

The Oaks
Oak Road, Wrexham Industrial Estate

Arboricultural Impact Assessment and Method Statement

Report Ref: 311/R/200

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EXECUTIVE SUMMARY

1. This report has been produced to detail the arboricultural impacts of proposed development at The Oaks, Oak Road, Wrexham Industrial Estate.
2. A tree survey a has been undertaken of the development site and wider land area and Tree Constraint Plans have been produced for the site reference 311/TCP/T/100 to 119 and are included as part of this report, rather than a separate Tree Constraints Report.
3. Based on an objective assessment of the trees, groups of trees, woodland made in accordance with *BS5837:2012 Trees in relation to design, demolition and construction – Recommendations*, a total of 44 individual trees, two woodland compartments, ten groups of trees and separate areas of scrub were recorded. The features fall within category A, B, C and U of the BS5837:2012 cascade chart for tree categories.
4. Correspondence with Wrexham County Borough Council, has identified that there are ten individual Tree Preservation Orders (TPO) at the site. No Conservation Areas are affected by the proposals.
5. Numerous trees were observed to have arboricultural features suitable for bats and a separate ecological inspection has been undertaken. The capacity of any trees potentially affected by the works to support roosting bats, should be confirmed by an Ecologist prior to undertaking tree works. The trees also provide nesting opportunities for birds and any tree works should occur between September to February to avoid the nesting and breeding bird season from March to August inclusive.
6. A total of 24 individual trees would be removed to facilitate the main development works. Areas of scrub would be removed to facilitate the development works and habitat restoration works. Two groups of trees would be partially removed for the habitat restoration works. Of the trees to be removed, there are nine Category B trees and 15 Category C trees.
7. Tree protection will be required to demarcate a Construction Exclusion Zone (CEZ) around trees to be retained prior to site establishment and commencement of construction. This will take the form of temporary tree protection fencing and ground protection to confine site access and avoid detrimental impact on the retained trees.
8. A proposal for replacement planting would mitigate for the tree removal and forms part of an overall strategy of habitat enhancement and restoration throughout the wider site, reference 311/LAND/L/100 Landscape Masterplan.
9. This assessment considers potential impacts based on the proposed construction and is valid for two years from the date of the report. Changes to trees can occur as a result of natural processes and disease, as well as the influences of development, therefore regular tree inspections at least every two years are recommended to monitor the health and condition of the woodland, groups and individual trees.

1 INTRODUCTION

1.1 Scope of assessment

1.1.1 MDLandscape have been commissioned by FI-REM Ltd to undertake a tree survey and Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) for a proposed development at The Oaks, Oak Road, Wrexham Industrial Estate. It has been compiled to help ensure the successful retention of the trees on site during the proposed construction of development, and details the arboricultural impact to the trees, groups of trees and woodland, proposed protection measures and mitigation.

1.1.2 This report includes:

- The tree data schedule and constraints plans for trees present within the survey and assessment area;
- A photographic record of notable trees and general character and group composition in Appendix 2;
- An assessment of trees and impacts on trees in relation to development and requirements for protection during construction; and
- Recommendations for tree removal, retention and management.

1.1.3 This report should be read in conjunction the following arboricultural reports and drawings and relevant ecology reports by UES Ltd

- Tree Constraints Plans 311/T/100 to 119 and data schedule in Appendix 1;
- Arboricultural Impact Assessment Plans Tree Removals 311/T/200 to 219; and
- Arboricultural Method Statement Plans Tree Works and Tree Protection 311/T/300 to 320.

1.1.4 The report and plans detail the proposed tree and scrub removals for the main development area and initial clearance for habitat restoration works.

1.1.5 The Landscape and Ecology Management Plan (LEMP), produced by UES Ltd as a separate report, will provide detail on the strategy for scrub clearance and woodland enhancement at the site from commencement of development continuing in phases over an initial ten year period.

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2 THE SITE AND SURROUNDINGS

2.1.1 The assessment area is located on land centred on grid ref SJ 38740 49238, as shown in figure 1.0 and is located to the south of Oak Road at Wrexham Industrial Estate.



Figure 1.0 Site location - Contains ordnance survey data (OpenStreetMap) not to scale

2.1.2 The site forms part of the wider industrial estate but is now designated as a Local Wildlife Site. It comprises a rich mosaic of priority habitats including woodland, dense scrub and flower rich-grasslands. The River Clywedog borders the site to the south adding increased biological value and morphological interest.

2.1.3 The ecological diversity of the site is tied to its post-industrial past when it functioned as a key manufacturing complex as part of the wider Royal Ordnance Factory. Historically the site would have been much more open with a significant number of buildings, storage facilities and access tracks. Some of the original munitions buildings to the east of site still exist albeit many are now covered by bramble and willow.

2.1.4 Over the last 15 to 20 years, the site has progressed from a mosaic of habitats with grassland to one where dense scrub is now the most abundant habitat on site. Bluesky aerial photography in figure 2.0 shows the extent of scrub across the site and this is further illustrated in the site photographs in Appendix 2. The majority of the site is only accessible via the existing tracks and managed easements for electricity and telecomms. The scrub supports an assemblage of breeding birds and provides terrestrial habitat for mammals and amphibians.



Figure 2.0 Aerial view of the site (Bluesky) not to scale, imagery dated 2022

2.1.5 Wrexham Industrial Estate extends to the north, east and west boundary of the site. The density and scale of built development reduces to the east along Oak Road with smaller individual units and then a transition to occasional residential properties and farms with an increase in hedgerows and tree cover.

2.1.6 To the south, the site is bound by Redwither Brook and Afon Clywedog / River Clywedog, beyond which lies agricultural land, smaller groups of woodland and copses and a solar farm.

2.1.7 There is no public access to the site, although informal access does occur. There is a Public Right of Way[1] to the west of the site ABE/19 which skirts the boundary to the west of Redwither Brook, from which there are views into the site along an existing track.

[1] Public Rights of Way Definitive Map – Wrexham, https://www.wrexham.gov.uk/service/public-rights-way/public-rights-way-definitive-map (accessed 15.3.2024)

2.2 Survey methodology

2.2.1 The tree survey was carried out on 7th March 2024 and undertaken in cool overcast weather. Inspection was carried out from ground level by M Dobson FdScArb, MArborA and Lantra certified in Professional Tree Inspection in accordance with *BS5837:2012 Trees in relation to design, demolition and construction – Recommendations*.

2.2.2 The survey method was undertaken as follows:

- A topographical survey was not available at time of survey. Four oak trees (T22, T23, T26, T39) have been georeferenced and located on site and this has been used to verify tree positions and crown spread. The majority of trees have been located using Bluesky aerial photography and Ordnance Survey mapping;
- Where access was available, notable trees were plotted as individuals. Where access was impeded due to dense scrub, and due to character, age and species, the majority of the features were surveyed as groups and woodland;
- Notable and accessible trees over 75mm stem diameter at breast height (DBH) and potentially impacted by development to the north of the site, were surveyed. In areas away from the development area, accessible and notable trees with a stem of 150mm DBH and above were plotted[2] in accordance with BS5837:2012 recommendations for woodland surveys. Dense scrub prevented access to several areas and some tree measurements were estimated;
- Crown spreads were measured to four cardinal points with a Disto laser distance measure and measurements noted the nearest 0.5m;
- Height measurements were taken using clinometers and tree diameter measurements taken using a calibrated specialist diameter tape. Where this was not possible, heights and diameter measurements were estimated; and
- Where access to determine exact location was impeded, the measurements were estimated.

2.2.3 The assessment identifies the trees potentially affected by development and discusses their suitability for retention on site. The assessment also identifies trees that are undesirable to retain because of structural or other defects, trees that can be retained with an acceptable level of risk in their current location and the measures that are required to ensure their long-term retention.

2.2.4 The data schedule lists trees located within, or in close proximity to, the proposed development area (Appendix 1) noting:

- Tree reference number and whether an individual tree, a group, a woodland or a hedge;
- Tree protection status or designation;
- Species type stating full common and latin name where identifiable;
- Height in metres;

[2] Clause 4.2.4 of BS5837:2012 states that *In the case of woodlands or substantial tree groups, only individual trees with stem diameters greater than 150mm usually need to be plotted.*

- Stem diameter at-breast-height (dbh) in millimetres;
- Crown spread to four cardinal points in metres;
- Height of crown clearance in metres;
- Maturity – young, semi-mature; middle age; mature, over mature;
- Condition – good, fair, poor, veteran;
- Comments on physiological and structural form, condition, health and significant defects;
- Tree quality category as detailed in Table 1.0;
- Radius of the root protection area (RPA);
- Management recommendations; and
- Estimated remaining contribution in years – less than 10, 10-20, 20-40 and over 40.

2.2.5 An assessment of trees, based on BS 5837:2012 has been undertaken and trees have been categorised into one of four categories: A, B, C or U and illustrated in the Tree Constraints Plan 311/T/100 to 119 (Figure 2.0). Locations of the trees are mapped, indicating their category, canopy spread and Root Protection Area (RPA). An assessment of arboricultural constraints to current site operations and future proposed development and operations; and advice is noted in the schedule on the management of trees based on their current condition and location.

2.2.6 The British Standard recognises many additional factors will ultimately determine changes to the site, for example redevelopment or natural physical changes. Information in this report is presented in order to allow an informed judgement to be made on tree retention and removal and should not be interpreted rigidly.

2.2.7 This survey data is valid for two years from the date of survey.

2.3 Topography

2.3.1 The topography of the site is flat to gently sloping, from 31m AOD to the north and 19m AOD to the south at the Afon Clywedog / River Clywedog. Within the site are localised changes in topography with man-made features relating to the former land use of the site.

2.4 Soil survey

2.4.1 A soil survey has not been undertaken as part of the tree survey. An examination of magic.defra.gov.uk website identifies the site soilscape to the north and south of the river as slowly permeable, seasonally wet, slightly acid but base-rich loamy and clayey soils of impeded drainage and moderate natural fertility. Along the Afon Clywedog / River Clywedog, the soils are loamy and clayey floodplain soils with naturally high groundwater and moderate natural fertility.

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2.5 The Development Proposals

2.5.1 The AIA and AMS have been prepared in relation to a planning application for a proposed green eco-heritage park and single employment unit with integral offices (for HIAB), new vehicular access, car and HGV parking, servicing and storage, landscaping, heritage and ecology mitigation and ancillary development.

2.5.2 The Client has advised, that the planned future development of The Oaks will be sensitive, sustainable, proportionate and targeted to maximise the potential of its future biodiversity value. The proposed development includes the restoration, enhancement and management of a larger area of land to the east, south and west, to seek to recover and enhance some of the irreplaceable open-mosaic habitats which have significantly declined due to the successional process of scrub encroachment.

2.5.3 The proposed site layout is shown on figure 8.0 planning application drawing 1256-MCAU-P.02-00-001-P9-Proposed Site Plan.

2.5.4 An enquiry to Wrexham County Borough Council to confirm Tree Preservation Order (TPO) status was made on 25.03.2024. Confirmation has been received that there are ten individual TPO at the site, all of which are mature oak. Four TPO oak are present within the main development area of the site, south of Oak Road. The survey and assessment area is not within a conservation area. A copy of the order extract is included in Appendix 3.

2.6 Ancient Woodland, Veteran and Ancient Trees

2.6.1 An examination of the DataMapWales website Interactive Map Viewer 25.03.2024[3] confirms there is no ancient woodland within the survey area. There is no comprehensive national register of veteran trees, however, an examination of the Woodland Trust Ancient Tree Inventory[4] confirms there are no recorded veteran trees in the immediate vicinity of the site.

2.7 Protected Species

2.7.1 Trees and hedges are a potential habitat for nesting birds and roosting habitat for bats, both of which are protected under the *Wildlife and Countryside Act 1981* (as amended) and certain species under the *Conservation of Species and Habitat Regulations 2010*. This makes it an offence to intentionally or recklessly, damage or destroy an active birds' nest.

2.7.2 Several trees within the survey boundary may be suitable habitat for nesting birds and roosting habitat for bats, therefore all trees should be inspected for the absence or presence of nesting bird activity or presence of bats, before removal or major pruning work is carried out. A qualified Ecologist should be appointed to ensure a preliminary ecological assessment is undertaken.

3 PLANNING CONSIDERATIONS

3.1 Planning Policy

3.1.1 In addition to statutory designations and protection, the planning system also confers importance on trees and woodland in the context of potential development. The Planning Policy Wales document[5] states a number of policies relating to trees and benefits of trees in design, specifically relating to green infrastructure (paragraph 6.2), trees, woodlands and hedgerows in paragraphs 6.4.37 to 6.4.44:

Trees, Woodlands and Hedgerows

6.4.37 Trees, hedgerows, groups of trees and areas of woodland are of great importance for biodiversity. They are important connecting habitats for resilient ecological networks and make an essential wider contribution to landscape character, culture, heritage and sense of place, air quality, recreation and local climate moderation. They also play a vital role in tackling the climate emergency by locking up carbon, and can provide shade, shelter and foraging opportunities, wider landscape benefits such as air and diffuse pollution interception, natural flood management, and building materials. The importance of trees, in particular urban trees, in creating distinctive and natural places which deliver health and well-being benefits to communities, now and in the future should be promoted as part of plan making and decision taking. Planning authorities must promote the planting of new trees, hedgerows, groups of trees and areas of woodland as part of new development.

6.4.38 Welsh native tree and hedge species, characteristic of the local area, provide a strong ecosystem resilience function, and they provide resources for local wildlife, particularly other native plants and species. Native tree and hedge species can also complement opportunities for natural regeneration. Alongside broader woodland habitat types, such as wood pasture, parkland and traditional orchards, native tree and hedge species help to define our cultural heritage and landscape, creating a strong sense of place and connection to the past.

6.4.39 Planning authorities must protect trees, hedgerows, groups of trees and areas of woodland where they have ecological value, contribute to the character or amenity of a particular locality, or perform a beneficial green infrastructure function. Planning authorities should consider the importance of trees and woodland, particularly native woodland and valued trees, and should have regard to local authority tree strategies or SPG and the Green Infrastructure Assessment. Planning authorities should adopt appropriate, locally relevant, time sensitive, minimum tree canopy cover targets for their authority area to guide the protection and where appropriate the expansion of canopy cover. The Green Infrastructure

[3] DataMapWales Ancient Woodland Inventory 2021 Ancient Woodland Inventory 2021 | DataMapWales (gov.wales)
[4] Ancient Tree Inventory How to record ancient trees - Ancient Tree Inventory (woodlandtrust.org.uk)
[5] Planning Policy Wales, Edition 12, February 2024 Welsh Government Planning Policy Wales - Edition 12 (gov.wales)

Assessment and tools such as NRW's Tree Cover in Wales' Towns and Cities study and Forest Research's i-Tree Eco tool will help establish a baseline of canopy cover and guide the identification of appropriate and measurable canopy targets.

6.4.40 Where trees, woodland and hedgerows are present, their retention, protection and integration should be identified within planning applications. Where surveys identify trees, hedgerows, groups of trees and areas of woodland capable of making a significant contribution to the area, these trees should be retained and protected. The provision of services and utilities infrastructure to the application site should also avoid the loss of trees, woodlands or hedges and must be considered as part of the development proposal; where such trees are lost, they will be subject to the replacement planting ratios set out below.

6.4.41 Whilst most focus within the planning system is targeted at urban trees, planning authorities should recognise the importance of trees within the countryside, either as woodlands, within hedgerows and hedgebanks, or free-standing trees in fields, or as wood pasture. This is particularly important as the effects of climate change are leading towards pests and diseases that are damaging many of our native species in the rural landscape. Positive mechanisms of rural tree retention should be considered, and measures taken to replace them in an effective and economic manner, either with new planting or by allowing them to grow to their full potential.

6.4.42 Permanent removal of trees, woodland and hedgerows will only be permitted where it would achieve significant and clearly defined public benefits. Where individual or groups of trees and hedgerows are removed as part of a proposed scheme, planning authorities must first follow the step-wise approach as set out in paragraph 6.4.15. Where loss is unavoidable developers will be required to provide compensatory planting (which is proportionate to the proposed loss as identified through an assessment of green infrastructure value including biodiversity, landscape value and carbon capture). Replacement planting shall be at a ratio equivalent to the quality, environmental and ecological importance of the tree(s) lost and this must be preferably onsite, or immediately adjacent to the site, and at a minimum ratio of at least 3 trees of a similar type and compensatory size planted for every 1 lost. Where a woodland or a shelterbelt area is lost as part of a proposed scheme, the compensation planting must be at a scale, design and species mix reflective of that area lost. In such circumstances, the planting rate must be at a minimum of 1600 trees per hectare for broadleaves, and 2500 trees per hectare for conifers. The planting position for each replacement tree shall be fit to support its establishment and health, and ensure its unconstrained long-term growth to optimise the environmental and ecological benefits it affords.

6.4.43 Ancient woodland, semi-natural woodlands, individual ancient, veteran and heritage trees and ancient hedgerows are irreplaceable natural resources, and have significant landscape, biodiversity and cultural value. Such trees, woodlands and hedgerows are to be

afforded protection from development which would result in their loss or deterioration unless very exceptionally there are significant and clearly defined public benefits; this protection must prevent potentially damaging operations and their unnecessary loss. In the case of a site recorded on the Ancient Woodland Inventory, authorities should consider the advice of NRW. Planning authorities should also have regard to the Ancient Tree Inventory, work to improve its completeness and use it to ensure the protection of trees and woodland and identify opportunities for more planting as part of the Green Infrastructure Assessment, particularly in terms of canopy cover.

6.4.44 The protection and planting of trees and hedgerows should be delivered, where appropriate, through locally-specific strategies and policies, through imposing conditions when granting planning permission, and/or by making Tree Preservation Orders (TPOs). They should also be incorporated into Green Infrastructure Assessments and plans.

4 TREE POPULATION AND CONDITION

4.1 Tree species and population

4.1.1 The trees surveyed included the following species: hawthorn, blackthorn, oak, elder, ash, dogwood, silver birch, hazel, crab apple, alder and willow species.

4.1.2 A total of 44 individual trees, two woodland compartments, ten groups of trees and scrub and several large areas consisting predominantly of scrub were recorded.

4.1.3 During the assessment, the overall tree population, composition of groups and woodland, arboricultural, landscape and conservation qualities have been considered. A full description of the woodland compartments, groups of trees and individual trees, is given in the tree data schedule in Appendix 3 and is not repeated in the body of the report.

4.2 Categorisation and value

4.2.1 Trees, groups of trees and woodland compartments within the survey area have been identified within categories A, B, C. Under the current land management, no trees are considered to be category U. Should the level of access within the site change, the categorisation of some trees within the site would need to be reviewed.

4.2.2 It is recommended that a Tree Inspection Report be undertaken if public access is to be invited and encouraged. This should be carried out before any access is formalised, to address the landowner's duty of care to employees and the general public with regard to tree safety, as set out within the Occupiers Liability Acts of 1957 and 1984 and general duties of the Health and Safety at Work etc. Act 1974.

4.2.3 The trees surveyed are detailed in the tree data schedule in Appendix 1. Photographs of notable trees, groups, woodland and general character of the site vegetation are given in Appendix 2.

4.2.4 A summary of the cascade chart for tree categories is given below. The full table is included in Appendix 4.

- Category A Trees of high value including those that are particularly good examples of their species and/or those that have visual importance or significant conservation or other value.
- Category B Trees of moderate value including those that do not qualify as Category A due to impaired condition and/or those that collectively have higher value than they would as individuals; also trees with material conservation or other value.
- Category C Trees of low value including those with very limited merit or impaired condition; trees offering transient or temporary landscape benefits.
- Category U Trees with irremediable defects and anticipated early loss due to collapse; dead trees or those in immediate decline and those with infectious pathogens that threaten other trees.

4.2.5 A summary of the baseline of the existing tree population within the planning application red line boundary area of the proposed development site is given in Table 1.0 below. This does not include the overall habitat restoration area:

BASELINE TREE AND HEDGEROW POPULATION		CATEGORY A High quality		CATEGORY B Moderate quality		CATEGORY C Low quality		CATEGORY U Unsuitable for retention		HEDGEROW (Not categorised under BS5837:2012; formal hedgerow survey not undertaken)	
FEATURE	Total Features	Quantity	Area of crown/ canopy spread (ha)	Quantity	Area of crown/ canopy spread (ha)	Quantity	Area of crown/ canopy spread (ha)	Quantity	Area of crown/ canopy spread (ha)	Quantity	Total length (m)
TREE	29	3	0.04536701	11	0.08222691	15	0.03545427	0	0		
GROUP	1	0		0		1	3.57920889	0	0		
WOODLAND	0	0		0		0		0	0		
HEDGEROW										0	0
TOTAL		3	0.04536701	11	0.08222691	16	3.61466316	0	0	0	0

Table 1.0 Baseline of the existing tree and hedgerow population, by quantity of features, BS5837:2012 category rating and as a measure of canopy/crown cover within the development site red line boundary.

5 ARBORICULTURAL IMPACTS OF THE PROPOSED DEVELOPMENT

5.1 Trees to be removed to facilitate development

5.1.1 The proposed site layout including the building, roads, parking, sustainable drainage proposals, soft landscape and habitat enhancement proposals, has been overlaid onto the Tree Constraints Plan to identify the potential impact of the permanent works on existing trees.

5.1.2 In addition, beyond the main development area, in order to restore areas of floristically diverse irreplaceable grassland habitat, areas of scrub are proposed for removal. The strategy of the habitat enhancement and restoration work is to seek to recover and enhance some of the irreplaceable open-mosaic habitats which have significantly declined due to the successional process of scrub encroachment. Features to be retained include a former concrete water storage tank built in the 1940s which has now filled with aquatic vegetation. Nowadays the tank function as a wildlife pond and contains good populations of great crested newt, an internationally protected amphibian. A main badger sett will also be retained in perpetuity. Some dense scrub will be managed so that this habitat which supports a significant assemblage of breeding birds with at least 20 songbird species present can be retained at the site. Areas of more mature scrub and woodland to the south section of the site will be retained and enhancement proposals will be included in the LEMP.

5.1.3 There have been several iterations of the site layout to minimise impact on valuable habitats and mature trees, whilst also accommodating requirements for safe highways access, suitable layout for the building, access and parking and sustainable drainage features.

5.1.4 It is acknowledged that there are likely to be numerous native trees establishing on site within the dense scrub that are in good condition and that have arboricultural, landscape, amenity and biodiversity value. It is the intention that where possible, as scrub areas are cleared, semi-mature trees of good form and condition will be identified, tagged and assessed for retention within the habitat restoration area, to ensure the long term replenishment of the tree population for individual trees, to create extensions to the existing woodland and to enhance and strengthen green infrastructure links and habitat corridors.

5.1.5 Part of the landscape, habitat and mitigation proposals will also include new hedgerow planting, with hedgerow trees, to further strengthen green infrastructure and link to habitats to the site boundaries and beyond.

5.2 Impacts as a result of tree removal

5.2.1 The impact of the tree and scrub losses are summarised as follows and as given in Table 2.0. A total of 24 individual trees would be removed to facilitate the main development works. Areas of scrub would be removed to facilitate the development works and habitat restoration works. Two groups of trees would be partially removed for the habitat restoration works. Of the trees to be removed, there are nine Category B trees and 15 Category C trees. The total area of initial scrub removal for the habitat restoration work is 1.08401470 ha.

IMPACT OF DEVELOPMENT AND EFFECTS ON THE TREE AND HEDGEROW POPULATION	CATEGORY A High quality		CATEGORY B Moderate quality		CATEGORY C Low quality		CATEGORY U Unsuitable for retention		HEDGEROW (Not categorised under BS5837:2012; formal hedgerow survey not undertaken)	
FEATURE	Quantity Removed	Area of crown/ canopy spread removed (ha)	Quantity Removed	Area of crown/ canopy spread removed (ha)	Quantity Removed	Area of crown/ canopy spread removed (ha)	Quantity Removed	Area of crown/ canopy spread removed (ha)	Quantity removed	Total length removed (m)
TREE	0	0	9	0.05287023	15	0.03545427	0	0		
GROUP	0		0		1	3.57920889	0	0		
WOODLAND	0		0		0		0	0		
HEDGEROW									0	0
TOTAL % of crown cover removed BY CATEGORY	0	0	64.3	0.05287023	100.0	3.61466316	0	0	0	0

Table 2.0 Impact of development and effects on the tree and hedgerow population within the main development area, excluding the habitat restoration area.

5.2.2 The impact of the tree and scrub losses will be most noticeable from Oak Road to the north site boundary, with clearance of trees for visibility splays, compound installation and the main construction area.

5.2.3 Features over 75mm DBH requiring removal and proposed tree works for the initial phase of development are shown in Table 3.0[6] on the following pages. This does not include further clearance of scrub for habitat restoration within the ecology area, that is detailed in the LEMP.

[6] Refer to the tree survey data schedules for further information.

Tree ref	Species	Stem dia.	BS5837 Tree Quality Category	Radius of RPA	Affected by development	Proposed works
T - individual / G - Group / W - Woodland / H – Hedgerow * - TPO (XXXX) – tree tagged on site	*Latin name* *Common name*	mm	A, B, C, U (1,2,3)	m		
TREES - estimated measurements are in italics						
T1	Crataegus monogyna (hawthorn)	140 130	C2	1.9	Remove for construction	
T2	Malus sylvestris (crab apple)	260 320	C3	4.1	Remove for construction	
T3	Crataegus monogyna (hawthorn)	190	C2	2.28	Remove for construction	
T4	Fraxinus excelsior (ash)	200 160	C2	2.6	Remove for construction	
T5	Crataegus monogyna (hawthorn)	170	C2	2.04	Remove for construction	
T6	Malus sylvestris (crab apple)	180 190	C3	2.6	Remove for construction	
T7	Crataegus monogyna (hawthorn)	>75	C1	1	Remove for construction	
T8	Crataegus monogyna (hawthorn)	290BD	C2	2.9	Remove for construction	
T9	Quercus robur (English oak)	260	B2	3.12	Remove for construction	
T10	Fraxinus excelsior (ash)	270	B2	3.24	Remove for construction	
T11	Fraxinus excelsior (ash)	260	B2	3.12	Remove for construction	
T12	Fraxinus excelsior (ash)	100 130	C2	1.6	Remove for construction	
T13	Quercus robur (English oak)	310	B2	3.72	Remove for construction	
T14	Quercus robur (English oak)	350 BD	B2	3.5	Remove for construction	
T15	Quercus robur (English oak)	380	B1, B2	4.56	Remove for construction	
T16	Fraxinus excelsior (ash)	160 170 220	C2	3.2	Remove for construction	
T17	Fraxinus excelsior (ash)	300	B2	3.6	Remove for construction	
T18	Crataegus monogyna (hawthorn)	140 BD	C2	1.4	Remove for construction	
T19	Malus sylvestris (crab apple)	380 BD	C2	3.8	Remove for construction	
T20	Quercus robur (English oak)	150	C2	1.8	Remove for construction	
T21	Fraxinus excelsior (ash)	230	B2	2.76	Remove for construction	
T22 (2076) *	Quercus robur (English oak)	670	B3	8.04	Adjacent to proposed access road; in new soft landscape area	Retain and protect
T23 (2077) *	Quercus robur (English oak)	560	B1	6.72	Remove for construction	
T24	Quercus robur (English oak)	160	C2	1.92	Within proposed car park area adjacent to new building	Lift and translocate to new landscape area
T25	Quercus robur (English oak)	150	C2	1.8	Within proposed car park area adjacent to new building	Lift and translocate to new landscape area
T26 (2078) *	Quercus robur (English oak)	840	B2, B3	10.08	Adjacent to proposed access road and car park; within new soft landscape area	Retain and protect
T27 (2079) *	Quercus robur (English oak)	920	A2	11.04	No impact from development works	
T28 (2080) *	Quercus robur (English oak)	840	A2	10.08	No impact from development works	
T29 (2081) *	Quercus robur (English oak)	880	B2	10.56	No impact from development works	
T30 (2082) *	Quercus robur (English oak)	800	B2	9.6	No impact from development works	
T31	Salix species	*650 BD*	C2	6.5	No impact from development works	
T32	Fraxinus excelsior (ash)	*500 BD*	C2	5	No impact from development works	
T33 (2083)	Quercus robur (English oak)	1010	A3	12.12	No impact from development works	
T34	Quercus robur (English oak)	*750*	C2	9	No impact from development works	
T35	Quercus robur (English oak)	*750*	C2	9	No impact from development works	
T36 (2084) *	Quercus robur (English oak)	950	B3	11.4	No impact from development works	
T37 (2085) *	Quercus robur (English oak)	900	B2, B3	10.8	No impact from development works	
T38	Fraxinus excelsior (ash)	*450*	C2	5.4	No impact from development works	
T39 *	Quercus robur (English oak)	*800*	A2	9.6	Adjacent to proposed access road and swale	Retain and protect
T40	Quercus robur (English oak)	*800*	A2	9.6	Adjacent to proposed access road and swale	Retain and protect
T41	Quercus robur (English oak)	*800*	A2	9.6	Within new landscape area, retain and protect	Retain and protect
T42	Quercus robur (English oak)	*700*	B1, B2	8.4	No impact from development works	
T43	Quercus robur (English oak)	*450*	B1, B2	5.4	No impact from development works	
T44	Quercus robur (English oak)	*750*	B1, B2	9	No impact from development works	
GROUPS						
G1	Quercus robur (English oak)	*750*	A2	see tree constraints plan	No impact from development works	

Tree ref	Species	Stem dia.	BS5837 Tree Quality Category	Radius of RPA	Affected by development	Proposed works
T - individual / G - Group / W - Woodland / H – Hedgerow * - TPO (XXXX) – tree tagged on site	*Latin name* *Common name*	mm	A, B, C, U (1,2,3)	m		
G2	Alnus glutinosa (alder)	*average stem dia 280*	B2	see tree constraints plan	No impact from development works	
G3	Alnus glutinosa (alder)	*75-600*	B2	see tree constraints plan	No impact from development works	
	Salix fragilis (crack willow)					
	Crataegus monogyna (hawthorn)					
	Prunus spinosa (blackthorn)					
	Quercus robur (English oak)					
G4	Crataegus monogyna (hawthorn)	*under 300*	C2	see tree constraints plan	Scrub within area of proposed development	Partial removal of group within area of development and for habitat restoration works
	Prunus spinosa (blackthorn)					
	Occasional numbers of:					
	Quercus robur (English oak)					
	Alnus glutinosa (alder)					
	Salix fragilis (crack willow)					
	Cornus sanguinea (dogwood)					
	Betula pendula (silver birch)					
	Salix fragilis (crack willow)					
	Fraxinus excelsior (ash)					
G5	Crataegus monogyna (hawthorn)	*under 300*	C2	see tree constraints plan	Scrub and trees outside area of proposed development but within area for habitat restoration	Partial removal of group for habitat restoration works
	Prunus spinosa (blackthorn)					
	Salix fragilis (crack willow)					
	Fraxinus excelsior (ash)					
	Alnus glutinosa (alder)					
G6	Salix fragilis (crack willow)	*150-450*	B3	see tree constraints plan	No impact from development works	
	Fraxinus excelsior (ash)					
	Alnus glutinosa (alder)					
	Crataegus monogyna (hawthorn)					
G7	Salix fragilis (crack willow)	*150-450*	B3	see tree constraints plan	Scrub and trees outside area of proposed development but within area for habitat restoration	Partial removal of group for habitat restoration works
	Salix caprea (goat willow)					
G8	Crataegus monogyna (hawthorn)	*150-450*	B2, B3	see tree constraints plan	No impact from development works	
	Prunus spinosa (blackthorn)					
	Salix fragilis (crack willow)					
	Fraxinus excelsior (ash)					
	Betula pendula (silver birch)					
	Quercus robur (English oak)					
	Alnus glutinosa (alder)					
G9	Crataegus monogyna (hawthorn)	*150-450*	B2	see tree constraints plan	No impact from development works	
	Salix fragilis (crack willow)					
	Fraxinus excelsior (ash)					
	Betula pendula (silver birch)					
	Quercus robur (English oak)					
	Alnus glutinosa (alder)					

Tree ref	Species	Stem dia.	BS5837 Tree Quality Category	Radius of RPA	Affected by development	Proposed works
T - individual / G - Group / W - Woodland / H – Hedgerow * - TPO (XXXX) – tree tagged on site	*Latin name* *Common name*	mm	A, B, C, U (1,2,3)	m		
G10	Crataegus monogyna (hawthorn)	*150-300*	C2	see tree constraints plan	No impact from development works	
	Salix fragilis (crack willow)					
	Fraxinus excelsior (ash)					
	Betula pendula (silver birch)					
	Quercus robur (English oak)					
	Alnus glutinosa (alder)					
W1	Quercus robur (English oak)	*up to 650*	B2, B3	see tree constraints plan	No impact from development works	
	Alnus glutinosa (alder)					
	Salix fragilis (crack willow)					
	Betula pendula (silver birch)					
	Fraxinus excelsior (ash)					
	Corylus avellana (hazel)					
	Crataegus monogyna (hawthorn)					
	Prunus spinosa (blackthorn)					
	Malus sylvestris (crab apple)					
	Sambucus nigra (elder)					
W2	Salix fragilis (crack willow)	*up to 650*	B2, B3	see tree constraints plan	No impact from development works	
	Alnus glutinosa (alder)					
	Crataegus monogyna (hawthorn)					
	Quercus robur (English oak)					
	Fraxinus excelsior (ash)					

Table 3.0 Schedule of tree works for initial phase of development

6 ARBORICULTURAL METHOD STATEMENT

6.1 General requirements

6.1.1 A copy of this document should be provided to the Project Manager and retained at the site office, with all relevant drawings included in the appendices clearly displayed on site notice boards. The method statement must be made freely available for inspection to contractors and sub-contractors. The document shall be introduced to all new contractors as part of the general site induction.

6.1.2 An Arboricultural Consultant shall be appointed to inspect the tree works and protection measures to ensure compliance with this method statement in accordance with the draft Arboricultural Inspection Proforma in Appendix 5 and reporting procedures. Timing of inspections will generally be every 6-8 weeks, timed to coincide with planned work stages and include ad-hoc inspections.

6.1.3 All proposed tree works shall be carried out by a suitably qualified, competent and insured contractor, preferably an Arboricultural Association approved contractor. Tree work should be undertaken in accordance with BS 3998:2010 – "Tree Work - Recommendations" and current issued FISA Safety Guides (Forestry Industry Safety Accord). No tree works shall be undertaken by construction personnel.

6.1.4 All tree works to be carried out shall comply with all appropriate legislation, including planning application decision notices and conditions, felling licences, statutory Tree Preservation Order and Conservation Area constraints and requirements. This includes The Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000 which provides statutory protection to protected species and birds. All tree work operations are covered by these provisions and advice from an ecologist should be obtained before undertaking any works that might constitute an offence.

6.1.5 The proposed tree works are shown on:

- Arboricultural Impact Assessment Plans Tree Removals 311/T/200 to 219;
- Arboricultural Method Statement Plans Tree Works 311/T/300 to 219; and
- Arboricultural Method Statement Plans Tree Protection 311/T/300 to 320.

6.1.6 All proposed tree pruning and tree removal, shall be undertaken in accordance with the approved schedule and plans appended within this report and in consultation with the Arboricultural Consultant and Ecologist. No works are to be undertaken on trees that are shown to be retained and protected without prior consultation with the Arboricultural Consultant and Ecologist.

6.1.7 Trees to be removed shall be spray painted in accordance with the drawings and accompanying schedule.

6.1.8 The Site Manager shall be responsible for daily compliance with this method statement and shall contact the Arboricultural Consultant as required for general queries, ad-hoc inspections and unexpected occurrences affecting trees during the course of the works, such as encountering large roots over 25mm diameter or if additional pruning is required.

6.1.9 The tree works and subsequent installation of protection must be carried out prior to the commencement of construction, ground preparation works, establishment of site compounds, delivery of construction plant and materials or other investigation works.

6.1.10 No tree removal or pruning works other than those identified in this method statement, are to be carried out as further permissions from Wrexham County Borough Council may be required and ecological constraints may be present.

6.1.11 All tree works should be undertaken outside of the nesting bird season which is between 1st March to 1st September, however it should be noted, that should warm weather be prevalent at the end of February, it is possible that bird nesting activity may start early.

6.1.12 If any tree works are to take place between March and August, a suitably qualified Ecologist should check the tree works area a maximum of 24 hours before any works commence. Should any nesting birds be found, or suspected to be present, advice should be sought from the Ecologist before proceeding.

6.1.13 If nesting birds are found, the tree should be marked with tape or spray paint to prevent the tree from being removed until the young have fledged the nest. The drawing displayed in the site office and showing the relevant tree should be marked to identify the presence of a birds nest and the date noted. This will allow forward planning for reinspection and removal once the young have fledged the nest.

6.1.14 INNS are present at the site and are adjacent to the working area. A separate INNS management plan will be developed.

7 ARBORICULTURAL METHOD STATEMENT WORKS TO EXISTING TREES

7.1 Tree works

7.1.1 In addition to the tree removals, tree surgery works are recommended to allow clearance for construction access, to prevent potential damage from construction vehicles and as remedial or formative pruning. The tree works proposed are shown in Table 1.0 and on the:

- Arboricultural Method Statement Plans Tree Works 311/T/300 to 219; and
- Arboricultural Method Statement Plans Tree Protection 311/T/300 to 320.

7.1.2 All operations must be carried out to avoid damaging neighbouring retained trees. Trees to be retained must not be used for anchorage or winching purposes.

7.1.3 Any pruning to facilitate access must ensure there is no significant adverse impact on tree physiology or amenity value. A suitable working area may be created by temporarily tying back tree branches to avoid excessive pruning. The visual appearance, health and stability of a tree must be considered when undertaking pruning works and remedial pruning may be required as part of the tree works.

7.1.4 All trees that have been approved for removal shall be cut down to a low stump. Those that are in close proximity to trees to be retained shall either have their stumps ground out or left in situ. The stumps of felled trees not in close proximity to retained trees can be fully grubbed out. Access for stump removal must gained from within the designated construction working area, not through the woodland to avoid damaging the RPA of trees to be retained.

7.1.5 All arising timber shall be stacked to form habitat piles in clearings within the woodland in the CEZ, it should not be stacked below the canopy of trees to be retained and not within the construction working area.

7.1.6 Removal of ivy growth is included in these works where there is a need for more detailed inspection of a tree, or where there is concern that the extent of ivy may create a windsail effect with regard to tree stability. Ivy growth can create valuable habitat for insects, invertebrates, birds and bats and therefore where this is considered of wildlife benefit, it will be retained.

7.1.7 Trees in category U that are dead or in decline may be retained as standing dead wood where there is no public access and no targets. Where there is existing public access, or where new access is planned, in the vicinity of category U trees, it is proposed that these trees are either reduced to 4m in height as standing dead wood, or removed completely.

7.1.8 Tree protection fencing and ground protection measures shall be installed following completion of the tree works and prior to any other construction or clearance works taking place.

7.1.9 All tree work should be undertaken with due regard to ecological constraints and any mitigation requirements.

7.2 Tree and root protection

7.2.1 Following completion of the tree works, and subsequent inspection and sign off by the Arboricultural Consultant, the Site Manager will arrange installation of the temporary tree protection.

7.2.2 Tree protection fencing in accordance with BS5837:2012 (See Appendix 2 for details) or other suitable robust and immovable fence to minimum 1.5m in height to be approved by the Arboricultural Consultant and Wrexham County Borough Council Tree Officer, shall be erected prior to the commencement of any of the following activities:

- Soil stripping;
- Delivery of any plant or materials;
- Demolition and site clearance;
- Commencement of construction works;
- Installation of any utilities;
- Soiling / ground reinstatement; and
- Landscape works.

The protective fencing shall be erected to the alignment as shown on the

- Arboricultural Method Statement Plans Tree Protection 311/T/300 to 320.

Setting out co-ordinates can be provided by MDLandscape if required.

7.2.3 Weather proof tree protection fence signs (See Appendix 3) shall be attached to the fencing at 25m intervals and positioned at eye level. These signs must be replaced if they are removed or become illegible.

7.2.4 Once erected these fenced areas should be respected and after installation, barriers and ground protection should not be removed or altered without prior recommendation by the Arboricultural Consultant and must remain in place until completion of all construction works on site.

7.2.5 No works are proposed within the CEZ once the fence and ground protection measures are installed. The CEZ must not be altered and the following restrictions shall apply:

- No change in ground level, reprofiling or mechanical excavations;
- No excavations by other means without the advice and agreement of the Arboricultural Consultant;
- No removal of grass areas by mechanical means;

- No storage of plant or materials;
- No storage or handling of any chemicals, fuels, wash out areas; and
- No vehicular access.

7.2.6 Where the Root Protection Areas (RPA) for retained trees extends beyond the tree protection fencing, temporary ground protection shall be installed in accordance with BS5837:2012. Such ground protection must ensure that there is no soil compaction and root growth is uninhibited. The ground protection shall consist of the following as relevant to the proposed site layout and construction requirements:

7.3 Topsoil storage

7.3.1 Topsoil storage within the RPA of existing trees to be retained should be avoided. It is recommended that geotextile be laid below the proposed topsoil storage bund to segregate existing and stored soils to prevent inadvertent excavation at reinstatement. Topsoil should not be stored more than 1m in height.

7.4 Temporary pedestrian access during construction

7.4.1 Single thickness non-slip boards on a 100mm compression-resistant layer of woodchip, over a robust geo/textile membrane; or, geotextile laid over existing ground with 100mm depth clean inert hardcore; or, non-slip boards laid on a purpose formed scaffold frame, creating a suspended walkway. Alternative proposals may be submitted to the Arboricultural Consultant.

7.5 Vehicular access

7.5.1 Where vehicular construction access is required within the RPA of trees to be retained, an above ground protection system shall be provided. This shall be installed to accommodate the potential loading within the RPA (e.g. proprietary systems as shown in Appendix 4) and shall be designed to an engineering specification in conjunction with arboricultural advice.

7.5.2 On completion of construction and reinstatement works the above ground protection systems shall be removed only with the approval of the Arboricultural Consultant. Surface de-compaction and root zone enhancement measures may be required and can then be undertaken.

7.6 Additional precautions outside the CEZ

7.6.1 Care should be taken when planning site operations to ensure that all types of machinery can operate without encountering retained trees. Such contact can result in significant damage and compromise safe retention of the tree. It is recommended that a banksman is employed to ensure adequate clearance from trees is always maintained. Where this is not possible, access facilitation pruning in consultation with the Arboricultural Consultant may be required. No signs, apparatus or any other services shall be attached to any part of a retained tree.

7.7 Site compounds, cabins, storage of materials and spoil

7.7.1 Temporary site compounds, including portable welfare facilities and temporary service connections, are to be positioned clear of the RPA of retained trees. The site poster 'Common causes of tree death' (see Appendix 6) shall be posted in the site cabin(s).

7.7.2 The delivery, storage, mixing and discharge of concrete and all other cement based materials shall be carried out away from retained trees, so that there is no risk of runoff and spillage in the RPA. No substances that are potentially injurious to trees (including fuels, building materials and other phyto-toxic materials) shall be stored or used in the vicinity of retained trees where there is a risk of injurious contact. Emergency spillage kits must be available to minimise the impacts of any accidental spillages to the local environment.

7.7.3 No materials shall be stored within the RPA of retained trees. Spoil from any site activity shall be removed or if to be retained for reuse, stored or piled outside the CEZ.

7.8 Installation of services and excavation within the RPA

7.8.1 Underground services should be routed outside the RPA of all retained trees to avoid risk of roots being severed during excavation. Mechanical trenching can also affect local soil hydrology. Common ducts should be used to minimise disturbance and segregated from the RPA.

7.8.2 Where there is no alternative and new services are to pass within the RPA, the service plans should be developed with input from the Arboricultural Consultant. Trenchless insertion methods should be used where possible, with the entry and exit pits situated outside the RPA.

7.8.3 Where this is not possible the NJUG 10 Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees should be adopted. Hand excavation may be acceptable for shallow service runs, where they can be undertaken with the supervision of the Arboricultural Consultant and where roots can be retained and suitably protected. Where possible an air spade or air lance should be used to loosen the soil and removed using a vacuum excavator. Soils should be stored and retained on site for reinstatement on completion of the works. This may also involve wrapping or covering exposed roots to prevent desiccation and the effects of rapid temperature change. All wrappings must be removed prior to backfilling.

7.8.4 Prior to backfilling of soils the installation of a root protection barrier may be required to ensure there are no long-term effects of root growth on buried assets. Backfilling to trenches should ensure that subsoils are replaced first in 300mm layers and soils consolidated but not compacted. The final 300mm of soil backfill to ground level should be topsoil excavated from the trench or a 50/50 mix by volume of as dug topsoil and proprietary tree and shrub compost with organic matter content to replicate the upper soil profile. Injection of soils with mycorrhizal inoculant may also be considered where fibrous roots have been lost due to excavation.

7.9 Demolition and new surfacing within the CEZ

7.9.1 Demolition of existing structures in close proximity to retained trees should be carried out under the supervision of the Arboricultural Consultant with works planned to avoid deposition of material within the CEZ and to avoid damage to retained trees. Mechanical plant access within the CEZ should be avoided. Temporary pedestrian access shall be allowed within the CEZ to carry out these operations. A temporary breach in the fencing shall be created to facilitate pedestrian access only.

7.9.2 Removal of the existing hard surfacing adjacent to the RPA should be undertaken first, working away from the retained tree to allow any exposed roots to be appropriately covered and protected as work proceeds. Debris within the RPA should be removed by hand and transported clear of the protective fencing using wheelbarrows.

7.9.3 Where roots are encountered during the course of the works, they shall be retained and carefully worked around, wherever practicable. No root greater than 25mm dia. shall be cut without advice from the Arboricultural Consultant. If damage does occur to a root greater than 25mm diameter, then advice must be sought from the Arboricultural Consultant. Where it is essential to sever roots, they shall be cleanly cut, using an appropriate, sharp clean bladed hand tool. Roots that are to be retained shall be covered with hessian, or similar, to protect from desiccation. Prior to backfilling, any hessian wrapping should be removed and retained roots should be surrounded with sharp sand, or other loose granular fill before soil or other material is replaced.

7.9.4 To minimise risk of damage to tree roots to be retained, an air spade or vacuum excavator may be used to loosen and remove soils, in order to identify the location of roots adjacent to a planned excavation. Roots may then be pruned as previously described.

6 Kinderton Close | High Legh | Knutsford| Cheshire | WA16 6LZ | mdlandscape@btinternet.com | 07710 498231

7.9.5 Where there is a deficit of cover due to removal of existing surfacing, inert sandy subsoil shall be placed where the depth exceeds 300mm. Where the depth of cover is 300mm or less, a loam-sand-based topsoil shall be placed to provide at least 300mm of cover. Grading shall be undertaken using hand tools only to avoid compaction. No reduction of levels of the underlying soil surface shall be carried out. Soiling shall be undertaken in accordance with the Construction code of practice for the sustainable use of soils on construction sites.[7]

7.10 Reinstatement and soft landscaping within the CEZ

7.10.1 Reinstatement and soft landscape works, excavation and ground preparation within the CEZ shall be carried out using hand tools to minimise risk of damage to roots. Mechanical cultivation and rotovation shall be avoided.

7.10.2 Chemical application for treatment of woody plant matter shall be minimised. Where used, all instructions, warnings and other relevant information from manufacturers should be strictly observed and followed. Care must be taken to avoid damage to adjacent vegetation and trees to be retained.

7.10.3 During reinstatement, there must be no unplanned changes in ground levels within the RPA and works should only be carried out when ground conditions are suitable to avoid risk of compaction. Final grading to marry in new levels with existing ground with imported soils shall be carried out by hand tools only. Cultivations for seeding shall also be by hand.

7.10.4 All new tree planting should be undertaken in accordance with *BS8545:2014 Trees: from nursery to independence in the landscape - Recommendations.* Planting pits for hedgerows, shrubs or trees within the RPA of existing retained trees, must be hand excavated. If substantial roots are encountered, the planting pit should be relocated if possible.

7.10.5 Plants and materials for the landscape works should be transported in wheelbarrows and must be moved across existing hard surfacing where possible, or via temporary ground protection minimise risk of compaction.

7.11 Construction of new footpaths within the CEZ

7.11.1 The construction of any new footpaths and vehicle access within the CEZ or potentially affecting RPA of retained trees must be installed using a 'no dig' construction method using a 3D cellular confinement system such as Cellweb, in accordance with the Manufacturer's recommendations.

[7] Construction Code of Practice for the Sustainable Use of Soils on Construction Sites, www.defra.gov.uk September 2009

7.11.2 The process for installation should be in accordance with Manufacturer's recommendations and generally involves:

- Remove all existing vegetation from the surface using hand tools only. Arisings should be removed from the RPA using wheelbarrows only. No further excavations in this area are to take place. Any voids or depressions within the ground surface are to be made good using sharp sand (not builder's sand) to maintain levels.
- Position kerb edges where there is no conflict with tree roots with minimal haunching, or Install a metal edging to the full depth of proposed surfacing.
- Install geotextile to the ground surface and lay 3D cellular confinement mat (e.g. Cellweb) to the recommended thickness for the proposed access use on top of this membrane. Expand the mat to its full length and trim to the desired length and width. Carefully peg down the matting with proprietary staking pins to keep the cells open. Fill all the cells with a 20-40mm no fines angular granular stone working from the area furthest from the tree first. Continue filling all the cells using the previously filled cells as a working platform.
- The finished surface of the access area may be the gravel surface or laid as required with block paving or similar to manufacturers recommendations.

7.11.3 Topsoil is to be graded from the top of the kerb edge or installed edge restraints to the existing ground level to avoid creating trip hazards.

7.12 Arboricultural watching brief and supervision of excavations

7.12.1 The Site Manager shall inform the Arboricultural Consultant as soon as possible of the need to undertake excavation works within the RPA of existing trees and programme in an arboricultural watching brief. All watching briefs must be performed by an Arboricultural Consultant.

7.12.2 An arboricultural watching brief is required to ensure the pruning of roots is minimised, kept to within acceptable limits and to supervise the reinstatement of soils. Where possible, root pruning should be carried out at the same time as the installation of the temporary fencing to ensure the fence is in the correct position immediately after the root pruning and reinstatement of soils has been completed.

7.12.3 The root pruning work should be undertaken in dry conditions, ideally whilst the ground is moist. Reinstatement of soils, should be carried out as soon as possible after root pruning to avoid drying out of roots to retained trees. There should be at least 300mm of topsoil cover over tree roots to the final ground profile and levels should marry in with existing ground levels. A tree protection fence shall be sited at the base of the newly profiled slope or edge of the soiled area on completion to prevent vehicular access.

7.12.4 The watching brief will also ensure that roots of trees to be retained at the edge the area to be regraded are not damaged.

7.12.5 The use of plant and machinery beyond this demarcation line is prohibited unless at the direction of the arboricultural consultant.

7.12.6 Work to remove trees, stumps and roots may then progress slowly to the extent of the tree protection area. The Arboricultural Consultant will monitor the level and likelihood of potential root loss and make on-site recommendations as works progress relevant to presence of roots, diameter of roots and how they are to be pruned as work proceeds.

7.12.7 Any regraded soils must be seeded with a perennial ryegrass mix on completion of the reprofiling to aid stabilisation of surface soils and avoid erosion.

7.12.8 The Arboricultural Consultant will make a photographic record of the soiling works for inspection by the local authority and the completion of the watching brief must be verified by the Arboricultural Consultant.

8 MITIGATION PLANTING & LANDSCAPING

8.1 Mitigation

8.1.1 On completion of construction, soil stored within the working area will be reinstated to marry in levels with the adjacent soils and additional imported subsoil and topsoil laid for new planting areas. Temporary geotextile membranes and temporary surfacing to compounds and temporary surfaces shall be lifted and removed, and the soil surface beneath shall be lightly raked over. Works are to be carried out in accordance with section 7.10 and the reseeding and replanting requirements will be detailed on the Landscape Masterplan 311/LAND/L/100.

8.1.2 Plants and materials for the landscape works shall be transported along the new footpaths and hard surfacing areas to avoid trafficking over existing soils.

8.1.3 Soils to either side of the hard surfacing areas shall be graded to smooth, flowing contours, suitable for seeding and planting as per the reinstatement proposals. Care shall be taken not to overwork soils.

8.1.4 Replacement tree planting is proposed to mitigate for the removed trees, and to replace amenity or biodiversity value that may be lost because of the tree removal. The Landscape Masterplan 311/LAND/L/100 includes proposals to enhance screening, biodiversity and visual amenity.

8.1.5 Native trees and shrubs appropriate to the area are recommended to be consistent with the vegetation of the locality and for the benefit of biodiversity and site ecology, however ornamental species are also included for more formal entrance areas, access routes and garden.

8.1.6 Planting works would be undertaken between November to March.

9 INSPECTIONS

9.1 Prior to commencement of construction

9.1.1 Once the protective fencing and ground protection measures have been installed but prior to the commencement of the development a site inspection should be undertaken by the Arboricultural Consultant. This is to confirm that all protection measures have been installed in accordance with the Tree Protection Plan and the method statement.

9.1.2 Checks of the tree fence and ground protection should be carried out by the contractor at regular intervals during the development to ensure trees remain adequately protected.

9.1.3 On completion of the development a general survey of the trees by the Arboricultural Consultant is recommended to identify any remedial action necessary as a result of the works. Note that permission for any additional tree works not included in the original development consent may need to be obtained through application to the LPA/Wrexham County Borough Council.

9.1.4 If any arboricultural issues arise during the development, then the site manager should immediately contact the Arboricultural Consultant for advice on how to proceed.

9.2 Reinspection

9.2.1 It is recommended that trees are inspected every two years, particularly after storms or other extreme weather events, to identify potential new hazards or changes to known defects. Annual inspections have been recommended for specific trees where fungal fruiting bodies or defects are known to be present. Inspections of all retained trees should be undertaken by a qualified Arboriculturist/Arboricultural Consultant and records of inspection held at the site or with the landowner.

9.2.2 Hazard recommendations are based on observations at the time of survey. Trees are dynamic living organisms whose structure is constantly changing. Even those in good condition can suffer from damage or stress. Following site development, regular (annual or biennial) inspections of all retained trees should be undertaken by a qualified Arboricultural Consultant.

10 FIGURES

11 APPENDICES

APPENDIX 1 - ARBORICULTURAL SURVEY DATA SHEETS – refer to Tree Constraints Plans.

Site	The Oaks, WIE	Surveyor	Marianne Dobson	Date	07/03/2024	Weather	cool, overcast	Drawing	311/T/100-119

The information in the data sheets is correct as of time of survey. Trees are dynamic organisms and their condition can change as a result of changes in their environment, stress factors, physical and man-made conditions.

Tree ref T - individual G - Group W - Woodland H - Hedgerow * - TPO (xxxx) tree tagged on site	**Species** *Latin name* *Common name*	**Height** m	**Stem dia.** mm	**Crown spread**				**Direction and height of lowest branch** m	**Height of crown clearance** m	**Maturity** Young; Semi-mature; Middle Age; Early mature; Mature	**Structural condition** Good; Fair; Poor; Veteran	**Physiological condition** Good; Fair; Poor; Veteran	**Comments on form condition, health and significant defects**	**BS5837 Tree Quality Category** A, B, C, U (1,2,3)	**Radius of RPA** m	**Management recommendations**	**Estimated remaining contribution** less than 10yrs, 10-20, 20-40, 40yrs+
				N	S	E	W										
TREES - estimated measurements are in italics																	
T1	Crataegus monogyna (hawthorn)	5	140 130	2.5	3	2.5	2.5	0	0.5	Mature	Good	Good	Bifurcate at base	C2	1.9		10-20 years
T2	Malus sylvestris (crab apple)	5	260 320	3	3	3	3	0	0.5	Mature	Poor	Poor	Bifurcate at base; poor condition; one stem dead	C3	4.1		10-20 years
T3	Crataegus monogyna (hawthorn)	5	190	2.5	3.5	3	3.5	0	0.5	Middle Age	Good	Good	Scrubby small tree	C2	2.28		10-20 years
T4	Fraxinus excelsior (ash)	8	200 160	3.5	4	3.5	3.5	NW2	0.5	Middle Age	Good	Good	Bifurcate at base with spreading crown	C2	2.6		10-20 years
T5	Crataegus monogyna (hawthorn)	5	170	2.5	6	4.5	6	W2	0.5	Mature	Good	Good	Adjacent to fence and suppressed by surrounding trees	C2	2.04		10-20 years
T6	Malus sylvestris (crab apple)	5	180 190	2	2	2	2	N1.5	0.5	Middle Age	Poor	Fair	Bifurcate at base; occluded split at base; splaying growth with stems separating; splits to stems	C3	2.6		<10 years
T7	Crataegus monogyna (hawthorn)	4	>75	2	2	2	2	W0.5	0.5	Young	Fair	Fair	Scrubby small tree	C1	1		10-20 years
T8	Crataegus monogyna (hawthorn)	6	290BD	3	3.5	3	4.5	SW0.2	0.5	Mature	Good	Good	Three stems arising at 50cm, spreading crown	C2	2.9		10-20 years
T9	Quercus robur (English oak)	6	260	3.5	3.5	3	4.5	SW2.5	0.5	Semi-mature	Good	Good	Basal branch 80mm dia.; tree 1.5m from verge; damage to north side of crown from passing traffic	B2	3.12	Remove low branch	20-40 years
T10	Fraxinus excelsior (ash)	8	270	3.5	64	2.5	3	E2	1.5	Semi-mature	Good	Good	Bifurcate at 2.5m	B2	3.24		20-40 years
T11	Fraxinus excelsior (ash)	8	260	3.5	3.5	3.5	5	NE2.5	1.5	Semi-mature	Good	Fair	Dieback to branch at 2.2m west	B2	3.12	Review condition of crown in summer	20-40 years

Tree ref T - individual G - Group W - Woodland H - Hedgerow * - TPO (xxxx) tree tagged on site	**Species** *Latin name* *Common name*	**Height** m	**Stem dia.** mm	**Crown spread**				**Direction and height of lowest branch** m	**Height of crown clearance** m	**Maturity** Young; Semi-mature; Middle Age; Early mature; Mature	**Structural condition** Good; Fair; Poor; Veteran	**Physiological condition** Good; Fair; Poor; Veteran	**Comments on form condition, health and significant defects**	**BS5837 Tree Quality Category** A, B, C, U (1,2,3)	**Radius of RPA** m	**Management recommendations**	**Estimated remaining contribution** less than 10yrs, 10-20, 20-40, 40yrs+
				N	S	E	W										
T12	Fraxinus excelsior (ash)	8	100 130	2	2	1.5	1	NW1.2	1.5	Semi-mature	Fair	Fair	Bifurcate at base with occlusions to stem; possible dieback	C2	1.6		<10 years
T13	Quercus robur (English oak)	8	310	3.5	4	4.5	4.5	S0.5	0.5	Early Mature	Good	Good	Open spreading habit with low branching crown; bifurcate at 1.5m; broken small dia branch at 1.5m	B2	3.72	Remedial prune of broken branch	20-40 years
T14	Quercus robur (English oak)	9	350 BD	3.5	3.5	3	3.5	NW0.6	0.5	Early Mature	Good	Good	Open spreading habit with low branching crown; bifurcate at 1m with basal banch to south; two smaller oaks behind at fence line under 75mm dbh but good condition	B2	3.5		20-40 years
T15	Quercus robur (English oak)	10	380	4	5	3.5	4.5	W1.5	0.5	Early Mature	Good	Good	Spreading habit with low branching crown	B1, B2	4.56		20-40 years
T16	Fraxinus excelsior (ash)	10	160 170 220	3	3	3	3.5	NW1.5	1	Early Mature	Fair	Fair	Three stems arising together at base; low vigour; possible dieback	C2	3.2	Review condition of crown in summer	10-20 years
T17	Fraxinus excelsior (ash)	9	300	3.5	4	0.5	3.5	S0.5	0.5	Semi-mature	Good	Good	Good form	B2	3.6	Review condition of crown in summer	20-40 years
T18	Crataegus monogyna (hawthorn)	6	140 BD	1.5	2.5	1.5	1.5	E1	1	Semi-mature	Good	Good	Small scrubby hawthorn	C2	1.4		10-20 years
T19	Malus sylvestris (crab apple)	6	380 BD	3	3.5	3	3.5	SE1.7	1	Mature	Fair	Fair	Dense congested crown; multiple banches at 1m with spreading crown; habitat value	C2	3.8		10-20 years
T20	Quercus robur (English oak)	6	150	1	1.5	1.5	2	NW2.5	1	Young	Fair	Good	Fused branch at 1.8m south; broken branches; damage from traffic to north of crown	C2	1.8		10-20 years
T21	Fraxinus excelsior (ash)	10	230	3	3.5	3	3	N2	1.5	Semi-mature	Good	Good	Bifurcate at 2.5m good bud development	B2	2.76	Review condition of crown in summer	20-40 years

Tree ref T - individual G - Group W - Woodland H - Hedgerow * - TPO (xxxx) tree tagged on site	**Species** *Latin name* *Common name*	**Height** m	**Stem dia.** mm	**Crown spread**				**Direction and height of lowest branch** m	**Height of crown clearance** m	**Maturity** Young; Semi-mature; Middle Age; Early mature; Mature	**Structural condition** Good; Fair; Poor; Veteran	**Physiological condition** Good; Fair; Poor; Veteran	**Comments on form condition, health and significant defects**	**BS5837 Tree Quality Category** A, B, C, U (1,2,3)	**Radius of RPA** m	**Management recommendations**	**Estimated remaining contribution** less than 10yrs, 10-20, 20-40, 40yrs+
				N	S	E	W										
T22 (2076) *	Quercus robur (English oak)	13	670	8	9	7	7	S2	1	Mature	Good	Good	Mature oak within site; bifurcate at 1.8m; at edge of wet area; bark loss and cavity to base on south east side; historic damage, occluding, 1m high extending up from base; sweep at base, no decay fungi; descending branches and low crown	B3	8.04	Avoid crown lifting due to size of lowest branches	20-40 years
T23 (2077) *	Quercus robur (English oak)	12	560	8	8	5	10	N2	1	Mature	Good	Good	Edge of wet area; barbed wire embedded in stem; spreading crown; epicormic growth to branches; descending branches	B1	6.72	Avoid crown lifting due to size of lowest branches	20-40 years
T24	Quercus robur (English oak)	6	160	1.5	1.5	1.5	1.5	S2.5	0.5	Young	Good	Good	Lost leader but secondary stem assuming dominance	C2	1.92		10-20 years
T25	Quercus robur (English oak)	6	150	1.5	2	2	1.5	N2.5	0.5	Young	Good	Good	Good form and condition; potental to establish as a tree of higher category rating	C2	1.8		10-20 years
T26 (2078) *	Quercus robur (English oak)	14	840	4	8	8.5	4.5	S2	1	Mature	Good	Good	Sweep at base with biased crown to east; low branching crown and spreading habit; epicormic growth and burrs to stem; descending branches	B2, B3	10.08	Avoid crown lifting due to size of lowest branches	20-40 years
T27 (2079) *	Quercus robur (English oak)	15	920	8	11	7	9	N2	0.5	Mature	Good	Good	Low branching crown and spreading habit; descending branches; good form and condition	A2	11.04	Avoid crown lifting due to size of lowest branches	20-40 years
T28 (2080) *	Quercus robur (English oak)	16	840	8	12	7.5	11	S2.5	1.5	Mature	Good	Good	Low branching crown and spreading habit; descending branches; natural branch shedding; good form and condition	A2	10.08	Avoid crown lifting due to size of lowest branches	20-40 years
T29 (2081) *	Quercus robur (English oak)	16	880	9	11	12	8.5	N2.5	2	Mature	Good	Good	Sweep at base with biased crown to north; low branching crown and spreading habit; some fused branches in crown	B2	10.56		20-40 years

Tree ref T - individual G - Group W - Woodland H - Hedgerow * - TPO (xxxx) tree tagged on site	**Species** *Latin name* *Common name*	**Height** m	**Stem dia.** mm	**Crown spread**				**Direction and height of lowest branch** m	**Height of crown clearance** m	**Maturity** Young; Semi-mature; Middle Age; Early mature; Mature	**Structural condition** Good; Fair; Poor; Veteran	**Physiological condition** Good; Fair; Poor; Veteran	**Comments on form condition, health and significant defects**	**BS5837 Tree Quality Category** A, B, C, U (1,2,3)	**Radius of RPA** m	**Management recommendations**	**Estimated remaining contribution** less than 10yrs, 10-20, 20-40, 40yrs+
				N	S	E	W										
T30 (2082) *	Quercus robur (English oak)	15	800	5	6.5	5.5	4	N2	1.5	Mature	Good	Good	On a mound with track to all sides; cavity at 1.8m up stem on west side, 0.7m long and up to 15cm wide; no fungi present; slow occlusion; buckling noted below cavity	B2	9.6		20-40 years
T31	Salix species	13	*650 BD*	*5*	*7*	*6*	*7*	-	-	Mature	Good	Good	Multi stemmed at base with five stems arising, average 200mm dia; dieback to each stem in crown	C2	6.5		10-20 years
T32	Fraxinus excelsior (ash)	16	*500 BD*	*6*	*7*	*5*	*6*	-	-	Mature	Good	Good	Three stems at base average 300 dia	C2	5		10-20 years
T33 (2083)	Quercus robur (English oak)	15	1010	4	6	6	7.5	S2	1.5	Mature	Good	Good	In depression/quarry/stone fill area; adjacent to track; Bifurcate at 2.5mwith codominant stems;no apical dominance; large scaffold branches to lower corwn; slightly sparse bud distribution	A3	12.12		20-40 years
T34	Quercus robur (English oak)	16	*750*	*5*	*5*	*5*	*5*	-	-	Mature	Good	Fair	To edge of site on fenceline; crown pruned back where adjacent to overhead wires affecting form	C2	9		10-20 years
T35	Quercus robur (English oak)	16	*750*	*4*	*6*	*5*	*5*	-	-	Mature	Good	Fair	To edge of site on fenceline; crown pruned back where adjacent to overhead wires affecting form	C2	9		10-20 years
T36 (2084) *	Quercus robur (English oak)	8	950	4.5	5	5	5.5	-	-	Mature	Fair	Fair	Storm damage with loss of leader and upper crown; major tears to stem; recent damage	B3	11.4		20-40 years
T37 (2085) *	Quercus robur (English oak)	14	900	3.5	4.5	5	4.5	-	-	Mature	Good	Fair	Mature tree with gnarly burrs and epicormic growth from base up main stem indicating some dysfunction; bifurcate at 2m; historic branch loss; sparse branching structure to crown; buckling to underside of main scaffold branch to south side	B2, B3	10.8		20-40 years

Tree ref T - individual G - Group W - Woodland H - Hedgerow * - TPO (xxxx) tree tagged on site	**Species** *Latin name* *Common name*	**Height** m	**Stem dia.** mm	**Crown spread**				**Direction and height of lowest branch** m	**Height of crown clearance** m	**Maturity** Young; Semi-mature; Middle Age; Early mature; Mature	**Structural condition** Good; Fair; Poor; Veteran	**Physiological condition** Good; Fair; Poor; Veteran	**Comments on form condition, health and significant defects**	**BS5837 Tree Quality Category** A, B, C, U (1,2,3)	**Radius of RPA** m	**Management recommendations**	**Estimated remaining contribution** less than 10yrs, 10-20, 20-40, 40yrs+
				N	S	E	W										
T38	Fraxinus excelsior (ash)	15	*450*	*6*	*5*	*6*	*6*	-	-	Early Mature	Fair	Good	Growing at base of brick building and into brickwork	C2	5.4		10-20 years
T39 *	Quercus robur (English oak)	15	*800*	*8*	*8*	*6*	*7*	-	-	Mature	Good	Good	No access due to dense scrub; condition and stem dia are estimated	A2	9.6		20-40 years
T40	Quercus robur (English oak)	15	*800*	*7*	*7*	*6*	*7*	-	-	Mature	Good	Good	No access due to dense scrub; condition and stem dia are estimated	A2	9.6		20-40 years
T41	Quercus robur (English oak)	15	*800*	*6*	*8*	*8*	*8*	-	-	Mature	Good	Good	No access due to dense scrub; condition and stem dia are estimated	A2	9.6		20-40 years
T42	Quercus robur (English oak)	10	*700*	*6*	*8*	*6*	*6*	-	-	Mature	Good	Good	No access due to dense scrub; condition and stem dia are estimated	B1, B2	8.4		20-40 years
T43	Quercus robur (English oak)	10	*450*	*6*	*6*	*5*	*6*	-	-	Middle Age	Good	Good	No access due to dense scrub; condition and stem dia are estimated	B1, B2	5.4		20-40 years
T44	Quercus robur (English oak)	10	*750*	*11*	*8*	*10*	*7*	-	-	Mature	Good	Good	No access due to dense scrub; condition and stem dia are estimated	B1, B2	9		20-40 years
GROUPS																	
G1	Quercus robur (English oak)	15	*750*	*see tree constraints plan*				-	-	Mature	Good	Good	No access due to dense scrub; condition and stem dia are estimated; group of oak to field boundary	A2	see tree constraints plan		20-40 years
G2	Alnus glutinosa (alder)	18	*average stem dia 280*	*see tree constraints plan*				-	-	Middle Age	Good	Good	Two multistemmed mature alder standing within grassed area; spreading crowns	B2	see tree constraints plan		20-40 years
G3	Alnus glutinosa (alder) Salix fragilis (crack willow) Crataegus monogyna (hawthorn) Prunus spinosa (blackthorn)	20	*75-600*	*see tree constraints plan*				-	-	Young Mature	Good	Good	Group of trees in man-made depression with made ground to the north; adjacent to linear group of scrub to the south edge with the track with willow and alder to base of the depression; greater value as a group than as individuals	B2	see tree constraints plan		20-40 years

Tree ref T - individual G - Group W - Woodland H - Hedgerow * - TPO (xxxx) tree tagged on site	**Species** *Latin name* *Common name*	**Height** m	**Stem dia.** mm	**Crown spread** N	S	E	W	**Direction and height of lowest branch** m	**Height of crown clearance** m	**Maturity** Young; Semi-mature; Middle Age; Early mature; Mature	**Structural condition** Good; Fair; Poor; Veteran	**Physiological condition** Good; Fair; Poor; Veteran	**Comments on form condition, health and significant defects**	**BS5837 Tree Quality Category** A, B, C, U (1,2,3)	**Radius of RPA** m	**Management recommendations**	**Estimated remaining contribution** less than 10yrs, 10-20, 20-40, 40yrs+
G4	Quercus robur (English oak) Crataegus monogyna (hawthorn) Prunus spinosa (blackthorn) Occasional numbers of: Quercus robur (English oak) Alnus glutinosa (alder) Salix fragilis (crack willow) Cornus sanguinea (dogwood) Betula pendula (silver birch) Salix fragilis (crack willow) Fraxinus excelsior (ash)	14	*under 300*	*see tree constraints plan*				-	-	Young Middle Age	Good	Good	Group composition forms majority of the scrub habitat on site; high proportion of hawthorn and blackthorn, with lower percentage of other species. Oak saplings noted throughout. Self set; screening and habitat value but low quality with regard to tree composition.	C2	see tree constraints plan		10-20 years
G5	Crataegus monogyna (hawthorn) Prunus spinosa (blackthorn) Salix fragilis (crack willow) Fraxinus excelsior (ash) Alnus glutinosa (alder)	14	*under 300*	*see tree constraints plan*				-	-	Young Middle Age	Good	Good	Willow, hawthorn and blackthorn scrub. Self set; screening and habitat value but low quality with regard to tree composition.	C2	see tree constraints plan		10-20 years
G6	Salix fragilis (crack willow) Fraxinus excelsior (ash) Alnus glutinosa (alder) Crataegus monogyna (hawthorn)	16	*150-450*	*see tree constraints plan*				-	-	Semi-mature Middle Age	Good	Good	Wet woodland mix of predominantly willow and alder extending along watercourse more mature than G5; difficult access for survey; Japanese knotweed and Himalayan balsam along watercourse	B3	see tree constraints plan		20-40 years

Tree ref T - individual G - Group W - Woodland H - Hedgerow * - TPO (xxxx) tree tagged on site	**Species** *Latin name* *Common name*	**Height** m	**Stem dia.** mm	**Crown spread** N	S	E	W	**Direction and height of lowest branch** m	**Height of crown clearance** m	**Maturity** Young; Semi-mature; Middle Age; Early mature; Mature	**Structural condition** Good; Fair; Poor; Veteran	**Physiological condition** Good; Fair; Poor; Veteran	**Comments on form condition, health and significant defects**	**BS5837 Tree Quality Category** A, B, C, U (1,2,3)	**Radius of RPA** m	**Management recommendations**	**Estimated remaining contribution** less than 10yrs, 10-20, 20-40, 40yrs+
G7	Salix fragilis (crack willow) Salix caprea (goat willow)	14	*150-450*	*see tree constraints plan*				-	-	Semi-mature Middle Age	Good	Good	Area of predominantly willow around small pond; many collapsed stem and regrowth; potential to develop into group of higher landscape value; good habitat value	B3	see tree constraints plan		20-40 years
G8	Crataegus monogyna (hawthorn) Prunus spinosa (blackthorn) Salix fragilis (crack willow) Fraxinus excelsior (ash) Betula pendula (silver birch) Quercus robur (English oak) Alnus glutinosa (alder)	16	*150-450*	*see tree constraints plan*				-	-	Semi-mature Middle Age	Good	Good	Area of older established scrub with greater species diversity and emerging tree species to upper canopy; establishing oak, alder, occasional silver birch; landscape and habitat value; potential to progress into woodland over time	B2, B3	see tree constraints plan		20-40 years
G9	Crataegus monogyna (hawthorn) Salix fragilis (crack willow) Fraxinus excelsior (ash) Betula pendula (silver birch) Quercus robur (English oak) Alnus glutinosa (alder)	10	*150-450*	*see tree constraints plan*				-	-	Middle Age	Good	Good	Area of older established predominantly hawthorn scrub with occasional emerging tree species to upper canopy; establishing oak, alder, occasional silver birch and willow near watercourse; potential to progress into woodland over time, although species diversity is limited it has a distinctive landscape character	B2	see tree constraints plan		20-40 years
G10	Crataegus monogyna (hawthorn) Salix fragilis (crack willow) Fraxinus excelsior (ash) Betula pendula (silver birch) Quercus robur (English oak) Alnus glutinosa (alder)	10	*150-300*	*see tree constraints plan*				-	-	Middle Age	Good	Good	Predominantly willow and hawthorn to site frontage along Oak Road on third party land, not surveyed in detail	C2	see tree constraints plan		10-20 years

Tree ref T - individual G - Group W - Woodland H - Hedgerow * - TPO (xxxx) tree tagged on site	**Species** *Latin name* *Common name*	**Height** m	**Stem dia.** mm	**Crown spread** N	S	E	W	**Direction and height of lowest branch** m	**Height of crown clearance** m	**Maturity** Young; Semi-mature; Middle Age; Early mature; Mature	**Structural condition** Good; Fair; Poor; Veteran	**Physiological condition** Good; Fair; Poor; Veteran	**Comments on form condition, health and significant defects**	**BS5837 Tree Quality Category** A, B, C, U (1,2,3)	**Radius of RPA** m	**Management recommendations**	**Estimated remaining contribution** less than 10yrs, 10-20, 20-40, 40yrs+
WOODLAND																	
W1	Quercus robur (English oak)	20	*up to 650*	*see tree constraints plan*				-	-	Young	Good	Good		B2, B3	see tree constraints plan		20-40 years
	Alnus glutinosa (alder)									Mature			Wet woodland of alder, willow and occasional oak, with understorey species present and varied groundflora; follows the watercourse and noticeably different in character from areas of scrub; larger individuals present; many willows have failed and are regrowing as is typical the species profile; landscape and habitat value				
	Salix fragilis (crack willow)																
	Betula pendula (silver birch)																
	Fraxinus excelsior (ash)																
	Corylus avellana (hazel)																
	Crataegus monogyna (hawthorn)																
	Prunus spinosa (blackthorn)																
	Malus sylvestris (crab apple)																
	Sambucus nigra (elder)																
W2	Salix fragilis (crack willow)	20	*up to 650*	*see tree constraints plan*				-	-	Young	Good	Good	Wet woodland of alder, willow and occasional oak, with larger specimens along the south bank of the watercourse, with some trees developing from lapsed hedgerows. Less varied structure than W1; landscape and habitat value	B2, B3	see tree constraints plan		20-40 years
	Alnus glutinosa (alder)									Mature							
	Crataegus monogyna (hawthorn)																
	Quercus robur (English oak)																
	Fraxinus excelsior (ash)																

APPENDIX 2 – SITE PHOTOGRAPHS



IMG_6137



IMG_6138



IMG_6129



IMG_6130



IMG_6132



IMG_6133

Site frontage at Oak Road – trees and scrub would need to be cleared to accommodate visibility splays



IMG_6140

North east of existing access



IMG_6242

Further to the north east of the site



IMG_6149



IMG_6150



IMG_6153



IMG_6154

Typical areas of G4 scrub on site



IMG_6370



IMG_6374

G5 – predominantly alder



IMG_6188

Towards the west boundary and Redwither Brook



IMG_6189



IMG_6145



IMG_6146

Many oak trees at the front (north west) of the site are surrounded by areas of impenetrable scrub



IMG_6199



IMG_6208

6199 - Typical concrete walkway with dense scrub and occasional trees either side to the south west of the site

6208 – Majority of the areas around pylons and below overhead powerlines are kept managed to ground level scrub/bramble



IMG_6216



IMG_6217



IMG_6220



IMG_6221

Oak trees to the south of the site, some in poor condition due to storm damage but offering potential habitat



IMG_6224



IMG_6225

G8 and G9 boundary at watercourse prone to seasonal flooding



IMG_6378



IMG_6379

G9 mature hawthorn scrub and willow

APPENDIX 3 – TREE PRESERVATION ORDER EXTRACT





Graphic provided by Tree Officer (08/04/2024) to confirm TPO status.

APPENDIX 4 – TREE QUALITY ASSESSMENT CHART

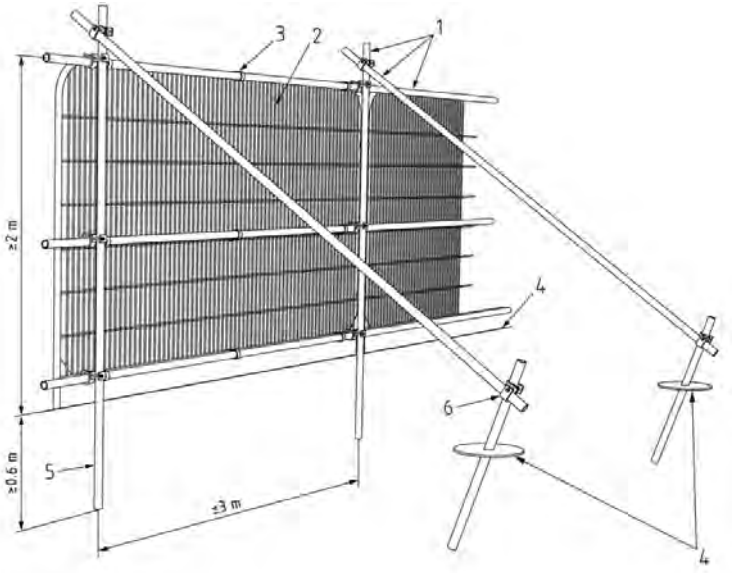
Table 1 **Cascade chart for tree quality assessment**

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall dedine • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see **4.5.7**.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, induding conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

Table 1: Summary of *BS 5837:2012* tree quality categorisation criteria

APPENDIX 5 EXAMPLES OF TREE PROTECTION SYSTEMS

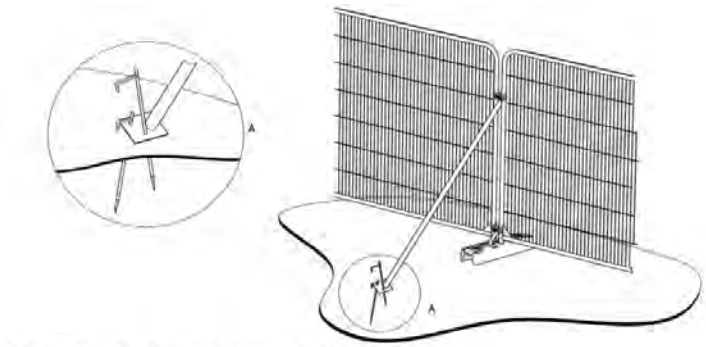
(Extracts taken from BS5837: (2012), "Trees in relation design, demolition and construction – Recommendations".)



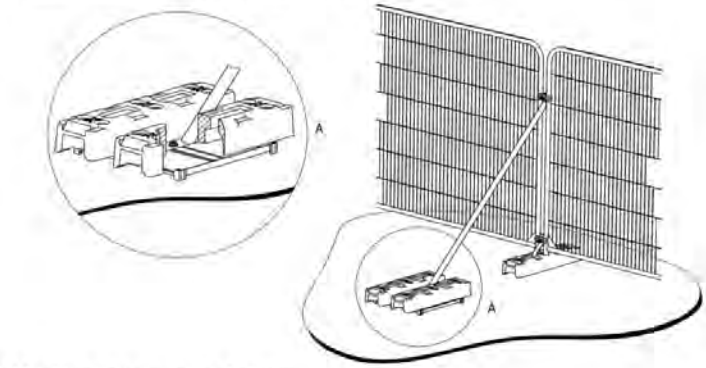
Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Default specification for protective barrier



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

APPENDIX 6 – TREE PROTECTION SIGNAGE





TREE PROTECTION FENCING

THIS FENCE MUST BE MAINTAINED IN ACCORDANCE WITH THE APPROVED METHOD STATEMENT AND DRAWINGS FOR THIS DEVELOPMENT

TREE PROTECTION AREA

ACCESS INTO THIS AREA IS PROHIBITED FOR THE DURATION OF THE DEVELOPMENT IN ACCORDANCE WITH THE APPROVED METHOD STATEMENT FOR THIS DEVELOPMENT

APPENDIX 7 PROPRIETARY ROOT PROTECTION SYSTEM - 3D CELLULAR CONFIEMENT SYSTEM, eg CELLWEB TRP OR EQUIVALENT PRODUCT

Cellweb® TRP

Tree Root Protection

Cellweb® TRP is a 3D cellular confinement tree root protection system. The system provides a 'no dig' solution for the construction of new hard surfaces within root protection areas (RPAs). Cellweb® TRP has been designed and independently tested to comply with recommendations made in Arboricultural Practice Note 12 and BS 5837 2012 – Trees in relation to design, demolition and construction.



Cellweb® TRP Key Functions

Cellweb® is a 'no dig' solution which is constructed directly on the existing ground surface. This eliminates the requirement for excavation, preventing root severance.

Cellweb® is a completely porous system allowing continued water permeation and gas exchange between the rooting environment and atmosphere.

Cellweb® spreads point loads, minimising increases in soil compaction within the rooting environment. This maintains an open graded soil structure allowing continued root growth, water, gas and nutrient migration.

The Cellweb® TRP system comprises the following three components

Treetex™ Geotextile. Following minimal ground preparation the Treetex™ is laid onto the existing ground and top soil. This acts as a separation layer, separating the system above from the soil and rooting environment below. Treetex™ performs as a hydrocarbon pollution control measure in accordance with BS5837, holding 1.7lt of oil per square meter.

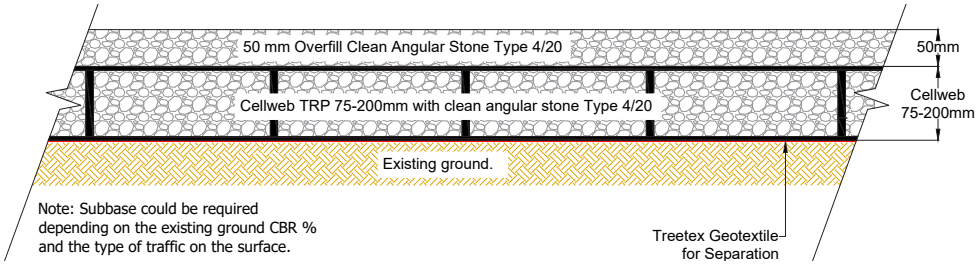
Cellweb® 3D Cellular Confinement. The Cellweb® is installed on top of the Treetex™ layer. This is fixed to the ground using ten steel J pins per panel. The panels can be cut to the required shape and adjoining panels can be connected using heavy duty staples or cell ties.

4-20mm Clean Angular Stone. The expanded Cellweb® is infilled with a 4-20mm clean angular stone. The confined angular stone locks together to produce a rigid stone mattress, while maintaining air pockets for continued water permeation and gas exchange. The low fines content of the stone prevents the Treetex™ layer from becoming blocked over time.

Which depth of Cellweb® TRP?

The Cellweb® System is provided in four different depths; 200mm, 150mm, 100mm and 75mm. The depth required is determined by the proposed traffic loadings and the site ground conditions. Geosynthetics in house engineering department can provide a free site specific technical recommendation. For free technical and engineering support please contact Geosynthetics Ltd 01455 617139 or the full installation guide can be found on our website www.geosyn.co.uk.

Indicative Cellweb with overfill



Web: www.geosyn.co.uk | Tel: 01455 617139
Fax: 01455 617140 | Email: Sales@geosyn.co.uk

Geosynthetics
Engineered Solutions

APPENDIX 8 – ARBORICULTURAL INSPECTION PROFORMA - example

Part 1 Project details

RECORD OF ARBORICULTURAL INSPECTION			**Inspection by**	**Arboricultural Consultant**	**Visit number**			**Date of visit**
			Signed		**Work stage**			
			Accompanied by		**Activities inspected**			
			Signed		**Weather conditions**			
	PROJECT DETAILS							
	The Oaks and Oak Road, Wrexham Industrial Estate		**Drawing**		**Drawing Number**		**Version**	
	Planning application reference							
	Tree Preservation Order and/or Conservation Area Details							
	Other Site Constraints							
	Add other information as required							

Part 2 Record of arboricultural inspection – *inspections will generally be undertaken every 4-8 weeks depending on progress of the works and complexity, unless specific visits are programmed to coincide with planned site activities. Planned dates to be entered in the table once programme of works is known.*

Ref	**Work stage** *Add or delete as relevant to specific works*	**Activity requiring on site attendance by Arboriculturist** *Add or delete as relevant to specific works*	**Planned date of inspection**	**Actual date of inspection**	**Inspection details and comments**	**Compliance with AMS**	**Follow up action required**
1	Advance works	Prestart meeting for tree works					
		Marking out for trees to be removed					
		Commencement of tree works					
		Completion of tree works					
		Commencement of installation of tree protection fencing					
		Completion of installation of tree protection fencing					
		Periodic monitoring (depending on timing of specific inspection visits)					
2	Site clearance and demolition	Toolbox talk					
		Removal of above ground structures within the crown spread or RPA of trees to be retained					
		Removal of hard standing and below ground structures or features within the crown spread or RPA of trees to be retained					
		Periodic monitoring (depending on timing of specific inspection visits)					
3	Construction works	Toolbox talk					
		Excavation or works within RPA of trees to be retained					
		Reprofiling of ground levels within RPA of trees to be retained					

Ref	**Work stage** *Add or delete as relevant to specific works*	**Activity requiring on site attendance by Arboriculturist** *Add or delete as relevant to specific works*	**Planned date of inspection**	**Actual date of inspection**	**Inspection details and comments**	**Compliance with AMS**	**Follow up action required**
		Installation of services within RPA of trees to be retained					
		Installation of ground protection below temporary hard standing within RPA of trees to be retained					
		Installation of ground protection below permanent hard standing within RPA of trees to be retained					
		Periodic monitoring (depending on timing of specific inspection visits)					
4	Landscape reinstatement	Toolbox talk					
		Soiling within RPA of trees to be retained					
		Land drainage within RPA of trees to be retained					
		Turfing and Seeding within RPA of trees to be retained					
		Planting within RPA of trees to be retained					
		Periodic monitoring (depending on timing of specific inspection visits)					
5	Completion	Removal of tree protection fencing					
		Add other activities as required relevant to the project and construction activities					

Part 3 Follow up actions identified during inspection

Ref	Follow up action required	Date completed	Comments and / or photographs from site team	Follow up or close out

Part 4 Evidence of arboricultural inspection

	PHOTOGRAPHS TAKEN DURING SITE VISIT	Date

Part 5 Circulation of record of inspection

	RECORD OF INSPECTION ISSUED BY		
	Print name	*Signature*	*Date*

RECORD OF SITE INSPECTION ISSUED TO THE FOLLOWING

ISSUE	PROJECT CONTACTS	NAME	CONTACT NUMBER	EMAIL OAK ROAD, WREXHAM INDUSTRIAL ESTATE	ROLES AND RESPONSIBILITIES FOR ARBORICULTURAL ISSUES ON SITE
☐	**Project Manager**				• Delivery of project and compliance with legal requirements and planning consents relating to the project
☐	**Site Construction Manager**				• Ensure compliance with the Arboricultural Method Statement, monitor performance of construction site staff and sub-contractors and maintain records to demonstrate compliance with and implementation of the Arboricultural Method Statement; and • Main contact for any Third Party queries and shall keep a record of any Third Party contacts and any follow up actions that may be taken.
☐	**Site Manager with responsibility for environmental compliance / Environmental Advisor / or Environmental Clerk of Works**				• Delivery of tool box talks for inductions of construction site staff and sub-contractors to ensure arboricultural protection methods are effectively communicated to the site team; • Undertake daily audits of tree protection fencing, ground protection fencing and compliance with the Arboricultural Method Statement; and • Liaises and cooperates with the Arboricultural Consultant at each site inspection and for the duration of the project
☐	**Arboricultural Consultant**				• Delivery of initial tool box talk for construction site staff to ensure arboricultural protection methods are effectively communicated to the site team; • Undertake site inspections at key work stages identified in the programme and at 8 weekly intervals during the course of the construction project; and • Report to the Local Planning Authority within 3 days of each inspection
☐	**Site construction team and sub-contractors**	*Updated information on arboricultural constraints to be issued to site team as part of regularly site briefings, inductions and tool box talks*			• Work to agreed Arboricultural Method Statements, plans and procedures and minimise environment impacts; • Understand the importance of maintaining arboricultural protection on site and maintaining the integrity of the tree protection fencing; • Understand the importance of avoiding pollution, including silt run-off, dust, escape of fuel, chemicals, cement and concrete; • Report all incidents immediately to the Environment Site Manager; and • Monitor the site for potential environmental risks and engage with co-workers to be proactive and ensure method statements, plans and procedures are complied with
☐	**Third Party Co-ordinator / Project Co-ordinator / Customer Co-ordinator**				• Liaison with Local Planning Authority, stakeholders and Third parties
☐	**Arboricultural Contractor**				• Undertake tree removal and pruning requirements prior to commencement of construction; • Works to be in accordance with approved planning drawings; and

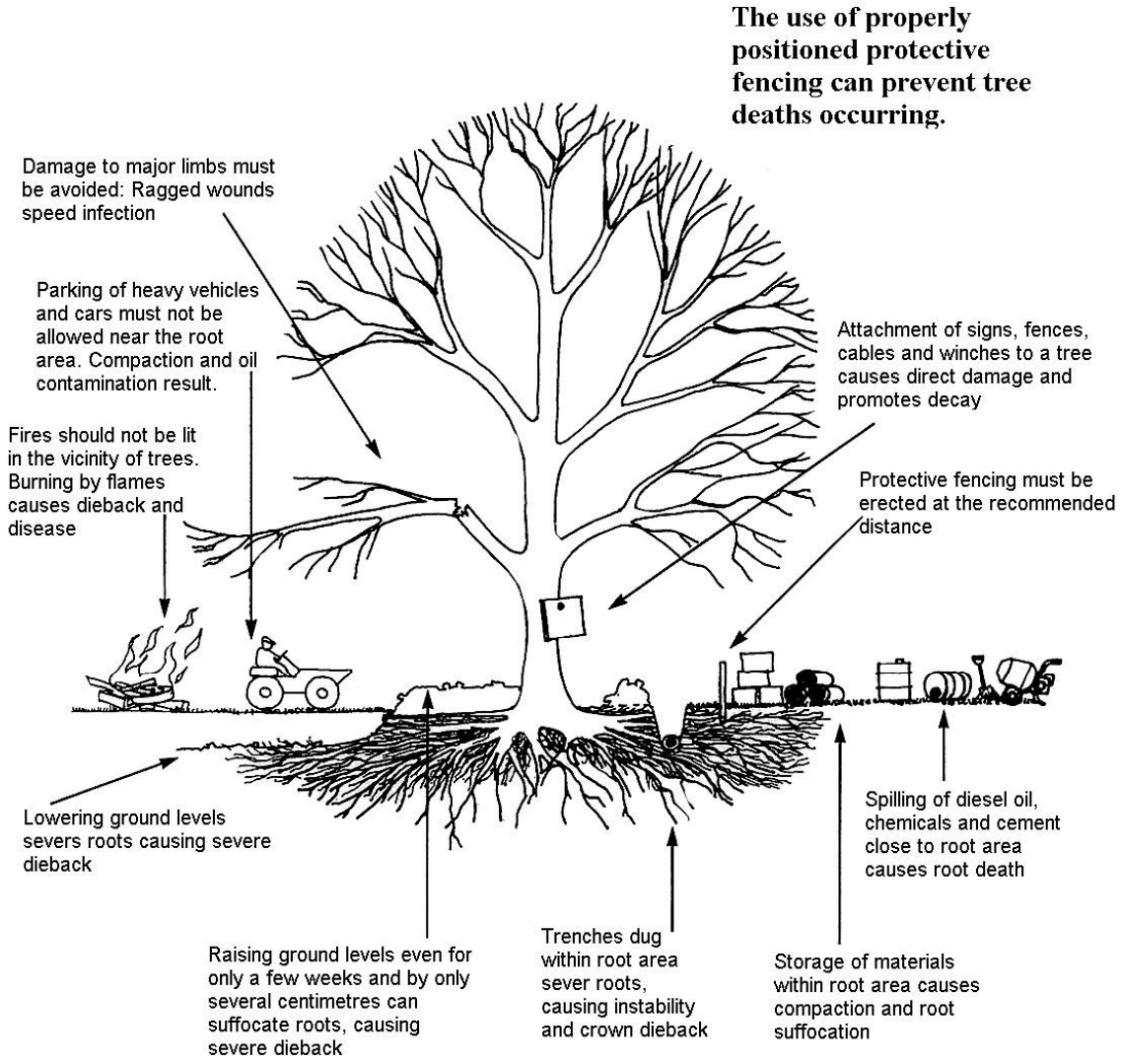
ISSUE	PROJECT CONTACTS	NAME	CONTACT NUMBER	EMAIL OAK ROAD, WREXHAM INDUSTRIAL ESTATE	ROLES AND RESPONSIBILITIES FOR ARBORICULTURAL ISSUES ON SITE
					• Works to be undertaken with regard to environmental and ecological constraints, such as nesting and breeding birds, bats, proximity to watercourse
☐	**Ecology Consultant**				• Advise on ecological constraints at the site
☐	**Local Authority, include Tree Officer details where known**				
	Additional contacts				

Part 6 Reporting procedure:

a) Undertake site inspection and record comments (Parts 2);
b) Discuss any follow up actions immediately with the responsible person on site for environmental compliance and set date for completion of actions (Part 3) where possible rectification works should be undertaken as soon as possible, exceptions to this may include works to protected trees that requires additional consent or work that may require LPA approval before proceeding;
c) Add evidence of rectification works or follow up actions to inspection record in Part 3;
d) Add photographic record of site visit inspection in Part 5; and
e) Issue record of inspection to nominated person for liaison with Local Planning Authority (LPA) or direct issue of record of inspection to LPA, project team and site team as per circulation list.

APPENDIX 9 – COMMON CAUSES OF TREE DEATH POSTER

Common causes of Tree Death



Please use copies of this as an on-site poster for personnel

APPENDIX 10 - GLOSSARY OF TERMS

Maturity	Newly planted - Not fully established and capable of being transplanted or easily replaced
	Young - Establishing, usually with good vigour, still capable of being transplanted or replaced
	Early mature - Established, usually vigorous and increasing in height
	Semi-mature – Established with an overall height in excess of 4 metres and or a stem girth measurement (circumference) of 20 centimetres or larger;
	Middle Age - Trees in the established growth stage of their life with the potential to continue increasing in size;
	Mature - Trees that have reached their ultimate size, given their location and surroundings;
	Over-mature - Fully mature, in last quarter of life expectancy, vigour decreasing
Condition	Good, Fair, Poor. An overall assessment of a tree's physiological and structural state
Veteran	Trees that have biological, cultural or aesthetic value due to age and / or condition. Typically trees that may be living beyond their expected age range for their species
BS 5837 Tree Quality Assessment	The tree quality assessment is based on four categories (A, B, C and U) are used to denote tree quality (A= High, B = Moderate, C = Low, U= Unsuitable for retention).
	Subcategories (1-3) denote the specific function value of the trees and the reasoning behind the allocation of a specific category.
Root Protection Area (RPA)	The theoretical rooting area of a tree as defined in *BS5837: 2012*. RPA is allocated to ensure that a sufficient area is left undisturbed during development. It is provided as an area (m^2) and as the radius of a circle (m) typically plotted from the centre of the stem.
Estimated Remaining Contribution	The approximate life expectancy as healthy functioning tree and relates to species and the condition of the tree at the time of survey. Long > 40 years Medium 20 – 40 years Short – Medium 10- 20 years Short - Imminent removal <10years
Adventitious or Epicormic shoots	Small branches that grow in clusters around the stem or base of a tree in an uncharacteristic fashion for a normally healthy tree, usually at the site of pruning wounds or as an indicator of stress
Bifurcate	Divided into two branches or forks
Buckling	Deformation of a structure subjected to a bending load Buttress zone, irreversible.
Chalara – Ash dieback	Chalara dieback of ash, also known as Chalara or ash dieback, is a disease of ash trees caused by a fungus called *Hymenoscyphus fraxineus*
Decurrent	The tree crown is borne on several major wide spreading limbs of similar size
Defect	A feature which detracts from the uniform distribution of mechanical stress, or which makes the tree mechanically unsuited to its environment
Dieback	A condition in which a tree or shrub begins to die from the tip of its leaves or roots backwards, owing to disease or an unfavourable environment.
Disease	A malfunction or destruction of tissues usually caused by pathogens.
Dominance	The tendency for a leading shoot to grow faster than the lateral shoots; also a tree that maintains a taller crown than its neighbours.
Excurrent	A well-defined central main stem to the crown, bearing branches which are limited in their length, diameter and secondary branching.
Flush-cut	A pruning cut which removes part of the branch bark ridge and or branch-collar.
Girdling root	A root which circles and constricts the stem.

Hazard beam	An upward curving part of a tree in which strong internal stresses may occur without being reduced by adaptive growth; prone to longitudinal splitting or may form a banana shaped crack.
Included bark (ingrown bark)	Bark of adjacent parts of a tree (usually forks, acutely joined branches or basal flutes) which is in face-to-face contact.
Infection	The establishment of a parasitic micro-organism in the tissues of a tree or other organism.
Lopping	Removal of large branches from a tree that does not follow natural target pruning practices.
Natural target pruning	The siting of pruning cuts at the branch bark ridge with a cut of minimal surface area to allow quicker healing of the wound.
Occlusion	The process of continual radial growth and healing of a wound which is progressively closed by the formation of new wood and bark around it.
Plant pathogen	Infectious organism that causes a disease on a plant. Although relatives of some plant pathogens are human or animal pathogens, most plant pathogens only harm plants. Plants are rarely cured of disease once infected.
Pollarding	The removal of the tree canopy, back to the stem or primary branches. The management regime is usually repeated as part of a regular management programme.
Primary branch	A major branch, of greater order than secondary branches.
Pruning	The removal or cutting back of lesser branches or twigs.
Reactive Growth/ Reaction Wood	Production of woody tissue in response to mechanical stresses.
Root-collar	The transitional area between the stem/s and roots prior to development of a root flare or buttress.
Secondary branch	A branch, of lower order than primary branch.
Veteran tree	An aged old specimen that has features which increase its value as habitat for wildlife (dead wood, cavities etc.) irrespective of its chronological age and that is of interest biologically, culturally or aesthetically because of its age, size or condition, is usually of advanced age.
Windthrow	The fall of a tree in high wind, blowing over of a tree at its roots.
Wound wood	Wood developing in response to a wound which gradually heals and occludes the wound