landscape proposals.
- 1.9 The aim is to promote a sensitive management approach, which protects, manages and enhances the application site for the benefit of wildlife, landscape quality and character and integrates the application site into the surrounding landscape. It is a dynamic

document that should be reviewed on a regular basis and amended as circumstances change with the evolving development of the application site.

Methodology

- 1.10 Section 2.0 sets out the vision and overarching management objectives of the LBMS. Section 3.0 provides an inventory of each of the existing landscape and biodiversity components of the application site, listing the habitats and their key species. Section 4.0 details specific management aims and objectives for these components and those to be added as part of the proposed development and Section 5.0 outlines the recommended framework for the implementation, monitoring and review of the LBMS.

2.0 LANDSCAPE AND BIODIVERSITY MANAGEMENT VISION

2.1 The proposed development offers the opportunity to maintain and create a variety of landscape and habitat features. These will promote a strong sense of place as well as contributing to local biodiversity. There is an opportunity to reinforce and enhance the existing landscape framework through ongoing management which ensures its long-term presence.

2.2 The delivery of the LBMS can be expressed by a clear and simple vision, which has been set out below:

To ensure the long-term management of the landscape and ecological components within the proposed development, and to maximise the wildlife, landscape and amenity value of the application site. Connectivity between the existing landscape features and habitats will be reinforced wherever possible and new landscape features introduced. Long term care of an attractive, sustainable environment will be promoted.

Overarching Objectives

2.3 To achieve the overall vision, the LBMS identifies objectives for each Landscape Component. The detailed management and maintenance proposals have been prepared as guidance to ensure the continued upkeep of the application site in order to enhance its visual amenity and biodiversity value.

2.4 However, to provide an approach to overall management of the landscape and biodiversity features of the application site, the key overarching objectives of the LBMS are set out below:

- i. **To promote the conservation, protection and improvement of the physical, natural and historic environment of the landscape setting of the application site.** The environment should be seen as part of the essential infrastructure of the development.
- ii. **To diversify ecological value** through the retention of existing landscape features, such as woodland and trees, and to enhance these through **restoration and creation of diverse habitats** offering greater botanical and faunal interest to the application site. Notably, suitable habitat for Smooth Newt (which receives full protection under Schedule 5 of the Wildlife (Northern Ireland) Order 1985) will be maintained and enhanced to ensure their long-term conservation status within the application site.
- iii. **To use native indigenous species of local provenance wherever appropriate.** Habitat restoration and creation shall be sensitive to the character

of the landscape and its component habitats and species. The design and maintenance of landscape and biodiversity components aims to preserve and enhance local distinctiveness. New structural planting which links with existing habitats shall take account of species that are locally appropriate.

- iv. **To enhance the interfaces of the proposed development** with the surrounding landscape thereby enhancing landscape character and habitat value in the peripheral areas of the application site.
- v. **To retain as much as feasible of the native structural vegetation** that exists within and around the application site, including woodland, scrub, hedgerows and healthy specimen trees to ensure the long-term management of these areas.
- vi. **Enhanced management of vegetation**, such as tree belts, hedgerows and grassland.
- vii. **To create a high quality landscape setting for the proposed development** through the provision of a robust landscape infrastructure.
- viii. **To provide a framework for monitoring and reviewing the LBMS.**

3.0 LANDSCAPE INVENTORY

Application Site Context

- 3.1 The application site is located to the south-west of Glengormley, which forms the south-western part of the urban area of Newtownabbey. The application site comprises Hightown Quarry, as well as the proposed access route, which extends north from the quarry along the existing access route and then east along Boghill Road to Hydepark Road. The quarry is located approximately 1.2km to the south-west of the neighbourhood of Hightown. The application site lies within the Antrim Borough Council and Newtownabbey Borough Council administrative areas.
- 3.2 The application site boundary includes Hightown Quarry, as well as the proposed access route, which extends north from the quarry along the existing access route and then east along Boghill Road as far as Hydepark Road.
- 3.3 The immediate surrounds of the application site include moorland to the south and south-west of the quarry and enclosed pasture fields flanking Boghill Road and to the north, west and east of the quarry. An area of agricultural / industrial storage is located to the eastern side of the quarry access road, midway between the quarry area and Boghill Road.
- 3.4 The transition between pasture fields and moorland occurs at approximately 300m AOD. Below this height the field pattern comprises regular, small and medium sized fields, enclosed by hedgerows. On more elevated ground, the land comprises areas of rough grazing and open moorland, with limited hedgerow or fenced enclosure sub-dividing these areas.
- 3.5 Vegetation features surrounding the application site comprise a network of hedgerows that define field boundaries and flank roadways to the north, east and west. These features comprise a mixture of species with frequent rows of canopy trees, typically Beech. Ash, Sycamore, Alder and Pine species are also present.
- 3.6 Scrub and canopy trees are evident along the watercourses of Flush River and its tributary, providing a sinuous irregular pattern of vegetation, varying between intermittent scrub and canopy trees and small belts of woodland.
- 3.7 The landform in the vicinity of the application site varies considerably. The most prominent landforms in the surrounding area are the Belfast Hills to the east, south and south-west. To the north, the land falls gradually into the valley of the Ballymartin Water. Flush River extends north from its source on higher ground, approximately 1.1km to the south of the application site, passing approximately 100m to the east of the quarry area and passing beneath Boghill Road under Blacks Bridge. The western valley

flank forms an area of elevated landform extending east from Mc Ilwhans, to the quarry area. Mc Ilwhans reaches approximately 340m AOD, approximately 650m to the south-west of the application site.

Nature Conservation Designations

- 3.8 There are a number of European/internationally designated sites associated with Belfast Lough which is located approximately 5.5km to the east of the application site.
- 3.9 There are no nature conservation designated sites within or adjacent to the application site.
- 3.10 The nearest non-statutory designated sites are Hydepark Dam (Site of Local Nature Conservation Importance – SLNCl) located approximately 300m to the north of the application site and Belfast Hills – Squires Hill SLNCl which is situated approximately 500m to the south of the application site. The Flush River eventually flows into the Six Mile Water, a river that supports native Dollaghan Trout.

Existing Landscape Components

- 3.11 Existing landscape components are identified on the Ecological Features Plan, Figure 9.1 (refer to **Appendix 1** of this document), and described by Ecology Solutions Ltd within the Ecology Chapter of the Environmental Statement.
- 3.12 There is minimal vegetation present within the quarry area, the only limited colonisation being achieved by perennial herb species in areas that have not been recently disturbed. The area surrounding the quarry predominantly comprises scrub and grassland, with small pockets of deciduous woodland. The Ecology Chapter of the Environmental Statement notes that much of the quarry is:

“dominated by bare ground, scree and compacted areas along with a number of quarry buildings, and hence are of very little interest in ecological terms. More interesting habitats occur along the edges of the quarry and comprise of a mosaic of acid grassland, scrub and some small areas of heathland. Other habitats within the wider application site include marshy grassland, a number of ponds, grazed pasture and hedgerows. In addition, two fast flowing watercourses (Flush River and its tributary) pass beneath Boghill Road in the extreme north of the application site. These habitats (i.e. acid grassland, heath, Flush River and tributary, ponds and marshy grassland) are being retained and enhanced as part of the proposed development (...)” (page 215)

3.13 There are 13 settling ponds within the application site, associated with the quarry workings.

3.14 The following landscape and habitat components are identified within the Ecology Chapter as being within or adjacent to the application site:

- Quarry floor;
- Acid grassland;
- Marshy grassland;
- Rush pasture;
- Neutral grassland;
- Species-poor semi-improved grassland;
- Improved grassland;
- Grassland verge;
- Semi-natural broadleaved woodland;
- Dwarf scrub / heath;
- Scattered scrub;
- Hedgerows;
- Trees;
- Bracken;
- Wet flush / damp grassland;
- Ponds and seasonal pools;
- Stream;
- Around buildings; and
- Invasive species.

3.15 The characteristics of these areas and their contribution to the landscape and biodiversity value of the application site have been briefly outlined below. Further detail is provided in the Ecology Chapter of the Environmental Statement and accompanying Ecological Plans prepared by Ecology Solutions Ltd and in BWLPD's Landscape and Visual Impact Assessment chapter in the Environmental Statement (2013) that also accompanies this application.

Quarry floor

3.16 This area is dominated by excavated landform, with the prominent quarry faces of bare rock, with quarried scree typically buttressing the lower extents, reaching up to approximately 30m in height.

3.17 Ecology Solutions Ltd describe the quarry floor as the dominant habitat within the application site, comprising predominantly bare ground, recolonising scree and compacted areas, and note that this habitat is of limited ecological value (with the

exception of offering opportunities for Smooth Newt and nesting and roosting birds within the cliff face habitats).

- 3.18 Invasive species such as Japanese Knotweed and Piri-piri-bur are noted within the Ecology Chapter as being present on the quarry floor. These species are identified on Schedule 9 of the Wildlife (Northern Ireland) Order 1985 making it an offence to knowingly cause it to grow in the wild. Whilst not identified on Schedule 9 of the Wildlife (Northern Ireland) Order 1985 Indian Balsam, also an invasive species, is also present.

Acid grassland

- 3.19 A priority habitat in Northern Ireland, detailed within the Northern Ireland Habitat Action Plans, acid grassland habitat is present within and adjacent to the application site, mainly on elevated locations around the periphery of the quarry.
- 3.20 The areas of acid grassland combine with the scrub to form a varied and locally characteristic vegetation structure, notably around the southern perimeter of the application site where they are more closely associated with the adjacent landscape character.
- 3.21 Much of the grassland is rank and tussocky in places, and interspersed with scattered scrub in places. Purple Moor-grass dominates in places. Other species identified during the ecology surveys including Yorkshire-fog, Cock's-foot and Crested Dog's-tail, and occasional Heath Spotted-orchid. Present within some areas of acid grassland are Bell Heather and Gorse, which indicate some early transition to heath.

Marshy grassland and rush pasture

- 3.22 These grassland types are present in small areas adjacent to waterbodies:
- Small areas of rush pasture are present to the north of Boghill Road adjacent to the streams
 - Two small areas of marshy grassland are present upslope of ponds P9 and P10 to the east of the quarry access road, located in the northernmost extent of the application site.

Neutral grassland, species-poor semi-improved grassland and improved grassland

- 3.23 Areas of intensively grazed species-poor semi-improved grassland are present to the north and west of the quarry and adjacent to Boghill Road.
- 3.24 An area of neutral grassland is present adjacent to ponds P5 to P8 and around buildings B1 and B2.

- 3.25 Small areas of improved grassland are located within the application site adjacent to Boghill Road. The sward is dominated by perennial rye-grass with a very limited herbaceous assemblage.

Semi-natural broadleaved woodland

- 3.26 An area of broadleaved woodland, predominantly formed of mature beech and sycamore species, with an understorey dominated by elder and also including nettle and bramble, is located on a mound on the northern edge of the quarry. This woodland provides an element of structural containment of the quarry landscape
- 3.27 Ground flora is predominantly Common Nettle, Cow Parsley, Butterbur, Bramble. Hogweed and Wood Anemone are also present.

Dwarf scrub / heath

- 3.28 Small areas of dwarf scrub and heath are present around the periphery of the quarry. These species represent upland heathland which is a priority habitat in Northern Ireland, however, acid grassland heath is identified by Ecology Solutions Ltd as a more valuable habitat.
- 3.29 Gorse is common throughout with Western Gorse, Bell Heather, Cross-leaved Heath, Heather, Heath Milkwort, Heath Bedstraw and Heath Speedwell also present.

Scattered scrub

- 3.30 Evident in pockets around the perimeter of the quarry, scrub is formed primarily of gorse, although hawthorn and other species also feature in parts, and is characteristic of local landscape character, albeit a common, readily replicated feature. In addition, it provides one of few softening elements within the otherwise largely industrial character of the application site.
- 3.31 Immature and sapling trees including Rowan, Ash and Willow species are also present.

Hedgerows

- 3.32 Hedgerows flank Boghill Road, Flush Road and the western side of the quarry access road. In addition, short extents of hedgerow are located on the western and northern boundaries of the quarry area, flanking pasture fields.
- 3.33 Hedgerows within the application site are formed of a mixture of native species, dominated by Hawthorn and Gorse, but also including ash maintained as a hedgerow shrub. Hedgerow trees include ash and beech species. The hedgerows are in moderate to poor condition, owing to the fact that they are often gappy or absent altogether. However, they have potential to form an important characteristic feature of the local

landscape.

- 3.34 Some of the hedgerows are regularly maintained (e.g. along Boghill Road) whilst the majority of the remaining hedgerows within the application site have not been subject to regular management.

Trees

- 3.35 A number of trees are present along the northern side of Boghill Road, in a woodland block adjacent to stream S2 Flush River tributary, much of which is Ash, Alder, Sycamore and Willow. These are in addition to semi mature and mature specimens present within the hedgerows and dense scrub habitats locally.
- 3.36 The Tree Survey and Report for Land at Boghill Road, Mallusk - November 2012, by arboricultural consultant Dr Philip Blackstock, identified the majority of trees were of fair condition, with very few considered to be in good condition.
- 3.37 The report notes the trees have a reduced longevity, likely to be due to the exposed and elevated position of Boghill Road, and many of these should be felled to ensure safety. Refer to the arboricultural survey for further details.

Bracken

- 3.38 Adjacent to the eastern boundary of the application site, there is a stand of Bracken.

Wet flush and damp grassland

- 3.39 A wet flush and a small area of associated damp grassland are located within the quarry. Ecology Solutions note that many of the terrestrial habitats have some value to Smooth Newt. The waterbodies that support this species are noted below.

Ponds and seasonal pools

- 3.40 A total of 13 water bodies are present across the application site, as labelled P1 – P13 within the Ecological Features Plan in Appendix 1. Three of these are seasonal pools (P1, P2 and P11). The remaining waterbodies represent permanent ponds, four of which (P5, P6, P7 and P8) were constructed to serve as existing settlement lagoons which discharge via oil interceptors into ponds P9 and P10, which provide tertiary treatment as part of the drainage attenuation of the former quarry workings under the existing Minerals Extraction Consent.
- 3.41 Ponds P3 and P4 represent shallow depressions which have developed some aquatic/emergent vegetation.
- 3.42 Pond P13 is considered to represent the only 'natural' pond within the application site

that does not form part of the quarry attenuation.

3.43 Smooth Newt have been found to be breeding within nine waterbodies within the application site (P1, P2, P4, P6, P7, P8, P9, P10 and P12).

3.44 In landscape and visual terms, whilst water bodies within the quarry landscape do provide some structural variety they are semi-transient and of relatively low visual amenity. Ponds within the northern area of the quarry site are of more structural value and visual interest.

Stream

3.45 The Flush River and its tributary (S1 and S2 respectively) traverse beneath Boghill Road in the far north of the application site, and S2 flows under the quarry access road. Both watercourses are fast flowing streams with substrates dominated by gravel, cobble and boulder. No aquatic vegetation was observed by Ecology Solutions, as a result of their fast flowing nature.

Around buildings

3.46 Vegetation, including immature trees, has colonised areas around the traditional farm buildings present to the west of the top of the quarry access road.

Invasive species

3.47 As noted above, a small stand of the non-native and invasive Japanese Knotweed is located in the northern part of the quarry site. Piri-piri-bur, also non-native and invasive, is common site-wide, dominant across the quarry floor and other recolonising habitats.

3.48 Both Japanese Knotweed and Pirri-pirri-bur are included on Schedule 9 (Part 2) of the Wildlife (Northern Ireland) Order 1985 (as amended).

3.49 Whilst not specifically listed on the Wildlife (Northern Ireland) Order 1985, Rhododendron, Snowberry and Indian Balsam are also present within the application site, and these non-native species are also widely recognised as being an invasive species.

Fauna Presence on and Use of Site

3.50 The Ecology Chapter of the Environmental Statement notes that the application site has been subject to specific surveys for a number of protected species by a number of consultants since 2007. In 2012, Ecology Solutions Ltd undertook further survey works and wrote the Ecology Chapter of the Environmental Statement. The text below summarises findings, and should be read in conjunction with the Ecology Chapter.

3.51 The following species were identified as being present within or near the site:

- Bats: activity surveys in 2012 confirmed the presence of foraging Common Pipistrelle, Soprano Pipistrelle, Leisler and Myotis species bats within the application site.
- Badger: 2010 surveys identified badger footprints. However, more recent surveys found no obvious evidence of Badger activity within the application site. The application site is therefore not considered to form an important part of a local population.
- Otter: 2012 surveys confirmed the presence of Otters locally in Flush River although no evidence of any resting places (i.e. holts) was observed. The Flush River (and its tributary) is therefore considered to offer foraging and commuting opportunities for Otter although no evidence of activity was observed along this watercourse in 2013.
- Birds: The application site offers a range of nesting (buildings, quarry face, trees, pond/seasonal pool habitats) and foraging habitats. A number of bird species commonly associated with woodland, wetland and open pasture habitats were recorded across the application site, in particular Peregrine and Ringed Plover. Evidence of birds nesting and potential for roosting (but no nesting) Peregrine were noted in relation to the quarry face.
- Amphibians: surveys established the presence of breeding Smooth Newt within a number of the waterbodies within the application site. Suitable terrestrial habitat within the application site is present in the form of rank and tussocky grassland and the quarry floor which provide numerous foraging and hibernation opportunities. Components of the quarry floor in close proximity to the ponds and grassland habitats are also considered to offer hibernation opportunities.
- Invertebrates: A relatively low number of species of raised conservation significance were found during the specific surveys undertaken with small, isolated marginal areas within the quarry floor, the heathland and the marginal zones of the waterbodies having a raised invertebrate interest. Devil's-bit Scabious plants were hand searched for Marsh Fritillary (like Smooth Newt, this species receives full protection under Schedule 5 of the Wildlife (Northern Ireland) Order 1985 and is also included on Northern Ireland's Priority Species

List, as described within Northern Ireland Habitat Action Plans), however no evidence of this species was found.

- 3.52 The Ecology Chapter sets out a number of mitigation measures for species listed above; these recommendations are included within the management of landscape components below.

Summary

- 3.53 The application site comprises a number of existing landscape and biodiversity components with a range of values. Key opportunities for ecological and landscape enhancement include the retention, where feasible, and enhancement of woodland, trees and hedgerows, and the encouragement and management of natural regeneration of grassland, heath and sparse scrub areas.
- 3.54 The existing mature trees, scrub and grassland are important landscape and visual features within the application site, and have the potential to support fauna, as identified within the Ecology Chapter.
- 3.55 Appropriate management of vegetation within and on the boundaries of the application site, and potential enhancement and habitat creation, will encourage a higher diversity of wildlife and provide a softening effect to the appearance of built forms and increased visual amenity of the proposed development. An improved landscape structure can strengthen habitats and improve connectivity, assimilating the proposed development into the landscape and extending the landscape character of the local area into the application site.

4.0 LANDSCAPE MANAGEMENT AIMS, OBJECTIVES AND PRESCRIPTIONS

Overview

4.1 The basis for establishing an effective and user-friendly management strategy is the identification and description of existing and proposed 'Landscape Components' which are illustrated within the Landscape Proposals Plans sheets 1 – 8 included within Appendix 2.

4.2 The Landscape and Biodiversity Management Components are as follows:

- **Component 1: Existing and proposed trees**
- **Component 2: Existing and proposed woodland**
- **Component 3: Existing and proposed hedgerows**
- **Component 4: Existing and proposed waterbodies and associated vegetation**
- **Component 5: Existing and proposed rough grassland**
- **Component 6: Proposed wildflower verges**
- **Component 7: Proposed hydro-seeded banks**
- **Component 8: Existing and proposed dwarf scrub / heath**
- **Component 9: Existing and proposed dense scrub**
- **Component 10: Proposed planted timber screen**
- **Component 11: Proposed ornamental planting**
- **Component 12: Hard landscape surfaces, security fencing and gates**
- **Component 13: Removal / control of invasive species**
- **Component 14: Quarry face and quarry floor**

4.3 Descriptions of the management aims, objectives and prescriptions for Landscape Management Components are provided below. These prescriptions should be assumed to be for a 25 year period unless stated otherwise.

Component 1: Existing and proposed trees

Management Aim:

4.4 To reinforce the local landscape character, biodiversity and habitat value and assist in softening the appearance of the proposed development and contributing to visual amenity.

Management Objectives:

- 4.5 The overall management aim can be broken down into the following objectives:
- i. **Provide** a softening function;
 - ii. **Develop** value as components of wildlife foraging corridors;
 - iii. **Enhance** visual amenity and contribute to the setting, legibility and green structure of the proposed development;
 - iv. **Enhance** the biodiversity value of the application site as part of a mosaic of habitats; and
 - v. **Establish** healthy growth of well formed, structurally sound specimens.

Prescription:

Existing trees:

- 4.6 The existing trees to be retained are indicated within the Landscape Proposals Plans within Appendix 2.
- 4.7 The majority of trees along Boghill Road are proposed to be removed, to facilitate widening of Boghill Road and associated visibility splays. Trees within the application site are to be retained where feasible, and protected from damage during construction (see detailed text below).
- 4.8 Mature trees are to be monitored on a regular basis by a qualified arboriculturist. Any safety works that may affect wildlife, for example nesting birds, will be checked before action and if necessary, further surveys carried out and appropriate licenses obtained to ensure legal compliance and/or secure appropriate or necessary mitigation. Any timber arising from safety works will be stacked within undisturbed areas of the application site to provide potential wildlife habitats where feasible. Future dead wood and structures with potential for hole-nesting birds and roosting bats will be secured as far as is compatible with safety considerations. All works to mature trees will be undertaken by a suitably qualified tree surgeon in accordance with published guidance, taking into account protected species constraints.
- 4.9 Ecology Solutions Ltd recommends bird boxes and 8 bat boxes are erected on suitable retained mature trees. These are to be located on the basis of detailed recommendations by a suitable qualified ecologist, and are to be situated out of direct sunlight and out of the reach of predators, particularly cats.
- 4.10 During construction works, all tree protection methods shall be in accordance with BS 5837:2012, Trees in Relation to Design, Demolition and Construction. Vertical barriers should be erected and ground protection installed before any materials or machinery are brought onto site and before any development or enabling work commences. Once

erected, barriers and ground protection should be regarded as sacrosanct, and should not be removed or altered.

- 4.11 In order to avoid compaction during construction, there should be no vehicle or plant access within root protection areas. Where accidental compaction has occurred, advice should be sought from an arboricultural consultant on de-compaction measures.
- 4.12 Care should be taken when planning construction site operations to ensure that wide or tall loads, or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Such contact can result in serious damage to trees and might make their safe retention impossible. Material which will contaminate the soil, e.g. concrete mixings, diesel oil and vehicle washings, should not be discharged within 10m of the stems of retained trees. Fires should not be lit in a position where their flames can extend to within 5m of foliage, branches or trunk. Notice boards, telephone cables or other services should not be attached to any part of the tree.

Proposed trees:

- 4.13 Proposed trees will enhance biodiversity opportunities as part of a mosaic of habitats and provide structural diversity, complementing the existing local character of the landscape and reinforcing the sense of place. They will contribute to the visual amenity of the proposed development, by providing a vertical landscape structure to the development and by softening views towards the proposed built forms. They are likely to provide bats and birds with additional foraging and movement opportunities across the application site.
- 4.14 Specimen tree species to be planted are native species Beech and Birch.
- 4.15 Planting is to be in accordance with BS 4428:1989 and the horticultural notes included in the Landscape Proposals Plans within **Appendix 2**.
- 4.16 For all trees, a yearly routine inspection will be undertaken by a qualified arboricultural consultant appointed by the management company, in addition to *ad hoc* inspections following extreme weather events. Provision should be made to engage the expertise of a qualified arboricultural consultant as necessary should any trees or parts of trees which are suffering from visible defects be identified that are likely to cause danger, obstruction or nuisance to users of pathways and roadways.
- 4.17 Weed control is the single most important activity during the establishment stage of planted trees. Weeds, particularly grasses, compete aggressively with young trees for water and nutrients, and may also compete for light.
- 4.18 Existing and proposed trees will require an intensive management regime to ensure

their continued contribution to the application site / satisfactory establishment and development. The management action should include carrying out works as identified within the tables below.

Summary of Management Tasks – Existing Trees	
Task:	Frequency/Timing
<p>All trees are to be inspected annually to monitor health. There are a number of Ash trees on the application site. These are to be monitored for effects of Ash Dieback Disease.</p> <p>Retain dead, over mature or dying trees wherever possible. However, those which are considered dangerous for health and safety reasons are to be felled or lopped. Ensure all necessary approvals are attained prior to works.</p>	<p>Annual inspections</p> <p>Tree works to be undertaken as necessary in accordance with recommendations / method statements provided by a qualified arboriculturist, outside of bird breeding season (March to August inclusive).</p>
<p>Cut back undergrowth, overgrowing or overhanging shrubs and minor tree branches from any access routes to maintain an unimpeded route. Minimum canopy clearance above any vehicle routes to be not less than 5.05m. Vegetation adjacent to vehicle routes must be maintained not to extend into the visibility splays shown on the Landscape Proposals Plans.</p>	<p>Annually or as required following maintenance visits</p>
<p>Remove and dispose of all litter to a licensed tip. Remove woody-stemmed debris from all roadways and pathways.</p>	<p>Monthly or as often as required if debris is impeding access</p>
<p>In the interests of wildlife, hand weeding, where feasible, should take precedence over the use of herbicides (except for invasive plants).</p> <p>In certain instances, herbicide may be the most effective measure to take against unwanted species. Where herbicide application is needed this should be in small controlled areas around the tree/shrub base. Herbicides should comply with pesticide regulations</p>	<p>Hand weeding: As required by maintenance visits</p> <p>Herbicide application: quantities and timings to be in accordance with the manufacturer's written instructions</p>
<p>Undertake formative pruning to encourage well balanced, stable and healthy trees.</p>	<p>As appropriate</p>
<p>Check bird and bat boxes are securely fastened to the trees and replace missing boxes.</p>	<p>Annually</p>

Summary of Management Tasks – Proposed Trees	
Task:	Frequency/Timing

Maintenance of a 1m 80% weed-free area to the base of each tree for five years.	Check twice a year and refasten mulch mats / top up mulch as required
Maintenance of rabbit guards and other forms of protection.	Monthly until removal
Maintenance of stakes and ties where applicable, including loosening as necessary.	Monthly until removal
Removal of guards, stakes and ties.	After 3 years, or as appropriate, subject to inspection
Maintenance of adequate moisture levels. Irrigation may be required during dry periods. Mulch around the bases of trees will increase retention of soil moisture.	Watering (to field capacity) to ensure healthy establishment and thriving
Treatment of pests and diseases and repair of any damage from vandalism.	Monthly
Check for root firmness and upright alignment of tree after high winds, frost heave and in spring and autumn until trees are considered to be wind firm.	Twice annually or as required
Trees are to be inspected by a qualified arboriculturist who will provide a time-bound schedule of tree works to be undertaken. Recommendations will be based upon satisfying the objectives of this management strategy and ensuring no hazards are present on site	Annually
Formative pruning to avoid future structural problems and to remedy disease and vandalism problems. Minimum canopy clearance above any vehicle routes to be not less than 5.05m. Vegetation adjacent to vehicle routes must be maintained not to extend into the visibility splays shown on the Landscape Proposals Plans.	Annually or as required following maintenance visits

4.19 Where any new tree planting fails to establish well or subsequently deteriorates, measures should be taken to resolve any underlying problems. All poorly established and failed or vandalised trees should be replaced as per contractual obligations. Following establishment, maintenance works may only involve occasional formative pruning, and then only where necessary.

Component 2: Existing and proposed woodland

Management Aim:

4.20 To retain and enhance local landscape character and biodiversity value and assist in softening and absorbing development into the landscape.

Management Objectives:

4.21 The overall management aim can be broken down into the following objectives:

- i. **Develop** the value of understorey as wildlife foraging areas;
- ii. **Reinforce** the structure and integrity of existing woodland, notably woodland edges;
- iii. **Establish** the structure and integrity of all proposed native woodland planting; and
- iv. **Enhance** visual amenity and contribute to the legibility and green structure of the proposed development.

Prescription:

4.22 The area of woodland located centrally within the application site is to be retained and protected.

4.23 New planting is to be in accordance with BS 4428:1989 and Landscape Proposals Plans in Appendix 2.

Summary of Management Tasks – Proposed structural woodland mix	
Task:	Frequency/Timing
Maintenance of mulch levels / replacement of mulch mats as necessary.	Check twice a year and refasten mulch mats / top up mulch as required
Regular formative pruning to be undertaken. Minimum canopy clearance above any vehicle routes to be not less than 5.05m. Vegetation adjacent to vehicle routes must be maintained not to extend into the visibility splays shown on the Landscape Proposals Plans.	Annually or as appropriate to species or as required following maintenance visits. Pruning of established woodland mix to be undertaken outside of bird breeding season (March to August inclusive).
Maintenance of rabbit guards / other forms of protection.	Monthly until removal
Maintenance of stakes and ties where applicable, including loosening as necessary.	Monthly until removal

Removal of guards, stakes and ties.	After 3 years, or as appropriate, subject to inspection
Maintenance of adequate moisture levels. Irrigation may be required during dry periods. Mulch around the bases of trees will increase retention of soil moisture.	Watering (to field capacity) to ensure healthy establishment and thriving.
Treatment of pests and diseases and repair of any damage from vandalism.	Monthly
Check for root firmness and upright alignment of shrubs after high winds, frost heave and in spring and autumn until shrubs are considered to be wind firm.	Twice annually or as required

Summary of Management Tasks – Existing woodland	
Task:	Frequency/Timing
Regular formative pruning to be undertaken appropriate to the plant species.	As appropriate to species, outside of bird breeding season (March to August inclusive).
Non-desirable woody species such as Rhododendron should be removed to a licensed tip during management operations and at other times as necessary, where this does not prejudice screening requirements.	Monthly
Retain dead, over-mature or dying understorey wherever possible in the interests of biodiversity, but those that are considered dangerous for health and safety reasons, to be felled or lopped as appropriate to maintain safety, and in accordance with protected species constraints.	As recommended by annual inspection
Native ground flora development will be encouraged, where necessary, at the expense of introduced species. Ground flora should be maintained through removal of vigorous weed species. In relation to the Woodland Anemone within the woodland habitat: Clear elements of scrub that are encroaching into this habitat to ensure the longevity of the Wood Anemone.	Twice a year or as appropriate. Avoid working in poor conditions and trampling within the woodland area, as this is likely to lead to compaction of the soil and damage to habitat.
Trees are to be inspected by a qualified arboriculturist who will provide a time-bound schedule of tree works to be undertaken. Recommendations will be based upon satisfying the objectives of this management strategy and ensuring no hazards are present on site	Annually
Formative pruning to avoid future structural problems and to remedy disease and vandalism problems.	As required following maintenance visits

Landscape Management Component 3: Existing and proposed hedgerows

4.24 Hedgerows along Boghill Road will be lost to facilitate widening of this road. Proposed replacement planting will be of mixed native species of local provenance, and a number of native trees (refer to Landscape Management Component 1: Existing and proposed trees).

4.25 All proposed and retained vegetation is to be managed sympathetically for the benefit of biodiversity.

Management Aim:

4.26 To enhance and reinforce linear habitats which contribute to the enclosure of the application site and which contribute towards a larger network of green infrastructure retained throughout the proposed development.

Management Objectives:

4.27 The overall management aim can be broken down into the following objectives:

- i. **Enhance** the structure and integrity of existing hedgerows;
- ii. Contribute to the **legibility and green structure** of the proposed development;
- iii. **Contribute** to the local landscape character; and
- iv. **To provide** well connected foraging corridors of benefit to biodiversity

Prescription:

4.28 Retained existing native woody-species hedgerows should be allowed to develop a tall, dense, bushy structure although they may require trimming outside the bird breeding season from March to August inclusive, to prevent encroachment over any adjacent footpaths and roadways, and to promote new growth. Should these timings not be possible, potential nesting habitat will be subject to a check survey by an experienced ecologist immediately prior to its removal. Should an active nest be found, a 10m buffer will be established around the nest and kept in place until the young have fledged.

4.29 Trimming of hedgerows should manage an A or domed shape, with no vertical sides. Hedgerows adjacent to vehicle routes must be maintained not to extend into the visibility splays shown on the Landscape Proposals Plans.

4.30 New planting will be undertaken with appropriate native species of local provenance, with planting in the autumn. New stock will be trimmed by one third after planting to encourage basal growth and will be watered during periods of dry weather until established. Plants which die in the first year after planting will be replaced with new

stock in the following season.

Summary of Management Tasks – Existing and proposed hedges and hedgerows	
Task:	Frequency/Timing
Protect existing retained hedgerows during construction works using standard measures.	Throughout construction
Hedge trimming as detailed above. Cut to encourage the growth of fruits and berries and nectar production.	Annually, outside of bird breeding season (March to August inclusive).
Monitor the growth of all hedges and plant up gaps where vegetation has failed to establish.	Annually, in the dormant season following inspection.
Check rabbit guards and stakes and any associated fencing, repair or replace as appropriate.	Monthly
Maintain mulch levels / replace mulch mats as necessary.	Twice annually
Maintain stakes and ties where applicable, including loosening as necessary.	Monthly until removal
Maintain adequate moisture levels. Irrigation may be required during dry periods.	Watering (to field capacity) to ensure healthy establishment and thriving.
Treat for pests and diseases where required and repair any damage from vandalism.	Monthly
Check for root firmness and upright alignment of shrubs after high winds, and frost heave in spring and autumn until shrubs are considered to be wind firm.	Twice annually or as required

Landscape Management Component 4: Existing and proposed waterbodies and associated vegetation

- 4.31 The Ecology Chapter notes that the new drainage attenuation feature will increase foraging opportunities for bats.
- 4.32 This new feature will remove from attenuation operation ponds P5, P6, P7 and P8. Ponds P9 and P10 will retain their role for drainage / settlement purposes. Ponds P5, P6, P7 and P8 will be brought under specific management for Smooth Newt.
- 4.33 The Ecology Chapter of the Environmental Statement lists specific mitigation measures proposed for Smooth Newt, as follows:

- ***“periodic scrub clearance in close proximity to ponds;***

- **management of grassland to maintain rank and tussocky components through cutting on rotation;**
- **fencing to prevent interference impacts, i.e. cattle poaching;**
- **clearance of litter and any other potential polluting sources;**
- **In relation to ponds P9 and P10, periodic checks for water quality and vegetation levels with appropriate dredging and removal of reedbeds if they become choked”**

Management Aim:

- 4.34 The combination of existing and proposed attenuation features within the application site offer a coordinated approach to water management. In addition to this, they are to be managed to benefit wildlife and green infrastructure within the application site. In particular the existing waterbodies will be managed for the benefit of Smooth Newt to ensure their long-term favourable conservation status.
- 4.35 The attenuation features have potential to provide marginal habitat, such as wet grassland, important to local biodiversity.

Management Objectives:

- 4.36 The overall management aim can be broken down into the following objectives:
- i. **Attenuate** the flow of surface water run-off;
 - ii. **Promote** groundwater infiltration;
 - iii. **Create** habitat diversity;
 - iv. **Prevent** vegetation encroachment from compromising the hydraulic function of the drainage features,
 - v. **Enhance** visual amenity and contribute to the legibility and green structure of the application site; and
 - vi. **Introduce** vegetation to the edges of proposed waterbodies within the application site;

Prescription:

- 4.37 In relation to the proposed drainage attenuation feature, the Ecology Chapter recommends mitigation measures such as silt traps in order to prevent pollution entering the Flush River and its tributary,

“Sustainable Drainage Systems (SuDS) [will be] incorporated into the surface water drainage system equipped with measures to remove pollutants during operation of the proposed development which would include silt traps before water enters the proposed attenuation feature. The attenuation feature would then be connected to existing drainage attenuation ponds P9 and P10 to provide further attenuation”.

4.38 The attenuation basin will be monitored annually to assess their condition in hydrological, amenity and ecological terms. This should continue for the duration of the construction phase and through the management plan period.

4.39 The growth of woody vegetation adjacent to waterbodies should be monitored and controlled, where appropriate, to ensure light penetration, assisting in the establishment of emergent and aquatic vegetation.

4.40 The establishment of wet grassland around the attenuation ponds will also be monitored.

4.41 Monitoring will assess the following:

- Success of wet grassland colonisation;
- Condition of banks, including presence of scrub;
- Maintenance of open and shaded sections; and
- The spread of any invasive species which will be controlled, ideally by hand, to ensure the growth of other species is not suppressed.

4.42 Specific management operations include:

- Remove rubbish and pollutants, including in the bottom sediments as required;
- Confine movement channels for maintenance to the minimum number of routes to avoid excessive trampling of the habitat;
- Diversify habitat and prevent ecological succession by removing deep bottom muck, silt or dense stands of dominant vegetation; and
- Periodic scrub clearance in close proximity of ponds

Summary of Management Tasks – Existing and proposed waterbodies and associated vegetation	
Task:	Frequency/Timing
Remove any litter or debris	Weekly
Monitor pH levels of waterbodies	6 x year
Diversify habitat and prevent ecological succession in the waterbodies by removing deep bottom muck, silt or dense stands of dominant vegetation. Clear overgrown	Annually, Autumn or Winter

aquatic/marginal planting (including reedbeds) by hand and leave on the bank for 1-2 days, in accordance with protected species constraints.	
Cut back bankside herbaceous plants and grasses before they set seed to 75mm to promote a diverse, tussocky growth. Confine movement channels for maintenance to the minimum number of routes to avoid excessive trampling of the habitat.	Annually, late summer, on rotation, in accordance with protected species constraints
Undertake periodic scrub clearance to maintain appropriate habitat for Smooth Newt and to ensure light penetration to the waterbody	Annually, Autumn or Winter
Clear bottom of ditches of any obstacles impeding flow of water with appropriate dredging.	Annually, Autumn or Winter, in accordance with protected species constraints

Additional management will be included were required within the forthcoming Smooth Newt licence application to be submitted to and agreed with NIEA.

Landscape Management Component 5: Existing and proposed rough grassland

Management Aim:

- 4.43 To maintain and where required, enhance existing areas of grassland and create new areas of grassland as part of the proposed landscape scheme. This habitat should comprise locally native grass and herb species of local provenance and provide a resource for a range of wildlife, in particular Smooth Newt.

Management Objectives:

- 4.44 The overall management aim can be broken down into the following objectives:
- i. **Establish** areas of new grassland appropriate to the local area through natural colonisations;
 - ii. **Secure** foraging opportunities and a mix of habitat types for wildlife; and
 - iii. **Provide** a structured mosaic of grassland under various mowing regimes and microclimates.

Prescription:

- 4.45 The proposals comprise the retention and natural colonisation of acid grassland site wide, the potential natural colonisation of wet grassland around the water attenuation features, and the retention of species-poor semi-improved pasture grassland.

- 4.46 Any undesirable herbaceous (ruderal) species will need to be controlled. These species include those which legally need to be controlled (see Landscape Management Component 12: Removal / control of invasive species) and those which suppress or otherwise inhibit the development of the sward.
- 4.47 Where the grassland fails to establish or dies out, measures will be undertaken to resolve underlying problems such as clearing encroaching scrub. It is expected that species diversity will naturally increase over a period of years due to the slow process of self-colonisation.

Acid grassland (included within Existing Rough Grass and Slopes within Landscape Proposals Plans within Appendix 2)

- 4.48 Areas of acid grassland are present across the application site and this habitat represents a priority habitat in Northern Ireland, detailed within Northern Ireland Habitat Action Plans.
- 4.49 All areas of existing acid grassland will be retained as part of the proposed development, the exception being any minor loss associated with new landscape planting which is proposed within this habitat.
- 4.50 Areas of existing acid grassland which have the potential to support the Marsh Fritillary (where Devil's Bit Scabious is recorded) are to be retained as part of the proposed development. These areas are located principally around the eastern and southern peripheries of the quarry. Landscape proposals ensure that these areas are not subject to proposed planting, in order to maintain the species composition and encourage future colonisation.
- 4.51 Any newly planted or existing areas of scrub will be managed such that they do not cause significant encroachment and subsequent loss of the acid grassland.

- 4.52 This habitat is to be fenced-off or marked with high visibility tape during construction to prevent encroachment by construction machinery.

Marshy grassland and neutral grassland (included within Existing Rough Grass and Slopes within the Landscape Proposals Plans within Appendix 2)

- 4.53 This habitat will be retained as part of the proposed development. It is likely that existing grazing regimes would continue.
- 4.54 Proposed areas of grassland around water features will colonise naturally, utilising the local seed bank.

Species-poor semi-improved grassland (included within Existing Pasture within the Landscape Proposals Plans within Appendix 2)

- 4.55 The Ecology Chapter notes that should the existing grazing regime in the pastoral fields within the application site cease, the grassland is to be overseeded with an appropriate grassland mix in order to increase its botanical interest, and a cutting regime adopted of no more than twice a year, in late March and late July to August, once flowers have set seed, is to be adopted. All arisings are to be removed from these areas.

Summary of Management Tasks – Proposed and existing grassland (excluding land in continued pastoral use)	
Task:	Frequency/Timing
Cut all grassland no more than twice a year, once in late March (if required) and once in late July to August once the flowers have set seed, and all arisings removed to keep fertility low.	Twice annually, March and July / August
Scrub within the grassland must be managed to avoid encroachment.	Inspect annually and cut as required
If competitive grasses become prominent in grassland areas, consideration should be given to the over-sowing of Yellow Rattle, as this species can help to control the coverage of vigorous grasses. As Yellow Rattle sets seed in July, cutting or grazing between April and mid-July should be avoided as this will prevent the plant seeding and therefore eliminate it. A late July hay cut then supports the propagation of the species within the sward by scattering the seed.	Autumn

Landscape Management Component 6: Proposed wildflower verges

Management Aim:

- 4.56 To enhance the biodiversity and visual amenity value along Boghill Road.

Management Objectives:

- 4.57 The overall management aim can be broken down into the following objectives:
- i. **Establish** new areas of wildflower verges, of an appropriate management regime which encourages a self sustaining and thriving of wildflower species;
 - ii. **To contribute** to the local landscape character; and
 - iii. **Benefit** biodiversity by offering corridor habitat, and foraging opportunities for pollinators.

Prescription:

- 4.58 Existing grassland verge lost along Boghill Road due to the road upgrade works is to be reinstated with margins of wildflower grassland.
- 4.59 Areas of wildflower grassland will provide areas for habitat connectivity as well as visual appreciation of native wildflower species and associated fauna.

Summary of management tasks:

Summary of Management Tasks – Proposed wildflower verges	
Task:	Frequency/Timing
In the first year after planting, wildflower grassland will be mown short twice, once in the spring (to 70mm) and once in the autumn (to 40-70mm to allow key species to set seed and to prevent grasses and annuals outcompeting perennial species), and all arisings removed to reduce soil fertility	Twice a year
Undesirable herbaceous (ruderal) species will need to be controlled. Ideally, weeds will be removed by hand pulling.	Monthly during growing season
Where the meadow sward fails to establish or dies out, or where the level and range of wildflower species is poor, measures will be undertaken to resolve any underlying problems. Areas will be re-sown following implementation of other remedial works. It is expected that following establishment, species diversity will naturally increase with time.	Checks to be undertaken in summer, and reseeding to be undertaken in autumn or spring.

- 4.60 The measures detailed above aim to ensure development of a species-rich wildflower flora and to control undesirable herbaceous species. If correctly implemented, they will help to ensure the visual attractiveness of areas of wildflower grassland while enhancing nature conservation interest.

Landscape Management Component 7: Proposed hydro-seeded banks

Management Aim:

- 4.1 To enhance the visual amenity of steep banks within the application site.

Management Objectives:

- i. **Establish** vegetated banks; and
- ii. **Maintain** vegetation to provide additional opportunity within the application site for wildlife foraging and habitats appropriate to the local landscape.

Prescription:

- 4.61 The hydro-seeding mixture is to comprise scrub species, maintained in accordance with a specification developed in conjunction with the specialist hydro-seeding contractor.

Summary of Management Tasks – Hydro-seeded banks	
Task:	Frequency/Timing
Regularly inspect the stability of banks in consultation with an Engineer, report any loose material at the base of the bank or other signs of erosion.	Monthly or as deemed appropriate by an Engineer
Maintenance of adequate moisture levels. Irrigate as necessary to ensure healthy establishment and thriving.	As appropriate
Prune scrub regularly to encourage strong root growth, to aid stabilisation of the bank.	Annually, timing appropriate to species

Component 8: Existing and proposed dwarf scrub / heath (included within Moorland Scrub on Landscape Proposals Plans within Appendix 2)

Management Aim:

- 4.2 To encourage healthy growth and development of the existing dwarf scrub / heath and to establish new areas of this habitat for the benefit of local wildlife.

Management Objectives:

- i. **Establish** new vegetation;
- ii. **Benefit** biodiversity by strengthening and enhancing important habitat, and foraging opportunities; **and**
- iii. **Maintain** a diverse species range and prevent succession of this habitat to scrub

Prescription:

- 4.62 This is a priority habitat in Northern Ireland, detailed within Northern Ireland Habitat Action Plans, and should be managed sensitively to encourage growth and long term sustainability of the existing areas of dwarf scrub. These areas are at risk of being colonised by dense, larger scrub and trees such as Ash, Hawthorn, Willow and Rowan, so must be regularly inspected and managed to prevent this.
- 4.63 New planting detailed within the Landscape Proposals Plans comprises Bell Heather, Cross Leaved Heath and Gorse.

Summary of Management Tasks – Proposed dwarf scrub / heath	
Task:	Frequency/Timing
Regular formative pruning to be undertaken appropriate to the plant species, to ensure that plants establish and thrive.	Annually outside of bird breeding season (March to August inclusive), timing appropriate to species
Maintenance of rabbit guards / other forms of protection.	Monthly until removal
Maintenance of adequate moisture levels. Irrigation may be required during dry periods.	Watering (to field capacity) to ensure healthy establishment and thriving.
Treatment of pests and diseases and repair of any damage from vandalism.	Monthly
Check for root firmness and upright alignment of shrubs after high winds, frost heave and in spring and autumn until shrubs are considered to be wind firm.	Twice annually or as required

Summary of Management Tasks – Existing dwarf scrub / heath	
Task:	Frequency/Timing
Checks to be undertaken for the presence of saplings. Saplings (succession species such as Rowan, Ash, Willow and Hawthorn) to be removed to avoid the dwarf scrub / heath from being colonised. Non-desirable woody species should be removed to a licensed tip during management operations and at other times as necessary.	Twice annually or as required

Landscape Management Component 9: Existing and proposed dense scrub

Management Aim:

- 4.3 To manage dense scrub to prevent encroachment into sensitive grassland and heath.

Management Objectives:

- i. **Establish** new vegetation
- ii. **Maintain** existing vegetation for biodiversity and visual amenity

- iii. **Control** future colonisation and encroachment into neighbouring sensitive habitats

Summary of Management Tasks – Proposed dense scrub	
Task:	Frequency/Timing
Regular formative pruning to be undertaken appropriate to the plant species, to ensure that plants do not encroach into grassland areas.	Annually outside of bird breeding season (March to August inclusive), timing appropriate to species
Maintenance of rabbit guards / other forms of protection.	Monthly until removal
Maintenance of adequate moisture levels. Irrigation may be required during dry periods.	Watering (to field capacity) to ensure healthy establishment and thriving
Treatment of pests and diseases and repair of any damage from vandalism.	Monthly
Check for root firmness and upright alignment of shrubs after high winds, frost heave and in spring and autumn until shrubs are considered to be wind firm.	Twice annually or as required

Summary of Management Tasks – Existing dense scrub	
Task:	Frequency/Timing
Regular formative pruning to be undertaken appropriate to the plant species, to ensure that plants do not encroach into grassland areas.	Annually outside of bird breeding season (March to August inclusive), timing appropriate to species
Non-desirable woody species should be removed to a licensed tip during management operations and at other times as necessary.	Twice annually or as required
In order to maintain breeding habitat for Ringed Plover, appropriate management involving periodic clearance of scrub where necessary will be undertaken to ensure suitable open habitat for this species.	Annually or as appropriate

Landscape Management Component 10: Proposed planted timber screen

- 4.64 Maintenance comprises the monthly inspection of climbers on the climbing frame and securing planting as appropriate to encourage upward growth.
- 4.65 The timber screens are to be inspected on a monthly basis for structural damage and results reported to the site managers.

Landscape Management Component 11: Proposed ornamental planting (included within Shrubs for Visitor Centre Area and Car Park in the Landscape Proposals Plans within Appendix 2)

Management Aim:

- 4.66 To maximise the ecological and amenity benefits of ornamental landscaping.

Management Objectives:

- 4.67 The overall management aim can be broken down into the following objectives:
- i. **Enhance** the ecological and visual amenity value of the proposed development Landscape; and
 - ii. **Ensure** the ongoing maintenance of these habitats to maximise biodiversity and safeguard the communities present in the long term.

Prescription:

- 4.68 The ornamental areas of planting consist of predominantly native species, with the selection of cultivars and non-native species made for increased visual amenity and seasonal interest. The growth cycle of planting may require varying maintenance involvement at different stages, and management operations should be adapted as the planting matures. In subsequent years, management may not need to be as intensive but it will be necessary to periodically rejuvenate or redevelop planting due to ageing and decline or disease in plants.
- 4.69 Routine maintenance visits should identify any plants suffering from pest or disease and non-desirable woody species should be removed during management operations.
- 4.70 Planting areas shall be 95% free of grass and weed growth and kept tidy. In the interests of wildlife, weed control should be undertaken by hand weeding, with the use of herbicides avoided wherever possible. However, in certain instances, herbicide may be the most effective measure to take against unwanted species. Where herbicide

application is needed this should be spot treatment of a non-residual herbicide. Herbicides should comply with the Control of Pesticides Regulations 1986 and be on the current DEFRA list of approved products and be approved for use near water.

- 4.71 Over time, selective thinning of plants should be undertaken to encourage natural regeneration. Where possible, larger, mature and over-developed individuals should be removed.

Summary of Management Tasks – Proposed ornamental planting	
Task:	Frequency/Timing
Regular formative pruning to be undertaken appropriate to the plant species.	Annually and outside of bird breeding season (March to August inclusive) where required, timing appropriate to species
After the first year, <i>Cornus</i> species should be cut down to their base before they bud in February / March on rotation to maintain vigorous fresh growth and their ornamental structure.	Every 3 years
Planting beds should be kept clear of litter.	Monthly
Planting shall be pruned in accordance with the individual species requirements and growth rate to maintain a healthy vigorous form, however the following will apply generally: Cut back straggling stems to leave well balanced form. Clip back previous season's growth to maintain agreed height to maintain sight lines and vision splays. Cut back flowering shoots after seeding. Remove suckers, dead, discoloured or weak stems. All shrubs are to be pruned so as not to project beyond kerb lines, perimeter walls and footpath edges. Shrubs to verges between entrance/exit roads and car park areas i.e. traffic routes, must be maintained to ensure sight lines are not obstructed.	As appropriate to the species
All off-cuts shall be removed from site.	After pruning works
Check for root firmness and upright alignment of shrubs after high winds, frost heave and in spring and autumn until shrubs are considered to be wind firm.	Twice annually or as required

Landscape Management Component 12: Hard Landscape Surfaces, security fencing and gates

Management Aim:

- 4.72 Provide clean, safe, attractive and functional areas for pedestrian and vehicle movement within the proposed development and enable appropriate usage whilst discouraging anti-social behaviour.

Management Objectives:

- 4.73 The overall management aim can be broken down into the following objectives:
- i. **Ensure** vehicular, cycle and pedestrian routes through the proposed development and parking areas within the proposed development remain safe, clear and accessible;
 - ii. **Ensure** clear, defensible delineation of spaces for public and private access; and
 - iii. **Maintain** hard landscape features and elements in good condition and repair deterioration or damage.

Prescription:

Summary of Management Tasks – Hard Landscape Surfaces	
Task:	Frequency/Timing
<p>The following measures will be undertaken twice a year or additionally as the need arises, in addition to the routine sweeping and de-littering that would be carried out by an appointed management body:</p> <p>Removal of weeds by hoeing, pulling or (as a last resort) use of approved herbicide, or in the case of invasive species, refer to Landscape Management Component 12 Removal/ control of invasive species. In the interests of wildlife, weed control should be undertaken by hand weeding, with the use of herbicides avoided wherever possible. Herbicides should comply with the Control of Pesticides Regulations 1986 and be on the current DEFRA list of approved products and be approved for use near water.</p>	Twice a year or as required
Cut back undergrowth, overgrowing or overhanging shrubs, hedges and minor tree branches from roadways through the proposed development to maintain an unobstructed width as required for vehicle access.	Monthly or as required
Inspection of any defects and potential dangers in surfacing, and undertake remedial works at the earliest opportunity.	Monthly or as required
Keep pedestrian-accessed hard surfaces safe to walk on during prolonged freezing conditions, using grit rather than salt to achieve this objective.	As required

Security Fencing and Gates

Summary of Management Tasks – Security Fencing and Gates	
Task:	Frequency/Timing
Regular inspection of fencing and gates. Repair or replace as necessary.	Twice a year or as required

Landscape Management Component 13: Removal / control of invasive species

Management Aim:

- 4.74 Long term eradication of invasive species within the application site.

Management Objective:

- i. **Develop** a comprehensive eradication programme with a licensed contractor; and
- ii. **Continue monitoring** to ensure that invasive species do not reoccur, and if they do, are appropriately treated.

Prescription:

- 4.75 A small stand of Japanese Knotweed is present within the application site, as shown within Appendix 1. Pirri-pirri-bur and Indian balsam were also identified within the Ecology Chapter as being present on site. Other invasive plants present on the site include Rhododendron and Snowberry.
- 4.76 A comprehensive strategy for the eradication of these invasive species from the site must be adopted in consultation with an expert contractor, and the eradication contract is to include regular checks for its reoccurrence and treatment on identification to be agreed with specialist KN contractors. All invasive plant material must be disposed of by an appropriately licensed contractor.
- 4.77 Non-invasive plants damaged / destroyed during the works must be replaced in next available planting season.

Landscape Management Component 14: Quarry Face and Quarry Floor

Management Aim:

- 4.78 Quarry Face: limiting disturbance to the quarry face during construction works.
- 4.79 Quarry Floor: minimal planting intervention to retain openness of quarry floor, allowing colonisation of herbaceous and grass species, whilst eradicating invasive species

Management Objectives:

- 4.80 The overall management aims can be broken down into the following objectives:
- i. **Ensure** quarry face is undisturbed to avoid disturbance of nest sites;
 - ii. **Eradicate** invasive species on quarry floor; and
 - iii. **Maintain** an open character to the quarry floor allowing and encouraging self-colonisation through a light-touch approach to management.

Prescription:

Quarry Face:

- 4.81 These quarry faces provide a substantial degree of containment to this area of the application site, although the elevated terraced landform allows extensive views across the landform to the north
- 4.82 The Ecology Chapter notes that the quarry face offers roosting opportunities for Peregrine. In addition, although considered unlikely, the quarry face could also provide hibernation sites.
- 4.83 Enabling works to the quarry face will require loose material to be removed and larger blocks to be bolted. The Ecology Chapter notes,

“As a precaution, a specific check survey prior to the quarry wall enabling works commencing will be undertaken for any Peregrine nesting ledges. As Peregrine nesting ledges are afforded protection all year round (not just during the breeding season), if any nests deemed to be disturbed are identified then works would cease and be undertaken under an appropriate NIEA licence.” (page 209)

“As a precaution and where necessary, if enabling works to the quarry walls are to be undertaken during the hibernation period (i.e. November – March inclusive and weather dependent) then such works would be undertaken following a pre-commencement check and under the supervision of a suitably qualified ecologist. If hibernating bats are encountered then impacting works would cease with remaining works to be undertaken under a NIEA licence.”

Quarry Floor:

- 4.84 Undertake an eradication programme for invasive species. Refer to Landscape Management Component 12: Removal / control of invasive species, for details relating to the eradication of the invasive species.

- 4.85 Due to the exposed conditions and low fertility of the application site, little vegetation is likely to colonise. Any vegetation that does must be managed sensitively appropriate to the species.
- 4.86 Dependent on what vegetation establishes, a suitable management plan is to be agreed with an Ecologist to enhance and encourage the vegetation, for the benefit of biodiversity.

5.0 IMPLEMENTATION, MONITORING AND REVIEW

Implementation and Management Structure

- 5.1 This LBMS incorporates the objectives and prescriptions for the suggested approach to be adopted in the maintenance and management of the landscape and nature conservation features which are to be incorporated into the proposed development.
- 5.2 The aim is to promote a sensitive management approach, which protects and improves the landscape and visual amenity value and biodiversity interests of the application site, and is compatible with the proposed uses of the application site.
- 5.3 It is recommended that responsibility for landscape maintenance be established and supervised such that a robust framework is in place for the ongoing achievement of the management objectives within this document.

Long Term Monitoring and Review

- 5.4 The LBMS is a dynamic document that should be reviewed regularly and developed, as circumstances change and the application site evolves.
- 5.5 It is recommended that LBMS reviews appraise the effectiveness of the maintenance regimes, and establish any changes in the landscape and biodiversity conditions. Monitoring requires that some record should be made of the condition of the landscape and biodiversity components at the start of the period, the work carried out, and how well the habitats and landscape respond. Reviews should assess the extent to which the measures undertaken have achieved the objectives and vision of the LBMS and should identify whether the same measures should continue, or different methods be introduced, in order to achieve the objectives.