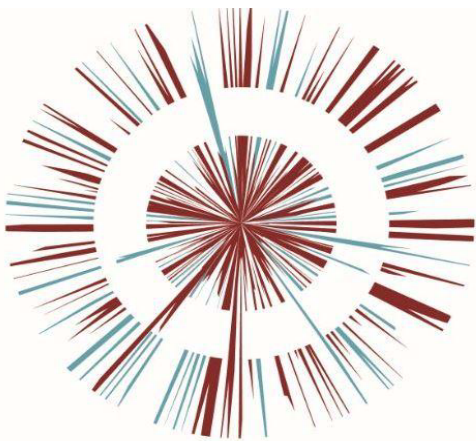




OMEGA ZONE 8, ST HELENS

Omega St Helens Ltd / T. J. Morris Limited



Document Title
ES Vol. 2 Appendix 9.7
Arboricultural Survey
Document No. OPP DOC.11.22f

Ecological Assessments

Environmental Statements (Biodiversity)

Species Surveys

Phase I Habitat Survey

National Vegetation Classification

Planning Guidance

Habitat Regulation Assessment

Protected Species Licensing

42020 CEMP: Biodiversity

BREEAM LE01 - 05

Arboricultural Impact Assessment, Method Statement and Tree Protection Plan



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Omega Zone 8

St Helens, Warrington



Consultant Report on behalf of:

REPORT STATUS

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EXECUTIVE SUMMARY

An assessment of trees was undertaken at Omega West following the guidance of British Standards 5837:2012 'Trees in relation to design, demolition and construction – Recommendations', and to provide a report on the arboricultural implications to the proposed development of Unit 1 within the overall site, for which full planning permission is sought.

A current topographical survey of the site in AutoCAD format has been provided and this formed the basis for the **Tree Constraints Plan**.

We were provided with an AutoCAD copy of the proposed site plan (**Drawing reference: 6385 - 150 Proposed Site Layout Plan Warrington with Survey Overlay**), which has been considered during the **Arboricultural Impact Assessment** and used to produce **Tree Protection Plan**.

Findings and Recommendations

The survey assessed **28 individual trees, 16 groups of trees, 7 woodlands and 2 hedgerows** overall. The majority of the tree cover being made up of woodlands of high value, the remainder of the vegetation comprising of tree lined boundary's and scattered early mature trees throughout the central area of the site.

There are currently tree preservation orders (TPO) at this location. Therefore, trees/woodlands detailed within this report were subject to statutory protection at the time of the survey.

The survey identified 1 individual tree which was unsuitable for retention (within proximity to development) due to its condition.

In addition, 2 individual trees and 1 group of trees have been identified as requiring removal solely to accommodate the proposed new site layout (**T7, T8, and G5**). The proposed development will also require the removal of 2 high valued woodlands (**W4, W5**).

It is recommended that temporary protective fencing should be erected in order to create a construction exclusion zone which adequately protects retained trees from damage during the construction works.

1. INTRODUCTION

1.1. PURPOSE AND SCOPE OF REPORT

- 1.1.1. This report has been prepared following the guidance within BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations' Its purpose is to assess the likely arboricultural implications to the development proposals for the site and to be submitted in support of a planning application to the Local Planning Authority seeking consent for these proposals. It also provides arboricultural guidance on how the proposed development can be achieved while minimising any potential detrimental impacts to retained trees.
- 1.1.2. In preparing this report, the condition of the trees and the final use of the site with a focus on providing a harmonious, balanced environment between the trees, buildings and end users of the site.
- 1.1.3. Whilst not definitive, the findings and any associated recommendations detailed within this report are considered reasonable, practicable, sustainable and in the interests of promoting good arboricultural management.
- 1.1.4. Recommendations included within this report are the professional opinion of an experienced Arboriculturist and are the view of the Ecology Practice Ltd. This is based on a review of the information provided by The Client, the brief and a survey of the site. This report pertains to these results only.
- 1.1.5. This report and the survey(s) on which it depends have been carried out by a competent Arboriculturist¹.

1.2. SITE LOCATION AND CONTEXT

- 1.2.1. The site is located just south of the M62, on the eastern outskirts of Warrington, comprising of a number of agricultural fields divided by hedgerows with scarred mature

¹ As per the Terms and Definitions detailed in British Standards 5837:2012-Trees in relation to design, demolition and construction – Recommendations.

trees and dense scrub boundaries. The site is primarily surrounded by similar agricultural fields, woodland compartments and an area of new industrial development to the east aspect

1.3. REGULATORY AND POLICY FRAMEWORK

- 1.3.1. Part VIII of the Town and Country Planning Act 1990 (as amended) and the Town and Country Planning (Tree Preservation)(England) Regulations 2012 enable a local planning authority to make a Tree Preservation Order (TPO) to protect specific trees, groups of trees or woodlands in the interests of amenity. A TPO prohibits the cutting down, toppling, lopping, uprooting, wilful damage and wilful destruction of protected trees with the local planning authority's written consent.
- 1.3.2. Section 211 of the Town and Country Planning Act 1990 makes provisions to protect trees which are within a conservation area, but not the subject of a TPO. These provisions require anyone intending to carry out works to a tree within a conservation area to give the local planning authority 6 weeks' notice before carrying out certain works, unless an exemption applies.
- 1.3.3. The Forestry Act (1967) requires that a Felling Licence, issued by the Forestry Commission, is obtained before felling trees, unless an exemption applies. Such exemptions include; felling small quantities of trees (less than 5m³ of timber in any calendar quarter) or when felling in specific areas (e.g. gardens).

Figure 1

Location

Omega Zone 8

Legend

-  Development Site
-  Site Location



Drawing No.: 16903-1AIA_A

Revision Dates

A	B	C	D
10/10/19			

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Figure 2

Site Context Plan

Omega Zone 8

Legend



Development Area



Drawing No.: 16903-02AIA_A

Revision Dates

A	B	C	D
02/12/9			

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75m

375m



Drawings are diagrammatic and not to scale. Refer to architect drawings for exact measurements



2. SURVEY METHODS

2.1. FIELD SURVEY

2.1.1. The site was visited on Tuesday 1st and Wednesday 2nd October 2019 to carry out an assessment in accordance with BS 5837:2012 – Trees in relation to Design, Demolition and Construction - Recommendations.

2.1.2. The weather at the time was dry, bright, clear and still and considered to be adequate for conducting the survey during which, the following information was collected:

- i) Sequential reference number (recorded on the tree survey plan), including reference to type (tree, group, woodland or hedgerow);
- ii) Species, listed by common name (a key to scientific names is provided at Appendix B);
- iii) Height;
- iv) Stem diameter measured @ 1.5m height (for trees with more than one stem, the combined stem diameter is recorded as per BS5837:2012 Section 4.6);
- v) Branch spread (measured at the four cardinal points);
- vi) Existing height above ground level of first significant branch;
- vii) Life stage;
 - Y – Young,
 - SM – Semi Mature,
 - EM – Early Mature,
 - M – Mature,
 - OM – Over Mature;
- viii) General observations, particularly of structural and/or physiological condition, and/or preliminary management recommendations as appropriate;
- ix) Estimated remaining contribution (future life expectancy) in years (<10, 10+. 20+, 40+);

- x) Tree quality assessment category grading as per Section 4.5 and Table 1 of BS5837:2012. 'U' or 'A' to 'C' grading with the subcategory 1, 2 or 3 reflecting arboricultural, landscape or cultural values, respectively.
- 2.1.3. Notes; Only individual trees with a stem diameter of 75mm or greater are included in the survey. It is not always practical or necessary to record individual details for every tree within a group or woodland. Only basic details (height and species) for domestic hedgerows and significant shrubs were recorded. More substantial hedgerows (including evergreen screens) are generally recorded in a similar manner to groups of trees.
- 2.1.4. The measurement conventions used were as follows:
- Height, crown spread and crown clearance was recorded to the nearest half metre for dimensions up to 10m and to the nearest whole metre for dimensions over 10m;
 - Stem diameter was recorded in millimetres, rounded to the nearest 10mm.
 - Any estimated dimensions (for offsite or otherwise inaccessible trees where accurate measurements cannot be taken) were clearly identified as such in the tree schedule (Appendix A).
- 2.1.5. The survey includes all trees plotted on the provided topographical survey. Should any relevant trees on or adjacent to the site have been missed on the topographical survey, these have been included where appropriate. However, the positions indicated on any plans included within this report for all trees not included on the provided topographical survey have been approximated for the purposes of identification only and if accurate locations are required, these should be confirmed on site.

3. LIMITATIONS

3.1. SURVEY

- 3.1.1. Each of the surveyed trees has been plotted and recorded as an individual tree or a tree group in accordance with the criteria detailed in section 4.4.2.5 of BS 5837:2012.
- 3.1.2. The information contained within this report is based on the author's knowledge and experience in respect of tree related issues. Whilst the appropriate level of skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information.
- 3.1.3. Any survey work undertaken will have been subject to natural limitations, including seasonal and phenological aspects.
- 3.1.4. Trees were assessed from ground level using the Visual Tree Assessment (VTA) method. The trees included in the survey were not climbed, no samples were removed and no detailed internal investigation of decay was made.
- 3.1.5. Where other vegetation (e.g. ivy or dense ground cover) prevented full access to any tree, this is noted in the tree survey schedule (Appendix A). Dense ivy cover can prevent full access to a tree and so obscure the presence of cavities or other defects. Any such situations are noted in the tree survey schedule with, where appropriate, recommendations for the ivy to be removed and a re-inspection carried out. No ivy was removed from any tree during the survey.
- 3.1.6. No liability can be accepted by the Ecology Practice Ltd. in respect of the trees unless the recommendations of this report are carried out under their supervision and within their recommended timescales. Acceptance of this report represents an agreement with the guiding principles and the terms listed.
- 3.1.7. The findings and recommendations contained within this report are, assuming its recommendations are observed, valid for a period of twelve months from the date of survey. Trees are living organisms and their condition can change significantly over a

relatively short period of time – good practice dictates they are inspected on a regular basis for reasons of safety.

- 3.1.8. Any hedgerows within the survey area were assessed solely for their general arboricultural condition and value. Further detailed assessment, following the Hedgerow Regulations 1997, is outside the scope of this report and no attempt was been made during this assessment to classify any hedgerow under the criteria within those Regulations.
- 3.1.9. Tree rooting characteristics and soils are both enormously variable as are their interactions. This makes any attempts to quantify tree related subsidence risk assessment impossible. No attempt has been made to assess subsidence risk potential nor should any be construed.
- 3.1.10. The report relates only to the trees included within the Tree Schedule (Appendix A).

4. RESULTS

4.1. SURVEYORS

- 4.1.1. The survey was carried out by Jake Mellor B.A. (Hons) who is experienced within the arboricultural sector, previously working as an Arborist gaining extensive knowledge/training within this field. He has also completed the LANTRA Professional Tree Inspection course and is now working towards a 'FdSc' in Arboriculture.
- 4.1.2. The survey was completed during suitable conditions as detailed in the table below.

Table 1. Summary of conditions during survey

Abiotic Factor	Survey 1
Survey type	BS 5837:2012 Tree Survey
Date completed	01/10/2019 & 02/10/2019
Temperature	10°C
Wind speed (Beaufort Scale)	1
Cloud cover	80%
Precipitation	1

4.2. STATUTORY TREE PROTECTION

- 4.2.1. Warrington Borough Council confirmed that the site is not within a conservation area but that some of the woodlands detailed within this report are covered by a tree preservation order (TPO) – TPO 5/2 'Area South of M62'. This order includes a number of woodlands designations within the site/survey area.
- 4.2.2. Trees at this location are therefore subject to statutory protection and as a result no tree works may be carried out without the prior consent of Warrington Borough Council.

4.3. TREE SURVEY

- 4.3.1. The survey assessed 28 individual trees, 16 groups of trees, 7 woodlands and 2 hedgerows the quality and value of which are summarised in the table below whilst full results of the tree survey are provided in the Tree Schedule (Appendix A).

- 4.3.2. The majority of the site's tree cover was made up of woodland compartments comprising of mixed of species from English oak, sweet chestnut to understory of holly. These areas were of high arboricultural merit and covered under a tree preservation order.
- 4.3.3. The remainder of the site's vegetation comprised of tree lined boundary's with scattered pockets of mature trees throughout. The majority of these areas were of moderate/low quality.

Table 2. Survey results

BS5837:2012 Tree Quality Assessment Category		Trees	Groups	Woodlands	Total
A	Trees of high quality which are healthy and attractive with high visibility and no significant defects, and which can make a substantial contribution for a minimum of 40 years	0	0	6	6
B	Trees of moderate quality which are healthy and attractive but with some remediable defects such that they are in a condition to be able to make a significant contribution for a minimum of 20 years	10	5	1	16
C	Trees of low quality which are unremarkable, of limited merit and that are easily replaced, small-growing, young species which have a relatively low potential amenity value, and low landscape benefits. These trees typically include self-seeded trees of limited life span, small (below 150mm stem diameter) and young trees and trees of poor form and limited amenity value.	17	11	0	28
U	Trees which are 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 and/or are considered to be unsuitable for retention in the proximity of new dwellings or areas of public open space.	1	0	0	1
Total		28	16	7	51

5. ARBORICULTURAL IMPACT ASSESSMENT

5.1. INTRODUCTION

- 5.1.1. The arboricultural constraints, both above and below ground, identified during the tree survey (Section 4) and illustrated on the Tree Constraints Plan (Appendix A), have been used, through consultation with the Client, to inform the proposed site layout design.
- 5.1.2. The following arboricultural impact assessment evaluates the direct and indirect effects of the proposed design, with recommendations for appropriate mitigation where necessary. It takes account of the effects of any tree loss required to implement the design and any proposed construction activities which may have the potential to damage retained trees.

5.2. TREES SUITABLE FOR RETENTION

- 5.2.1. Where possible, it is generally considered desirable for any Category 'A' and Category 'B' trees to be retained and appropriately integrated within the layout for new developments. Category 'U' trees are unsuitable for retention other than for the very short-term or exceptionally for their conservation value and therefore should not be considered to be a constraint to development.
- 5.2.2. In assessing the probable impact of the proposed development on the trees and vice versa, and therefore identifying which trees are suitable for retention and integration within the context of the proposed layout, the following factors have all been considered:
- Root Protection Areas for Retained Trees
 - Shading
 - Direct Damage
 - Construction Activity
 - Demolition/Ground Works
 - Future Pressure for Tree Removal and Pruning
 - Seasonal Nuisance
 - Infrastructure

- Future Management

5.3. ROOT PROTECTION AREAS

- 5.3.1. Recommended Root Protection Areas (RPA) for all individual trees on or immediately adjacent to the survey area are detailed within the Tree Schedule (Appendix A) and illustrated on the Tree Constraints Plan (Appendix C).
- 5.3.2. These RPAs have been calculated following the recommendations within BS5837:2012 Section 4.6 and are represented on the Tree Constraints Plan as a circle centred on the base of the tree's stem. Should any deviation from this circular RPA be considered appropriate, for example where previous site conditions (the presence of roads, structures and underground apparatus), topography or soil type/structure will have influenced root growth, any modifications to the RPA will be clearly explained and reflect a soundly based arboricultural assessment of the likely root distribution for the individual tree. Any such modified RPA will be of an overall area which is equivalent to the BS5837:2012 recommendation.
- 5.3.3. Recommendations for RPAs for any groups of trees, woodlands or hedgerows, where the positions of individual trees are not included on the provided topographical survey, also reflect a soundly based arboricultural assessment of the likely collective root distribution of the constituent trees.

5.4. RECOMMENDATIONS FOR TREE REMOVALS

- 5.4.1. The survey identified 1 tree which was unsuitable for retention (within proximity to development) due to its condition T10 – English oak. In the interests of good arboricultural management, if this tree is within proximity to development it is recommended that it's made safe by reducing to standing deadwood poles for the benefit of biodiversity
- 5.4.2. also, 2 trees, 1 group and 2 woodlands have been identified as requiring removal solely to accommodate the proposed new site layout T7 - Beech, T8 - English oak, G5, W4 and W5 – all of mixed species.

- 5.4.3. In addition, the proposed development will also require the partial removal of 2 groups of trees G3 and G10.
- 5.4.4. Table 5 (section 6) below provides a summary of all recommended tree works (pruning and removals).
- 5.4.5. All Arboricultural work should be carried out by qualified and competent Arborists working to BS 3998:2010 'Tree Work – Recommendations'.

5.5. TREE LOSS EVALUATION

- 5.5.1. The trees recommended for removal to accommodate the development consist of 1 moderate quality (Category B) and 1 low quality (Category C) individual trees and 1 low quality (Category C) groups of trees.
- 5.5.2. In addition, the proposed development will require the removal of 1 high quality (Category A) woodland. This woodland has a tree preservation order.
- 5.5.3. Due to the high arboricultural merit of the woodlands, it is inevitable that the development will result in a significant loss of high-quality local tree cover and therefore also arboricultural value.
- 5.5.4. These arboricultural losses should be balanced against the overall benefits of the development and mitigated against through appropriate new tree planting, as part of the overall landscaping scheme for the development. With the aim being to maintain an appropriate amount of tree cover while improving the long term arboricultural value of individual trees within the site.

5.6. RECOMMENDATIONS FOR TREE PRUNING

- 5.6.1. Any recommendations within the Tree Survey Schedule (Appendix A) details pruning works **solely** in the context of the current use of the site that are recommended in the interest of good arboricultural management of the trees irrespective of any changes in use of the site. These recommendations should not be considered as necessary to implement or facilitate the proposed development.

- 5.6.2. Any additional pruning which is recommended solely to accommodate the proposed site layout (e.g. access facilitation pruning) is detailed within Table 5 (section 6).
- 5.6.3. All Arboricultural work should be carried out by qualified and competent Arborists working to BS 3998:2010 'Tree Work – Recommendations'.

5.7. TREE PROTECTION PLAN

- 5.7.1. The Tree Protection Plan (Appendix D), when read in conjunction with this report, details the required tree protection and mitigation measures for all trees proposed to be retained and integrated within the proposed layout.
- 5.7.2. The Tree Protection Plan is superimposed on the proposed layout and includes details of;
- Trees selected for retention and trees proposed for removal.
 - The precise location and specification of protective barriers to form a construction exclusion zone around the retained trees.
 - The extent and type of any temporary ground protection, and/or any additional physical measures, that are recommended in association with any temporary access or other activities which are permitted within the construction exclusion zone.
 - The position, extent and general construction specification of any new permanent new hard surfacing within the RPA.

5.8. SHADING

- 5.8.1. Although there are circumstances where shade from trees could be considered beneficial, excessive shading of buildings by trees can be a problem, particularly where it affects rooms which require natural light. Similarly, it is often considered that open spaces such as gardens and sitting areas benefit from direct sunlight, for at least part of the day, and therefore that excessive shading of these areas by trees is undesirable.
- 5.8.2. In this instance, no further investigation, illustration or mitigation is considered necessary due to the generally favourable layout orientation and the nature of the proposal (i.e. non-residential) which means that the development is not considered likely to be subjected to an unreasonable level of shading from trees.

5.9. DIRECT DAMAGE

- 5.9.1. All new developments should consider the likelihood of direct damage occurring to any new structures, hard surfacing or associated utilities from incremental tree stem/root growth or mechanical damage resulting from encroachment of branches.
- 5.9.2. The proposed layout locates all new structures and services outside of the recommended RPAs.
- 5.9.3. For any proposed new planting, Table 3 below, taken from Annex A of BS 5837:2012, provides recommendations that are advised as minimum distances from structures and services for new tree plantings.

Table 3. Minimum distance between young trees or new planting and structure

Type of structure	Stem dia. ≤300mm ^{A)}	Stem dia. 300mm to 600mm ^{A)}	Stem dia. ≥600mm ^{A)}
Building and heavily loaded structures	---	0.5	1.2
Lightly loaded structures such as garages, porches etc.	---	0.7	1.5
Services: ≤1m deep	0.5	1.5	3.0
Services: ≥1m deep	---	1.0	2.0
Masonry boundary walls	---	1.0	2.0
In-situ concrete paths and drives	0.5	1.0	2.5
Paths and drives with flexible surfaces or paving slabs	0.7	1.5	3.0

A) Diameter of stem at 1.5m above ground level at maturity.

©The British Standards Institution 2012

5.10. TEMPORARY GROUND PROTECTION

- 5.10.1. The proposed site layout does not include any conflict between the necessary construction working space and retained trees. Therefore, it is not considered that any temporary ground protection will be required to implement the development.
- 5.10.2. In this instance it is considered that, if the existing hard surfacing within the RPAs of the above trees is retained during the construction (See 6.5.6 below), any incursions into the RPAs of the trees, which are necessary to facilitate the construction and any other related activities, can be carried out without the need for additional ground protection measures and that the protective fencing specification shown in Figure 4 will be appropriate, in this instance.
- 5.10.3. Suitable existing hard surfacing that is not proposed for re-use as part of the finished design should be retained to act as temporary ground protection during the construction and, development rather than being removed.
- 5.10.4. British Standard 5837:2012 advises that temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction to underlying soil and further provides the following note:

The ground protection might comprise one of the following:

- a) for pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;*
- b) for pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;*
- c) for wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.*

- 5.10.5. Final on-site measurements should be taken to ascertain the extent of any tree protection measures and provide an indication of whether incursions, which have not been anticipated, into the RPAs of retained trees might prove necessary.

5.11. EXCAVATION/GROUND WORKS

- 5.11.1. The installation of any protective mitigation measures, if necessary, prior to the commencement of any works on site, will allow excavations and ground works to take place whilst minimising any anticipated adverse effect and/or impact on the retained trees.
- 5.11.2. All plant and vehicles engaged in ground works should either operate outside the RPAs, or run on appropriate ground protection, if necessary, in the proximity of retained trees.
- 5.11.3. Where trees stand adjacent to hard surfaces and/or buildings to be removed, excavation should be undertaken inwards, from within the footprint of the existing hard surfacing, or outside of the RPAs.

5.12. CONSTRUCTION WITHIN THE ROOT PROTECTION AREA

- 5.12.1. The use of traditional strip foundations can result in extensive root loss and should be avoided. However, BS5837:2012 recommends that the insertion of specially engineered structures within RPAs may be justified if it enables the retention of a good quality tree (usually category A or B) that would otherwise be lost.
- 5.12.2. The foundation design should minimise any adverse impact on the trees and should take into consideration all relevant Site-specific constraints. In order to arrive at a suitable solution, the combined advice of the project arboriculturist and an engineer will be required.
- 5.12.3. BS5837:2012 recommends that root damage can be minimised by using piles, located optimally to avoid any structural roots, by means of hand tools or compressed air soil displacement, to a minimum depth of 600mm, or beams laid at or above ground level to avoid tree roots.
- 5.12.4. Where piling is to be installed near to trees, the smallest practical pile diameter should be used to reduce the possibility of striking major tree roots. Temporary ground protection, appropriate to the size of the piling rig in use, should be used as detailed above in section 5.6.

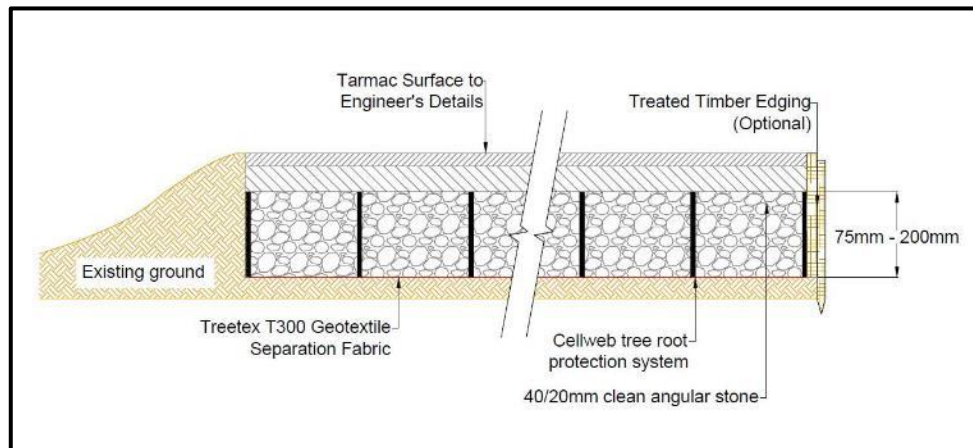
- 5.12.5. It may be appropriate for slabs for minor structures (e.g. a shed base) to be formed within the RPA. It should however be placed on the existing ground level with no new excavation, and should not exceed an area greater than 20% of the unsurfaced ground within the RPA.
- 5.12.6. The proposed layout does not include any construction within the RPA and so there is no requirement for any specially engineered structures in this instance.

5.13. HARD SURFACING WITHIN THE ROOT PROTECTION AREA

- 5.13.1. It is not anticipated that the installation of any specially engineered hard surfaces to protect the roots of retained trees will be necessary in this instance. However, general guidance on such surfacing is provided below should a subsequent need arise.
- 5.13.2. BS5837:2012 recommends that three-dimensional cellular confinement systems, incorporating geotextile or impermeable barriers as necessary, may be appropriate sub-base options for new hard surfacing within the RPA.
- 5.13.3. A 'no-dig' design should be used which does not require excavation into the soil other than the removal, using hand tools, of any turf layer or other surface vegetation. The structure of the hard surface should be designed to avoid localised compaction and in all cases, the advice of a structural engineer should be sought to ensure that the design is suitable for the anticipated vehicle loads it will be subjected to.
- 5.13.4. The new hard surfacing should be resistant to deformation by tree roots and should be set back from the tree's stem and above ground buttresses by a minimum distance of 500mm to allow for growth and movement. Where no-dig installations are proposed to be located particularly close to the main stems of retained trees then it is recommended that consideration is given to realigning the hard surfacing in order to reduce the total area (m²) of RPAs affected in order to reduce the likelihood for future pruning pressure and minimise the potential for any detrimental impact on the retained trees.
- 5.13.5. It is recommended that the total area for all new permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.

5.13.6. Indicative cross-sectional drawings of a suitable three-dimensional cellular confinement system (CellWeb™) are shown below (Figure 3).

Figure 3. Cross section illustrating a permeable tarmac surface finish



5.14. CONSTRUCTION ACTIVITY

5.14.1. The installation of any recommended protective or mitigation measures prior to the commencement of any works on site will allow the development to take place whilst minimising any anticipated adverse effect and/or impact on the retained trees.

5.14.2. All plant and vehicles engaged in construction works should either operate outside the RPA, and/or run on appropriate ground protection.

5.15. FUTURE PRESSURE FOR TREE PRUNING/REMOVAL

5.15.1. Whilst the presence of retained trees can often enhance the immediate environment upon completion, any proposed layout should provide sufficient space that will allow for future tree growth and to provide a subsequently reduced need for future, frequent remedial pruning.

5.15.2. The tree works detailed in Table 5 are considered, in this instance, to provide an environment and layout juxtaposition that will allow for the future growth of the retained trees whilst minimising any immediate future pruning pressures.

5.16. SEASONAL NUISANCE

- 5.16.1. Foliage, fruit and cone fall can be considered by some to be a nuisance and requests to Local Planning Authorities to carry out pruning works to negate these issues are often refused due in part to their brief, seasonal nature of the problem.
- 5.16.2. Providing a suitable juxtaposition when considering new layouts will help in minimising issues experienced by people living in proximity to trees.
- 5.16.3. A certain level of leaf fall in the autumn will be inevitable due to the generally deciduous nature of the existing trees on the site. This it is however not considered to be unreasonable in the context of the site's use.

5.17. INFRASTRUCTURE

- 5.17.1. Infrastructure requirements have been considered and there is/no evidence to suggest that retained trees will have an impact on lighting, signage, CCTV sightlines or visibility splays.
- 5.17.2. Where the installation of any underground apparatus and drainage is considered necessary then particular care should be taken in its routeing and methods of installation and wherever possible be routed outside RPAs.
- 5.17.3. Where routeing services outside RPAs is not possible then detailed plans showing the proposed routeing should be drawn up in conjunction with the project Arboriculturist. Trenchless insertion methods are considered appropriate for this purpose and British Standards 5837:2012 details solutions for differing utility apparatus requirements (see table 4 below).
- 5.17.4. British Standards 5837:2012, Section 7.7.2 suggests that in the event roots can be retained and appropriately protected during exposure, then excavation using hand-held tools might be acceptable for shallow service runs. The National Joint Utilities Group's publication 'NJUG Volume 4' contains further guidelines on the installation of new underground services in proximity to trees.

Table 4. Trenchless solutions for differing utility apparatus installation requirements.

Method	Accuracy	Bore dia. ^{A)}	Max sub. ^{B)} length	Applications	Not suitable for
Micro tunnelling	≤20	100 to 300	40	Gravity-fall pipes, deep apparatus, watercourse/road way undercrossing	Low-cost projects due to relative expense
Surface-launched directional drilling	≈100	25 to 1,200	150	Pressure pipes, cables including fibre optic	Gravity-fall pipes, e.g. drains and sewers ^{C)}
Pipe ramming	≈150	150 to 2,000	70	Any large-bore pipes and ducts	Rocky and other heavily obstructed soils
Impact moling ^{D)}	≈50 ^{E)}	30 to 180 ^{F)}	40	Gas, water and cable connections, e.g. from street to property	Any application that requires accuracy over distances in excess of 5m

A) *Dependent on strata encountered.*

B) *Maximum subterranean length.*

C) *Pit-launched directional drilling can be used for gravity fall pipes up to 20m subterranean length.*

D) *Impact moling (also known as thrust-bore) generally requires soft, cohesive soils.*

E) *Substantial inverse relationship between accuracy and distance.*

F) *Figures given relate to single pass up to 300mm bore achievable with multiple passes.*

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5.18. LANDSCAPING

- 5.18.1. BS 5837:2012 advises that any new tree planting and associated landscaping proposals should consider the ultimate height and spread, form, habit and colour, density of foliage and maintenance implications, in relation to both the built form of the new development, and the retained landscape features.
- 5.18.2. Consideration should also be given to the advice detailed in section 5.4 in respect of distances of newly planted trees in relation to new structures.
- 5.18.3. For all new tree planting, the guidance within BS 8545:2014 'Trees: from nursery to independence in the landscape – Recommendations' should be followed.
- 5.18.4. No details of any proposed landscaping have been provided.

5.19. ISSUES TO BE ADDRESSED BY AN ARBORICULTURAL METHOD STATEMENT

- 5.19.1. The Arboricultural Method Statement (Section 6) details the general methodology for the implementation of those aspects of the proposed development that have the potential to result in damage to the retained trees.

6. ARBORICULTURAL METHOD STATEMENT

6.1. RECOMMENDED TREE WORKS/REMOVALS

6.1.1. Tree works tabled below (Table 5) have been identified as a result of one or more of the following reasons:

- to directly implement the proposal,
- to facilitate the implementation and construction of the proposals,
- to assist in the creation of a balanced and desirable layout juxtaposition and
- in the interests of reasonable arboricultural management.

6.1.2. All tree works should be carried out by qualified and competent Arborists working to BS 3998:2010 'Tree Work – Recommendations'.

Table 5. Summary of Recommended Tree Works

Tree No.	Species	BS5837:2012 Category	Recommended Works
T10	English oak	U	If within proximity to development reduce to standing dead wood poles and retain as habitat to benefit biodiversity.
T7	Beech	C1	Remove - to accommodate the proposed development. Note: W4 and W5 are covered by the TPO 5/2.
T8	English oak	B1	
G5	Mixed species*	C2	
W4		A2	
W5	Mixed species*	B2	
	Mixed species*		
G3	Mixed species*	C2	Partial Removal - to accommodate the proposed development.
G10	Mixed species*	B2	

**Reference Tree Schedule for mixed species within groups and woodlands.*

6.2. SUMMARY OF MITIGATION

- i The table below summaries the mitigation methods required for the site, specific to any trees where their RPA may be subject to impact by the proposed development.
- ii Each specific requirement is detailed further in the subsequent sections of this report.

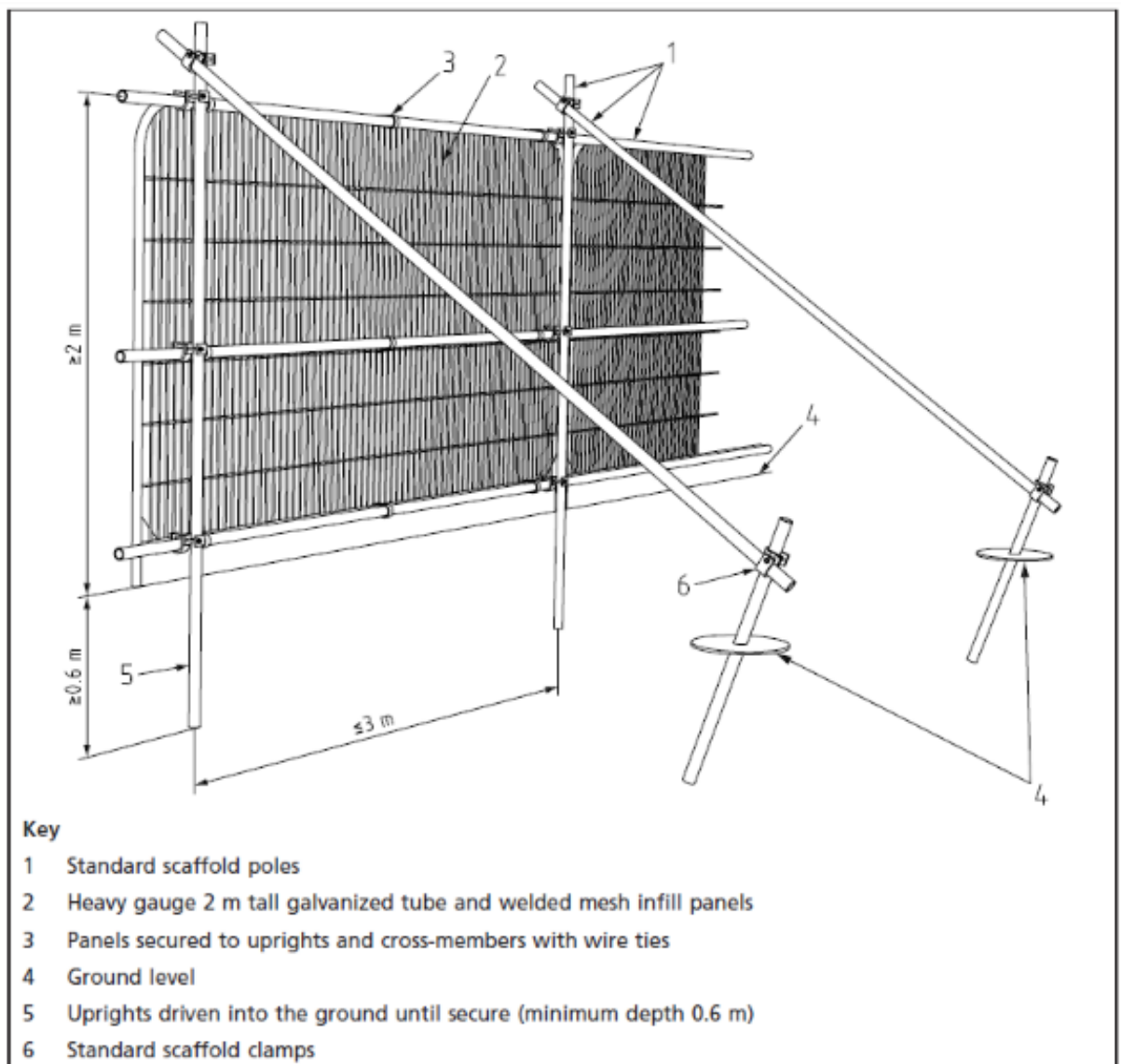
Table 6. Summary of Mitigation Requirements

Tree No.	Species	Works effecting	Mitigation Required
Throughout the site		Retained trees in general proximity to the proposed construction works	Create a construction exclusion zone, by erecting and maintaining temporary tree protection fencing for the duration of the construction works. The tree protection fencing should be installed as detailed on the Tree Protection Plan (Appendix D).

6.3. ERECTION OF PROTECTIVE FENCING

- 6.3.1. It is recommended that temporary protective fencing should be erected in order to create a construction exclusion zone which adequately protects the retained trees from damage during the construction works. This fencing should be erected at the outset of the development works, before any activities (including demolition and ground works) are carried out or materials and plant brought onto site.
- 6.3.2. The recommended position for protective fencing is detailed on the Tree Protection Plan (Appendix D).
- 6.3.3. The fencing should consist of a vertical and horizontal scaffold framework which is well braced to resist impacts as seen below in **Error! Reference source not found..**

Figure 4. Default specification for protective barrier © British Standards Institute

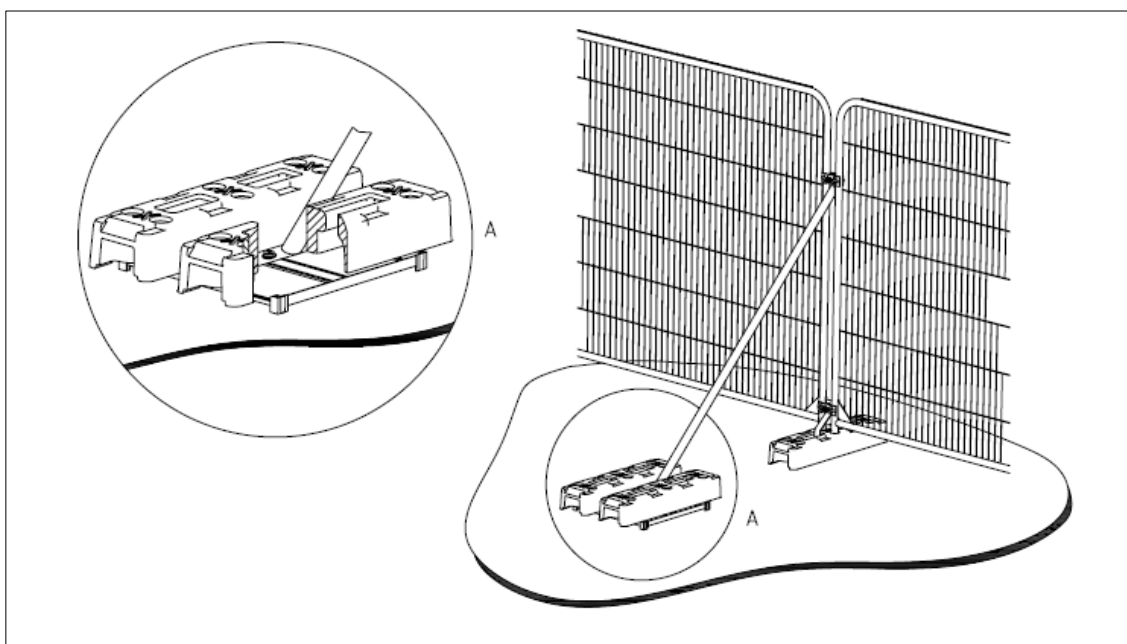


- 6.3.4. All-weather warning notices should be attached to the fencing to clearly identify the area as a tree protection exclusion zone into which access is not permitted
- 6.3.5. Once erected, the protected area should be regarded as sacrosanct and the fencing should not be removed or altered unless recommended by the project Arboriculturist and, where necessary, approval from the local planning authority.
- 6.3.6. Where the site circumstances and associated risk of damaging incursion into the RPAs do not necessitate the default level of protection, an alternative specification may be

considered to be appropriate. For example, 2m tall welded mesh panels on rubber or concrete feet as illustrated in Figure 5.

- 6.3.7. In this instance, it is considered that the associated risks to trees from the proposed development are such that the default specification for temporary protective fencing should be used.

Figure 5. Alternative Specification for Protective Fencing © British Standards Institute



6.4. ADDITIONAL GENERAL PRECAUTIONS OUTSIDE OF THE EXCLUSION ZONE

- 6.4.1. Fires on site should be avoided wherever possible. Where they are unavoidable, they should be kept well away from the exclusion zone, and only lit in positions where heat will not affect foliage or branches. The potential size of a fire and wind direction should be taken into account and it should be attended at all times until safe to leave.
- 6.4.2. Any materials, fuel or chemicals whose accidental spillage would cause damage to a tree should be stored and handled well away from the exclusion zone.

6.5. SITE MONITORING

- 6.5.1. Following consideration of the likely arboricultural impacts to the development, together with the recommended mitigation options, it is not considered that on-site arboricultural monitoring will necessary during the construction works.

6.6. GROUND WORKS, DEMOLITION & CONSTRUCTION WORKS

- 6.6.1. Installation of the recommended protective mitigation measures prior to the commencement of any works, combined with use of temporary ground protection and/or the retention of existing hard surfacing within the RPAs, will allow the ground works to take place whilst minimising any adverse effect or impact on the retained trees.
- 6.6.2. All plant and vehicles engaged in ground works should either operate outside the RPA, or run on temporary ground protection or existing hard standing, where appropriate.
- 6.6.3. During ground works and demolition, the utmost caution should be used to not sever any roots, especially those measuring $\geq 25\text{mm}$ in diameter. Any roots uncovered roots should be wrapped/covered to prevent them from desiccation and rapid temperature changes (any wrapping should be removed prior to backfilling).
- 6.6.4. In the case where plant or wide/tall loads are being used, it must be ensured that all parts of the equipment remain outside of the RPAs, in order that they can operate without coming into contact with any of the on-site or adjacent trees. All works must have appropriate supervision by a banksman, to ensure that adequate clearance from trees is maintained at all times.
- 6.6.5. Access facilitation pruning should not be necessary on this site but if it does become necessary to maintain a safe clearance. All work must be approved by the project Arboriculturist and carried out taken by a qualified and competent Arborist working to BS 3998:2010.
- 6.6.6. If damage occurs to part of a tree during the works, the project Arboriculturist must be contacted without delay.

6.7. SOIL COMPACTION AND REMEDIATION MEASURES

- 6.7.1. Soil that has been compacted will not provide suitable conditions for the survival and growth of vegetation, whether existing or new, and is a common cause of post-construction tree loss on development sites.
- 6.7.2. Compacted soil will adversely affect drainage, gas exchange, nutrient uptake and organic content, and will seriously impede or restrict root growth.
- 6.7.3. Soil compaction should be avoided around existing vegetation, including trees, and in areas where new planting or seeding is proposed.
- 6.7.4. Where soil compaction has occurred near to existing trees, remedial works might include sub-soil aeration using compressed air, and the addition of other materials, preferably of a bulky, organic nature (but excluding peat), to improve structure.
- 6.7.5. Heavy mechanical cultivation such as ploughing or rotavation should not occur within the RPA.
- 6.7.6. Any cultivation operations should be undertaken carefully by hand to minimize damage to the tree, particularly the roots.
- 6.7.7. Decompaction measures include forking, spiking, soil augering and tilled radial trenching. Care should be taken during such operations to minimize the risk of further damage to tree roots.

6.8. CONTRACTORS STORAGE, PARKING & ACCESS

- 6.8.1. Provision should be made for welfare facilities, the site office, contractor parking, storage for materials, plant and spoil and space for mixing outside of the RPAs of retained trees.
- 6.8.2. In this instance, it is considered that there is sufficient space for provision of the above, without placing significant constraints on the working space available for the construction and its associated activities.

6.9. COMPLETION

- 6.9.1. At the completion of the construction works, before removal of any of the tree protection measure at the completion of the project it is recommended that the advice of the project Arboriculturist is sought regarding whether a re-survey of the retained trees is necessary for signs or symptoms of damage and/or stress that the construction may have caused.
- 6.9.2. The protective fencing and ground protection measures should remain in position until its use is considered unnecessary and any risk of damage to the retained trees and/or their respective RPAs e.g. soil compaction from vehicular plant or machinery, has completely passed.

6.10. TREE PLANING & AFTER CARE

- 6.10.1. When planning or implementing any new tree planting scheme, it is recommended that the guidance within BS 8545:2014 'Trees: from nursery to independence in the landscape – Recommendations' is followed.
- 6.10.2. The following points summarise good after care for newly planted trees with an additional consideration to any necessary formative, corrective and maintenance pruning:
- 6.10.3. Water immediately after planting and weekly throughout the first growing season by allowing 10 – 20 litres of water for each tree. This is especially important during prolonged periods of dry weather in which case the frequency of watering may need to be increased.
- 6.10.4. Do not allow weeds or grass to grow within a 500mm radius of the stem.
- 6.10.5. Maintain an organic mulch (e.g. composted woodchip or bark) to a minimum depth of 75mm for a radius of 500mm around the base of new trees.
- 6.10.6. At the end of each growing season, check that tree-ties are not damaging the tree stems and loosen if necessary.

- 6.10.7. Ensure that the tree stakes remain firm while the new planting becomes established and only remove when the tree can support itself, usually after a period of 2 -3 years.
- 6.10.8. Carry out formative pruning to the young trees by removing dead or crossing branches, suckers arising from the roots or weak shoots on the stems.

6.11. CONTACTS

- 6.11.1. Ecology Practice Ltd, 0845 602 3822, enquiries@ecologypractice.co.uk

7. APPENDICES

7.1. APPENDIX A: TREE SCHEDULE

169-03 Omega Zone 8: Tree Schedule

Tree N°	Species	Age Class	Height (m)	Diameter (mm)	Crown Spread (m)				Life Exp	Cat	Condition	General Observations	Works	RPA (m ²)	RPA Radius (m)
					N	E	S	W							
T1	English Oak	M	12	740	7	7	7	7	40+	B1	Fair	Located on the edge of G1 along the eastern aspect of site, multiple competing upper stems, deadwood throughout crown, slight change in ground level around base of main stem.	No works at present (NWR)	249	8.9
T2	English Oak	M	12	956	7	7	7	7	40+	B1	Fair	Located within a waterlogged area on top of a small embankment.	NWR	416	11.5
T3	Common Alder	M	10	600	4	4	4	4	10+	C1	Fair	Located within a waterlogged area on top of a small embankment. suppressed by the surrounding canopy, storm damage within upper crown.	NWR	163	7.2
T4	English Oak	M	8	638	6	6	6	6	40+	C2	Fair	Located adjacent to drainage ditch, twin stemmed from 0.5m, deadwood throughout crown.	NWR	186	7.7
T7	Beech	M	10	600	4	4	6	4	20+	C1	Fair	Located adjacent to drainage ditch, exposed roots, previous pruning in lower canopy, shallow basal cavity, slight dieback in upper canopy.	Annual monitoring .	163	7.2
T8	English Oak	M	12	730	6	6	6	6	40+	B1	Fair	Located adjacent to drainage ditch, good structure and form.	NWR	243	8.8
T9	English Oak	M	10	480	6	5	5	7	40+	B1	Fair	Located adjacent to duck pond, exposed root system.	NWR	106	5.8

Tree N°	Species	Age Class	Height (m)	Diameter (mm)	Crown Spread (m)				Life Exp	Cat	Condition	General Observations	Works	RPA (m²)	RPA Radius (m)
					N	E	S	W							
T10	English Oak	M	10	400	3	3	3	3	<10	U	Dead	Located within middle of pond, standing deadwood.	Retain as habitat.	72	4.8
T11	English Oak	M	10	640	5	5	6	5	40+	B1	Fair	Located adjacent to duck pond, deadwood within upper crown.	NWR	186	7.7
T12	English Oak	M	10	580	5	5	7	5	40+	B1	Fair	Located adjacent to duck pond, deadwood within upper crown.	NWR	154	7
T13	Sycamore	M	6	288	3	3	3	3	10+	C1	Fair	Located adjacent to drainage ditch, multi-stemmed from base.	NWR	38	3.5
T15	Ash	M	6	264	4	4	4	4	10+	C1	Fair	Located adjacent to ditch, multi-stemmed from base.	NWR	32	3.2
T16	Sycamore	M	6	260	3	3	3	3	10+	C1	Fair	Located adjacent to ditch, multi-stemmed from base.	NWR	30	3.1
T17	Crack Willow	M	6	379	3	3	3	3	10+	C1	Fair	Located adjacent to ditch, multi-stemmed from base.	NWR	64	4.5
T18	Sycamore	M	6	249	3	3	3	3	10+	C1	Fair	Located adjacent to ditch, multi-stemmed from base.	NWR	28	3
T19	Sycamore	M	6	248	3	3	3	3	10+	C1	Fair	Located adjacent to ditch, multi-stemmed from base.	NWR	28	3
T20	Sycamore	M	6	120	3	3	3	3	10+	C1	Fair	Located adjacent to ditch, multi-stemmed from base.	NWR	6	1.4
T21	Sycamore	M	6	298	3	3	3	3	10+	C1	Fair	Located adjacent to ditch, multi-stemmed from base.	NWR	41	3.6
T22	English Oak	M	10	438	6	6	5	5	40+	B1	Fair	Located adjacent to woodland (W1), multi-stemmed from base.	NWR	88	5.3

Tree N°	Species	Age Class	Height (m)	Diameter (mm)	Crown Spread (m)				Life Exp	Cat	Condition	General Observations	Works	RPA (m²)	RPA Radius (m)
					N	E	S	W							
T23	English Oak	M	10	495	5	5	6	6	40+	B1	Fair	Located adjacent to woodland (W1), multi-stemmed from base.	NWR	109	5.9
T24	English Oak	M	10	500	6	5	6	6	40+	B1	Fair	Located adjacent to woodland (W1), multi-stemmed from base.	NWR	113	6
T25	English Oak	M	10	671	4	2	4	4	40+	C1	Fair	Located adjacent to drainage ditch, has been previously heavily side pruned.	NWR	206	8.1
T26	English Oak	M	8	400	4	4	4	4	40+	C1	Fair	Located adjacent to drainage ditch on field boundary.	NWR	72	4.8
T27	English Oak	M	8	636	4	4	7	4	40+	B2	Fair	Located adjacent to drainage ditch on field boundary.	NWR	181	7.6
T28	Hawthorn	EM	6	150	2	2	2	2	40+	C2	Fair	located adjacent to drainage ditch on field boundary.	NWR	10	1.8
G1	Hawthorn, English Oak, Ash, Hazel, Common Alder, Rowan, Silver Birch, Field Maple, Wych Elm, Beech, Holly, Blackthorn, Crack Willow	EM	8 (Avg)	300 (Avg)	/	/	/	/	20+	B2	Fair	A mixture of semi/early mature broadleaves with an old hawthorn boundary. Mostly made up of ash with an understorey of hazel.	NWR	/	3.6
G2	Crack Willow, English Oak, Hawthorn	EM	7 (Avg)	200 (Avg)	/	/	/	/	20+	C2	Fair	A linear group located adjacent to drainage ditch.	NWR	/	2.4
G3	English Oak	EM	7 (Avg)	200 (Avg)	/	/	/	/	20+	C2	Fair	Located along the northern boundary edge, with scattered early-mature trees (mostly ash).	NWR	/	2.4
G4	Hawthorn, Common Alder, Hazel, Blackthorn, Silver Birch	EM	7 (Avg)	200 (Avg)	/	/	/	/	20+	C2	Fair	A linear group located adjacent to drainage ditch.	NWR	/	2.4

Tree N°	Species	Age Class	Height (m)	Diameter (mm)	Crown Spread (m)				Life Exp	Cat	Condition	General Observations	Works	RPA (m²)	RPA Radius (m)
					N	E	S	W							
G5	Wych Elm, English Oak, Sycamore, Hazel, Hawthorn, Crack Willow, Beech, Ash, Silver Birch	EM	7 (Avg)	200 (Avg)	/	/	/	/	20+	C2	Fair	Old field boundary, connecting to adjacent woodland (W5), with scattered trees (mostly ash).	NWR	/	2.4
G6	Silver Birch, Hawthorn, Crack Willow, Common Alder, Elder	EM	7 (Avg)	200 (Avg)	/	/	/	/	20+	C2	Fair	Vegetation surrounding a pond located in middle of field.	NWR	/	2.4
G7	Sycamore, English Oak, Goat Willow, Hawthorn, Common Alder, Beech	M	12 (Avg)	500 (Avg)	/	/	/	/	40+	B2	Fair	Established field boundary, connecting to adjacent woodland (W6), with scattered mature oaks.	NWR	/	6
G8	Hawthorn, Crack Willow, Common Alder, Elder, Grey Poplar, Sycamore, English Oak, Horse Chestnut, Wild Cherry, Ash	M	7 (Avg)	400 (Avg)	/	/	/	/	40+	B3	Fair	Linear group forming a field boundary, located adjacent to drainage ditch, some standing dead stems within group.	NWR	/	4.8
G9	Hawthorn, Crack Willow, Common Alder, Elder, Sycamore, English Oak, Ash	M	7 (Avg)	400 (Avg)	/	/	/	/	40+	C2	Fair	Vegetation located along boundary line, connecting to adjacent woodland (W1).	NWR	/	4.8
G10	Hawthorn, English Oak, Ash, Hazel, Common Alder, Rowan, Silver Birch, Field Maple, Wych Elm, Beech, Blackthorn, Crack Willow, Elder, Hornbeam, Horse Chestnut, Holly	EM	8 (Avg)	300 (Avg)	/	/	/	/	20+	B2	Fair	Planted wooded group along eastern boundary, made up of a mixture of species, understorey mainly of hazel.	NWR	/	3.6

Tree N°	Species	Age Class	Height (m)	Diameter (mm)	Crown Spread (m)				Life Exp	Cat	Condition	General Observations	Works	RPA (m²)	RPA Radius (m)
					N	E	S	W							
G11	Hawthorn, English Oak, Ash, Hazel, Rowan, Silver Birch, Field Maple, Wych Elm, Beech, Blackthorn, Crack Willow, Elder, Horse Chestnut, White Poplar, Western Balsam Poplar, Red Oak, Wild Cherry	EM	10 (Avg)	300 (Avg)	/	/	/	/	20+	B2	Fair	Planted wooded group along eastern boundary, made up of a mixture of species, understorey mainly of hazel.	NWR	/	3.6
G12	Common Alder, Hawthorn, Crack Willow, Ash, Elder	EM	7 (Avg)	200 (Avg)	/	/	/	/	20+	C2	Fair	Vegetation surrounding a pond/flooded area, located in middle of field.	NWR	/	2.4
G13	Crack Willow, Hawthorn, Sycamore, English Oak, Elder, Goat Willow, Ash	M	7 (Avg)	200 (Avg)	/	/	/	/	10+	C2	Fair	A linear group forming a field boundary, connecting to adjacent woodland (W1), located adjacent to drainage ditch.	NWR	/	2.4
G14	English Oak, Common Alder, Sycamore	M	8 (Avg)	300 (Avg)	/	/	/	/	20+	C2	Fair	Vegetation surrounding a pond, located along western boundary.	NWR	/	3.6
G15	Ash, Sycamore, Hawthorn, Holly	M	8 (Avg)	300 (Avg)	/	/	/	/	20+	C2	Fair	Scattered trees along drainage ditch, located along southern boundary.	NWR	/	3.6
G16	Ash, Sycamore, Hawthorn, Holly, Goat Willow	M	10 (Avg)	300 (Avg)	/	/	/	/	20+	C2	Fair	A linear group forming a field boundary, connecting two woodland compartments (W3 and W4).	NWR	/	3.6

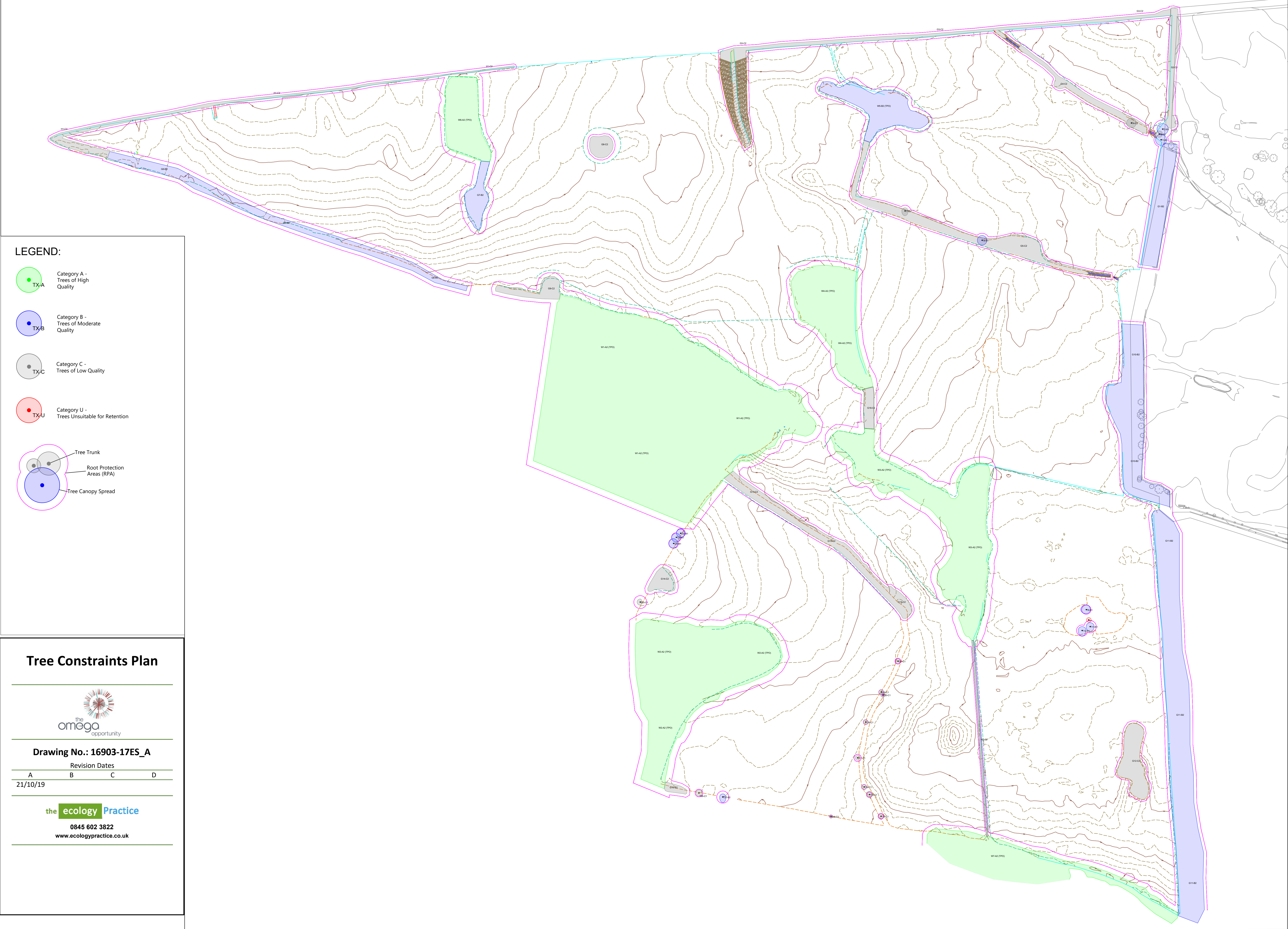
Tree N°	Species	Age Class	Height (m)	Diameter (mm)	Crown Spread (m)				Life Exp	Cat	Condition	General Observations	Works	RPA (m²)	RPA Radius (m)
					N	E	S	W							
W1	Common Alder, Sycamore, Horse Chestnut, Silver Birch, Hawthorn, Ash, Holly, English Oak, Crack Willow, Common Lime, Elder, Western Balsam Poplar, Wild Cherry	M	20 (Avg)	650 (Avg)	/	/	/	/	40+	A2	Fair	TPO 5/2 Woodland 8 - located outside the site redline boundary with dividing water course separating. Predominantly made up of oak with good species diversity, an understory of birch, sycamore and some scattered Rhododendron, standing deadwood along boundary edge.	NWR	/	7.8
W2	Common Alder, Sycamore, Horse Chestnut, Silver Birch, Hawthorn, Holly, English Oak, Common Lime	M	20 (Avg)	650 (Avg)	/	/	/	/	40+	A2	Fair	TPO 5/2 Woodland 5 - predominantly made up of oak with good species diversity, an understory of birch, sycamore and some scattered Rhododendron, standing deadwood along boundary edge, with a pond located to the eastern aspect.	NWR	/	7.8
W3	Sycamore, Hawthorn, English Oak, Common Lime, Western Balsam Poplar, Crack Willow, Horse Chestnut, Common Alder, Ash, Goat Willow, Beech, Hornbeam	M	19 (Avg)	650 (Avg)	/	/	/	/	40+	A2	Fair	TPO 5/2 Woodland 6 - situated between three agricultural fields, predominantly made up of oak and sycamore, some standing dead along boundary edges, large poplar within central area (diameter approx. 1000mm)	NWR	/	7.8

Tree N°	Species	Age Class	Height (m)	Diameter (mm)	Crown Spread (m)				Life Exp	Cat	Condition	General Observations	Works	RPA (m²)	RPA Radius (m)
					N	E	S	W							
W4	Sycamore, Hawthorn, English Oak, Wych Elm, Horse Chestnut, Silver Birch, Rowan	M	19 (Avg)	500 (Avg)	/	/	/	/	20+	A2	Fair	TPO 5/2 Woodland 7 - situated between two agricultural fields, some standing dead along boundary edges, with a pond to northern aspect.	NWR	/	6
W5	Sycamore, Crack Willow, English Oak, Goat Willow, Silver Birch, Common Alder, Hazel	M	16 (Avg)	400 (Avg)	/	/	/	/	20+	B2	Fair	TPO 5/2 Woodland 17 - mostly made up of <i>Acer</i> , some standing dead along boundary edges, with a pond area to southern aspect.	NWR	/	4.8
W6	Sycamore, Crack Willow, English Oak, Goat Willow, Silver Birch, Hawthorn	M	20 (Avg)	500 (Avg)	/	/	/	/	40+	A2	Fair	TPO 5/2 Woodland 16 – mostly made up of oak, with scattered <i>Rhododendron</i> in understory, separating fields.	NWR	/	6
W7	Common Alder, English Oak, Sycamore, Ash, Hawthorn	M	17 (Avg)	500 (Avg)	/	/	/	/	20+	A2	Fair	TPO 5/2 Woodland 4 – extending south beyond the site boundary, predominantly made up of oak, an understory of hawthorn, sycamore, standing deadwood along boundary edge.	NWR	/	6
H1	English Oak, Hawthorn, Sycamore, Ash, Wild Cherry	M	5 (Avg)	200 (Avg)	/	/	/	/	20+	C2	Fair	Boundary hedgerow to M60, with scattered early mature trees to eastern section and western section (both ends of hedgerow).	NWR	/	2.4
H2	Hawthorn, Elder	EM	4 (Avg)	100 (Avg)	/	/	/	/	20+	C2	Fair	Maintained hawthorn hedgerow, dividing field boundary.	NWR	/	1.2


7.2. APPENDIX B: KEY TO SPECIES SCIENTIFIC NAMES

Common Name	Scientific Name
Alder	<i>Alnus glutinosa</i>
Ash	<i>Fraxinus excelsior</i>
Beech	<i>Fagus sylvatica</i>
Blackthorn	<i>Prunus spinosa</i>
Common lime	<i>Tilia X europaea</i>
Crack willow	<i>Salix fragilis</i>
English oak	<i>Quercus robur</i>
Elder	<i>Sambucus nigra</i>
Field maple	<i>Acer campestre</i>
Goat willow	<i>Salix caprea</i>
Grey poplar	<i>Populus canescens</i>
Hawthorn	<i>Crataegus monogyna</i>
Hazel	<i>Corylus avellana</i>
Holly	<i>Ilex aquifolium</i>
Hornbeam	<i>Carpinus betulus</i>
Horse chestnut	<i>Aesculus hippocastanum</i>
Red oak	<i>Quercus rubra</i>
Rowan	<i>Sorbus aucuparia</i>
Silver birch	<i>Betula pendula</i>
Sycamore	<i>Acer pseudoplatanus</i>
Western balsam poplar	<i>Populus trichocarpa</i>
White poplar	<i>Populus alba</i>
Wild cherry	<i>Prunus avium</i>
Wych elm	<i>Ulmus glabra</i>

7.3. APPENDIX C: TREE CONSTRAINTS PLAN

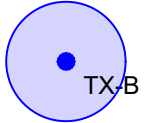


LEGEND:



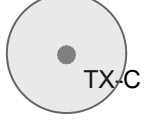
TX-A

Category A -
Trees of High
Quality



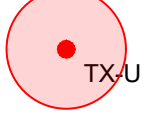
TX-B

Category B -
Trees of Moderate
Quality



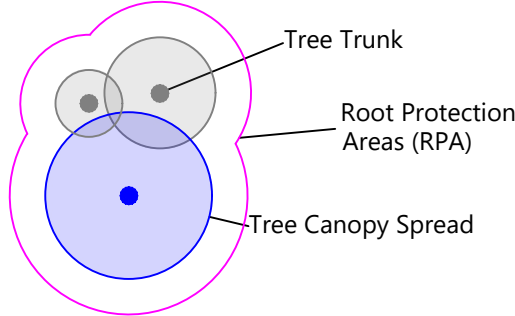
TX-C

Category C -
Trees of Low Quality



TX-U

Category U -
Trees Unsuitable for Retention



Tree Trunk
Root Protection
Areas (RPA)
Tree Canopy Spread

Tree Constraints Plan



Drawing No.: 16903-17ES_A

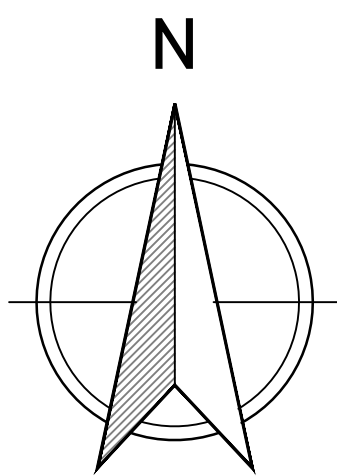
Revision Dates

A	B	C	D
21/10/19			


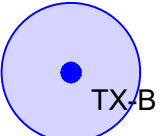


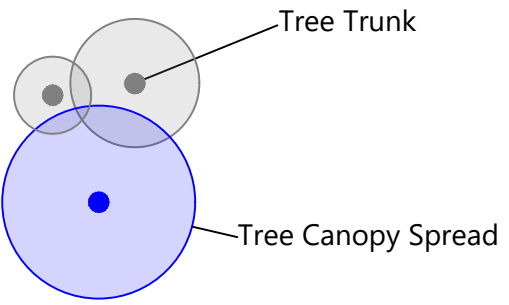

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7.4. APPENDIX D: TREE PROTECTION PLAN



LEGEND:

-  TX-A Category A - Trees of High Quality
-  TX-B Category B - Trees of Moderate Quality
-  TX-C Category C - Trees of Low Quality
-  TX-U Category U - Trees Unsuitable for Retention
-  Tree Trunk
Tree Canopy Spread
-  Tree Protection Fencing

Tree Protective Fencing



Drawing No.: 16903-16ES_A

Revision Dates

A	B	C	D
16/12/19			

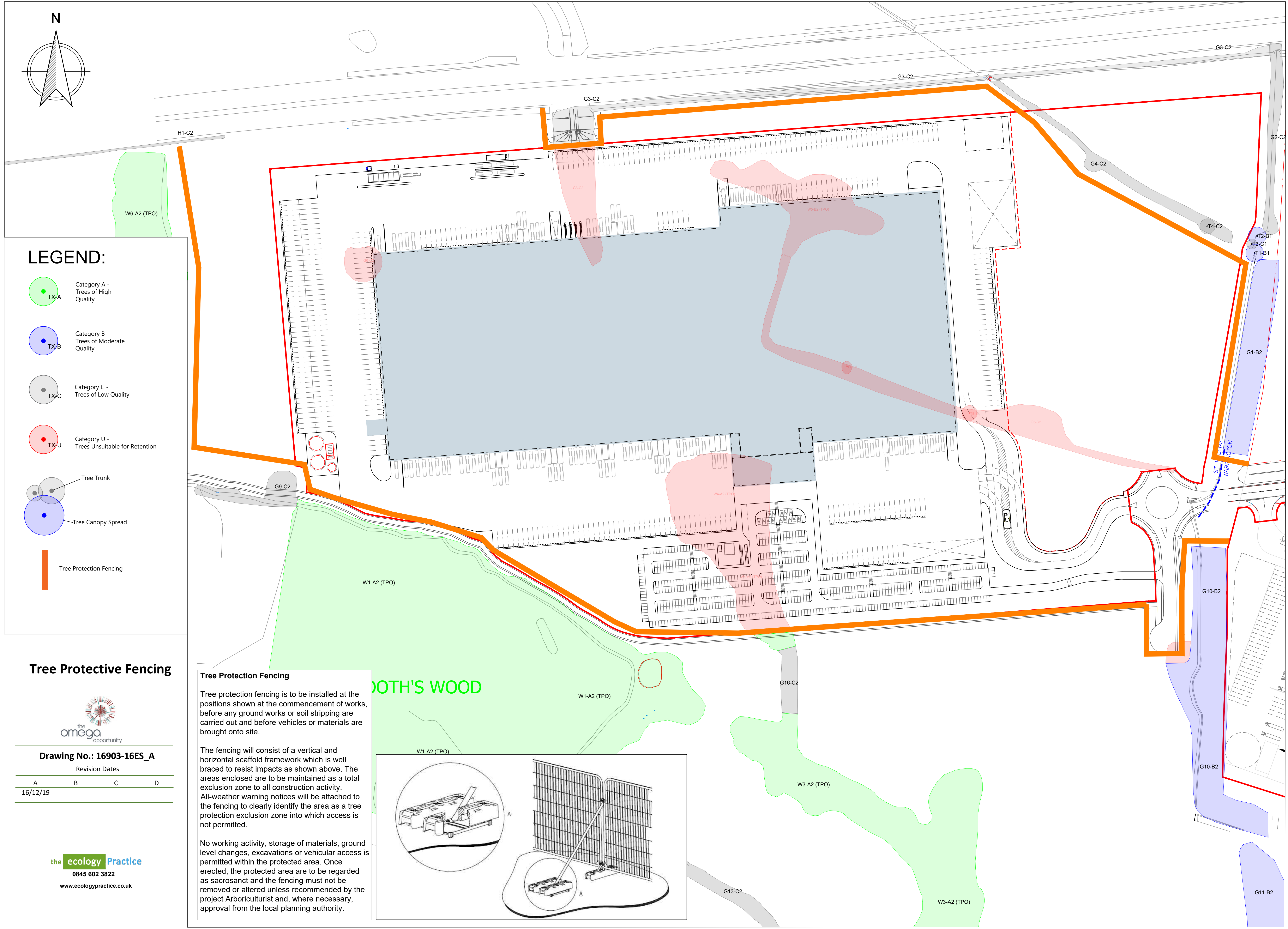
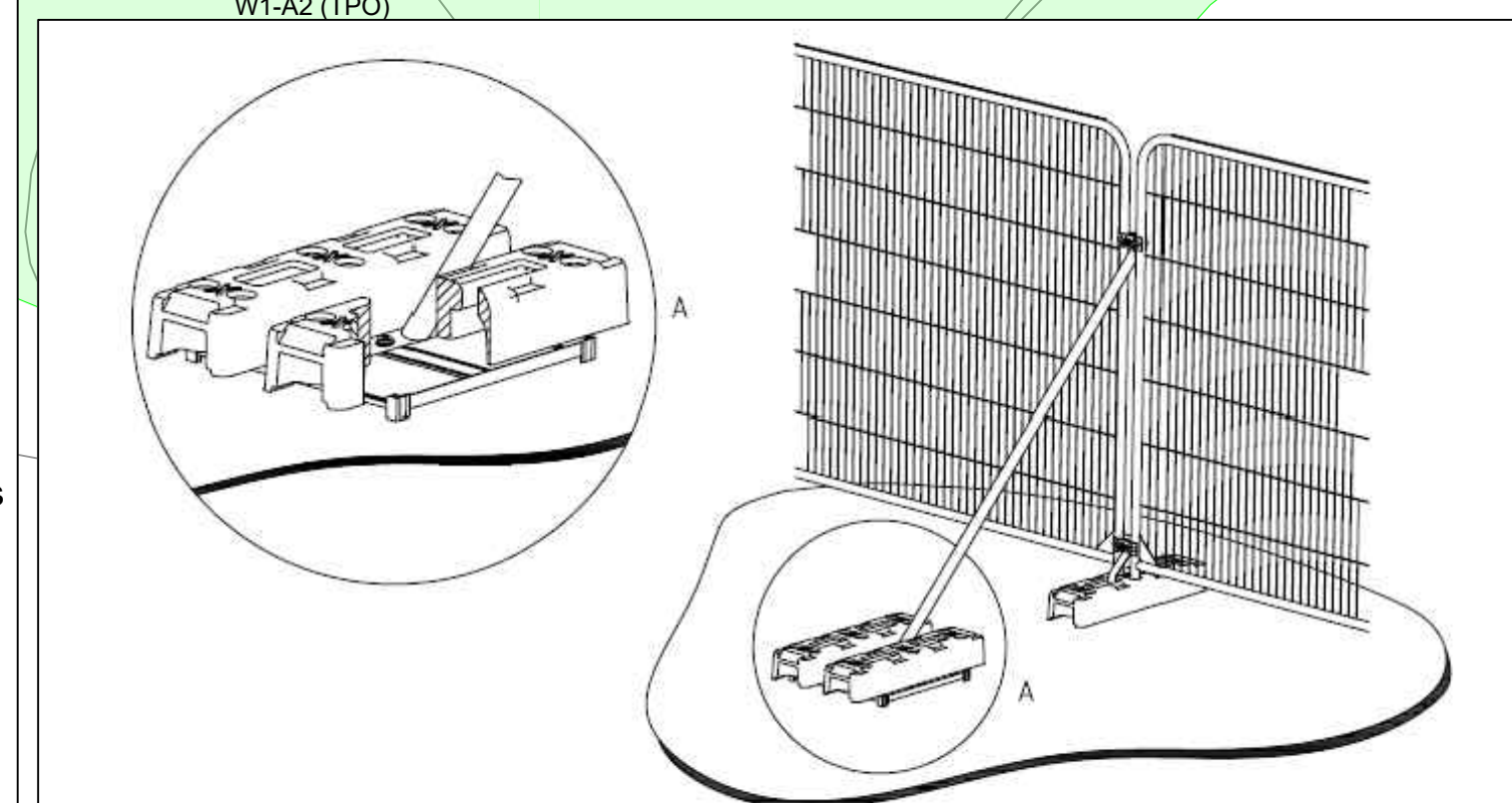
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Tree Protection Fencing

Tree protection fencing is to be installed at the positions shown at the commencement of works, before any ground works or soil stripping are carried out and before vehicles or materials are brought onto site.

The fencing will consist of a vertical and horizontal scaffold framework which is well braced to resist impacts as shown above. The areas enclosed are to be maintained as a total exclusion zone to all construction activity. All-weather warning notices will be attached to the fencing to clearly identify the area as a tree protection exclusion zone into which access is not permitted.

No working activity, storage of materials, ground level changes, excavations or vehicular access is permitted within the protected area. Once erected, the protected area are to be regarded as sacrosanct and the fencing must not be removed or altered unless recommended by the project Arboriculturist and, where necessary, approval from the local planning authority.



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