

KNOWSLEY IMAGE BUSINESS PARK LTD

SITE 2, IMAGE BUSINESS PARK

**ARBORICULTURAL IMPACT ASSESSMENT
TO BS 5837:2012**

our ref: 2159 / EH / AIA001
date: 27TH October 2021
prepared by: E.C.H
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arboricultural impact assessment



1.0 INTRODUCTION:

- 1.1 This Arboricultural Impact Assessment has been prepared by Bea Landscape Design Limited on behalf of Knowsley Image Business Park Ltd for the proposed development at Image Business Park, Knowsley in accordance with BS 5837:2012 'Trees in Relation to Design, Demolition and Construction - Recommendations'
- 1.2 The assessment has been prepared to accompany a detailed planning application based on the layout prepared by the project architects Hale Architecture.

2.0 SUMMARY OF TREE SURVEY:

2.1 Tree Survey:

- 2.1.0 The tree survey for the above site was carried out by Bea Landscape Design (refer to Appendix A) on behalf of Knowsley Image Business Park Ltd on the 24th July 2019 with a subsequent visit to update the survey of the woodland W1 on the 27th July 2021 in accordance with BS 5837:2012 'Trees in Relation to Design, Demolition and Construction - Recommendations'.

2.2 Tree Constraints:

- 2.2.0 As part of the survey a Tree Constraints Plan 19-87-02 has been prepared to inform future development proposals identifying the root protection areas and shadow patterns in accordance with BS 5837:2012 for those A to C Category trees.
- 2.2.1 The tree survey also identifies the constraints provided by tree species with particular characteristics that may affect any proposed development and schedules the ultimate predicted tree height and canopy spread.

2.3 Regulatory Protection

- 2.3.0 It is our understanding that none of the surveyed trees are protected by a Tree Preservation Order and the site is not within a Conservation Area.

3.0 IMPACTS OF THE PROPOSED DEVELOPMENT

3.1 Site Layout

- 3.1.0 A site layout has been prepared for the development area including for a single light industrial unit with associated service yard, car parking and ancillary structures. In order to assess the impact of the development of the site and the existing trees the proposed site layout was superimposed into the Tree Constraints Plan.
- 3.1.1 The proposed development has been designed to retain the majority of the existing trees particularly those to the boundary that have good screening effects. However to accommodate the proposed development it will be necessary to remove a number of trees to the edge of the woodland W1.



21-59-01 Tree Retention & Removal Plan

3.2 Tree removal

3.2.0 The assessment highlighted 25 trees that would need to be removed from the Southern edge of the moderate quality and value woodland W1 as a result of the development of the site and as identified within the Tree Retention & Removal Plan 21-59-01.

3.2.1 The location of these trees within the site limits the effect of their removal on the surrounding landscape and the proposed development includes for tree planting within the site which will mitigate for their loss. The removal of these trees is therefore not considered to be a constraint to the proposed development of the site.

3.3 Tree retention & pruning:

3.3.0 The assessment also identified a number of trees that should be retained as part of the development proposals as identified within Table 2. below and as identified within the Tree Retention & Removal Plan 21-59-01.

3.3.1 The trees identified for retention are primarily located to the North of the proposed development and are of moderate quality and value.

3.3.3 It will also be necessary to undertake pruning to the retained trees at the Southern edge of the woodland W1 following the removal of those trees identified on the Tree Retention & Removal Plan 21-59-01.

3.3.4 The tree pruning required is likely to be of a minor extent including reshaping / tidying up the canopies and is not considered to have a significant impact on the long term health or visual quality of the retained trees.

Table 2: Trees to be retained:

No.	Common Name	Cat.	Pruning Works Required
T1	Lime	B1	Re-shaping the trees to the Southern woodland edge following tree removal.
T2	Lime	B1	
W1	Ash, Cherry, Field maple, Birch, Alder, Poplar, Pine & Oak	B2	

4.0 IMPACTS OF CONSTRUCTION - DEMOLITION OPERATIONS

4.0.1 The former building on the site has been demolished with the proposed development requiring the removal of the existing concrete foundations hard surfacing and services.

4.1 Demolition of Buildings

4.1.0 The proposed development requires the demolition of the building foundations and hard surfaces located within the site and sufficiently far away from the retained trees so that providing tree protection and appropriate working practices are adopted the demolition works will not impact the retained trees.

5.0 IMPACTS OF CONSTRUCTION – DIRECT

- 5.0.1 Following the removal of the trees to the Southern edge of the woodland W1 the construction of the proposed development will necessitate works within the root protection areas or and under the canopy of the retained trees.

6.0 IMPACTS OF CONSTRUCTION – INDIRECT

6.1 Site Construction Access

- 6.1.0 Access to the site for all visitors and construction traffic is to be from the internal estate roads. Haul roads into the site for materials and construction access are to utilise the existing hard standing at commencement and then areas of proposed hard standing during construction.

6.2 Site Compound

- 6.2.0 The site compound, including porta cabins and portable toilet facilities is to be located at the construction traffic site entrance and outside of the Construction Exclusion Zones.

6.3 Delivery & Storage of materials

- 6.3.0 The delivery and storage of materials will be undertaken using the haul roads as described above with materials being delivered locally to the building under construction. All materials are to be stored outside of the Construction Exclusion Zones as identified on the Tree Protection Plan 21-59-02.

6.4 Contractors Parking

- 6.4.0 A contractors and visitors parking area is to be located adjacent to the site compound and outside of the Construction Exclusion Zone.

7.0 IMPACTS POST DEVELOPMENT

7.1 Shading of buildings / open space

- 7.1.0 The retained trees are to the Northern boundary and as such the shade cast by the trees does not impact on the proposed development.

7.2 Privacy & Screening

- 7.2.0 The removal of the trees to the Southern edge of W1 may reduce the screening effect of the woodland to the neighbouring industrial building in the short term however in the longer term the retained trees will continue to grow and complete the visual screen.

7.3 Direct damage

- 7.3.0 There is the potential for the future canopy growth of the retained trees to the Southern edge of W1 to conflict with proposed building, with the trees at the edge of the woodland requiring management in the longer term.

7.4 Seasonal nuisance

- 7.4.0 The trees within the woodland will generate leaf litter in the autumn which will require maintenance to remove from hard surfaces and gutters. The building design should include netted or concealed guttering to reduce the maintenance required.

7.5 Future pressure for removal

- 7.5.0 The proposed development will increase the pressure for removal of the trees within woodland W1 due to the increased maintenance requirements however given the location of the woodland to the rear of the building it is anticipated that the management of the woodland edge would be part of an annual landscape maintenance regime.

8.0 MITIGATION OF DEVELOPMENT:

- 8.0.1 As detailed above the proposed development will entail the loss of a number of the existing trees to the edge of woodland W1. The loss of these trees is to be mitigated with replacement tree planting and tree protection measures where the proposed development construction works are in close proximity to the retained trees.

8.1 Replacement Tree Planting

- 8.1 Mitigation for trees required to be removed to facilitate the development are to be provided in the form of replacement tree planting. Tree species are to in keeping with the character of the surrounding landscape including native species such as Hornbeam, Silver Birch, Field maple, Cherry and Alder.

8.2 Special construction techniques

- 8.2.0 No special construction techniques are required.

8.3 Tree Protection:

- 8.3.0 The trees are to be protected from damage during the course of the works in accordance with the guidance of BS5837:2012.
- 8.3.1 The protection of those trees to be retained has been detailed within the Tree Protection Plan 21-59-02 which both identifies Construction Exclusion Zones and the locations of protective barriers as outlined in the above BS 5837:2012

8.4 ARBORICULTURAL METHOD STATEMENT:

- 8.4.0 In order to inform the carrying out of the proposed works in proximity to the retained existing trees a detailed method statement is to be prepared to specify the working practices to be followed by the contractor to comply with BS5837:2012 and mitigate for the proposed works.

8.4.1 An Arboricultural Method Statement is therefore to be prepared that addresses the following;

- a) tree protection measures
- b) site construction access;
- c) space for site huts, temporary toilet facilities (including their drainage) and their temporary structures;
- d) space for storing (whether temporary or long-term) materials, spoil and fuel and the mixing of cement and concrete;
- e) the effects of slope on the movement of potentially harmful liquid spillages towards or into protected areas.
- f) contractors' car parking;
- g) working space for cranes, plant, scaffolding and access during works;
- h) all changes in ground level, including the location of retaining walls, steps and making adequate allowance for backfilling;
- i) arboricultural supervision

APPENDIX A

TREE SURVEY

KNOWSLEY (IMAGE BUSINESS PARK) LTD

IMAGE BUSINESS PARK, KNOWSLEY

TREE SURVEY TO BS 5873:2012



our ref: 1987 / TGW / TR001Rev D
date: 25/10/2021
prepared by: TGW
checked by: E.C.H

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Image Business Park, Knowsley

1.0 Introduction:

- 1.1 The tree survey for the site at Image Business park Knowsley was carried out by Bea Landscape Design on behalf of Knowsley (Image Business Park) Ltd for submission to the local planning authority Knowsley Borough Council on the 24th July 2019 with a subsequent visit on the 2nd October 2019 The survey of the woodland W1 was updated on the 27th July 2021.
- 1.2 The tree survey inspection was carried out from ground level only and no invasive diagnostic tools were used. This is a pre-development site inspection prepared in accordance with BS5837: 2012 'Trees in relation to design, demolition and construction – Recommendations' and the report is valid and relevant only as part of the planning process.
- 1.3 It should be noted that tree surveys carried out at specific times of year are subject to seasonal limitations. For example; in spring leaves are not present or are just emerging and fungi are generally not visible (depending on species) which limits the assessment of a trees physiological condition, in summer trees are in leaf which reduces the visibility of the crown and can limit the ability to assess the structural condition with fungi not generally visible (depending on species), in autumn there is a decline in leaf quality / cover affording an improved view of the crown and fungal fruiting bodies can be present, in winter the structure of the crown can be easily assessed however assessment of physiological condition is limited and fungi are generally not visible.
- 1.4 Trees are dynamic natural structures and require frequent monitoring if predictable failures are to be identified. As such the trees should be re-inspected within at least a two year period from the date of this report or when changes occur to the trees (such as appearance of fungal growths, splits in branches etc.) or changes in their immediate environment occur. Any recommendations for action should also be carried out within this period unless identified in the report as requiring immediate action.
- 1.5 Some tree failures are not predictable such as those occurring during 'freak weather' conditions and those without external symptoms, these types of failure are not covered by this report.
- 1.6 The tree survey schedules document 1987/TGW/TS001C and survey drawing 19-87-01B are included within this report. The tree survey is based on the topographical survey carried out by Survey and Engineering Projects in April 2018.
- 1.7 In accordance with British Standard 5837: 2012 the survey records the tree common names (refer to Appendix A for a key to scientific names), height, stem diameter and branch spread and existing height above ground level of the canopy or first significant branch including life stage, general observations (such as structural, physiological condition and/or preliminary management recommendations) and the estimated remaining contribution in years.
- 1.8 Each tree is also awarded a category grading based on Table 1 'Cascade Chart for Tree Quality Assessment' of the British Standard as included within Appendix C.

The following are an explanation of the terms used to describe the life stage, physiological condition and sizes referred to within the tree survey schedule.

Life Stage

<i>Young</i>	A tree in the first third of its expected life span.
<i>Semi-mature</i>	A tree within the second third of its expected life span.
<i>Mature</i>	A tree within the final third of its expected life span.
<i>Over mature</i>	A tree in natural decline.
<i>Veteran</i>	A tree with habitat features such as wounds, decay in the branches, root or hollowing in the trunk with cavities or rot holes where limbs have broken off or bark is damaged. Wood decay fungal fruiting bodies and often evident. The trees have significant amount of deadwood with many dead limbs or branches (larger than 200mm in diameter) in the crown or fallen. A veteran tree is a survivor that has developed some of the features found on an ancient tree but not necessarily as a consequence of time, but of its life or environment.
<i>Ancient</i>	An ancient tree has great aesthetic appeal and is defined by the following characteristics; a small canopy exhibiting stag headedness following crown retrenchment, (gradual dieback and branch loss in which the area of foliage and root system are rebalanced with each other through the aging process); with a very wide hollowing trunk relative to other trees of the same species and one or more openings to the outside exhibiting the fruiting bodies of heart rot fungi.

Physiological condition

<i>Good</i>	The tree appears to have no obvious defects.
<i>Fair</i>	The trees condition is slightly compromised and considered to be remediable.
<i>Poor</i>	The trees condition is significantly compromised and considered non-remediable. Significant defects.

Sizes:

<i>Minor</i>	A diameter of less than 25 millimetres.
<i>Moderate</i>	A diameter of between 25 to 50 millimetres.
<i>Major</i>	A diameter of greater than 50 millimetres.

- 1.9 This report does not consider any potential influence that trees may have upon load bearing soils beneath existing or proposed structures through abstraction of water by their roots (i.e. soil shrinkage and expansion and subsequent building subsidence and heave). The advice of a structural engineer should be sought with regard to appropriate foundation depths for new buildings with reference to NHBC standards Chapter 4.2 (NHBC, 2011).

2.0 Context:

- 2.1 The site is located on part of the old Kodak works within in the Image Business Park area of Knowsley district as identified in Figure 01. Location Plan.

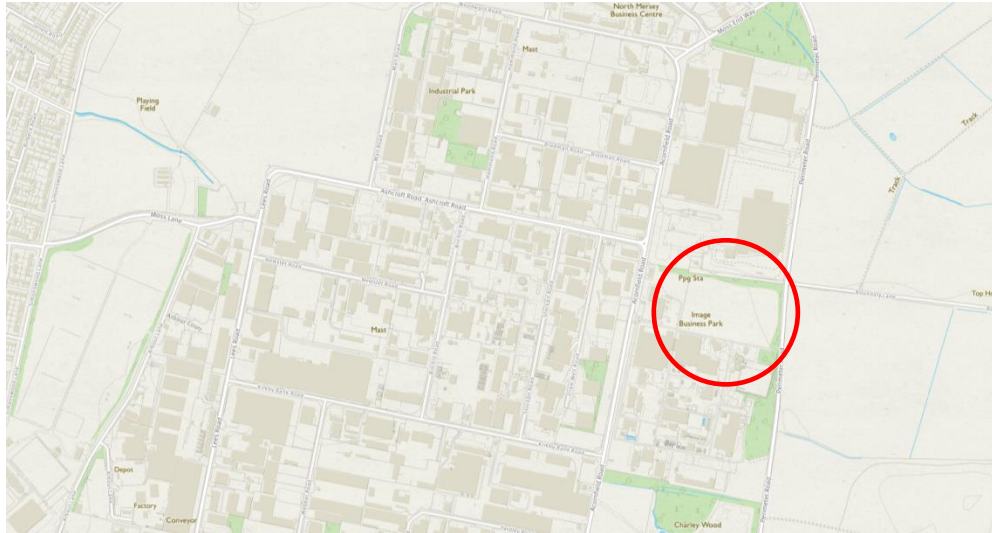


Figure 01. Location Plan

- 2.2 The area surveyed is currently unoccupied and the original buildings on the site have been cleared just leaving the floors and foundations in place (refer to Figure 02. Aerial Photograph).



Figure 02. Aerial Photograph

- 2.3 The topography of the site is relatively level with only a 2 metre change in level from West to East and localised slopes and retaining features to the boundary with Acorn Field Road.

3.0 Tree Survey Summary:

- 3.1 The trees on the site form one woodland belt along both the northern and eastern boundaries. This woodland belt appears to have been planted around 30 years ago and is a mixture of species with the majority of the sub canopy species having died out through suppression. There appears to have been little or no management since planting and the trees could do with thinning to select the better climax trees. As a mature and collective feature this woodland block has been given a Category B, Trees of Moderate quality.



Photo of W2 looking at the north east corner of the site with the large pines on the northern boundary and the suckering cherry and poplar visible at the front of the woodland block.

- 3.2 In certain areas (identified on drawing 19-87-01) there are large areas of self regeneration scrub. This takes the form of blackthorn to the east, with a large area of suckering poplar to the centre and then cherry and poplar to the north east corner. These areas of scrub, due to their self set nature, lack of maintenance and maturity are graded as a Category C Trees of Low Quality.



Large group of suckering poplar midway along the northern boundary.



Large group of suckering blackthorn.



Photo of eastern boundary illustrating the more defined areas of differing species such as pine.

- 3.3 Within the woodland block there are the occasional larger trees such as Red Oak, *Quercus rubra*, and Beech, *Fagus sylvatica*, including a Copper beech to the east of the northern boundary. It is not clear whether these trees have grown quicker than the surrounding species or that they existed prior to the mass planting along this boundary.



Photo of large Oak (centre of picture) within the woodland block.

4.0 Tree Preservation Orders & Conservation Areas

- 4.1 It is our understanding that there are currently no Tree Preservation Orders designated within the survey area and the site is not within a Conservation Area. For the avoidance of doubt we would recommend that the local authority tree officer is contacted and confirmation obtained.
- 4.2 The Town and Country Planning (Tree Preservation) (England) Regulations 2012 empowers local planning authorities to protect trees in the interests of amenity by making Tree Preservation Orders (TPO). Subject to certain specified exemptions, an application must be made to the local planning authority to carry out works upon or to remove trees that are subject to a TPO. However in certain situations where detailed planning permission has been granted and protected trees are directly affected by the implementation of the approved development, then it is possible to carry out the works necessary to said trees in order to implement the said development.
- 4.3 Under the Regulations any damage caused to, or the felling of those trees protected by an order will be considered an illegal act and subject to prosecution as set out in the TPO regulations.
- 4.4 Section 211 of the Town & Country Planning Act 1990 (the Act) affords protection for the trees of over 75mm diameter (measured at 1.5 metres above ground level) within a Conservation Area. Subject to certain specified exemptions six weeks' notice of intention (a 'Section 211 notice') must be given to the local planning authority to carry out works upon, or for the removal of the protected trees.

5.0 Protected Species

- 5.1 The Wildlife & Countryside Act 1981 forms the legislative basis for protecting Britain's flora and fauna, together with its 1985 and 1991 amendments, the subsequent variations to the schedule of orders, and strengthening amendments made within the Countryside & Rights of Way Act 2000.
- 5.2 Nesting birds are afforded statutory protection by the Wildlife & countryside Act 1981. The bird nesting season is officially from February until August with the busiest time for nesting birds from the 1st March until the 31st July according to species.
- 5.3 As such, consideration should be given to the presence of nesting birds when clipping hedges, pruning or removing trees or removing ivy or other climbing plants during the bird nesting season. Trees, hedges and ivy should be inspected for nests prior to pruning or removal and any work likely to destroy or disturb active nests should be avoided until the young have fledged. Hedges provide valuable nesting sites for a wide range of birds and clipping should therefore be avoided during the months of March to July.

5.4 In Britain all bats are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) and under Schedule 2 of the Conservation (Natural Habitats) Regulations 1994 (as amended). In England, under current legislation, it is an offence to:

- Deliberately capture, injure or kill a bat;
- Deliberately disturb in a way that would significantly affect their local distribution or abundance, or affect their ability to survive, breed or rear young;
- Damage or destroy a bat roost (note – this is an 'absolute' offence whereby intent or recklessness does not have to be proved).
- Possess, control, transport, sell, exchange or offer for sale/exchange any live or dead bat or any part of a bat;
- Intentionally or recklessly disturb at bat roost; and
- Intentionally or recklessly obstruct access to a roost.

5.5 In this respect it should be noted that bats utilise tree cavities, cracks and dense ivy as roosts and trees such as several of the trees were noted to have such features. It is also possible that unidentified bat habitat features may be located high up in the tree crowns and all personnel subsequently carrying out tree works at the site should therefore be vigilant and mindful of the possibility that roosting bats may be present. If any bats roosts are identified during tree works then it is essential that the works are halted immediately and an ecologist investigate them prior to works continuing.

6.0 Felling Licence

6.1 The Forestry Act (1967), as amended, requires that a 'Felling Licence' is obtained for the felling of growing trees subject to certain exemptions. Felling licences are administered by the Forestry Commission and the contravention of the associated controls can incur substantial penalties. Conditions, such as replanting requirements, may be attached to a licence. When processing a licence application the Forestry Commission generally consult the local planning authority and other statutory authorities.

6.2 Under these controls a Felling Licence is not required to fell up to five cubic meters of timber in any calendar quarter, providing that no more than two cubic meters of said timber are sold.

6.3 It should, however, be noted that a Felling Licence is not needed for the felling of trees where their removal is immediately required for the purpose of carrying out a development authorised by detailed planning permission granted under the Act (1990), or for felling trees within a garden, an orchard, churchyard or a designated open space.

7.0 Tree Surgery & Removal:

7.1 The identified dead ash trees should be felled, or removed due to its poor condition, being dead or structurally dangerous and unsuitable for retention.

8.0 Root Protection Area

- 8.1 In order to inform the future retention of existing trees the root protection area has been calculated for each tree in accordance with BS 5837:2012 Annex D, Table D.1 – Root Protection Area and using the two calculation methods as detailed within clause 4.6.1. The root protection areas are illustrated on the Tree Constraints Plan 19-87-02D.
- 8.2 Where pre-existing site conditions (i.e the presence of retaining walls) or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area had been illustrated
- 8.3 All trees that are being retained on site should be protected by barriers and/or ground protection before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. These 'Construction Exclusion Zones' are to be protected by barriers and ground protection in accordance with section 6.2 of BS 5837:2012 and as specified and indicated on an approved Tree Protection Plan to be prepared by the project arboriculturalist.
- 8.4 Of particular importance on sites where there are significant level changes it should be noted that existing ground levels are to be retained within the RPA. Intrusion into soil (other than for piling) within the RPA is generally not acceptable, and topsoil within it should be retained in situ and any re-grading works or the location of retaining features should take this into account. The advice of an arborist should be sought where underground structures are present within the RPA are, or will become, redundant. In general it is preferable to leave such structures in situ, as their removal could damage adjacent tree roots.
- 8.5 Where construction operations are proposed and permitted within the Root Protection Area precautions should be taken and specified within an Arboricultural Method Statement prepared by the project arboriculturalist to maintain the condition and health of the root system in accordance with Section 7 'Demolition and construction in proximity to existing trees' of BS 5837:2012.
- 8.6 Where permanent hard surfacing within the RPA is considered unavoidable, site-specific and specialist arboricultural and construction design advice should be sought to determine whether it is achievable without significant adverse impact on trees to be retained. As a general guide new permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.

9.0 Above Ground Constraints

- 9.1 In addition to the condition of the tree the probable impact on proposed buildings or development of trees considered for retention should be assessed to take into account the root protection areas, shadow patterns, species characteristics, maintenance requirements and allowances for space and future tree growth.

Shading:

- 9.2 In order to assess any unreasonable obstruction of sunlight or daylight to any proposed development tree shadow patterns are also illustrated on the Tree Constraints Plan 19-87-02D.

Species Characteristics:

- 9.3 Trees are living organisms and exhibit structural and seasonal characteristics that may give rise to conflicts in proximity to buildings, footpaths and hard standing areas.
- 9.4 Ash trees are a large spreading deciduous tree species with an upright branching habit, often exhibiting co-dominant stems with included bark. Heavy branches are susceptible to splits, cracks and branch failures. The lower shaded branches in the canopy have the propensity to die off and drop. This can result in increased maintenance requirements to surfaces and possible damage to structures located in the immediate vicinity.
- 9.5 Birch trees are susceptible to branch failures from dense branch ends. Stem and branch failures due to wood decay and weak wood. Dead branches due to borers, sensitivity to root problems. Leader failure due to multiple stems. Sensitive to storm damage from snow, ice and wind.
- 9.6 Cherry often suffer from stem breakage due to poor architecture. Stem and branch failures due to susceptible to wood decay. Branch failures due to heavy branch ends.
- 9.7 Oak trees are typically a large, wide spreading and long lived tree species (over 500 years) that are important for biodiversity and provide habitats for a variety of species including Bats with veteran Oak trees being important for saproxylic insects. Oak trees are resistant to decay and often exhibit fungal fruiting bodies, crown dieback and deadwood within the canopy, typically developing hollow trunks and other veteran tree features without there being a significant effect on longevity.
- 9.8 Pine are susceptible to stem and root failures due to low live crown ratios. Branch failures due to snow/ice accumulation.

Ultimate Height and Spread:

- 9.9 Where surveyed trees are classified as young to semi mature their future growth in terms of predicted height and canopy spread at maturity (refer to Appendix B) should be considered to prevent direct potential damage to structures or buildings, minimise future pressure for removal and increase the effect of shading as described above.

Appendix A: Scientific Names

<i>Common names:</i>	<i>Scientific Name</i>
Common alder	<i>Alnus glutinosa</i>
Crab apple	<i>Malus sylvestris</i>
Common ash	<i>Fraxinus excelsior</i>
False acacia	<i>Robinia pseudacacia</i>
Silver birch	<i>Betula pendula</i>
Downy birch	<i>Betula pubescens</i>
Common beech	<i>Fagus sylvatica</i>
Wild cherry	<i>Prunus avium</i>
Bird cherry	<i>Prunus padus</i>
Cherry plum	<i>Prunus cerasifera</i>
Horse chestnut	<i>Aesculus hippocastanum</i>
Sweet chestnut	<i>Castanea sativa</i>
Cypress	<i>Chamaecyparis cultivar</i>
Leyland cypress	<i>Cupressus x leylandii</i>
Lawson cypress	<i>Chamaecyparis lawsoniana</i>
Douglas fir	<i>Pseudotsuga menziesii</i>
Common hawthorn	<i>Crataegus monogyna</i>
Common hornbeam	<i>Carpinus betulus</i>
Holly	<i>Ilex aquifolium</i>
Laburnum	<i>Laburnum anagyroides</i>
Small leaved lime	<i>Tilia cordata</i>
Common lime	<i>Tilia x europaea</i>
Large leaved lime	<i>Tilia platyphyllos</i>
European larch	<i>Larix decidua</i>
Field maple	<i>Acer campestre</i>
Norway maple	<i>Acer platanoides</i>
Sycamore	<i>Acer pseudoplatanus</i>
Common oak	<i>Quercus robur</i>
Sessile oak	<i>Quercus petraea</i>
Holm oak	<i>Quercus ilex</i>
Pear	<i>Pyrus communis</i>
Scots pine	<i>Pinus sylvestris</i>
Aspen poplar	<i>Populus tremula</i>
Lombardy poplar	<i>Populus italica</i>
Hybrid black poplar	<i>Populus x canadensis</i>
London plane	<i>Platanus x hispanica</i>
Norway spruce	<i>Picea abies</i>
Rowan	<i>Sorbus aucuparia</i>
Whitebeam	<i>Sorbus aria</i>
Wild service tree	<i>Sorbus torminalis</i>
Crack willow	<i>Salix fragilis</i>
Goat willow	<i>Salix caprea</i>
White willow	<i>Salix alba</i>
Weeping willow	<i>Salix babylonica</i>
Yew	<i>Taxus baccata</i>

Appendix B: Predicted Tree Height & Canopy Spread

<i>Common name</i>	<i>Height (m)</i>	<i>Canopy Spread (m)</i>
Common alder	25	10
Crab apple	9	7
Common ash	30	20
False acacia	25	15
Silver birch	25	10
Downy birch	20	10
Common beech	25	15
Wild cherry	20	10
Bird cherry	15	10
Cherry plum	10	10
Horse chestnut	25	20
Sweet chestnut	30	15
Cypress	15-40	2-5
Leyland cypress	35	5
Lawson cypress	15-40	2-5
Douglas fir	25-50	6-10
Common hawthorn	10	8
Common hornbeam	25	20
Holly	25	8
Laburnum	8	8
Small leaved lime	25	15
Common lime	35	15
Large leaved lime	30	20
European larch	30	4-6
Field maple	10	8
Norway maple	25	15
Sycamore	30	25
Common oak	35	25
Sessile oak	30	25
Holm oak	25	20
Pear	15	10
Scots pine	15-30	6-9
Aspen poplar	20	10
Lombardy poplar	30	5
Hybrid black poplar	35	20
London plane	30	20
Norway spruce	20-40	6
Rowan	15	7
Whitebeam	10-25	10
Wild service tree	20	12
Crack willow	15	15
Goat willow	10	8
White willow	25	10
Weeping willow	12	12
Yew	10-20	8-10

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
TREES UNSUITABLE FOR RETENTION				
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 U category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) - Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline. - Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality. <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve.</i>			DARK RED
TREES TO BE CONSIDERED FOR RETENTION				
	1 Mainly arboricultural values	2 Mainly landscape values	3 Mainly cultural values, including conservation	
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)	LIGHT GREEN
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	MID BLUE
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.	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	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	GREY

Appendix D: Root Protection Area

Single stem diameter <i>mm</i>	Radius of nominal circle <i>m</i>	Root Protection Area (RPA) <i>m²</i>
75	0.90	3
100	1.20	5
125	1.50	7
150	1.80	10
175	2.10	14
200	2.40	18
225	2.70	23
250	3.00	28
275	3.30	34
300	3.60	41
325	3.90	48
350	4.20	55
375	4.50	64
400	4.80	72
425	5.10	81
450	5.40	92
475	5.70	102
500	6.00	113
525	6.30	124
550	6.60	137
575	6.90	150
600	7.20	163
625	7.50	177
650	7.80	191
675	8.10	206
700	8.40	222
725	8.70	238
750	9.00	255
775	9.30	272
800	9.60	290
825	9.90	308
850	10.20	327
875	10.50	346
900	10.80	366
925	11.10	387
950	11.40	408
975	11.70	430
1000	12.00	452
1025	12.30	475
1050	12.60	499
1075	12.90	519
1100	13.20	547
1125	13.50	573
1150	13.80	598
1175	14.10	625
1200	14.40	652
1225	14.70	679
1250	15.00	707

Appendix E: Technical Definitions

Access Facilitation Pruning:	One off tree pruning operation, the nature and effects of which are without significant adverse impact on tree physiology or amenity value, which is directly necessary to provide access for operations on site.
Arboricultural Impact Assessment	An evaluation of the direct and indirect effects of the proposed design on the trees identified within the Tree Survey, where necessary recommending mitigation or amendments to the design.
Arboricultural Method Statement	Methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in loss of or damage to a tree to be retained.
Construction Exclusion Zone	An area based on the root protection area from which access is prohibited for the duration of a project
Root Protection Area (RPA)	The minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is considered a priority
Tree Protection Plan	A scale drawing informed by descriptive text where necessary, based upon finalised proposals, showing trees for retention and illustrating the tree and landscape protection measures.

Disclaimer:

This report is issued to the client for their sole use and for the intended purpose as stated in the agreement between the client and Bea Landscape Design Limited under which this work was completed, or else as set out within this report. This report may not be relied upon by any other party without the express written agreement of Bea Landscape Design Limited. The use of this report by unauthorised third parties is at their own risk and Bea Landscape Design accepts no duty of care to any such third party.

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Any recommendation, opinion or finding stated in this report is based on circumstances and facts as they existed at the time that Bea Landscape Design performed the work. The content of this report has been provided in accordance with the provisions of the BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations'.

Nothing in this report constitutes legal opinion. If legal opinion is required the advice of a qualified legal professional should be secured. Observations relating to ecology and the condition of built structures have been made from an arboricultural point of view and, unless stated otherwise, do not constitute structural or ecological advice.

Tree Survey in accordance with BS5837:2012

Estimated dimensions (for offsite or otherwise inaccessible trees where accurate data cannot be recovered).

Tree / Group Number	Common Name	Height (m)	Stem(s) Diameter (mm)	Branch Spread (m)				Canopy Height (m) / First Significant Branch	Life Stage	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Remaining Contribution (years)	Category Grading	Root Protection Area (m2)
				N	E	S	W								
T1,T2	Lime	9	250	4	4	4	4	2	Semi Mature	Good	Typical of specimen trees of this species.	No works required	40+	B1	28
W1	Ash, Cherry, Field Maple, Birch, Alder, Poplar, Pine, Oak	13-15	100-450	4	4	4	4	1	Mature	Fair	This is a planted woodland belt some 30-40 years old. The nurse trees have reached maturity and many are now in decline. The Ash and Pine are now the largest trees with the climax Oak trees starting to take shape. There is one dead ash tree but this does not appear to be due to 'Ash Die Back' Chalara.	Since the planting of this woodland, little or no management has taken place. Nurse trees should now be removed and selected climax trees retained.	40+	B2	
G1	Blackthorn	5	75-100	1	1	1	1	0	Young	Fair	This is a group of self suckering blackthorn	These self set saplings could be retained for biodiversity of cleared and replanted with species with greater longevity.	10+	C2	

Tree Survey in accordance with BS5837:2012

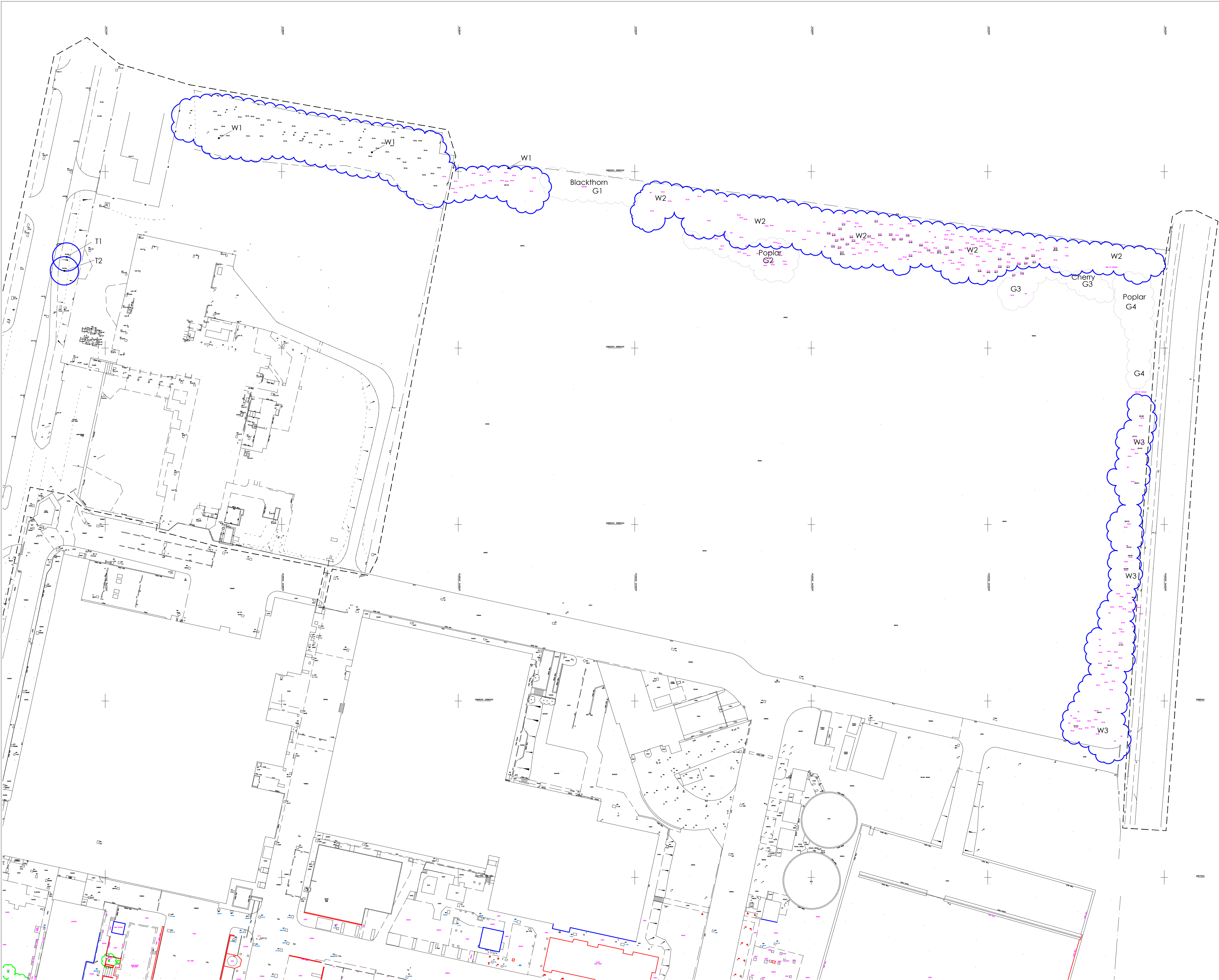
Estimated dimensions (for offsite or otherwise inaccessible trees where accurate data cannot be recovered).

Tree / Group Number	Common Name	Height (m)	Stem(s) Diameter (mm)	Branch Spread (m)				Canopy Height (m) / First Significant Branch	Life Stage	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Remaining Contribution (years)	Category Grading	Root Protection Area (m2)
				N	E	S	W								
W2	Scotts pine, Silver Birch, Red Oak, English Oak, Hawthorn, Blackthorn, Beech, Purple Beech, Poplar, Ash, Cherry	9-13	100-300	4	4	4	4	1	Mature	Fair	This is a planted woodland belt some 30-40 years old. The nurse trees have reached maturity and many are now in decline. The Ash and Pine are now the largest trees with the climax Oak trees starting to take shape. There is one dead ash tree but this does not appear to be due to 'Ash Die Back' Chalara.	Since the planting of this woodland, little or no management has taken place. Nurse trees should now be removed and selected climax trees retained.	40+	B1	
G2	Poplar	5-7	75-100	1	1	1	1	1	Young	Fair	A group of self set suckering poplars forming a dense stand of young trees	If these are to be kept then the stand should be selectively thinned to allow the trees to mature with less competition.	20+	C2	
G3	Cherry	3-5	75-100	2	2	2	2	1	Young	Fair	A group of self set suckering cherry trees forming a dense stand of young trees	If these are to be kept then the stand should be selectively thinned to allow the trees to mature with less competition.	10+	C2	
G4	Poplar	5-7	75-100	1	1	1	1	1	Young	Fair	A group of self set suckering poplars forming a dense stand of young trees	If these are to be kept then the stand should be selectively thinned to allow the trees to mature with less competition.	20+	C2	

Tree Survey in accordance with BS5837:2012

Estimated dimensions (for offsite or otherwise inaccessible trees where accurate data cannot be recovered).

Tree / Group Number	Common Name	Height (m)	Stem(s) Diameter (mm)	Branch Spread (m)				Canopy Height (m) / First Significant Branch	Life Stage	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Remaining Contribution (years)	Category Grading	Root Protection Area (m2)
				N	E	S	W								
W3	Ash, Cherry, Field Maple, Birch, Poplar, Pine, Oak	13-15	150-350	4	4	4	4	1	Mature	Fair	This is a planted woodland belt some 30-40 years old. The nurse trees have reached maturity and many are now in decline. The Ash and Pine are now the largest trees with the climax Oak trees starting to take shape. There is one dead ash tree but this does not appear to be due to 'Ash Die Back' Chalara.	Since the planting of this woodland, little or no management has taken place. Nurse trees should now be removed and selected climax trees retained.	40+	B2	



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rev	date:	amendments:	alt:
B	16.08.2019	Scale change and extension to W2	TGW
C	02.10.2019	Updated following revised survey	TGW

cdm 2015; designers residual risk information

In addition to the risks & hazards normally associated with the type of work detailed on this drawing the following residual risks should be noted:

Construction:

Standard Soft Landscape Works Only. No Additional Identifiable Risks.

Maintenance:

Standard Soft Landscape Works Only. No Additional Identifiable Risks.

It is assumed that works will be carried out by competent contractor working where appropriate to an approved method statement.

LEGEND: TREE SURVEY TO BS 5837:2012

NB The original of this drawing was produced in colour - a monochrome copy should not be relied upon).

T1 Category A: High quality and/or value.

T2 Category B: Moderate quality and /or value.

T3 Category C: Low quality and/or value

T4 Category U: Trees unsuitable for retention.

bea
landscape design ltd

client:
KNOWSLEY (IMAGE BUSINESS PARK) LTD.

project:
IMAGE BUSINESS PARK,
KNOWSLEY, CONTENUR SITE

title:
TREE SURVEY PLAN
TO BS 5837:2012

status:
PLANNING

date:	drawn:	number:
07.2019	TGW	19-087-01
scale@A1:	checked:	revision:
1:500	(-)	C

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Practice



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rev	date:	amendments:	alt:
B	16.08.2019	Scale change and extension to W2	TGW
C	02.10.2019	Updated due to revised survey	TGW
D	25.10.2021	W1 survey updated.	E.H

LEGEND: TREE SURVEY TO BS 5837:2012
NB The original of this drawing was produced in colour - a monochrome copy should not be relied upon.

- T1 Category A: High quality and/or value.
- T2 Category B: Moderate quality and/or value.
- T3 Category C: Low quality and/or value.
- T4 Category U: Trees unsuitable for retention.
- Category U: Trees unsuitable for retention.
- RPA: Root Protection Area: minimum area to be protected during construction in accordance with BS 5837:2012.
- Shadow Arc



client:
KNOWSLEY (IMAGE BUSINESS PARK) LTD.

project:
IMAGE BUSINESS PARK,
KNOWSLEY, CONTENUR SITE

title:
TREE CONSTRAINTS PLAN
TO BS 5837:2012

status:
PLANNING

date: 07.2019	drawn: TGW	number: 19-087-02
scale@A1: 1:500	checked: (-)	revision: D

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