

Habitat Management and Monitoring Plan

Survey site: Land off Archway Road, Huyton, Merseyside L36 9XD

Client: Genr8 Kajima Regeneration (Huyton) Limited

Report date: 9th June 2026

The survey results and recommendations contained within this report are valid for 18 months.

Project:

This report is prepared to inform a planning application with the Knowsley Metropolitan Borough Council. The proposal is described as: *‘Detailed application for the erection of a new Council Headquarters, hotel, public realm change of use of Cavendish Walk to flexible Class E and/or F1 uses, site-wide enabling and associated works following demolition of existing buildings. Outline application comprising details of access, with all other matters reserved for a mixed-use development comprising residential (Classes C2 and C3) uses, commercial and community uses (Classes E and F1), replacement car parking provision at Lathom Road, public realm and associated works, with provision for meanwhile uses’.*

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Guidelines

A Habitat Management and Monitoring Plan (HMMP) is a key document in the long-term stewardship of habitats created, enhanced, or restored as part of a development. It is essential in the context of Biodiversity Net Gain (BNG), a legal requirement under the Environment Act 2021, which mandates that developments must deliver a minimum 10% net gain in biodiversity and ensure its maintenance for at least 30 years. The HMMP outlines how newly created or enhanced habitats will be managed, monitored, and maintained to achieve their intended ecological value over time, ensuring compliance with BNG commitments.

The HMMP is designed to align with UK regulatory frameworks, including Natural England's guidance on habitat management, local planning authority policies, and the National Planning Policy Framework (NPPF) such as the 'British Standard 42020 (2022) 'Biodiversity – Code of Practice for Planning and Development'.

Proportionality

The work involved in preparing and implementing all ecological surveys, impact assessments and measures for avoidance, mitigation, compensation and enhancement should be proportionate to the predicted degree of risk to biodiversity and to the nature and scale of the proposed development. Consequently, the decision-maker should only request supporting information and conservation measures that are relevant, necessary and material to the application in question. Similarly, the decision-maker and their consultees should ensure that any comments and advice made over an application are also proportionate.

This approach is enshrined in Government planning guidance, for example, section 15 of the National Planning Policy Framework for England.

The desk studies and field surveys undertaken to provide a preliminary ecological appraisal (PEA) might in some cases be all that is necessary.

(BS 42020:2022)

In consequence of the scale and intensity of the proposed development, this plan-led report is considered adequate and proportionate. It communicates all relevant information necessary to determine a planning application or support the recommendations for further surveys.

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1.0 Introduction and Context

1.1 Background

Arbtech Consulting Ltd were commissioned by Genr8 Kajima Regeneration (Huyton) Limited to produce a Habitat Management and Monitoring Plan (HMMP) for a proposed development at Land off Archway Road, Huyton, Merseyside L36 9XD (hereafter referred to as the site).

The site has been subject to previous ecological assessments of relevance to this report, comprising:

- A Preliminary Ecological Appraisal (PEA) and Preliminary Roost Assessment (PRA) (Arbtech Consulting Ltd, 2026),
- Ground Level Tree Assessment (GLTA) (Arbtech Consulting Ltd, 2025),
- Arboricultural Survey (Arbtech Consulting Ltd, 2025),
- A Biodiversity Net Gain Assessment (BNG) (Arbtech Consulting Ltd, 2026),
- Bat emergence and re-entry surveys (BERS) (Arbtech Consulting Ltd, 2025).

1.2 Planning Conditions

Following the completion of the BNG report (Arbtech Consulting Ltd, 2026), a Habitat Management and Monitoring Plan (HMMP) was recommended. To ensure recommendations for the implementation, management and monitoring of the site for at least 30 years to ensure that biodiversity net gain is delivered on site.

1.3 Project Description

The planning application pertaining to the site describes the development as: Detailed application for the erection of a new Council Headquarters, hotel, public realm change of use of Cavendish Walk to flexible Class E and/or F1 uses, site-wide enabling and associated works following demolition of existing buildings. Outline application comprising details of access, with all other matters reserved for a mixed-use development comprising residential (Classes C2 and C3) uses, commercial and community uses (Classes E and F1), replacement car parking provision at Lathom Road, public realm and associated works, with provision for meanwhile uses (hereafter referred to as the proposed development). A plan showing the proposed development is provided in **Appendix 1**.

1.4 Site Context

The survey site is centred on National Grid Reference SJ 44183 90863 and has an area of approximately 2.8ha. The site comprises multiple buildings (B1-5), associated hardstanding and landscaping including grassland, ornamental shrubs, tree lines and hedgerows. The site is adjacent to Huyton Village Shopping Centre to the south, within the urban town of Huyton. The surrounding landscape is comprised of urban development including tarmacked roads subject to heavy traffic, urban buildings and residential dwellings with associated vegetated gardens. There are amenity green spaces including that associated with Lord Derby Academy situated ~400m east and Bowring Park and Golf Course situated ~800m west. A site location plan is provided in **Appendix 2**.

1.5 Scope of This Report

This Habitat Management and Monitoring Plan (HMMP) has been prepared to support the delivery of Biodiversity Net Gain (BNG) in accordance with the Environment Act 2021 and the approved Biodiversity Gain Plan for the development. BNG has been calculated using the Statutory Biodiversity Metric, and all habitat creation, enhancement, and retention detailed within this HMMP is intended to achieve and maintain the target habitat types and condition assessments specified within the approved metric (Statutory BNG Metric – Land off Archway Road, L36 9XD – V4, Arbtech Consulting Ltd, 2026).

The habitats managed under this HMMP are required to be maintained for a minimum period of 30 years from the completion of establishment works. Target habitat condition scores set out in the Statutory Biodiversity Metric define the required standard of success for each habitat parcel. Monitoring outcomes will be assessed against these target condition criteria.

Where monitoring identifies that habitats are not progressing towards, or are failing to achieve, their target condition, remedial management actions will be implemented in accordance with the adaptive management framework set out in this HMMP. This ensures that the required biodiversity gains are secured and maintained for the full management period.

Any biodiversity gains delivered off-site, where required to meet statutory BNG obligations, are secured through separate legal mechanisms and do not rely on the successful delivery of this HMMP.

2.0 Ecological Baseline Conditions Relevant to This Report

The baseline ecological conditions of relevance to this report were determined as a result of the PEA PRA and BNG Assessment.

2.1 Habitat Degradation

The site has not been subject to any degradation since 30th January 2020, and as such, the baseline biodiversity value of the site is derived from the site as observed during the Preliminary Ecological Appraisal (Arbtech Consulting Ltd., 2025).

2.2 BNG and Proposed Habitat Creation

The development, as currently proposed, is anticipated to result in a -15.69% net loss for area-based habitat units and a +38.00% net gain in linear-based units. The post-development habitat coverage and their target conditions in accordance with the BNG Assessment are detailed in **Table 1** below.

Table 1. Proposed post-development habitats.

Broad Habitat			Proposed Habitat Type	Area/Length	Condition
Retained	Sealed surface	Area-based	Areas of retained building – developed land; sealed surface.	0.09526ha	N/A
	Grassland		Modified grassland	0.03702	Poor
	Individual trees		Urban trees	1.7865ha (37 small trees, 80 medium trees, 7 large trees and 1 very large tree)	Moderate
	Native hedgerow	Linear-based	Native hedgerows will be retained within the site boundary.	0.152km	Moderate
	Non-native hedgerow		Areas of non-native hedgerow will be retained across the site.	0.055km	N/A
Created	Grassland	Area-based	Other neutral grassland	0.06146ha	Moderate
	Biodiverse green roof		Sections of green roof will be planted along the roof of each created building.	0.11863ha	Moderate
	Rain garden		Rain gardens will be created across the site near areas of amenity grassland.	0.18138ha	Moderate
	Grassland		Modified grassland	0.1296ha	Poor
	Sealed surface		New buildings and associated hardstanding.	2.67357ha	N/A
	Individual trees		Urban trees – 171 trees will be planted across the site (small).	0.6962ha	Moderate
	Hedgerow	Linear-based	New native hedgerow planting across the site.	0.281km	Moderate

Enhanced	Mixed scrub	Area-based	Area of bramble scrub will be enhanced to mixed scrub.	0.02224ha	Moderate
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2.3 Significant on-site Enhancements

Significant on-site enhancements are defined as habitat creation or habitat enhancement measures that make a material contribution to the biodiversity net gain (BNG) delivered by the development, relative to the pre-development baseline biodiversity unit value as calculated using the Statutory Biodiversity Metric. The retention of existing habitats, where no improvement in condition or distinctiveness is achieved, does not constitute a significant on-site enhancement for the purposes of BNG.

For this development, the following measures are considered to represent significant on-site enhancements:

- The creation of habitats of medium distinctiveness.
- Enhancements to baseline habitats that increase their condition or create a habitat of higher distinctiveness.

2.4 Scope for Management

Urban habitat types that generate negligible post-development biodiversity units do not require specific management or monitoring and are not considered further within this HMMP. Habitats of low distinctiveness and retained baseline habitats do not require targeted enhancement to meet BNG objectives; however, their retention is necessary to maintain compliance with the approved BNG assessment. These habitats will therefore be subject to periodic monitoring over the 30-year management period. Created and enhanced habitats of medium distinctiveness or above constitute significant on-site enhancements and will be subject to specific management and monitoring to ensure they achieve their target condition within the 30-year term.

Considering the above, the following management and monitoring is required for post-development habitats:

- **No management or monitoring**

Retained and created developed land; sealed surface.

- **Monitoring only**

Retained urban trees, retained non-native ornamental hedgerow, retained grassland, and retained native hedgerow.

- **Management and Monitoring**

Newly created other neutral grassland, biodiverse green roof, rain garden, modified grassland, new tree planting and enhancement of bramble scrub to mixed scrub.

3.0 HMMP

3.1 Site Monitoring

Site monitoring detail is provided in **Table 2** below.

Table 2. Site monitoring

Mitigation	Specification				
Persons Responsible and Lines of Communication	The details of the responsible persons and organisation(s) for delivering this management plan are outlined below.				
	Table 2.1. Organisation responsible for providing HMMP				
	Project Ecologist or Other Professional Responsible for HMMP				
	Name or Initials		Jamie-Lee Anderson BSc (Hons) - Senior Ecologist		
	Organisation		Arbtech Consulting Ltd		
	Responsibility	Start Date:	Commencement of works	End Date:	30 years following completion of the last establishment works
	Arbtech Consulting Ltd is responsible for producing this HMMP and providing ecological advice for the creation, management, and monitoring of the habitats on site, as well as other constraints to achieving the site's aims, e.g., any protected species presence. Any other competent persons required are to be appointed by the landowner. This will ensure that the HMMP is implemented in full and that all created habitats are in a fit state to meet objectives.				
	Statement of Competency				
	Arbtech Consulting has provided ecological consultancy services since 2006 and has expertise with Biodiversity Net Gain, including the statutory metric, BNG plans and management plans. The author of the HMMP is an ecologist of 3 years' experience and is the holder of Class 2 Natural England Bat Licence Number: 2025-85309-CL18-BAT and Great Crested Newt Level 1 Survey Class Licence CL08 2025-83855-SCI-CL08.				
	Table 2.2. Landowner or land manager				
	Landowner or Land Manager				

Name or Initials		N/A		
Organisation		Knowsley Metropolitan Borough Council		
Responsibility	Start Date:	Commencement of works	End Date:	30 years following completion of the last establishment works

Table 2.3. Organisation Responsible for Implementing the HMMP

Organisation Responsible for Implementing the HMMP				
Name or Initials		Alan Hall		
Organisation		Genr8 Kajima Regeneration Limited		
Responsibility	Start Date:	Commencement of works	End Date:	30 years following completion of the last establishment works

Alan Hall has been selected as the Development Biodiversity Champion for the habitat creation phase of the development. Alan Hall will be responsible for ensuring all actions outlined in this document are implemented. Any queries with regards to the mitigation and enhancement prescriptions will be addressed to the project ecologist, and communication will be retained between the Alan Hall and the project ecologist throughout the project. Alan Hall will be responsible for understanding when an Ecological Clerk of Works is required on site to supervise works, requirements of which are detailed within each mitigation section where necessary.

Once the development is complete, Alan Hall will act as the Post-Development Biodiversity Champion and will be responsible for implementing the proposed long-term management. Alan Hall will be responsible for ensuring all recommended management is undertaken and any associated remedial measures are completed where necessary.

Table 2.4. Organisation responsible for reviewing HMMP

LPA or Responsible body Reviewing HMMP	
Name or Initials	Council Ecologist
Organisation	Liverpool City Council

	Responsibility	Start Date:	Commencement of works	End Date:	30 years following completion of the last establishment works
	To ensure that the HMMP and legal agreement are followed, the objectives of the HMMP are delivered, and to take enforcement action should a breach occur.				
Creation Period	Habitat enhancement and creation work will be scheduled to take place following the completion of major development works to ensure newly created habitats are not damaged during construction activities. On-site biodiversity gain works will be implemented within 6 months of the completion of construction, and the 30-year management period will commence from the date of completion of all biodiversity enhancement works. The proposed timeline is as follows: 1. Pre-Development (Prior to Construction) • Identify and protect any existing ecological features that must be retained • Implement measures and avoid to areas designated for habitat creation to prevent soil compaction or contamination. 2. Post-Development (After Major Construction Works) • Soil Preparation Remove any construction debris and de-compact soil as necessary. Introduce appropriate soil treatments to optimise conditions for target grassland species. Undertake any excavation or reprofiling works for pond enhancement, including removal of nutrient-rich sediments where necessary. Seed Sowing and Planting (in autumn or spring) Introduce plug plants of key forbs to accelerate species establishment. • Initial Establishment and Maintenance (First 1–2 Years) Implement a sensitive cutting regime as to not destroy the habitats. Control competitive species such as dominant grasses to encourage plant diversity. Avoid the use of herbicides and artificial fertilisers to maintain habitat integrity. • Long-Term Management Continue appropriate management strategies outlined in Table 3. Adjust management practices if required, having discussed this with the SQE. This phased approach ensures that the habitat establishment aligns with best practices and maximises biodiversity benefits while avoiding damage from construction activities.				

Post-Development Monitoring	Post-development site visits will be undertaken by a Suitably Qualified Ecologist (SQE) over the 30-year management period to confirm the successful installation, establishment and ongoing management of habitats and species-specific enhancements. Monitoring visits will be completed in years 1, 2, 5, 10, 15, 20, 25 and 30 following occupation of the development. The success of habitat creation and enhancement will be assessed with reference to the target habitat condition criteria defined within the Statutory Biodiversity Metric. Monitoring will focus on habitat structure, species composition and evidence of appropriate management, rather than absolute species richness targets, and will be informed by professional judgement of the SQE. Success indicators may include, but are not limited to: • Establishment of characteristic species appropriate to the target habitat type; • Habitat structure consistent with the intended condition category (e.g. sward height variability, age and structural diversity of trees and shrubs); • Absence, or effective control, of invasive non-native species or dominant undesirable species; and • Evidence that management prescriptions are being implemented at the required frequency and intensity. A monitoring report will be produced following each SQE visit, detailing findings, photographic evidence and any required remedial actions. Remedial management may be triggered where monitoring identifies a failure to meet interim or target habitat condition criteria, where habitat establishment has been compromised by unforeseen factors (such as drought, flooding, soil compaction, vandalism or disease), or where management prescriptions have not been implemented as specified. Where remedial action is required, the SQE will recommend proportionate corrective measures, which may include adjustments to management regimes, re-seeding or re-planting, soil remediation, or enhanced control of undesirable species. The scale of evidence required to confirm implementation of remedial actions will be defined by the SQE and may include additional site visits or photographic evidence provided by the Post-Development Biodiversity Champion.
Adaptive Management	Adaptive management is a structured and systematic approach to natural resource management that involves the ongoing monitoring and evaluation of management actions, followed by informed adjustments to improve outcomes over time. It is an iterative process whereby management actions are implemented, monitored against defined objectives, and reviewed to inform subsequent management decisions. Monitoring results will be used to inform any necessary changes to management practices in order to support the achievement of Biodiversity Net Gain (BNG) targets set out in the statutory biodiversity metric and this Habitat Management and Monitoring Plan (HMMP). Monitoring also enables the early identification of unforeseen external influences that may affect the delivery of objectives, such as the emergence of plant disease, the spread of invasive species influenced by climate change, or changes to site accessibility resulting from flooding.

	In addition to formal monitoring, observations and records arising from routine site management are a critical component of effective adaptive management. Appropriate mechanisms should be established to ensure that such information is captured, reviewed, and incorporated into revisions of management prescriptions, and subsequently reflected in monitoring reports. Regular, robust monitoring and reporting to the responsible authority will enable potential issues to be identified at an early stage, allowing timely and proportionate management responses to be implemented. Where external factors significantly affect the achievement of BNG objectives, any proposed amendments to management prescriptions or targets should be agreed with the responsible authority. Following such reviews, all changes will be clearly documented within this management plan and the associated management and monitoring schedule.
Legal Responsibility	It is expected that compliance with this HMMP will be legally enforced through a planning condition or Section (s) 106 agreement. As part of this legal agreement, habitat creation and management detailed within this HMMP will need to be retained and appropriately managed for the entire 30-year term to meet legislative objectives outlined in the Environment Act (2021). Should any future development at the site be proposed that will impact habitats that deliver the required gain as part of the planning conditions/s106 agreement, this will need to be considered and suitably compensated for in accordance with any future plans.

3.2 Habitat Creation and Management

Best practice habitat creation and management over a 30-year term to ensure a BNG consistent with that reported within the BNG Assessment is provided in **Table 3** below. The final BNG Habitat Plan is provided in **Appendix 3**.

Table 3. *Habitat Creation and Management Prescriptions*

Ecological receptor	Specification
Other neutral grassland	Overview: It is proposed to create 0.06149ha of existing other neutral grassland of moderate condition. Objectives: - To achieve a moderate condition by passing condition criteria C, D, & F (as a minimum) in accordance with the Grassland – Medium, High, and Very High distinctiveness Habitat Type Condition Sheet and BNG Assessment. - To create grassland that will provide pollination, foraging, and commuting opportunities for protected and/ or notable species groups, including badgers, herptiles, hedgehogs, invertebrates, bats, and birds.

	- To undertake landscaping works in compliance with BS 4428:1989 – The Code of Practice for General Landscape Operation. Creation Method: Ground preparation It is recommended that a soft strip of the current vegetation present is undertaken and removed from the area to provide a bare soil substrate for sowing the seed mix. The bare soil will be subject to light rolling or trampling to provide a firm base for seeding. Seeding Seeding is best undertaken in Spring during April/ May. Seed rates of 5-10kg/ha are recommended. Seeds can be spread more evenly in combination with an inert, bulking material such as sawdust or silver sand. Light trampling by foot within each germination opening should be completed to help bed-in the seeds. Recommended seed mix: It is recommended that the Emorsgate EM10F ‘Tussock Wildflower Mix’ (or similar specification) is utilised. This seed mix includes 21no. wildflower species suitable for neutral soil conditions. Notably, the species mix includes yellow rattle, which is known to suppress dominant grass species and will allow existing grasses and herbs within the seed bank to colonise whilst preventing dominance and thus increasing species and structural diversity. Risk: - Failure to establish target sward – unsuitable soil conditions, excessive nutrient levels, drought, waterlogging, or inappropriate seed mix may result in poor establishment - Dominance of competitive grasses – coarse or agricultural grasses may outcompete forbs, preventing achievement of the target condition - Encroachment of undesirable or invasive species – invasive non-native or ruderal species may establish following soil disturbance, reducing habitat condition - Inappropriate management regime – cutting at unsuitable times, insufficient frequency, or failure to remove arisings may limit flowering, seed-setting, and species diversity - Nutrient enrichment – nutrient inputs from adjacent land uses, fertiliser drift, runoff, or retained cuttings may increase grass dominance and reduce botanical diversity - Extreme weather events – drought, prolonged wet conditions, flooding, or unseasonal weather may adversely affect establishment and long-term condition - Physical disturbance – trampling, vehicle movements, or site operations may cause soil compaction, bare ground, or localised
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degradation

- Inadequate aftercare and monitoring – failure to undertake monitoring, adaptive management, or remedial works may prevent the grassland from achieving or maintaining the target condition.

Management prescriptions covering a 30-year term:

Table 3.1: Wildflower meadow creation management prescriptions.

Management	When	Rationale	BNG condition criteria compliance
Cut meadow twice annually, height should be heterogenous where areas are mowed to varying sward heights.	Late March / early April and late August/ early Sept (twice annually)	This ensures the meadow does not grow excessively long and become rank but allows wildflowers to set seed and invertebrates to breed. This will also allow a diverse sward of varying lengths to naturally occur in accordance with the growth characteristics of each species. Cutting twice annually will also prevent encroachment of scrub and bracken.	A, B, F, & G.
Cut grass as to provide a heterogeneous habitat structure, aiming to maintain at least 20% of grass <7cm and 20% >7cm. As such, each cutting phase must cut 20% of the area to ground level, 60% of the area to 15cm, and the remainder to 30cm. These areas must be rotated each year to maintain a diverse sward.	Late March / early April and late August/ early Sept	To retain a diverse sward whilst limiting impacts to protected species potentially present at ground level and ensuring the natural germination of seeds.	B
Turn and dry the cut grass	Post cut	This allows the seeds to drop,	A, B, & F.

	over 3-5 days before removing arisings off Site Do not apply chemical fertilisers	At all times.	encouraging species diversity and invertebrates to relocate unharmed. The use of chemical fertilisers will encourage vigorous grasses and weeds to grow or cause large areas of bare ground due to inhospitable growing conditions,	C
Biodiverse green roof	Overview: It is proposed to create 0.11863ha of biodiverse green roof in moderate condition. Objectives - To create a biodiverse green roof of moderate condition by passing criteria A, B and C in accordance with the BNG Condition Assessment. - To a biodiverse green roof that will provide pollinating, foraging, and refuge opportunities for protected and/ or notable species groups, including invertebrates, bats, and birds. Creation Method: Installation Installation and management prescriptions vary depending on the green roof product selected and the supplying company. Installation pertaining to the biodiverse green roof will be provided by the green roof supplier and this HMMP presumes full compliance. However, the following key principle should be adhered to: - The method of installation will be agreed with the chosen contractor, as this will differ depending upon the building's structural capacities and properties in terms of load bearing, and is beyond the qualifications of the author and the scope of this report. - A waterproofing layer and a supporting frame will need to be constructed to enclose a layer of biodiverse substrate. This substrate will contain a mixture of gravels. Waste materials from the development can be added to this, as can rocks and logs to create enhanced structural heterogeneity. - It is important to ensure drainage is well designed to prevent future issues with pooling water. The green roof substrate should provide effective water irrigation to limit maintenance requirements and any related disturbance and to prevent waterlogging and associated plant deaths.			

	○ Planting density will be at a minimum of 12 plants per m². This will ensure a suitable coverage to provide micro-climatic conditions suitable to support increased numbers of invertebrates. ● Species The green roof mix will be seeded with seeds and sedum plugs, as supplied by green roof supplier. Species may include (list is not exhaustive): Sheep's Fescue <i>Festuca ovina</i>, Slender Creeping Red Fescue <i>Festuca rubra trichophylla</i>, Crested Dogstail <i>Cynosurus cristatus</i>, Autumn Hawkbit <i>Scorzoneroides autumnalis</i>, Betony <i>Stachys officinalis</i>, Birdsfoot Trefoil <i>Lotus corniculatus</i>, Bladder Campion <i>Silene vulgaris</i>, Catsear <i>Hypochaeris radicata</i>, Common Knapweed <i>Centaurea nigra</i>, Common Sorrel <i>Rumex acetosa</i>, Common St John's Wort <i>Hypericum perforatum</i>, Common Toadflax <i>Linaria vulgaris</i>, Common Vetch <i>Vicia sativa</i>, Cowslip <i>Primula veris</i>, Daisy <i>Bellis perennis</i>, Field Scabious <i>Knautia arvensis</i>, Lady's Bedstraw <i>Galium verum</i>, Meadow Buttercup <i>Ranunculus acris</i>, Meadow Cranesbill <i>Geranium pratense</i>, Meadowsweet <i>Filipendula ulmaria</i>, Musk Mallow <i>Malva moschata</i>, Ragged Robin <i>Silene flos-cuculi</i>, Red Campion <i>Silene dioica</i>, Red Clover <i>Trifolium pratense</i>, Ribwort Plantain <i>Plantago lanceolata</i>, Rough Hawkbit <i>Leontodon hispidus</i>, Salad Burnet <i>Sanguisorba minor</i>, Selfheal <i>Prunella vulgaris</i>, Tufted Vetch <i>Vicia cracca</i>, White Campion <i>Silene latifolia</i>, Wild Carrot <i>Daucus carota</i>, Wild Marjoram <i>Origanum vulgare</i>, Yarrow <i>Achillea millefolium</i>, and Yellow Rattle <i>Rhinanthus minor</i>. Risks: ● Structural or design constraints – inadequate drainage design, or inappropriate substrate depth may limit plant establishment and long-term performance ● Poor establishment and/or plant failure – unsuitable substrate, poor-quality planting material, drought stress, or inappropriate species selection may result in high mortality ● Extreme weather exposure – drought, high winds, frost, heat stress, or prolonged dry conditions may negatively affect establishment and ongoing condition ● Failure of drainage or waterproofing layers – blockages, damage, or design faults may lead to waterlogging, plant failure, or impacts on the building structure ● Colonisation by undesirable or invasive species – wind-blown weeds or invasive species may establish, reducing habitat quality and increasing maintenance requirements ● Lack of irrigation during establishment – insufficient watering during early stages may compromise establishment, particularly during dry periods ● Inadequate aftercare and monitoring – lack of routine inspections, vegetation management, or remedial works may compromise the long-term function and biodiversity value of the green roof Management Precautions Recommended by the Manufacturer Biodiverse green roofs require three maintenance visits per year. These visits should be scheduled during the spring and autumn, with an additional visit late summer when wildflowers are cut and left to dry off, and dispersed seeds ready for collection at the autumn visit. Maintenance visits should include the following tasks:
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- Identify and remove unwanted species
- Collect all leaf litter
- Remove spent flower heads from sedum and wildflowers
- Cut the wildflowers down to disperse the seeds, which will establish in the next growing season
- Autumn visit to remove unwanted species, and to remove this unwanted vegetation from the roof area
- Remove vegetation from cobble border areas to maintain fire breaks
- Ensure any walkways are kept clear of moss
- Ensure perimeter and edge trims are securely fastened and undamaged
- Checking that outlets remain clear of vegetation to enable water to drain freely
- Provide photographic report on completion of works

Irrigation is essential immediately after installing the green roof, with automated, temporary systems strongly recommended during the establishment period (especially between May and September). Biodiverse roofs require regular watering during dry spells to support germination and stop plants from drying out. A BIB tap with at least 3.6 bar pressure should be installed at roof level (one per 400m² for larger roofs), with timers set for two hours of nightly watering if automated. Manual watering should be done early morning (before 8am) or evening to reduce evaporation.

Additional Management prescriptions covering a 30-year term:

Table 3.2: Biodiverse green roof management prescriptions.

Management	When	Rationale	BNG condition criteria compliance
Vegetation will be maintained to promote a varying structure, with no specific niche forming over 80% of its area. Targeted pulling will be carried out to maintain this.	At all times	To maintain structural heterogeneity and thus maximise biodiversity value	A
A diverse range of native flowering plant species characteristic of the surrounding grassland will be maintained. Targeted pulling will take place should one species become over dominant.	At all times	To maintain biodiversity value and pollinator resources via high diversity.	B
Remove any non-native invasive species that appear.	At all times	To ensure the presence of invasive nonnative species cannot deteriorate the landscape.	C
A base substrate depth between 100mm and 150mm will be maintained.	At all times	To maintain water and nutrients required for health plant growth.	E2

	Maintenance is required twice a year to ensure drainage is cleared, plants are watered if required, and dead plants are replaced. Maintenance needs can be reduced by selecting species which self-seed prolifically and are adapted to dry environments. Acid grassland species are tolerant of drought stress and should thrive.	Twice annually	To ensure the habitat is retained in good condition.	A & B
	Access to the green roof will be prevented other than for maintenance only.	At all times	To prevent unnecessary damage and disturbance of plants and any faunal species utilising the habitat.	A & B
Rain garden	Overview: To create 0.18138ha of rain garden of moderate condition. Objectives: - To create a rain garden moderate condition by passing criterion B and C in accordance with the BNG Condition Assessment. - To create a successful and species rich rain garden, which must be maintained in full for the required 30-year term. - To provide foraging opportunities for protected and/ or notable species groups including bats. Creation Method: Ground preparation Any existing vegetation should be removed. It is recommended that the ground is dug out to a saucer shaped profile, to create a flat base for infiltration. The spoil will be placed around the margins to create a level berm or lip. The base of the excavation will be between 150mm and 450mm below the original ground level. A notch will be created in the berm, with a gravel-filled channel for the water to exit into a conventional drainage system. Organic matter will then be incorporated into the excavated soil to improve the soil structure and then the excavation will be backfilled to the original level. It is recommended that the soil is not compacted. Planting To be undertaken in spring or autumn. It is recommended that the rain garden is planted with a wide range of species in order to create a densely vegetated, stable and thriving bed with dense and thick root systems. A typical rain garden is planted with ~10 species planted in 2 to 3 clumps per square metre. Planting density is typically 6-10 plants per square metre. The perimeter berm will be seeded with general purpose wildflower grassland mix where possible, which can be left to grow, or mown as required. It is noted that most rain gardens are located adjacent to paved areas where this is not practicable. Bedding in of plants After planting, the soil will be pressed firmly around the roots.			

Management prescriptions covering a 30-year term:**Table 3.3:** Rain garden creation management prescriptions.

Management	When	Rationale
Weeding	Ongoing	This prevents un-wanted plants from competing with native, rain-tolerant plants for vital resources, ensuring the garden can effectively absorb stormwater and maintain ecological function.
Removal of debris	Annually; during winter	To maintain the gardens functionality by preventing the accumulation of debris that can hinder water infiltration and reduce plant growth.
Removal of spent flowers from perennial plants should be removed through 'deadheading'	Twice annually, late spring and in the autumn	Allows plants to place more energy into re-growth
Do not apply chemical fertilisers	At all times	The use of chemical fertilisers will encourage vigorous grasses and weeds to grow.
Watering should be undertaken after planting until the garden is established	When required; provide more water during periods of draught	Ensures plants do not dry out and subsequently fail.

Modified grassland**Overview:**

It is proposed to create 0.1296ha of modified grassland of poor condition.

Objectives:

- To create modified grassland in moderate condition by passing condition criterion C, F & G (as a minimum) in accordance with the

	Grassland – Low distinctiveness Habitat Type Condition Sheet and BNG Assessment. - To create grassland that will be suitable for amenity purposes whilst also providing pollination, foraging, and commuting opportunities for protected and/ or notable species groups, including badgers, herptiles, hedgehogs, invertebrates, bats, and birds. - To undertake landscaping works in compliance with BS 4428:1989 – The Code of Practice for General Landscape Operation. Creation Method: Ground preparation A soft strip of the current base substrate must be undertaken in the first instance and removed from the area to provide bare soil suitable for sowing the seed mix. The bare soil will be subject to light rolling or trampling to provide a firm base prior to seeding Seeding To be undertaken in the spring between April and May or in the Autumn between September and October. The following seed rates are recommended: 40kg/ha or 4g/m² Proposed seed mix: It is proposed to seed the grassland with Emorsgate EM2 General Purpose Meadow Mixture or similar alternative approved brand and seed mix. This seed mix contains 5no. grass species and 15no. wildflower species. The mixture contains no dominant grass species. Due to this diversity and absence of dominant species, the number of grass and wildflower species present per m² is increased; it is therefore considered reasonable to assume a species diversity of 6-8 species per m². For exact specifications, please refer to: https://wildseed.co.uk/about-us/. Enhancement Method: Seeding To be undertaken in the spring between April and May or in the Autumn between September and October. The following seed rates are recommended: 40kg/ha or 4g/m² Proposed seed mix: It is proposed to seed the grassland with Emorsgate EM2 General Purpose Meadow Mixture or similar alternative approved brand and seed mix. This seed mix contains 5no. grass species and 15no. wildflower species. The mixture contains no dominant grass species. This seed mix contains 5no. grass species and 15no. wildflower species. The mixture contains no dominant grass species. Due to this diversity and absence of dominant species, the number of grass and wildflower species present per m² is increased; it is therefore considered reasonable to assume a species diversity of 6-8 species per m². For exact specifications, please refer to: https://wildseed.co.uk/about-us/.
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Risks:

- Poor establishment – unsuitable soil conditions, drought, waterlogging, or inappropriate seed mix may result in poor germination and establishment
- Dominance of undesirable or competitive species – aggressive grasses or ruderal species may outcompete target species, reducing botanical diversity
- Colonisation by invasive or problem species – invasive non-native or undesirable species may establish following soil disturbance, reducing habitat condition by failing criterion G
- Extreme weather – prolonged drought, heavy rainfall, flooding, or unseasonal weather may negatively affect the establishment and ongoing condition of the grassland
- Damage from public access or site operations – trampling, vehicle movements, or machinery may cause soil compaction or localised damage to the sward
- Inadequate aftercare and monitoring – lack of appropriate management, monitoring, or remedial action may compromise the long-term success of the grassland.

Management prescriptions covering a 30-year term:**Table 3.4:** *Modified Grassland management prescriptions.*

Management	When	Rationale	BNG condition criteria compliance
Cut monthly during the growing season	Between April and October. Cutting frequency may be adjusted following monitoring, where required to achieve the target condition.	Cutting monthly will allow a neat and tidy appearance whilst allowing more species to effectively colonise.	A, C, F, & G.
Turn and dry the cut grass over 3-5 days before removing arisings off-site	Following cuts in May and September.	This allows any seeds present to drop, encouraging species diversity and invertebrates to relocate unharmed.	A.
Do not apply chemical fertilisers	At all times.	The use of chemical fertilisers will encourage vigorous grasses and weeds to grow or cause	D & E.

	large areas of bare ground due to inhospitable growing conditions.
Tree planting	Retained trees summary: Retained trees do not require specialist management and should be monitored. If they fail to pass criteria previously observed, specialist tree surgeons should be contacted for advice on maintenance and tree management. Overview: It is proposed to retain 1.7865ha of moderate condition, as well as create 0.6962ha of individual trees in moderate condition. Objectives: - To plant individual trees in moderate condition by passing condition criterion A, B,D & F (as a minimum) in accordance with the Individual Trees Habitat Type Condition Sheet and BNG Assessment. - To plant trees that will provide pollinating, foraging, and refuge opportunities for protected and/ or notable species groups, including invertebrates, bats, and birds. Tree planting Creation Method: Ground preparation and planting The locations for tree planting will be cleared and reduced to compacted permeable bare ground in preparation for planting. Planting substrate must comprise site-won material with any deficiencies made up of imported topsoil compliant with BS 3883:2015. Each tree will be pit planted upright within the centre in accordance with BS 4428:1989, within a hole at least 500mm greater than the root system when fully spread and at a depth 250mm greater than the root system. Root balls will be soaked thoroughly in water and loosened to expose restricted roots before planting. The planted trees will then be backfilled, ensuring there are no air pockets around roots or any roots protruding out of the ground. Timing The land will be prepared during the summer, ready for planting between November and March. Planting trees before the new year helps ensure better rooting and subsequent establishment, including faster growth during the first growing season. Species A large proportion of trees included in the proposed tree planting species palette are native. Not all trees are native, owing to the urban nature of the location and development which will be subject to unnatural temperature fluctuations, the balance of non-native and native trees is considered acceptable.

Risks:

- Tree failure and/or poor establishment - poor stock quality, drought stress, or unsuitable soil conditions may lead to mortality
- Damage from pests, diseases, or vandalism - disease and vandalism can reduce survival rates
- Inappropriate species selection - trees not suited to local soil, hydrology, climate, or landscape context may fail or cause long-term management issues.
- Extreme weather - drought, flooding, high winds, or frost can negatively affect the establishment of young trees
- Damage during maintenance – mowing and strimming may damage stems or roots
- Inadequate aftercare and monitoring - lack of watering, inspections, or replacement planting may compromise the long-term success of trees.

Management prescriptions covering a 30-year term:**Table 3.5:** New tree planting management prescriptions.

Management	When	Rationale	BNG condition criteria compliance
Prepare planting area in summer, in preparation for autumn/ winter planting.	Year 1 – June/ July/ August	To ensure the ground is dry and workable.	N/A
Plant native trees only within prepped areas in Autumn, whereby the canopy oversails the vegetation	Year 1 – September/ October/ November	To ensure trees take root and establish prior to the first growing phase, the following spring.	A & F
Standard trees will be staked and tied using a 75mm diameter stake with the bark removed. The stakes will be long enough to allow for 600mm of the stake to be driven into each pit. Stakes will be fitted prior to tree planting to prevent root	Year 1 – Immediately prior to planting.	Protect roots from damage.	B & D

	damage.			
	Ensure the stakes and ties are not restricting growth and are not damaged. Replace where necessary.	Year 2 onwards – Checked annually for the first 5 years.	Ensure growth isn't stunted.	B & D
	Remove stakes and ties.	Year 5 in Spring – April/ May	Allow trees to grow unperturbed once established.	B & D
	Removal of spent flowers is to be done through 'deadheading'	Years 1 – 5 - Twice annually, late spring and in the Autumn.	Allows trees to place more energy into re-growth.	B & D
	At the end of each growing season, all plant failures are to be 100% replaced	Year 2 onwards - Checked annually for the 30-year term after each growing season in Autumn.	To ensure the success of planted trees.	B & D
	Remove weeds	Year 2 onwards - Checked annually for the 30-year term after each growing season in Autumn.	Reduce competition for resources.	B & D
	Application of bark mulch at a depth of 50 mm	Year 2 onwards - Checked annually for the 30-year term after each growing season in Autumn.	Reduce competition for resources.	B & D
	Do not apply chemical fertilisers	At all times.	The use of chemical fertilisers will encourage vigorous grasses and weeds to grow	D
	Watering should be undertaken before and after planting out, and as necessary for the continued thriving of all planting.	Annually - for the 30-year term, when required following prolonged periods of drought.	Ensures plants do not dry out and subsequently fail.	B
	Undertake any pruning requirements outside of the nesting	At all times.	Ensure no active bird nests are impacted by maintenance	E

	bird season, which is between March and September inclusive.	works.
Native hedgerow	Overview It is proposed to retain 0.152km of native hedgerows and 0.055km of non-native hedgerow and create 0.281km of native hedgerows in moderate condition. Objectives - To maintain the existing moderate condition of retained native hedgerow by passing condition criteria A1, B1, C1, C2, & D1 (as a minimum) in accordance with the Hedgerows Habitat Type Condition Sheet and BNG Assessment. - To achieve a moderate condition for newly planted native hedgerows by passing condition criteria A1, B1, C1, C2, & D1 (as a minimum) in accordance with the Hedgerows Habitat Type Condition Sheet and BNG Assessment. - To create hedgerows that will provide pollinating, foraging, commuting, and refuge opportunities for protected and/ or notable species groups, including badgers, hedgehogs, herptiles, invertebrates, bats, and birds. - To undertake landscaping works in compliance with BS 4428:1989 – The Code of Practice for General Landscape Operation. Creation Method: Ground preparation Prepare the ground by digging over a strip approximately 60-90cm (2-3ft) wide and one spit (or spade blade) deep. Soils that become waterlogged in winter may require a permanent drainage system. Alternatively, form the soil into a ridge about 15-20cm (6-8in) high and 50-70cm (20-28in) across to plant into. Planting Plants should be positioned set back from hardscape boundaries to allow space for the hedgerow to develop and mature prior to requiring any significant management/ cutting back. Plant density should focus on achieving a hedgerow width >1m; as such, plants should be planted in a staggered double row approximately 45-60cm apart, where individual plants are planted 90cm apart within each row. Timing It is best to prepare the land during the summer ready for planting between November and March. Planting before the new year helps ensure better rooting and subsequent establishment including faster growth. Risks:	

- Poor establishment and/or plant failure – poor stock quality, unsuitable soil conditions, drought, waterlogging, or planting at an inappropriate time of year may result in high mortality
- Damage from pests, disease, or browsing – rabbits, deer, livestock, pests, or plant diseases may damage young plants and reduce establishment success
- Competition from weeds and grasses – excessive weed growth may suppress young hedgerow plants and slow establishment
- Damage during maintenance operations – strimming, mowing, or use of machinery may damage young plants or root systems
- Extreme weather – drought, frost, flooding, or prolonged wet conditions may negatively affect establishment and early growth
- Failure of protective measures – absence or failure of guards, fencing, or mulching may increase risk of damage from browsing, desiccation, or vandalism
- Inadequate aftercare and monitoring – lack of watering, weed control, replacement planting, or monitoring may compromise the long-term success and structure of the hedgerow.

Management prescriptions covering a 30-year term:

Table 3.6: *Hedgerow management prescriptions.*

Management	When	Rationale	BNG condition criteria compliance
At the end of each growing season, all plant failures are to be 100% replaced	When required - checked annually in Autumn.	To maintain amenity and wildlife value.	B1 & B2
If required, provision of stakes and guards. Guards to be left on for a minimum of 5 years	N/A	Protect from damage	A1 & A2
Stakes should be checked, and any broken or damaged stakes during this time would be removed (as above) and replaced with ties re-fixed	When required - checked annually in Autumn.	Maintain protection	D2
Remove weeds	When required - checked twice annually in early spring and in Autumn.	Reduce competition for resources and nutrients, etc., by weeds	D1

	Application of bark mulch at a depth of 50 mm	Immediately after planting and then when required, checked annually in Autumn.	Reduce competition for resources and nutrients, etc., by weeds	D1
	Do not apply chemical fertilisers	At all times.	The use of chemical fertilisers will encourage vigorous grasses and weeds to grow	C2
	Apply a light dressing of well-rotted manure	Annually in the winter	Note that the overuse of manure fertilisers will encourage vigorous grasses and weeds to grow.	A1 & A2
	Watering should be undertaken before and after planting out, and as necessary for the continued thriving of all planting.	When required - provide more water during periods of drought and less water during times of prolonged rain.	Ensures plants do not dry out and subsequently fail.	A1, A2, B1, & B2
	Check and replace any plant failures once a year	For the first 5 years	To ensure no gaps form.	A1, A2, B1, & B2
	Once the hedgerow reaches an average height of 1.5m or above along the hedgerow length, this height or above must be retained.	To be checked annually once the hedgerow reaches 1.5m in height.	To ensure the hedgerow is not maintained at a low level of value to biodiversity.	A1
	Once the hedgerow reaches an average width of 1.5m or above along the hedgerow length, this width or above must be retained.	To be checked annually once the hedgerow reaches 1.5m in width.	To ensure the hedgerow is not maintained at a thin density of worse value to biodiversity.	A2
	A minimum 1m strip of natural vegetation will be maintained on either side of the hedgerow base.	At all times.	To maintain a valuable ground flora.	C1
Mixed scrub enhancement from bramble scrub	Overview It is proposed to enhance 0.02224ha of bramble scrub to mixed scrub in moderate condition.			

	Objectives - To create mixed scrub in moderate condition by passing condition criterion A, C, and D (as a minimum) in accordance with the Scrub Habitat Type Condition Sheet. - To plant mixed scrub that will provide foraging and refuge opportunities for protected and/ or notable species, including invertebrates, nesting birds and hedgehogs. Mixed Scrub Creation Method Ground preparation and planting Bramble scrub present will be thinned and removed to create space for new shrub planting. Shrubs will be planted in holes three times the width of their supplied pots and of a similar depth. Before planting, root balls will be thoroughly soaked in water and gently loosened to free any restricted roots. Once positioned, the shrubs will be backfilled carefully, ensuring that no air pockets remain around the roots and that no roots are left exposed above ground. To create a natural vegetation structure, shrubs will be planted in small, single-species clumps rather than in rows, preventing the formation of wind tunnels. Plants will be in groups of three, at a density of 3 plants per m2. Irregular spacing will be used to encourage natural infill and promote biodiversity. Timing It is best to prepare the land during the summer, ready for planting between November and March. Planting trees and shrubs before the new year helps ensure better rooting and subsequent establishment, including faster growth during the first growing season. Species All shrub species will be native, and a mixture of species will be planted to prevent one species from dominating. Suitable species include Blackthorn (<i>Prunus spinosa</i>), Hawthorn (<i>Crataegus monogyna</i>), Hazel (<i>Prunus spinosa</i>), Goat willow (<i>Prunus spinosa</i>) and Buckthorn (<i>Prunus spinosa</i>). Ornamental species such as laurel, rhododendron and non-native cotoneasters listed on the schedule 9 invasive species list must be avoided. Risks: - Poor establishment and/or plant failure – unsuitable soil conditions, poor-quality planting stock, drought, waterlogging, or inappropriate planting may lead to high mortality - Inappropriate species selection – species not suited to local soil, hydrology, climate, or site conditions may fail to establish or reduce habitat diversity
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- Damage from pests, disease, or browsing – rabbits, deer, livestock, or plant diseases may damage young shrubs and reduce establishment success
- Competition from grasses or weeds – aggressive grasses, ruderal, or invasive species may suppress shrub growth and reduce biodiversity value
- Damage during site operations – mowing, strimming, or machinery may damage plants or disturb soil, impacting establishment
- Extreme weather – drought, flooding, frost, or high winds may negatively affect establishment and early growth
- Failure of protective measures – absence or failure of guards, fencing, or mulching may increase risk of browsing, desiccation, or vandalism
- Inadequate aftercare and monitoring – lack of inspections, replacement planting, or adaptive management may compromise long-term scrub structure and ecological function

Management prescriptions for new shrubs covering a 30-year term:

Table 3.7: New scrub management prescriptions.

Management	When	Rationale	BNG condition criteria compliance
Plant native whips between November and March.	Year 1	Planting should be carried out between November and March. Specimens should be spaced approximately 1.5m apart	A
If required, provision of stakes and biodegradable guards. Guards to be left on for a minimum of 5 years	Year 1 - 5	To protect young establishing shrubs from damage	A & B
Stakes will be checked, and any broken or damaged stakes will be removed and replaced where necessary	When required -checked annually in Autumn	To maintain the protection of shrubs	A & B
Watering will be undertaken before and after planting out, and as necessary for the continued thriving of all planting.	When required. Provide more water during periods of drought and less water during times of prolonged rain	Ensures plants do not dry out and subsequently fail	A, B & C

	Annually, prune scrub species until they are established	Year 3+	To prevent woodiness, remove dead branches, and promote a dense, bushy structure	A
	Remove weeds	Year 1+. Checked twice annually in early spring and in Autumn, and treatment applied when required	Reduce competition for resources and nutrients, etc., by weeds	C
	Do not apply chemical fertilisers	At all times.	The use of chemical fertilisers will encourage vigorous grasses and weeds to grow	C
	Apply a light dressing of well-rotted manure	Annually in the winter	Note that the overuse of manure fertilisers will encourage vigorous grasses and weeds to grow	C
	Rotational coppicing of the scrub, whereby a separate 20% section of the scrub is cut to ground level each year	Year 3+. Annually in the early spring.	To promote the diversification of age classes and create open glades	B & E
	At the end of each growing season, all plant failures are to be 100% replaced	When required - checked annually in Autumn	To maintain amenity and wildlife value	A & B

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Appendix 1: Proposed Development Plan

11.14 BNG Strategy

The site is viewed as a multi-layered mosaic of habitats which will be comprised of retained existing and enhanced habitats, and additional new habitat types which will contribute to an overall increase in habitat diversity on the site. Alongside offsite mitigation, these sitewide proposals achieve 10% biodiversity net gain.

As shown in the plan opposite, there are a range of new habitat types proposed on site, which will benefit a wide variety of species as well as people and the wider urban environment in Huyton. In addition to the retention of mixed scrub, trees and hedgerow, new trees and hedgerows will be introduced to partially mitigate the loss of those removed due to proposed building works. In addition, a mix of wildflower meadows, modified grassland, shrub planting, SuDS rain garden planting and green roofs are proposed.

- Legend
- Phase 1 boundary
 - Outline application boundary
 - Retained urban trees
 - New urban trees
 - Retained hedgerow
 - New native hedgerow
 - Wildflower meadow
 - Shrubs
 - Modified grassland
 - Mixed scrub
 - SuDS Rain Gardens
 - Green roof



Figure 11.14: BNG Strategy

Appendix 2: Site Location Plan



Appendix 3: Post Development Habitat Plan

