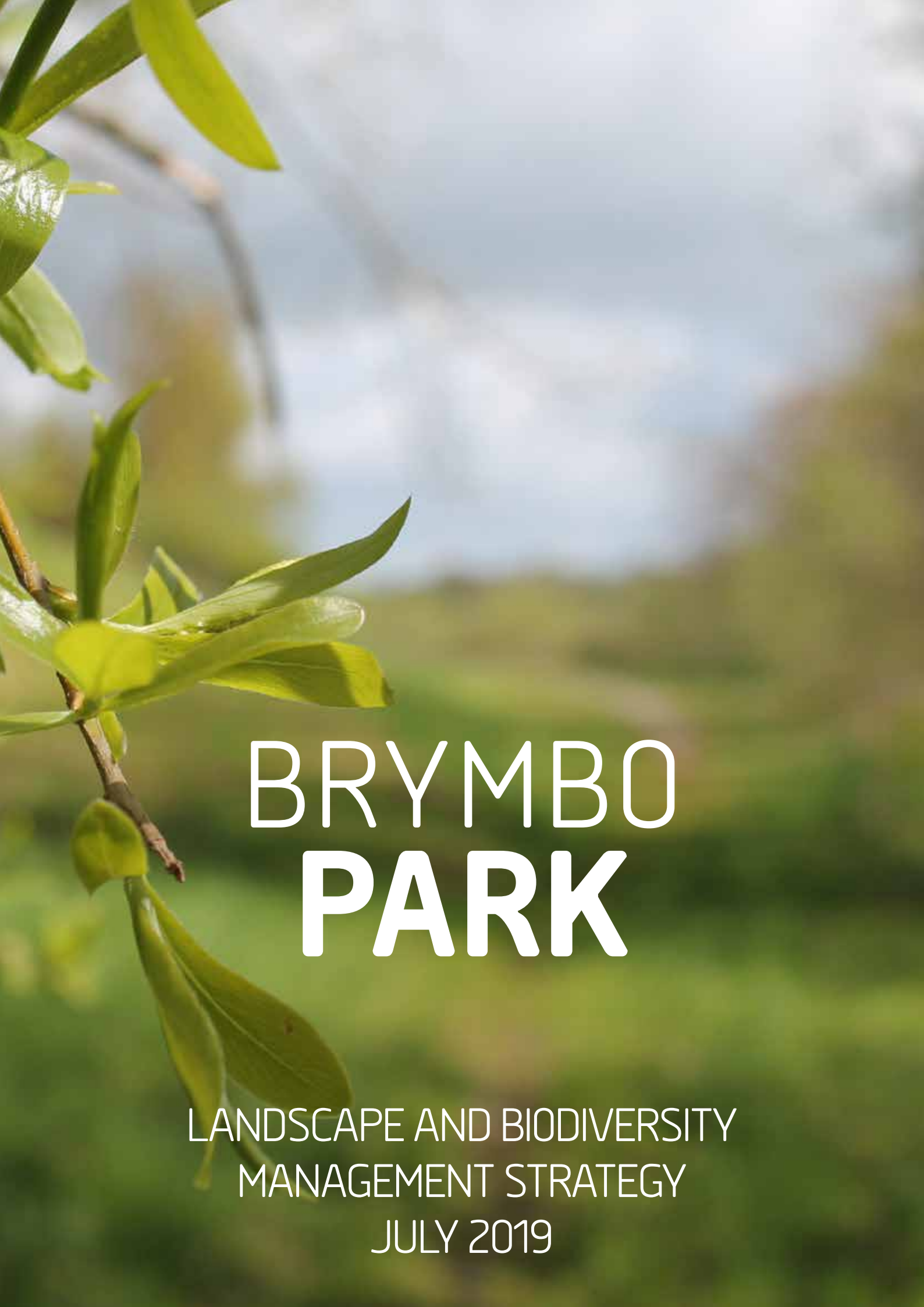




BRYMBO **PARK**

LANDSCAPE AND BIODIVERSITY
MANAGEMENT STRATEGY
JULY 2019

Brymbo Former Steelworks, Wrexham: Landscape and Biodiversity Management Strategy

Prepared on behalf of Parkhill EstatesLtd and Notcutts Garden Centres Ltd

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ILLUSTRATIVE MATERIAL

Figure 1: Landscape and Biodiversity Management Strategy Plan

APPENDIX

Appendix 1: Phase 1 Habitat Map

1.0 INTRODUCTION

- 1.1 This Landscape and Biodiversity Management Strategy (LBMS) has been prepared Barton Willmore Landscape Planning and Design (BWLPD) to provide a long-term landscape management and maintenance strategy for the implementation and long-term after-care of the landscape components of a residential led, mixed-use development with associated infrastructure and open space (the 'Proposed Development') on land at the Brymbo Former Steelworks, Wrexham, (the 'Site').
- 1.2 The LBMS is intended to satisfy the intent of Regulation 37 of the Conservation (Natural Habitats, &c.) Regulations 1994 which seeks the implementation of planning policies which encourage landscape management.
- 1.3 In the production of this strategy, reference is made to the Preliminary Ecological Appraisal produced by Wardell Armstrong¹, to ensure appropriate reference to existing species and habitats has been included.
- 1.4 In addition, reference has been made to the Natural Environment and Rural Communities (NERC) Act 2006, Section 41 Species and Habitats of Principal Importance. UK BAP priority habitats and species are no longer accountable at a UK level following publication of the Natural Environment White Paper in 2011. However, the Biodiversity 2020 strategy (which succeeds the UK BAP in England) aims to achieve protection and enhancement of priority species and habitats (now referred to as species and habitats of principal importance) listed under Section 41 of the NERC Act.

¹ Wardell Armstrong (January 2019), Preliminary Ecological Appraisal, Former Brymbo Steelworks. Initial site visit August 2017.

2.0 SCOPE

- 2.1 The overall aim of the LBMS is to promote a sensitive management approach, which protects, manages and enhances the Site for the benefit of the users; the features and character of the Site and views towards it; and biodiversity.
- 2.2 This document provides a strategy for overall management and maintenance of the landscape features of the Proposed Development, including existing features, hard and soft landscape proposals and newly-created habitats including trees, hedges, shrubs, biodiverse SuDS and pond features and amenity and wildflower grassland.
- 2.3 The LBMS has been prepared to provide an integrated approach to the management of the landscape, ecology and amenities associated with the Proposed Development. It is a dynamic document that should be renewed on a regular basis and amended as circumstances change with the evolving development of the Site.
- 2.4 This LBMS has been prepared to guide the management of landscape components on the basis of a series of Landscape and Biodiversity Management Zones. **Figure 1: Landscape and Biodiversity Management Strategy Plan** illustrates these zones in the context of the layout of the Proposed Development.

Document Structure

- 2.5 Section 3 describes the existing fauna and flora present in and around the Site, including key species. Section 4 sets out the vision, aims and objectives for the LBMS, and Section 5 describes the Landscape Management Components and their associated maintenance tasks. Sections 6 and 7 describe the general maintenance and management tasks and set these tasks out in an annual maintenance schedule.

3.0 EXISTING LANDSCAPE

- 3.1 The Site has an area of approximately 32.59 hectares and is located 4.6km to the north-west of Wrexham in a landscape strongly influenced by existing settlements including Coedpoeth and Gwersylt, approximately 1.8km south-east and 1.6km east of the Site respectively.
- 3.2 More locally, the Site lies immediately to the south of the existing settlement of Brymbo and the remaining structures of the former Brymbo Steelworks, and approximately 700m to the north of Tanyfron. Extensive areas of recently constructed housing are notable features in the landscape to the south of the Site, as is a substantial existing electrical substation located adjacent to the western site boundary.
- 3.3 The Site is located on the east facing slopes of a broad elevated foothill which rises to 275m AOD, approximately 500m north-west of the site boundary. Further west, levels briefly dip and then rise again to approximately 360m AOD in the western extent of the study area. The landscape in this vicinity is marked by a series of increasingly elevated hills, ridges and mountains, most notably including Esclusham Mountain, which peaks at 457m AOD, approximately 4.1km south-west of the Site.
- 3.4 The vegetation pattern within the wider rural landscape of the study area is primarily characterised by networks of hedgerows with numerous canopy trees, enclosing a patchwork of large to medium-sized agricultural fields. Robust linear belts of woodland reinforce the topography, extending along valley floors, enclosing river corridors and flanking ridgelines in the local area.
- 3.5 Further to the west the landscape of the higher ground of the Clwydian Range is characterised by open heaths on the exposed mountain tops and extensive areas of woodland, often plantation, covering the sheltered slopes.
- 3.6 Locally, existing vegetation is most notable within the ravine to the north of the Site, following steep sloping ground within Brymbo and encompassing the north-western edge of the Site. There are also substantial stands of semi-mature trees on the sloping ground immediately to the east of the Site.

Nature Conservation Designations

- 3.7 The Wardell Armstrong report states that there is one statutory designated site and 14 non-statutory designated sites within 2km of the Site, the closest being Coedwig Ffossil Brymbo Fossil Forest SSSI, designated for geological value rather than nature conservation. One Local Wildlife Site (LWS); Brymbo Pony Fields Wildlife Site, is located 150m east of the Site however, there are no shared ecological receptors between the LWS and the Site. The other 13 LWS

sites were considered at such a distance and lacking ecological connections from the Site as to not be affected by the Proposed Development.

Habitat

3.8 In relation to impacts on existing habitats, the Wardell Armstrong Report indicates that; *"The hedgerows and strips of plantation woodland within Ty Cerrig should be retained, as far as possible, within development proposals, particularly the species-rich lengths of hedgerows. Where small lengths need to be removed for access, compensatory lengths should be provided elsewhere within the Site, composed of native species that occur naturally in the local area"* (p.19).

3.9 The following habitat types have been recorded on the Site:

- Arable grassland
- Ephemeral/Short perennial grassland;
- Hedgerows (species rich and species poor);
- Vegetated field boundaries including tall ruderal, dense and scattered scrub and bracken;
- Dense and scattered scrub;
- Mixed plantation woodland;
- Broadleaf plantation woodland;
- Bare ground;
- Dry ditch; and
- Buildings (sub-stations).

3.10 Information relating to the characteristics and habitat value of features within the Site has been extracted from the Wardell Armstrong Report and the locations of recorded habitats are included on the Phase 1 Habitat Survey Plan (**Appendix 1**). The contribution of these features to landscape character and visual amenity are provided in the BWLPD Landscape and Visual Impact Assessment which accompanies this application.

3.11 The following headings summarise the Wardell Armstrong Report covering the implications on habitats and species identified on Site:

Arable grassland

3.12 Found within the western Ty-Cerrig area of the Site and dominated by perennial rye-grass. Habitat considered to be common and of low ecological importance thus not a constraint to development.

Ephemeral/Short perennial grassland

- 3.13 Found along the eastern plateau within the Site with a mixture of coltsfoot, fine grasses and herbs. Habitat lacks floral diversity and characteristic species assemblages thus is not considered a constraint to development.

Hedgerows (species rich and species poor)

- 3.14 Three species rich hedgerows and four species poor hedgerows were recorded within the Site and are identified on the Phase 1 Habitat Survey Plan. All native hedgerows are considered priority habitats.

Vegetated field boundaries including tall ruderal, dense and scattered scrub and bracken

- 3.15 The existing field boundaries on Ty-Cerrig within the western part of the were found to be bordered by a mixture of tall ruderal, bracken and scattered and dense scrub. Habitat is commonly found and of low ecological value thus not a constraint to development.

Dense and scattered scrub

- 3.16 Several areas located within western and central areas of the Site mainly comprised goat willow and gorse. Habitat is commonly found and of low ecological value thus not a constraint to development.

Mixed plantation woodland

- 3.17 Several blocks of mixed plantation woodland found within Site. The report considers that although this is not a priority habitat the mixed plantation contributes to the overall ecological value of the Site.

Broadleaf plantation woodland

- 3.18 Several blocks of broadleaf plantation woodland were found within Site. The report considers that although this is not a priority habitat the broadleaf plantation contributes to the overall ecological value of the Site.

Bare ground

- 3.19 Found near the listed buildings off Phoenix Drive and of no ecological value.

Dry ditch

- 3.20 Three ditches were recorded on the Site with one demonstrating evidence of water retention and young tree species to the ditch bank. Habitat commonly found and not considered a constraint to development.

Protected and Invasive Species

- 3.21 The Wardell Armstrong report notes that Japanese Knotweed (*Fallopia japonica*), which is listed within the Schedule 9 of the Wildlife and Countryside Act (1981) (as amended) was encountered within the northern area of the Site.

Reptiles

- 3.22 Habitats on the Site suitable for supporting low numbers of reptiles were found. However, much of the eastern area of the Site has undergone historic disturbance and the western area at Ty-Cerrig lacks structural diversity. No ecological record for reptiles returned on the Site.

Great Crested Newt

- 3.23 Records of GCNs adjacent to the Site and a previous translocation undertaken for land in the eastern area of the Site were recorded.

Badgers

- 3.24 Limited evidence of badger activity on Site, however a comprehensive badger was not undertaken.

Bats

- 3.25 No trees with bat roosting potential were recorded on Site. Habitats on the Site are suitable for bat foraging and commuting.

Hazel dormice

- 3.26 The Site is not considered to have suitable habitat to support dormice.

Birds

- 3.27 Habitats on the Site are suitable to support a variety of protected bird species.

4.0 VISION, AIMS AND OBJECTIVES

Vision

- 4.1 The landscape strategy seeks to provide an appropriate landscape setting for the Proposed Development which offers the opportunity to retain, enhance and create a variety of landscape features in association with the proposed built elements. These will promote accessibility, legibility and a strong setting and sense of place for the Proposed Development as well as complementing local landscape character and providing opportunities for the enhancement of biodiversity.
- 4.2 The delivery of the LBMS can be expressed by a clear and simple vision, which has been set out below:

"To promote the Proposed Development as an attractive and sustainable environment with strong sense of place, which positively contributes to the character of Brymbo, landscape and visual amenity value, enhances biodiversity and nature conservation, incorporates sustainable drainage, and assimilates into the existing landscape setting within a framework of significant Green Infrastructure."

Aims and Objectives

- 4.3 To achieve this vision, the key overarching aims and objectives of the LBMS are set out below:

Aim 1: To create a high-quality landscape setting to the Proposed Development

Objectives:

- Ensure new planting is healthy and of good form;
- Ensure pedestrian routes remain clear and accessible;
- Provide safe and legible channels for cycle and vehicle movement; and
- Maintain high quality surfacing for all new pedestrian, cycle and vehicle surfaces.

Aim 2: To retain and enhance existing features

Objectives:

- Secure the current value of existing landscape features to be retained; and
- Enhance those features that have the potential for improvement.

Aim 3: To enhance biodiversity and ecological value

Objectives:

- Secure a healthy structure for hedgerow and tree belts and encourage native ground flora development at the expense of introduced species;
- Extend and link the habitat areas of hedgerow and tree belts within and adjacent to the Site;
- Create a species diverse mix of seasonally wet meadow planting in association with swales and habitat ponds; and
- Provide additional foraging and shelter for local wildlife.

Aim 4: To enhance attractiveness and sense of place of the landscape setting to the Proposed Development

Objectives:

- Enhance species composition with appropriate wildflowers;
- Create and maintain robust structural elements creating enclosure, including hedgerow and trees;
- Provide transitional habitat from mown grassland to meadow, hedgerow and trees;
- Enhance visual amenity by providing more diversity in terms of type and structure of the vegetation; and
- Specify locally characteristic species.

Aim 5: To soften and integrate the Proposed Development within the surrounding landscape

Objectives:

- Maintain and enhance the healthy growth and the landscape and visual amenity value of trees, shrub and hedgerows; and
- Enhance and reinforce structural landscape features and habitats which contribute towards a larger framework of Green Infrastructure throughout the proposed development.

5.0 LANDSCAPE MAINTENANCE COMPONENTS

Landscape Maintenance Component Definition

- 5.1 Critical to the management process is the identification of a series of Landscape Maintenance Components. These are habitat and vegetative features with defined characteristics and qualities for which there are related user expectations, and which require distinct maintenance guidance.
- 5.2 The landscape features of the Proposed Development have been categorised into a number of different Landscape Maintenance Components, illustrated on **Figure 1: Landscape and Biodiversity Management Strategy Plan**. To achieve the overarching objectives for the LBMS, maintenance recommendations and tasks have been identified for each Landscape Maintenance Component.

Landscape Maintenance Components

- 5.3 The Landscape Maintenance Components are outlined as follows:
- Component 1: Native and Ornamental Trees;
 - Component 2: Hedgerows;
 - Component 3: Native Shrubs and Woodland Understorey;
 - Component 4: Ornamental Shrubs and Hedges;
 - Component 5: Wildflower Meadow Planting (including seasonally wet);
 - Component 6: Ponds and Marginal Aquatic Vegetation;
 - Component 7: Amenity Grassland; and
 - Component 8: Hard Surfaces and External Furniture.

Component 1: Native and Ornamental Trees

- 5.4 Good quality trees within the Site will be retained and managed as part of a network of structural vegetation connecting into wider Green Infrastructure to retain and enhance the important screening function, and to deliver enhancements to bird and bat habitat. Works will ensure reasonable safety precautions are taken to provide an acceptable level of risk to people or property. Some tree loss will be required within the proposed development footprint and its periphery, due to the route of proposed access routes, and for safety reasons. However good quality trees should be retained where possible, especially those assigned BS Category B within the Tree Survey undertaken by Wardell Armstrong November 2018, and replacement tree planting undertaken following works or within alternative areas of Green Infrastructure. Tree Preservation Order No. 184, 1996 protects the surveyed tree T23 and tree group G11 are protected by the TPO woodland designation W3. Parts of the surveyed woodlands W4 and W5

are protected by TPO designated woodland W4 and surveyed woodland W3 is protected by the TPO designated woodland W3. No veteran trees were identified on or adjacent to the Site. Furthermore, Natural Resources Wales is due to remove the area listed on site from the Ancient Woodland Inventory.

- 5.5 New tree planting is proposed throughout the development, including planting of street trees, specimen trees in open spaces and indigenous trees as linear belts of structural boundary planting. To the western boundary of Ty-Cerrig, larger tree stock is to be planted to provide an visual barrier effective in the short-term, and lessen the perceived massing of built form within Ty-Cerrig. Existing retained and proposed trees provide opportunities to enhance biodiversity as part of a mosaic of habitats and provide structural diversity, complementing the existing pattern of vegetation surrounding the Site. They will contribute to the visual amenity of the landscape by defining street patterns and hierarchy, by providing a vertical landscape structure to the development and by softening views towards proposed built form. It is also anticipated that, ultimately, they will provide bats and birds with additional foraging and movement opportunities across the Site. Tree species to be planted could include common oak, field maple, common alder, silver birch, hazel and goat willow.

Maintenance Recommendations

- 5.6 All tree works and their management are to be agreed with the Local Authority. Any specified tree surgery works will be carried out in accordance with BS 3998: 2010 'Tree Works – Recommendations', Health & Safety legislation and relevant best practice. Prior to the commencement of works the Contractor shall provide valid proof of the required Public Liability Insurance and a full working method statement and risk assessment.
- 5.7 The retention of mature trees will be secured by the continued application of "minimal safety management" rules. If possible, works should be undertaken outside the birds nesting season (nesting season – late February to end of August). If this is not possible, appropriate checks by a qualified ecologist should be undertaken and, if occupied nests are identified or suspected, works will need to be delayed until nestlings have fledged. If necessary, further surveys should be carried out and appropriate licenses obtained to ensure legal compliance and/or secure appropriate or necessary mitigation.
- 5.8 New planting is to be in accordance with BS 4428:1989. Structural tree planting is to be planted in autumn-spring to minimise risk of plant failure and encourage strong, healthy growth. All other tree planting, including specimen and street trees, will be planted in pits 100mm wider and deeper than root spread, backfilled with soil mixed with a slow release fertiliser. Stakes, ties and guards are to be fitted to protect new trees from damage.

- 5.9 Larger tree stock within the western area of Ty-Cerrig is to be 400-450cm high, heavy standard specimens, root ball transplants pit planted, 200cm minimum clear stem, planted in autumn-spring to minimise risk of plant failure and encourage strong, healthy growth. All specimen tree planting will be planted in pits 100mm wider and deeper than root spread, backfilled with topsoil mixed with a slow release fertiliser. Stakes and ties are to be fitted to protect new trees from damage along with spiral guards to limit damage from animal activity and maintenance operations whilst trees establish.
- 5.10 All staked trees shall be inspected on each maintenance visit, and any trees that have died or have suffered physical damage, such that they no longer provide any useful landscape function, shall be removed from site, complete with the stake, and reinstated.
- 5.11 Any trees which have failed during the maintenance period shall be replaced by the contractor at his own expense during the next planting season. Where the operations manager has agreed that plant deaths have arisen due to circumstances out of the control of the contractor, replacement planting shall be instructed by the operations manager and paid for at an agreed rate.
- 5.12 Any dead, diseased or damaged branches shall be pruned back to the main stem or suitable side shoot or removed.
- 5.13 Mulched areas around trees shall be maintained.
- 5.14 At the beginning and end of each growing season all stakes ties and guying systems shall be inspected. Any looseness, constriction or abrasion shall be corrected by adjustment or replacement as required. Where the support of a stake is no longer required the stake shall be removed from site.
- 5.15 Watering is to be undertaken as necessary to allow healthy establishment of plants.
- 5.16 A visual inspection of retained individual trees shall be carried out at every visit. Any damaged, diseased or dangerous timber shall be reported to the operations manager, for an application to be made to the Local Planning Authority under the Town & Country Planning (Trees) Regulations 1999 if it is considered hazardous to public use of the area.
- 5.17 Specific management is required for street trees to maintain a clear stem and prevent the canopies from causing an obstruction to properties, pedestrians or vehicles.

Table 5.1: Summary of Maintenance Tasks – Existing Trees

Task:	Frequency / Timing
Safety inspections and report on condition of trees by arboricultural advisor.	Once a year
Works recommended following inspection. Typically include the removal of fallen, diseased, dead, dying or dangerous trees and damaged or crossing branches.	As recommended by annual inspection
Remove timber and arisings from safety and regenerative work and use to create deadwood habitat and refugia in local areas.	Immediately following works

Table 5.2: Summary of Maintenance Tasks – Proposed Trees

Task:	Frequency / Timing
Maintenance of a 1m weed-free area to the base of each tree for five years – this can be achieved through the application of a 5-7.5 cm mulch in this area.	Once or twice a year and as required
Maintenance of rabbit guards and other forms of protection.	As required, following monthly inspection
Maintenance of stakes and ties, including loosening as necessary.	As required, following monthly inspection
Maintenance of good levels of soil fertility and moisture. Irrigation may be required during dry periods. A 5-7.5 cm mulch for 1m around the base of each tree will increase retention of soil moisture.	Watering (to field capacity) min. 8 times during dry months
Treatment of pests and diseases and repair of any damage from vandalism.	As required, following monthly inspection
Check for root firmness and upright alignment of tree after high winds, frost heave and in spring and autumn until trees are wind firm.	Twice annually and as required
Formative pruning to avoid future structural problems and to remedy disease and vandalism problems.	As required following maintenance visits
Removal of guards, stakes and ties.	After 2 years, subject to inspection
Following the maintenance period, 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 plan and ensuring no hazards are present on site. Maintenance will be conducted annually by a qualified landscape contractor.	Annually

Table 5.3: Summary of Maintenance Tasks – Street Trees

Task:	Frequency / Timing
Create clear stem to street trees, removing epicormic growth and suckers.	As required
Lift tree canopies to minimum height of 2m, maintaining balanced canopy as tree matures.	Annually

Task:	Frequency / Timing
Reduce crown to maintain canopies clear of buildings and lighting, maintaining a balanced form.	As required

Component 2: Hedgerow

- 5.18 Hedgerows are national (Section 41, NERC Act 2006) Habitats of Principal Importance. They provide benefits based on their intrinsic landscape and biodiversity value and as part of an extended Green Infrastructure and habitat corridor network.
- 5.19 Existing native hedgerows should be positively managed to maximise landscape and wildlife value, favouring hedge-laying for restoration of hedgerow structure and an alternating management cycle of cutting one side of the hedgerow every 2 or 3 years. Proposed hedgerow will comprise native, biodiverse hedgerows and will contribute to the mosaic of habitats within the Site and provide enhanced habitat connectivity. Both existing and proposed hedgerow will also contribute to the wider landscape setting of the Proposed Development. Hedgerow planting shall include the following native species: field maple, hazel, hawthorn, holly and blackthorn.
- 5.20 Proposed native hedgerows will be planted as 60-80cm height, transplanted, bare root, evenly mixed selection of native species, double staggered at 75cm offset (overall 1.5m width) and 50cm centres. Planting that performs an infill function is to receive an orange marker tag in order to limit damage to the early establishment of the plants whilst maintenance is carried out on the existing hedgerow.
- 5.21 To fulfil the management objectives, each hedgerow should be managed as appropriate, i.e. by trimming, laying, coppicing, bulking up, etc. Specific management tasks and their frequencies for the native hedgerows are therefore set out below.

Maintenance Recommendations

- 5.22 Best practice horticultural techniques should be used in the planting of native hedgerow vegetation to ensure rapid early growth. Rapid attainment of effective physical enclosure would be achieved through the autumn planting of both hedgerows and hedgerows with trees. The ground below planting will be maintained as bare ground in the first 2 to 3 years after establishment. The ground flora should be maintained through annual cutting and manual removal of vigorous weed species. Once established, new hedgerow planting should be subject to the same maintenance work as for the rest of the existing.

Table 5.4: Summary of Maintenance Tasks – Existing Hedgerow

Task:	Frequency / Timing
Undertake routine maintenance visits identifying the existence and location of any hedgerow plants which are suffering from visible defects likely to cause danger, potential danger, obstruction or nuisance to users of adjoining properties, pathways and roadways.	Yearly
Non-desirable woody species should be removed during management operations and at other times as necessary, where this does not prejudice screening requirements.	
Trim hedge to a height of approximately 3m and a width of no less than 1.5m.	
Cut back undergrowth, overgrowing or overhanging hedgerow shrubs and minor tree branches from any pathways to maintain an unobstructed width of at least 2m or the existing width of the pathway, whichever is the greater.	
In the interests of wildlife, hand weeding, where feasible, should take precedence over the use of herbicides in hedgerows. However, 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 base. Herbicides must be listed on the HSE Pesticides Register of UK Authorised Products, and herbicide application must conform to the 'Pesticides: Code of Practice for Using Plant Protection Products' (DEFRA, January 2006).	Hand weeding: As required by maintenance visits. Herbicide application: July - August

Table 5.5: Summary of Maintenance Tasks – Proposed Hedgerow

Task:	Frequency / Timing
Marker tags to be removed after 3 years once infill planting established and planting can be maintained with existing hedgerow.	Year 3
Coppicing or hard pruning of adjacent existing hedgerow plants to prevent over-shadowing of new infill plants until well established. Where large hedgerow trees cause overshadowing remove lower branches to encourage light exposure.	Yearly
Examine rabbit guards and where necessary remove guards on newly established hedgerow species to prevent spindly hedgerow growth.	
Inspect plant marker tags to ensure infill sections still adequately demarked and replace where necessary.	
Undertake routine maintenance visits identifying the existence and location of any hedgerow plants which are suffering from visible defects.	
Non-desirable woody species (e.g. <i>Sambucus nigra</i>) should be removed during management operations and at other times as necessary, where this does not prejudice screening requirements.	
Trim hedge sensitively but regularly to encourage dense, species rich hedgerow growth.	
In the interests of wildlife, hand weeding, where feasible, should take precedence over the use of herbicides in hedgerows. However, 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 base. Herbicides must be listed on the HSE Pesticides Register of UK Authorised Products, and herbicide	Hand weeding: As required by maintenance visits.

Task:	Frequency / Timing
application must conform to the 'Pesticides: Code of Practice for Using Plant Protection Products' (DEFRA, January 2006).	Herbicide application: July - August

Component 3: Native Shrub and Understory Planting

Maintenance Recommendations

- 5.23 Locally-sourced indigenous plant species should be used to establish a naturalistic transitional habitat between woodland and areas of wildflower grassland and within seasonally wet areas associated with surface water attenuation throughout the Site.
- 5.24 New planting is to be in accordance with BS 4428:1989.
- 5.25 To protect new planting from damage, Recycled HDPE mesh guards (height 60cm, diameter 150-180mm) shall be fitted around each new plant and secured to a single softwood stake of at least 25mmx25mmx900mm length, which is to be driven into the ground to a depth of 450mm.
- 5.26 Chipped conifer bark, size range 25-75mm, maximum 15% fines, composted for a minimum of six weeks prior to delivery, is to be used as a mulch. The organic mulch shall be spread evenly within a 1m diameter circle around each plant, to a depth of 75mm after settlement.
- 5.27 Management operations will ensure that vegetation is cut back from pathways and fences.
- 5.28 Planting beds should be kept clear of litter. 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 must comply with the Plant Protection Products Regulations 2011 and Plant Protection Products (Sustainable Use) Regulations 2012 and be on the current HSE Pesticides Register of UK Authorised Products
- 5.29 Over time, selective thinning of plants should be undertaken to encourage natural regeneration. Where possible, over-developed individuals should be removed. New structurally diverse habitat edges should be created by selective pruning and coppicing of shrub species to favour foraging by invertebrates, bats and other fauna.

Component 4: Ornamental Shrubs and Hedges

- 5.30 Ornamental shrub planting areas are set within the residential development, and provide seasonal interest and colour to the streetscape, softening of the streetscape and definition of

the public realm. Biodiversity will be incorporated through the planting of native, wildlife-friendly species, including climbers such as ivy and honeysuckle on buildings and boundaries where appropriate. Ornamental hedges contribute to the visual amenity of the streetscape and definition and legibility of the public and private realm. Ornamental hedges must be formally pruned to provide screening and spatial enclosure. The majority of the ornamental shrub and hedge planting comprises of frontages within the private domain of home and business owners and as such will therefore be maintained in the long term by individual homeowners. However, there are areas of ornamental planting that form part of the streetscape and local greens which will be managed and maintained in terms of this LBMS.

Maintenance Recommendations

- 5.31 The topsoil should be cultivated and shrubs, ground cover and perennial plants should be pit planted. Pits should be 150mm wider and deeper than root spread and backfilled with excavated material.
- 5.32 The growth cycle of planting may require varying maintenance involvement at different stages and management operations should be adapted as the planting matures and conditions dictate. 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 the plants.
- 5.33 After watering, weed control is the most important activity during the establishment stage of planted shrubs and regenerating species/seedlings. Weeds, particularly grasses, compete aggressively with young shrubs for water and nutrients, and may also compete for light. Hand weeding, where appropriate, should take precedence over the use of herbicides. However, herbicide use may be the most effective measure to take against unwanted species. Where herbicide application is needed, it is recommended that an appropriate herbicide is applied in July - August in small controlled areas around the shrub base.
- 5.34 Herbicides must be listed on the HSE Pesticides Register of UK Authorised Products, and herbicide application must conform to the 'Pesticides: Code of Practice for Using Plant Protection Products' (DEFRA, January 2006).
- 5.35 Weed growth within planting areas shall be eliminated during the summer visits with a suitable translocated herbicide, in line with the manufacturer's instructions. Tree and/or shrub shelters, if fitted, shall be lifted as necessary to achieve weed control, and re-firmed in the ground after completion of the work. Dead weed material shall be removed during the following visit to the Site.
- 5.36 Grass growth within planting beds shall be treated during the winter visit with a suitable residual herbicide in line with the manufacturer's instructions.

- 5.37 Planting shelters (if fitted) shall be checked at each visit, stakes firmed up as necessary, and ties adjusted. Any missing or vandalised shelters or ties shall be replaced and lopsided shelters straightened.
- 5.38 Any dead trees and shrubs shall be removed and the resulting hole to be filled. Replacement planting to be carried out during the winter visit.
- 5.39 Any damaged shoots or branches shall be pruned off plants using secateurs, cutting back to above a live, outward facing bud or shoot.
- 5.40 A summary of maintenance tasks and their frequency is set out below:

Table 5.6: Summary of Maintenance Tasks - Ornamental Shrubs and Hedges

Task:	Frequency / Timing
Where appropriate clear weeds by hand and remove arisings.	Spring
Continue hand weeding, where appropriate, until canopy of shrubs is closed (first 3 years). Inspect every 8 weeks and remove weeds. Prune back any badly damaged shrubs to sound growth. Water as necessary, allowing 10L/m ² for planting beds.	Summer Growing Season
Remove dead herbaceous vegetation, other than ornamental seed heads and stalks, and dead leaves. Prune out dead wood, cut leggy shrub growth hard back to promote bushy growth. Remove all arisings from site. Ensure that all shrubs are firmly bedded in the ground after strong winds, frost heave and other disturbance.	Autumn/Winter
Where herbicide application is needed, it is recommended that an appropriate herbicide is applied in small controlled areas around the shrub base. Herbicides must be listed on the HSE Pesticides Register of UK Authorised Products, and herbicide application must conform to the 'Pesticides: Code of Practice for Using Plant Protection Products' (DEFRA).	July - August

Component 5: Wildflower Meadow Planting (including seasonally wet)

- 5.41 Wildflower Meadow Planting (including seasonally wet) will be created to provide areas for habitat and foraging as part of wider Green Infrastructure strategy, linking together existing habitats. This planting will also enhance visual amenity for residents. The meadow planting will be managed to encourage communities of high nature conservation and amenity value, both in terms of floral diversity and in the provision of habitat and foraging.

Maintenance Recommendations

- 5.42 The areas of native wildflower will include a mown strip along the edges of paths and carriageways.
- 5.43 A 2m wide strip of native meadow grassland will be sown either side of the newly established hedgerows. A 1m strip nearest to the hedgerow to be left without cutting for several years to encourage tussocky grassland to establish.
- 5.44 Undesirable herbaceous (ruderal) and woody stemmed species will need to be controlled. These species include those that legally need to be controlled and those that suppress or otherwise inhibit the development of a species-rich sward. Undesirable plant species will be removed by hand pulling and mechanical removal only.
- 5.45 Where the meadow sward fails to establish or dies out, or where the level and range of 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.

Table 5.7: Summary of Maintenance Tasks - Wildflower Meadow Planting (including seasonally wet)

Task:	Frequency / Timing
Remove any litter or debris.	Monthly
In the first year after planting, native water meadow will be cut regularly to a height of 50mm, stopping in June-August and a final cut in September/October. Thereafter the grassland will be managed with annual cuts. Cut to 75mm late August or September. Arisings will be left in situ for 2 to 3 days before removing and disposing off site. Remove any woody species and weeds	Frequent cuts during first year, thereafter annually in autumn.
0.5m wide margins alongside pathways and roadways will be mowed to a height of 35mm with the first spring cut and all cuts thereafter whenever the sward reaches a height of 100mm.	Allow up to 16 cuts per season

Component 6: Pond and Marginal Aquatic Planting

- 5.46 Within the north-east corner of the Site a pond will be created to provide areas for habitat and foraging as part of the wider Green Infrastructure strategy, linking together existing habitats. This planting will also enhance visual amenity for residents and help create an attractive entrance green to the Site.

Maintenance Recommendations

- 5.47 Confine movement channels for maintenance to the minimum number of routes to avoid excessive trampling of habitat.
- 5.48 Remove any invasive or exotic species annually in autumn or winter, ideally by hand, to ensure growth of other species is not suppressed. Use of pesticides and fertilisers will be avoided. Herbicides shall not be used unless prior agreement has been obtained from the appropriate Welsh authority.
- 5.49 Monitor need for de-silting and clearance of leaf-fall on a 5-year basis and undertake as required. Remove deep bottom muck, silt or dense stands of dominant vegetation to diversify habitat and prevent ecological succession.
- 5.50 Cut back one third of reedbed and marginal herbaceous plants and grasses using hand tools (such as brush cutters) to 75mm every 5 years on a long rotation, using hand-held machinery, to promote structural diversity by removing older areas of reedbed and marginal vegetation to create opportunities for new reed and marginal colonisation and to maintain some areas of open water.
- 5.51 Clear overgrown aquatic planting by hand, as required, to avoid nutrient build-up causing an imbalance of vegetation and loss of habitat. Aim to create 75% open water. Leave arisings on the bank overnight, to allow invertebrates and reptiles to return to aquatic habitat. Remove arisings to a dedicated composting area set apart from ponds, dikes, drains and species-rich vegetation, to avoid nutrient return during decomposition. Excess arisings should be removed to a licensed composting or green waste disposal facility.
- 5.52 Assess extent of shading from trees and shrubs, especially to the south and east side of the pond. Consider cutting back or pruning to reduce shading where required.
- 5.53 Works will be carried out during late autumn or winter months (ideally late September to October). Works to be carried out in line with Ecologist recommendations.
- 5.54 A summary of maintenance tasks and their frequency is set out below:

Table 5.8: Summary of Maintenance Tasks - Pond and Marginal Aquatic Planting

Task:	Frequency / Timing
Remove any litter or debris	Monthly
Monitor water quality and take appropriate preventative/remedial action	Annually, and as necessary
Manual removal of invasive/exotic species	Yearly, in autumn or winter
Manual removal of overgrown aquatic planting	Yearly, in autumn or winter

Task:	Frequency / Timing
Cut back one third of reedbed and other marginal herbaceous vegetation using hand tools to 75mm on long rotation to maximise biodiversity	Every 5 years, on rotation, between September and January
De-silting and clearance of leaf-fall. Remove no more than 50% of bottom muck, silt or dense strands of dominant vegetation within any calendar year.	Every 5 years, as required, December to January
Assess extent of shading from trees and shrubs. Prune as necessary.	Every 5 years in late winter, as required

Component 7: Amenity Grassland

- 5.55 Amenity grassland provides areas for recreation, movement and relaxation. The open spaces will be managed as permanent grassland and, together with new planting, will provide a high-quality landscape setting to the Proposed Development. Amenity grassland to private gardens will be maintained by the homeowners.

Maintenance Recommendations

- 5.56 The management regime of these areas will minimise the use of herbicides and fertilisers to encourage species diversity. The use of fertilisers and herbicides on amenity grass areas will be limited to the spot control of invasive weeds once the grass has established.
- 5.57 Prior to cutting all areas shall be cleared of litter and debris.
- 5.58 All operations shall be carried out using machinery appropriate to the task, cylinder, rotary or mulch mowers and when weather and ground conditions are suitable.
- 5.59 Operations shall be suspended where ground conditions prevent the use of machinery without damage to the ground surface. Where operations are suspended due to unsuitable conditions, additional maintenance visits may be required to maintain the sward within acceptable growth limits.
- 5.60 During each maintenance visit the Contractor shall cut adjacent to fences, walls, kerbs, paths, trees and other boundaries or obstacles using equipment suitable to the task. Strimmers shall not be used around the base of trees. The frequency of cuts shall remain flexible in order to accommodate growth rates and weather conditions. As a general guide cutting is likely to be required every two weeks on high maintenance areas, ensuring that the sward height does not exceed 75mm and that the presence of flowering weed species is avoided. The height of cut shall be 30mm. The Contractor is required to assess growing conditions and adjust maintenance schedules as necessary, considering bulb planting where appropriate.
- 5.61 Following cutting, all grass clippings and other debris shall be swept from adjacent hard standing areas and removed from site to an authorised tip.

Table 5.9: Summary of Maintenance Tasks - Amenity Grassland

Task:	Frequency / Timing
Remove any litter or debris	Monthly
Grass should be mown to a height of 30mm whenever the sward reaches a height of 100mm (strimming to be carried out where grass abuts fences, walls and around other obstacles). Cleaning of paths after grass cutting.	Allow for 16 cuts per season.
Monitor grass erosion and regularly reinstate damaged or worn areas as required, including re-turfing of failed areas of grass.	As required following inspection.

Component 8: External Hard Surfaces and Furniture

- 5.62 The circulation areas and open spaces include a range of hard surfaces and street furniture, which articulate the public realm, define the hierarchy of routes and spaces, and provide recreational opportunities.

Maintenance Recommendations

- 5.63 To achieve these objectives, the following measures will be undertaken:

Table 5.10: Summary of Maintenance Tasks – External Hard Surfaces and Furniture

Task:	Frequency / Timing
Removal of litter.	Monthly
Removal of grit, mud, leaf litter and plant debris by sweeping.	Monthly
Remove any stains, marks or discolouration of surface materials by jet spraying.	Twice annually, and as required
Cut back undergrowth, overgrowing or overhanging shrubs, hedges and minor tree branches from pathways through the Proposed Development to maintain an unobstructed width of at least 2m or the existing width of the pathway, whichever is the greater.	
Removal of weeds by hoeing, pulling or (as a last resort) use of approved herbicide.	
Inspection of any defects and potential dangers in surfacing and signage, and undertake remedial works at the earliest opportunity.	
Keep all hard surfaces safe to walk on during prolonged freezing conditions, using grit rather than salt to achieve this objective.	As required in winter conditions

6.0 GENERAL MAINTENANCE AND MANAGEMENT TASKS

- 6.1 During years 1-5 or until canopy closure, planting shall be maintained by annual visits.
- 6.2 All plants shall be checked and if necessary, firmed up in the ground.
- 6.3 Any damaged shoots or branches shall be pruned off using secateurs.
- 6.4 The Contractor shall ensure that all shrubs are maintained free of weed growth. This shall normally be achieved by the application of appropriate contact or residual herbicides, although it remains the responsibility of the Contractor to adopt other methods where herbicide application is unsuccessful or impractical.
- 6.5 The Contractor shall remove any dead, dying or diseased plants, which are evident during any maintenance visit. The Operations Manager shall be informed of the location, number and species of all material that has been removed. Any plants that have died as a result of the contractor's operations or omissions shall be replaced by the contractor at his own expense during the next planting season.
- 6.6 Where the Operations Manager has agreed that plant deaths have arisen due to circumstances out of the control of the contractor, replacement planting shall be instructed by the Operations Manager and paid for at an agreed rate.
- 6.7 All replacement planting shall be with like species unless otherwise agreed with the Operations Manager.
- 6.8 The contractor shall clean all hard standings, gullies, gratings and grassed areas of soil spillage, bark mulch, leaves etc. which emanate from adjacent shrub beds.

The Use of Pesticides & Other Hazardous Substances

- 6.9 The Contractor's attention is drawn to the following statutes and regulations:
- The Food and Environment Protection Act 1986;
 - Plant Protection Products Regulations 2011;
 - Plant Protection Products (Sustainable Use) Regulations 2012;
 - The Control of Substances Hazardous to Health Regulations 1988; and
 - The Environment Protection Act 1990.
- 6.10 It is the Contractor's responsibility to ensure that he is fully conversant with the requirements of the foregoing legislation and other relevant Codes of Practice, British Standards, rules, guidelines or directives that relate to the use of hazardous materials.

- 6.11 All manufacturers' recommendations relating to application, storage, mixing and other safety precautions must be strictly adhered to, in the interests of health and safety.

Litter Removal

- 6.12 The Contractor shall ensure that all of the site is kept free of litter and other debris through a regular programme of monitoring, collection and disposal, coinciding with visits to maintain grassed areas and planting.
- 6.13 Particular care shall be taken to remove all broken bottles, glass, tins, sharp objects and other items likely to constitute a hazard to the public.
- 6.14 The Contractor shall take particular care when carrying out litter collection to ensure that any discarded needles or syringes are removed as soon as they are discovered. Such items must be packaged separately from other litter, and be contained within appropriately labelled, puncture-proof sharps containers supplied by the Contractor.
- 6.15 All litter and debris shall be removed off site to an authorised tip.
- 6.16 This shall be carried out in accordance with the Code of Practice on Litter and Refuse issued under Section 89 of the Environment Protection Act (1990).

7.0 ANNUAL MAINTENANCE SCHEDULE

Table 7.1: Annual Maintenance Schedule

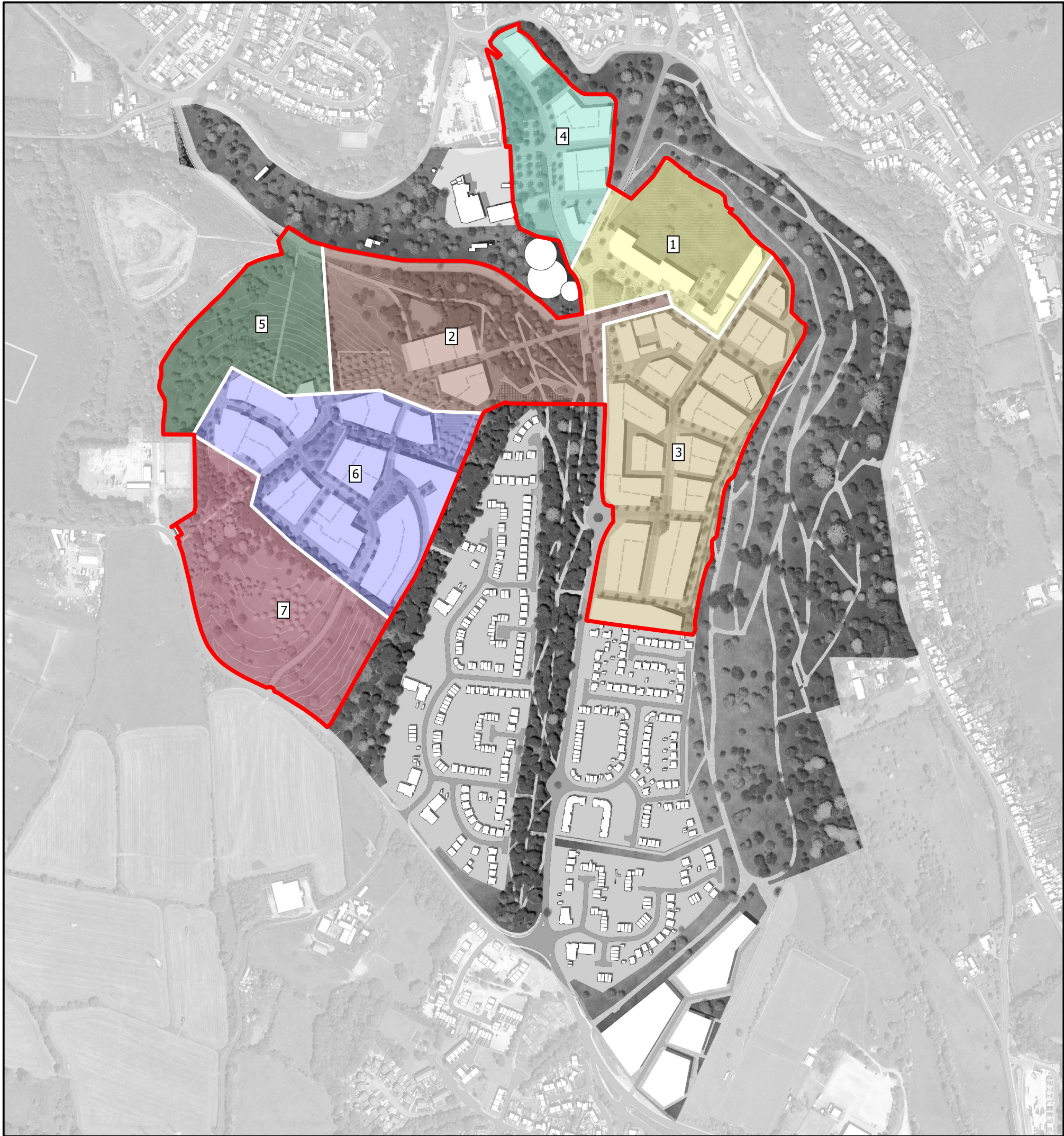
	JAN	APR	MAY	JUN	JUL	AUG	SEPT
Inspect all areas for litter and remove.	Throughout the year						
Amenity grassland: Cut grass and remove arisings from site.		✓	✓	✓	✓	✓	✓
Wildflower grassland: Cut grass and remove arisings from site following seed fall.							✓
Bare rooted, rootballed & containerised trees: inspect trees, carry out required pruning works, check stakes, ties and guying, maintain 1m mulched/weed free circles.	✓	✓		✓			✓
Ornamental shrubs, hedges & hedgerows: firm up plants, prune damage, control weed growth, and maintain mulch.		✓		✓			✓
Remove dead plants as they occur & replace during winter visit	✓						
Watering of all trees, grassland, shrubs and hedgerows	As required	As required	As required	As required	As required	As required	As required
Cut back herbaceous marginal vegetation and remove exotic invasive species						✓	

8.0 IMPLEMENTATION AND MANAGEMENT STRUCTURE

- 8.1 This LBMS incorporates the objectives and prescriptions for the suggested approach to be adopted in the maintenance and management of the landscape features which are to be incorporated into the Proposed Development.
- 8.2 The aim is to promote a sensitive management approach, which protects and improves the landscape and visual amenity value interests of the Site and is compatible with the proposed uses of the Site.
- 8.3 It would be appropriate that a management body be appointed under the terms of a planning obligation to take forward the relevant landscape and ecological components of this LBMS as construction is implemented.
- 8.4 It is recommended that where landscape components occur on adopted highways, the management of these components according to the prescriptions above be taken up by the relevant agency.
- 8.5 It is recommended that this LBMS is reviewed every five years to appraise the effectiveness of the maintenance regimes, and to 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. This review 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.

FIGURE 1

Landscape and Biodiversity Management Strategy Plan



LEGEND

 Site Boundary

Landscape Character Zones and Corresponding Landscape Management Components:

- 

ZONE 1: The Village Centre

 - 1: Native and Ornamental Trees
 - 4: Ornamental Shrubs and Hedges
 - 7: Amenity Grassland
 - 8: Hard Surfaces and External Furniture
- 

ZONE 2: Ty Cerrig Connection

 - 1: Native and Ornamental Trees
 - 3: Native Shrubs and Woodland Understorey
 - 4: Ornamental Shrubs and Hedges
 - 6: Ponds and Marginal Aquatic Vegetation
 - 7: Amenity Grassland
 - 8: Hard Surfaces and External Furniture
- 

ZONE 3: Eastern Residential Plateau

 - 1: Native and Ornamental Trees
 - 4: Ornamental Shrubs and Hedges
 - 7: Amenity Grassland
 - 8: Hard Surfaces and External Furniture
- 

ZONE 4: Heritage Hub

 - 1: Native and Ornamental Trees
 - 2: Hedgerows
 - 3: Native Shrubs and Woodland Understorey
 - 4: Ornamental Shrubs and Hedges
 - 8: Hard Surfaces and External Furniture
- 

ZONE 5: Green Edge

 - 1: Native and Ornamental Trees
 - 2: Hedgerows
 - 3: Native Shrubs and Woodland Understorey
 - 4: Ornamental Shrubs and Hedges
 - 5: Wildflower Meadow Planting (Including seasonally wet)
 - 8: Hard Surfaces and External Furniture
- 

ZONE 6: Ty Cerrig Residential Area

 - 1: Native and Ornamental Trees
 - 4: Ornamental Shrubs and Hedges
 - 7: Amenity Grassland
 - 8: Hard Surfaces and External Furniture
- 

ZONE 7: Residential Entrance

 - 1: Native and Ornamental Trees
 - 2: Hedgerows
 - 3: Native Shrubs and Woodland Understorey
 - 4: Ornamental Shrubs and Hedges
 - 5: Wildflower Meadow Planting (Including seasonally wet)
 - 7: Amenity Grassland
 - 8: Hard Surfaces and External Furniture

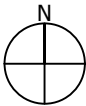


FIGURE 13

Project
Brymbo, Former Steelworks

Drawing Title
Landscape Biodiversity and Management Plan

Date	Scale	Drawn by	Check by
13.03.2019	1:5,000 @A3	SS/SA	JM
Project No	Drawing No	Revision	
27968	LN-LP-113	-	



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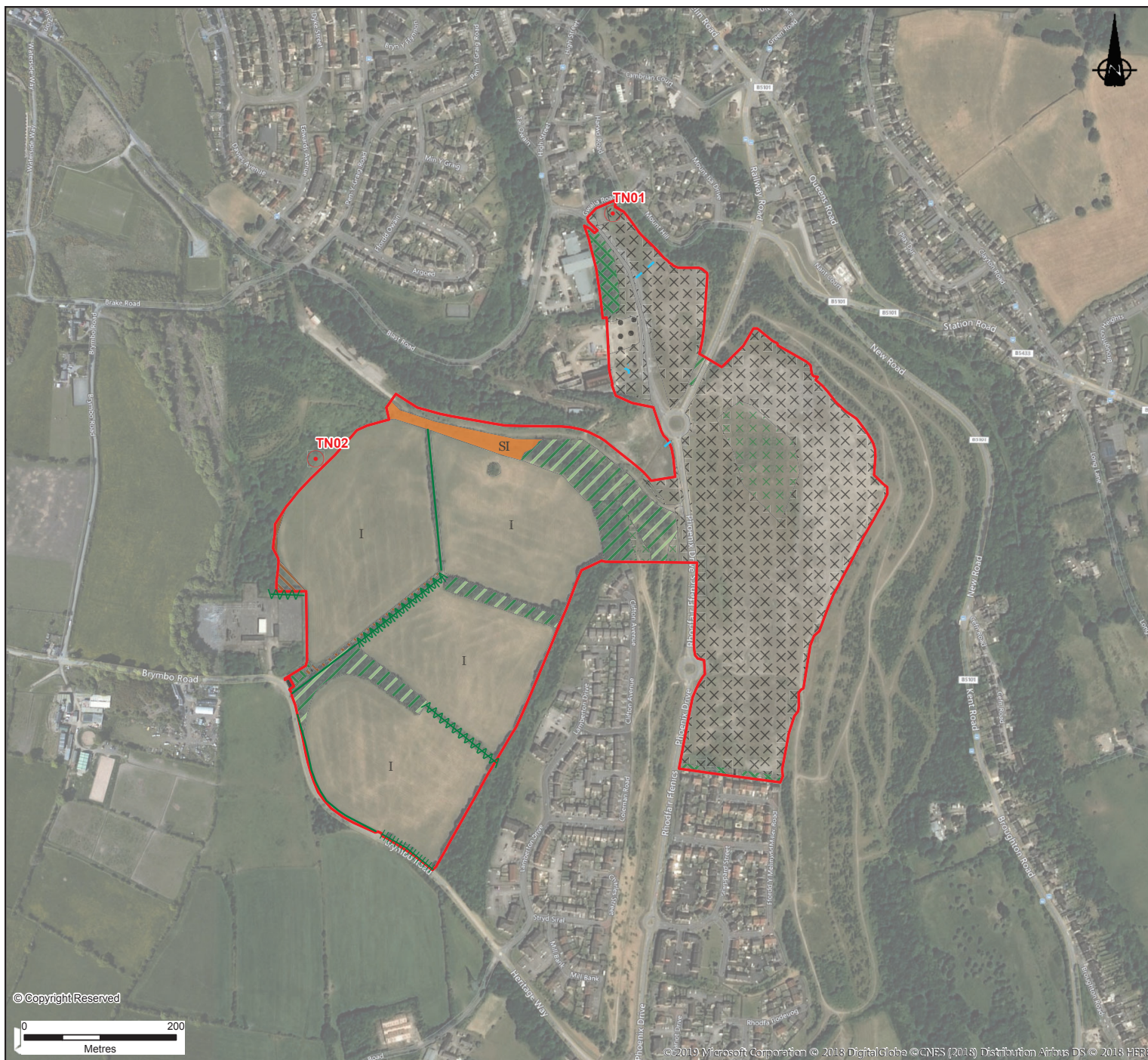
Planning • Master Planning & Urban Design • Architecture •
Landscape Planning & Design • Environmental Planning • Graphic
Communication • Public Engagement • Development Economics

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APPENDIX 1

Phase 1 Habitat Map



Key

- Site Boundary
- Broadleaved woodland - plantation
- Mixed woodland - plantation
- Scrub - dense/continuous
- Scrub - scattered
- SI Neutral grassland - semi-improved
- I Improved grassland
- Bracken - continuous
- Other tall herb and fern - ruderal
- Cultivated/disturbed land - ephemeral/short perennial
- Buildings
- Bare ground
- Other habitat
- Intact hedge - native species-rich
- Intact hedge - species-poor
- Hedge with trees - native species-rich
- Hedge with trees - species-poor
- Dry ditch
- Target Notes

REVISION	DETAILS	DATE	DRAWN	CHKD	APPD
CLIENT	Parkhill Estates				
PROJECT	Former Brymbo Steelworks				
DRAWING TITLE	Extended Phase 1 Habitat Survey				
DRG No	ST16882/007	REV	A		
DRG SIZE	A3	SCALE	1:5,000	DATE	January 2019
DRAWN BY	SW	CHECKED BY	MP	APPROVED BY	SW

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