

## Arboricultural Impact Assessment

**At:** Darton Business Park, Barnsley S75 5QX

**For:** Taylor Appleyard Architects

Date: **24/03/2025**

Reference: **BA24208**

## DOCUMENT CONTROL

|                     |                                                   |             |            |                    |                                  |
|---------------------|---------------------------------------------------|-------------|------------|--------------------|----------------------------------|
| <b>Surveyed by*</b> | Matt Metcalfe                                     |             |            | <b>Report date</b> | 20/03/2025                       |
| <b>Prepared by*</b> | Matt Metcalfe                                     |             |            |                    |                                  |
| <b>Reviewed by*</b> | Trevor Grigg                                      |             |            |                    |                                  |
| <b>Revision</b>     | A                                                 | <b>Date</b> | 24/03/2025 | <b>Notes:</b>      | First Issue                      |
|                     | B                                                 |             | 20/03/2025 |                    | Updated proposal- no Arb changes |
|                     |                                                   |             |            |                    |                                  |
|                     |                                                   |             |            |                    |                                  |
|                     | * Refer to qualifications and experience appendix |             |            |                    |                                  |

## VALIDATION STATEMENT FOR LPA REGISTRATION

This report contains information relating to the proposed building development at Darton Business Park, Barnsley S75 5QX.

For Local Planning Authority (LPA) validation purposes, this report contains the following:

- An **Arboricultural Impact Appraisal** of the proposed development, detailing trees to be retained and the proposed protection measures (Impact Appraisal).
- Appended information on trees and protection methods (Appendices)

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**TABLE OF CONTENTS**

|                                 | Page |
|---------------------------------|------|
| SUMMARY OF TREE INFORMATION     | 5    |
| ARBORICULTURAL IMPACT APPRAISAL | 6    |

**APPENDICES**

QUALIFICATIONS & EXPERIENCE  
TREE CONSTRAINTS  
DESIGN CONSIDERATIONS  
RISKS TO TREES DURING CONSTRUCTION  
TREE PROTECTION  
PLANS  
TREE MANAGEMENT TO ENABLE SCHEME

## SUMMARY OF TREE INFORMATION

**The Proposal.** This arboricultural impact appraisal accompanies the planning application at Darton Business Park, Barnsley S75 5QX as detailed in the extract of the block plan copied opposite.

**Tree Information.** This impact assessment is based upon our Tree Assessment reference BA24208TS, which includes information on the trees condition and minimum protection requirements – attached in APPENDIX – PLANS.

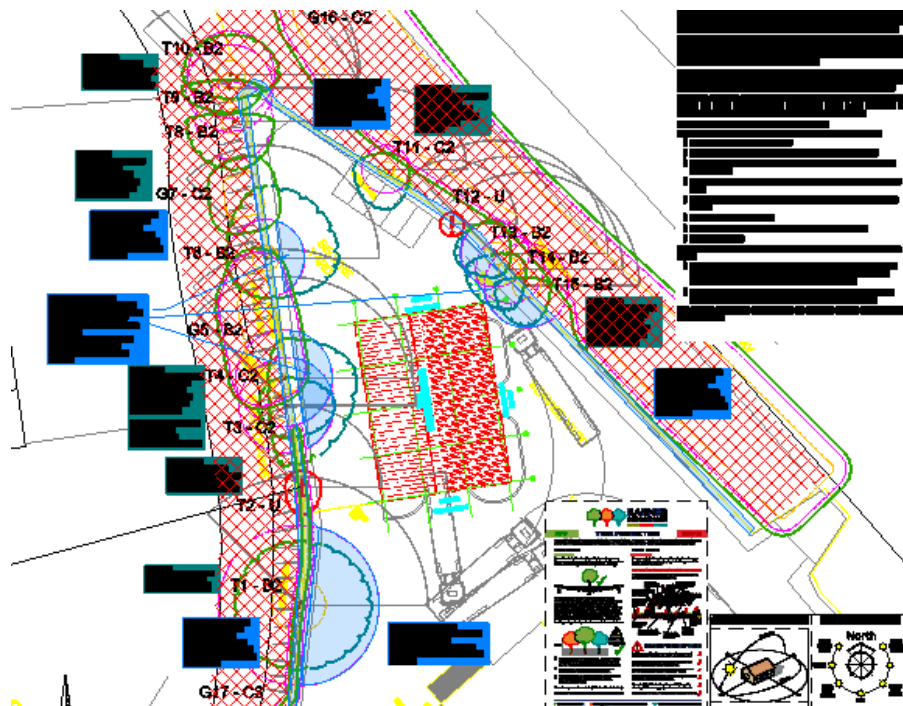
**The Scheme.** Details and shown on the Implication Assessment Plan reference BA24208AIA – in APPENDIX – PLANS.

**General Tree Losses.** The site currently has T2 and T12 which have been categorised as ‘U’ in line with BS5837:2012 and require removal for safety rather than for the benefit of the scheme.

**Tree losses to enable the scheme.**  
No tree losses to enable the scheme.

|                      | A | B | C | U |
|----------------------|---|---|---|---|
| Individual Tree loss | 0 | 0 | 0 | 0 |
| Entire Group loss    | 0 | 0 | 0 | 0 |
| Partial Group loss   | 0 | 0 | 0 | 0 |
| Entire Hedge loss    | 0 | 0 | 0 | 0 |
| Partial Hedge loss   | 0 | 0 | 0 | 0 |

**Tree pruning to enable development:** Tree pruning of retained trees is already required to facilitate the site pre development, however additional pruning is also required and outlined within BA24208\_AIA



**Replacement Trees:** No replacement trees required due to zero losses to enable the scheme.

**Trees Protection:** The scheme does enter the Root Protection Areas of retained trees, where it may be defensible with alternative construction methods and specialist design outlined in BA24208\_AIA.

This assessment considers the potential conflicts with existing trees, along with protection recommendations which are detailed on the Tree Protection Plan reference BA24208TPP – in APPENDIX – PLANS.

General protection can be easily achieved by erecting and maintaining Tree Protection Fencing (TPF) to restrict access close to trees and establishing and maintaining Construction Exclusion Zones.

Ground Protection where changes extend into the Root Protection Area, can be adopted to provide temporary or permanent access.

These protection methods can, if required, be expanded upon within a conditional Arboricultural Method Statement.

Providing appropriate protection is installed the risks to trees can be controlled enabling trees to continue to screen the site to help provide separation between the site, neighbouring properties, and the public realm.

## IMPACT ASSESSMENT

This assessment describes how the proposal will affect trees and any impact this will have on local amenity and character.

**Tree Constraints.** Typically, trees can offer constraints to potential layouts. Ideally, the requirements of the trees and the proposal should be considered at the design stage. A general guide to potential tree constraints is included in APPENDIX – TREE CONSTRAINTS.

**Limiting Damage to Trees.** Care has been taken regarding the retention of large, mature, over-mature or veteran trees which become enclosed within the new development. Achieving successful integration has required careful consideration during the design stages and has considered the constraints offered by trees and follows the general guidelines, included in APPENDIX – DESIGN CONSIDERATIONS.

**General Risks to Trees.** The development process does have the potential to both damage existing trees and compromise tree planting opportunities through the severance of roots or changes to the soil levels, volume, or structure. A general guide to potential tree damage is included in APPENDIX – RISKS TO TREES DURING CONSTRUCTION.

**Protection of Trees.** The potential for conflicts between the proposal can be defended through the adoption of tree protection to help protect the RPA and maintain sufficient space to enable the confident retention of trees. In general, tree protection requires a combination of protective fencing, ground protection, and the adoption of building design, materials, and techniques that can sustain normal growth, further details included in APPENDIX – TREE PROTECTION.

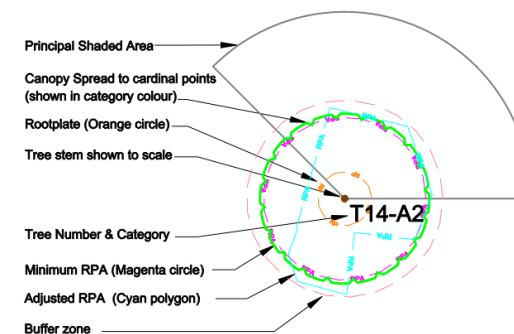
Retained trees need to be considered as part of any site changes and protected from the potentially negative effects of alterations or construction. Where

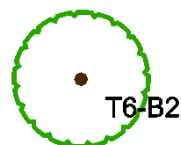
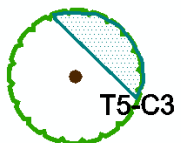
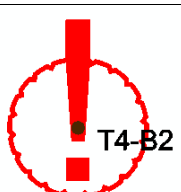
protection is not possible removal and replacement of a tree with a suitable landscaping scheme could offset losses and improve the overall levels of screening and biodiversity.

### Legislative Protection.

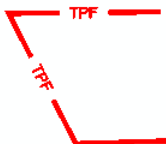
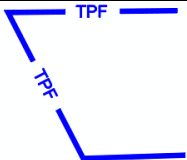
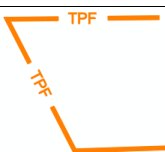
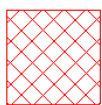
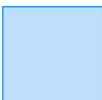
| Type of Check                                                  | Body                                                                                                                                               | Date       | Status         |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|
| Tree Preservation Orders                                       | Barnsley Borough Council                                                                                                                           | 20/03/2025 | Non identified |
| Conservation Area                                              | Barnsley Borough Council                                                                                                                           | 20/03/2025 | Non identified |
| National Park                                                  | Natural England<br><a href="http://tinyurl.com/3n2u3cdd">http://tinyurl.com/3n2u3cdd</a>                                                           | 20/03/2025 | N/A            |
| Listed Buildings                                               | Historic England<br><a href="https://historicengland.org.uk/listing/the-list/">https://historicengland.org.uk/listing/the-list/</a>                | 20/03/2025 | N/A            |
| National Landscapes, Ancient Woodlands/other Woodland Habitats | DEFRA Magic Map<br><a href="https://magic.defra.gov.uk/magicmap.aspx">https://magic.defra.gov.uk/magicmap.aspx</a>                                 | 20/03/2025 | N/A            |
| Ancient Trees                                                  | Woodland Trust Ancient Tree Inventory<br><a href="https://ati.woodlandtrust.org.uk/tree-search/">https://ati.woodlandtrust.org.uk/tree-search/</a> | 20/03/2025 | N/A            |

### Tree Management requirements



| Management                                                                            | Symbol                                                                                |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Retained tree                                                                         |    |
| Tree pruning outlined within marked quadrant.<br>Trees works in line with BS3998:2010 |    |
| Tree to be removed due to condition/location- not scheme related                      |   |
| Tree to be removed to enable the scheme.                                              |  |

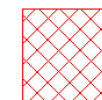
## Tree Protection Measures.

| Protection method                                  | Symbol                                                                              |
|----------------------------------------------------|-------------------------------------------------------------------------------------|
| High Risk Tree Protection Fencing Type 1 (TPF)     |    |
| Moderate Risk Tree Protection Fencing Type 2 (TPF) |    |
| Low Risk Tree Protection Fencing Type 3 (TPF)      |    |
| Construction Exclusion Zones (CEZ)                 |    |
| Tree Precautionary Zone (TPZ)                      |  |
| Stem Protection Box (SPB)                          |  |

**Reducing Risks to Trees.** Potential conflicts between the proposal and the existing trees do exist where site levels and significant material changes extend into the Root Protection Area and protection is not used.

Foreseeable risks to the retained trees can be largely defended through the use of Tree Protective Fencing (TPF) outside the Root Protection Areas indicated by the magenta circle around retained trees, or adjusted cyan area. The location of (TPF) as shown below is included on the Arboricultural Impact Assessment Plan - APPENDIX – PLANS. For this scheme, existing fencing should act as Tree Protection Fencing and replaced in sections.

**Tree Protection Fencing (TPF)** is to be used to define the location of **Construction Exclusion Zones (CEZ)** which are indicated by red net hatching shown opposite and on the Tree Protection Plan BA24208TPP attached as APPENDIX – PLANS.



The final details are to be agreed within an Arboricultural Method Statement, which shall detail access and activity within the **Tree Precautionary Zone (TPZ)**.

Principally, protection of retained trees will avoid excavation and minimise soil level changes and limit access by use of Tree Protection Fencing to limit access and avoid the effects of compaction and works within these areas.

Potential conflicts through the removal of existing hard surfacing shall be controlled using appropriate techniques and ground protection this should be detailed within an arboricultural method statement, to avoid direct damage and compaction and contamination of the soils.

The potential conflicts from traditional 'Cut and Fill' construction can be readily defended through the adoption of lower impact methods as outlined within

BS5837:2012. Techniques and materials, which limit excavation and minimise soil level or compaction changes will need to be adopted within the Tree Precautionary Zone.

The principal protection requirements are shown on the Arboricultural Impact Assessment Plan BA24208AIA attached as APPENDIX – PLANS.

Where hard surfacing is required close to trees, BS5837:2012 and the principles of Arboricultural Practice Note 12, through the Trees to Development, AAIS 2007, [APN 12] regarding “No-Dig” surfacing will be employed, although incorporating improvements to the construction methods.

**Location of Services.** Services may be located within the RPA or close to retained trees, if required they should be located outside the RPA of retained trees. Where there is not an alternative and they need to enter the RPA, they can be readily defended by adopting low impact methods for installation. Ideally, services that are required will be installed away from trees.

Underground services near to trees will need to be installed in accordance with the guidance given in BS5837 together with the National Joint Utilities Group Volume 4 [NJUG4]: 2007. Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees (Issue 2).

**Location of landscape areas within RPA.** Where RPA’s of retained trees enter the proposed landscape areas of the proposal, these areas should always be protected from compaction and level changes.

**Post Development Pressure.** Considering the layout and height of the buildings, some pruning will be required to prevent direct damage only and no other pressures are expected. Leaf litter will not cause additional conflict to the users and would not oblige the council to give consent for inappropriate tree works.

## Conclusion.

Retained trees will need to be considered as part of the site and protected at every stage of the scheme from the potentially negative effects of groundworks and construction.

Foreseeable risks to the retained trees can be readily defended through the creation of Construction Exclusion Zones which will restrict access to the Root Protection Areas.

Where access into these areas is required, protection of the ground can be achieved through the establishment of Tree Precautionary Zones where required. as detailed on the Arboricultural Impact Assessment Plan - APPENDIX – PLANS.

**Matt Metcalfe**

**Lead Surveyor/Consultant/UAS Pilot**

**FdSc Arboriculture**

**Arboricultural Association Professional Member (M.Arbor.A)**

**VALID Tree Risk Validator**

# APPENDICES

## APPENDIX – CONSULTANT BRIEF QUALIFICATIONS AND EXPERIENCE

### **Mr Ian Barnes - Director**

RCArbor.A, F.Arbor.A, C.Hort, CEnv,  
 Arboricultural Association Registered Consultant, Fellow Arboricultural Association, Chartered Horticulturalist, Chartered Environmentalist.  
 Professional member Consulting Arborist Society.  
 BSc (Hons), Arboriculture and Urban Forry, HND Arboriculture, NDH/Arb, Cert Arb L4 (ABC), ISA TRAQ Trained, QTRA Licensed

Ian has been in the Horticulture and Arboricultural industry since 1985. He has experience in commercial horticulture, Local Authority, and Highway Authority tree surveying. He has been a commercial Arboricultural climber for 15 years. He ran in partnership a tree and landscape contracting business for over 15 years. He has been a full time Arboricultural consultant since 2007. His main area of works are trees and development (BS5837) and advanced tree assessments using various advanced techniques. He is a qualified tree risk assessor and experienced in trees and subsidence claims. He is a trainer in the UK for Fakopp equipment, Sonic and Electronic tomography, and Dynaroot and Static Tree pulls. He is also director of a hi-tech arborist/ landscape equipment and training company Tree Diagnostics - providing training to arborists in advanced assessments. He undertakes ground-penetrating radar (Tree Radar) scans.

### **Mrs Sue Barnes- Director**

CMLI, F.Arbor.A, C.Hort, CEnv, MBALI  
 Chartered Landscape Architect, Fellow Arboricultural Association, Chartered Horticulturalist, Chartered Environmentalist, Registered Designer BALI.  
 FdSc Arboriculture, NDH/Arb  
 Affiliate member RIBA,

Sue has been in the Horticulture / Arboricultural industry since 1986. She has experience in amenity parks and gardens and has been a head gardener for Local Health Authority. In partnership she ran a tree contracting and landscape design and build company for 15 years and also has been a tree and landscape consultant full time since 2007. Her main area of works is detailed commercial planting design, specifications (NBS), tree planting specifications and Arboricultural management, Trees on development sites BS5837 reports and plans. Experienced in trees and subsidence and also legal and planning conditions in regard to trees and landscapes. Experienced in large scale landscape design for Housing developers, commercial schemes along with school design primarily detailed planting plans. Specialist landscape surveyor – Poisonous plants / invasives. LVIA Landscape Visual Impact Assessments. Tree and Landscape planning locum consultant for Local authorities. Sue assists in undertaking ground-penetrating radar (Tree Radar) scans along with assisting with other further invigilation works on trees such as tomography scans and assists in dynamic and static tree ts.

### **Mr Matt Metcalfe – Lead Surveyor/Senior Consultant/UAS Pilot**

M.Arbor.A  
 Professional member of the Arboricultural Association,  
 City and Guilds NPTC assessor/ Instructor  
 FdSc Arboriculture, National Diploma in Arboriculture, Level 5 Certificate in Education.  
 VALID tree risk validator  
 GVC Commercial Drone Pilot  
 IOSH Managing Safety in the Workplace

Matt has worked in the Arboricultural Industry since 2000. Firstly, as a climbing arborist in both the public and private sector. In 2009 Matt started teaching Arboriculture at a land-based college in York and became a City and Guilds NPTC assessor. In 2013 he became a course manager and internal verifier for the level 2 work-based learning-apprenticeships where later he became a senior course manager overseeing the management of other arboricultural courses. In 2018 he became a fulltime consulting arborist and provides advanced tree assessment training, undertakes BS5837 tree surveys, Arboricultural safety audits and is a trained tree risk assessor/validator. He undertakes ground-penetrating radar (Tree Radar) scans along with other further assessments on trees such as tomography, dynamic tree ting and static tree pulls. In 2021 he undertook the A2CoC and GVC Drone licences and carries out drone surveys of trees which also includes 2D and 3D mapping of sites. Also, in 2021 mat completed IOSH Managing safety in the workplace. Matt undertakes tree subsidence reporting and TPO objections.

### **Mr Trevor Grigg – Senior Consultant**

Technical member of the Arboricultural Association,  
 Cert Arb L4 (ABC)  
 NC Horticulture (Arboriculture)  
 Lantra Professional Tree Inspector  
 QTRA Licensed

Since 2004, Trevor has been involved in Arboriculture firstly as a climbing arborist, then as an Arboricultural Officer for a local authority. He has gained experience of working with a wide range of clients, from residential tree owners to schools, Parish Councils and Highways departments providing a variety of tasks and reus such as risk assessments, management plans and replanting schemes. Trevor joined Barnes Associates in 2021 and has widened his experience of trees in relation to developments and further invigilations of trees using the specialist equipment available, tomography, tree stability ting and Tree Radar. He has a wide experience in BS5837 Tree surveys and is trained in tree subsidence.

### **Mr John Evans – Arboricultural Consultant**

Technical member of the Arboricultural Association,  
 Forry and Arboriculture Level 3  
 Lantra Professional Tree Inspector

For the past six years, John has been a climbing arborist, firstly working freelance for utility and domic clients, then joining Darlington Borough Council. Whilst working for the council, he continued his professional development and working below and observing Darlington's Tree Officer. John was very excited to move into a role with Barnes Associates and has continued his development and knowledge in BS5837 Tree surveys, Tomography and Tree stability and reporting and tree subsidence.

### **Mr Jim Barnes – Arboricultural Surveyor / Contracts Manager**

Technical member of the Arboricultural Association,  
 Extended Diploma Level 3 in Arboriculture & Forry  
 Level 4 in Arboriculture & Forry Apprenticeship Scheme – Current  
 Lantra Professional Tree Inspector

Jim completed his Level 3 Extended Diploma in 2017 to become a commercial tree climber and tree care assistant as part of a private company. He gained experience of dealing with the lat, most invasive p in Southern England, the Oak Processionary Moth, carrying out aerial decontamination and collection. He performed tree care works for District Councils and Highways, the Environment Agency through to medium to large scale forry clearance and planting schemes. He has also undertaken plant healthcare throughout the country, using the lat modern technology and methods from soil aeration/decompaction works, utilising Air-Spade for root/ground care invigilation, and remedial works to soil and/or roots in sensitive and hard to access locations. He then set up his own tree care company, focusing on proper care and management and carrying out remedial soil/ground works, general Arboricultural and tree surgery; coping with a range of clients and meeting the Local Authorities policies with managing planning applications and necessary aftercare, working to BS:3998:2010 standards. Before this he was involved within the Consulting industry from a young age, assisting with walkthrough tree assessments and further invigilation works such as Tomography and Tree Radar. He is now expanding his education within the consulting industry by furthering his technical knowledge of further invigilations and has experience in BS5837 surveys.

### **Mr Lloyd Barnes – Arboricultural Surveyor**

Technical member of the Arboricultural Association,  
 Extended Diploma Level 3 in Arboriculture & Forry  
 Level 4 in Arboriculture & Forry Apprenticeship Scheme – Current  
 Lantra Professional Tree Inspector

Lloyd completed his Level 3 Extended Diploma in 2020 and then started working for a small private tree surgery firm, carrying out all aspects of tree work from tree management to soil care and everything in between in domic, highway, and forry settings. He has worked for large councils, Environment Agency, Forry Commission, large development sites with large planting schemes and aftercare. He then set up his own tree care business focusing on the care and management of trees, undertaking works to BS3998:2010 standards. He also got into the specialist area of soil/ ground care management for trees. He worked with a wide range of clients throughout the time of running the business, dealing with all sorts of problems that come with running your own business. He has grown up being surrounded by the arboricultural industry. He now undertakes walk-round tree risk assessments and further assessments using sonic and electrical impedance tomography, expanding his knowledge, experience, and education in these areas. He is advancing into BS5837 surveys, working with numerous architects and developers.

## APPENDIX - DESIGN CONSIDERATIONS

Care is needed regarding the retention of large, mature, over-mature or veteran trees which become enclosed within the new development. Where such trees are retained, adequate space should be allowed for their long-term physical retention and future maintenance. However, such retentions are seen as beneficial, helping to contribute to climate change resilience, amongst other benefits of habit and biodiversity. Achieving successful integration of large species trees requires careful consideration at the conceptual and design stages and specialist arboricultural input.

**Design Considerations.** To enable a realistic assessment of the probable impacts of any proposed development on the trees, and vice versa, the characteristics and condition of the trees should be taken into account. To maximize the probability of successful tree retention, the following factors are considered:

- **Shading of Buildings.** This can be a problem, particularly where there are rooms which require natural light.
- **Shading of Open Spaces & Gardens.** Enjoyment of outdoor spaces normally requires direct sunlight for at least for part of the day. However, *shading can be desirable to reduce glare or excessive solar heating, or to provide for comfort during hot weather.*
- **Privacy and screening.** The retention of trees helps to reduce overlooking by neighbours or to mitigate undesirable views, such as busy roads, railway lines or industrial premises.
- **Direct damage.** Below ground, damage to structures can occur because of incremental root and stem growth. In addition, above ground damage can occur to trees and structures by the continuous whipping of branches against the fabric of a building. Therefore, this needs to be considered to avoid the need for frequent remedial pruning or other maintenance.
- **Future pressure for removal.** The relationship of buildings to large trees can cause apprehension to occupiers or users of nearby buildings or spaces, resulting in pressure for the removal of the trees. Buildings and other structures should be sited to allow adequate space for a tree's natural development, with due consideration given to its predicted height and canopy spread.
- **Seasonal nuisance.** Trees are naturally growing and shedding organisms. Leaves of some species can cause problems, particularly in the autumn, by blocking gullies and gutters. Fruit can cause slippery patches or accumulations of honeydew, which can be damaging to surfaces. These aspects should also be considered.

In general, developments close to trees needs to maintain the site, and particularly the soils, close to the current prevailing conditions and avoid significant changes. However, a development is achievable providing the 8 key points listed below can be incorporated into the proposal's design: -

1. **Available Space,** the proposal should consider the available space both now and in the future, and avoid the need to remove large diameter branches and stems whilst providing sufficient space for future growth.
2. **Foundations,** the proposal will need to offer support to the structures with the need for minimal excavation to avoid tree root severance, typically a pile and beam or partial cantilever solution could be considered following the advice of a structural engineer.
3. **The Building,** particularly the underside of the proposal, will need to be above the current soil level to avoid compaction, excavation and ensure continued soil hydration and aeration. Typically, either a timber frame or block and beam can be adopted to achieve this relatively simply.
4. **Ground Protection** needs to be a principal theme running throughout the proposal with the current ground being protected from Excavation, Cultivation or Compaction and should remain wherever possible close to its current condition. This can be significantly simplified through the adoption of timber frame construction avoiding the need for potentially damaging heavy weights and potential noxious material such as concrete blocks, bricks and chemicals such as cements to be used near trees.

5. **Services** for the proposal should be located outside the Root Protection Area to avoid the need for excavation. Where new services are required within the Root Protection Area, these should adopt low impact methods of installation such as moling. Ideally, existing site utilities should be either isolated and retained in situ where they extend into the RPA or recycled or upgraded where this can be done without excavation.
6. **Hard surfacing** will typically be required unless it can be substituted for decking or above ground walkways. Hard surfacing will need to be installed without the need for excavation and should be porous to allow continued soil hydration and aeration. Typically, either a porous paving system or gravel supported by a NO-dig foundation such as Cell-Web can be adopted to achieve this.
7. **Building use**, within the proposal, available light should help inform the building design, layout and its use. Ideally, windows and views should be directed away from trees and toward open areas. In addition, the use of secondary or passive light through light reflecting tubes should be considered to help reduce the negative aspects of large trees.
8. **Building maintenance** will be required, particularly where canopies of trees extend close to or above the roofline, causing maintenance difficulties due to leaf and organic matter build up in the gutters and down pipes. This problem needs to be designed out as far as possible by the addition of filters in the gutters to restrict the access to leaves and small twigs.

The design should take account of the effects of any tree loss required to implement the design, and any potentially damaging activities proposed near retained trees. This might include the removal of existing structures and hard surfacing, the installation of new hard surfacing and the installation of services.

## APPENDIX - RISKS TO TREES DURING CONSTRUCTION

The following operations are all very damaging to trees. I have included a poster that demonstrates these points, and this might be useful for full circulation:

**Compaction of the soil** - Compaction will destroy the soil structure by removing the spaces between soil particles preventing the uptake of oxygen and nutrients. Compaction is caused by storage of materials, including bricks, soil, gravel and cement, and even a single vehicle movement will cause damage. Compacted ground will also affect soil drainage, which may then cause waterlogging.

**Excavations** - any excavations close to the tree are likely to cause root severance. The closer excavations occur to the tree the more severe the damage. Root severance will lead to loss of vigour of the tree, reduce uptake of water and nutrients, allow access for decay organisms, and increase likelihood of wind throw.

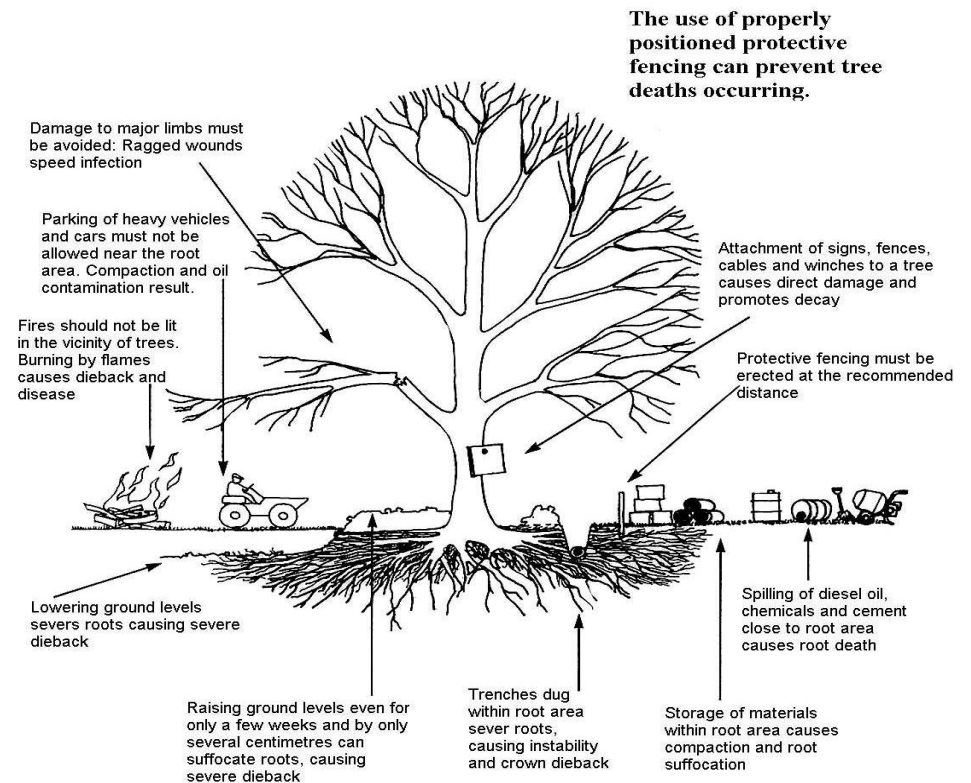
**Ground level changes** - both reduction and raising of soil levels will be detrimental even if this is only by a few centimetres. Reducing ground levels will sever roots and can increase the drainage of a site thereby reducing water availability. Raising ground levels will cause compaction, suffocate roots and damage fibrous roots.

**Impact damage** - this can be caused by machinery - including torn branches and damage to bark and trunks. This will lead to entry for decay organisms and reduced vigour.

**Soil contamination** - this can be caused by spillage of oil, fuel and chemicals, and mixing cement or other materials. Allow for sloping ground - keeping toxic material downhill from trees and aim to store them 10m from the Protected Zone to allow for leaching through the soil.

**Fires** - both the intense heat and direct flame will damage the trees causing loss and damage to both major roots and fibrous roots. Intense heat will damage the trees vascular system under the bark even if the bark does not appear burnt.

### *Common causes of Tree Death*



## APPENDIX - TREE CONSTRAINTS

**Legal constraints.** Trees can be protected by planning legislation in several ways. These include being located within a National Park or on a Site of Special Scientific Interest, located within the grounds of a listed building, conservation area or by being subject to a current Planning condition. In general, the main type of protection for trees adopted by the Local Planning Authority (LPA) on potential development sites is the Tree Preservation Order (TPO).

The protection of trees is a duty of the LPA under the Town and Country Planning Act 1990 and aims to encourage rational discussion and consideration of trees within the design process. The following guidelines are proposed to encourage rational discussion and consideration of trees within the design process. Legislation indicates that protection should be used to protect healthy trees that are likely to have a reasonable safe useful life expectancy. Generally, those classified with a condition rating of (A) Excellent & (B) Good are worthy of a TPO. Those classified (C) Fair are generally poorer and therefore unlikely to qualify for a TPO on grounds of poor appearance, management issues or unlikely to have a sufficient safe life expectancy. Those trees classified (U) are Unsuitable for retention, generally contain structural defects, have a short safe useful life expectancy or are dangerous and therefore would not qualify for a TPO as indicated within the legislation.

The presence of a TPO should be expected upon development sites for the above reasons. It can however only be regarded as a material consideration, as can any other tree or significant natural feature, and cannot be used as a means of preventing development. Any trees protected or otherwise, which are located on or close to the site can be expected to be regarded as a material consideration or offer a design constraint within the development process.

**General Constraints posed by existing trees.** The constraints imposed by trees, both above and below ground should inform the site layout design, although it is recognized that the competing needs of development mean that trees are only one factor requiring consideration.

Certain trees are of such importance and sensitivity as to be major constraints on development or to justify its substantial modification. However, care should be taken to avoid misplaced tree retention; attempts to retain too many or unsuitable trees on a site can result in excessive pressure on the trees during demolition or construction work, or post-completion demands for their removal.

Our tree survey schedule in APPENDIX – BS5837 TREE SCHEDULE & EXPLANATORY NOTES and the tree survey plan in APPENDIX - PLANS includes the relevant constraint information, plotted around each of the categories A, B and C trees and included information on shading and the minimum Root Protection Area (RPA), in addition to a suggested limit for construction.

Typically, development should endeavour to retain category A & B trees and category C trees where they can be either improved and included in low risk areas or help improve biodiversity.

Ideally, structures should be located outside areas of shading and the recommended construction limit (Minimum Root Protection Areas plus an additional 2 metres) of trees to be retained should inform the development. However, in some cases the existing site layout has impacted on the trees, in particular when existing structures or hard surfacing extend or have been installed in the root protection areas. To help understand this I have colour coded the principal Structures, Hard Surfacing, Services, Earthworks and areas of High water content on the tree survey plan in APPENDIX - PLANS

However, where there is an overriding justification for construction within the RPA, technical solutions might be available that prevent damage to the tree(s). If operations within the RPA are proposed additional information can be provided to demonstrate that the tree(s) can remain viable and offer mitigation measures such as but not limited to, improvements to the soil environment that is to be used by the tree for growth.

## APPENDIX - TREE PROTECTION

**Protection of retained trees.** The successful retention of trees depends on the quality of the protection and the administrative procedures to ensure those protective measures remain in place while there is a risk of damage. An effective means of doing this is through an arboricultural method statement that can be specifically referred to in a planning condition. A method statement for this site should ideally be agreed. Implementation of a method statement will allow all the retained trees to survive without any adverse impact and allow them to continue to contribute to local amenity and character.

**Limiting Threats to Trees.** To help reduce the potential impact of site changes BS5837:2012 recommends in Section 3.7 that a **Root Protection Area (RPA)** is included as a layout design tool. This protected area is based upon the Root Protection Area - a point equivalent to 12 times the trunk diameter. This indicates the minimum area around a tree deemed to contain sufficient roots and rooting volume to sustain the tree's viability, though ideally the offset shown as the Construction Limit should be adopted to provide additional space and enable trees to thrive.

**Tree Protection:** where retained trees need to be protected this is most easily achieved by abolishing a **Construction Exclusion Zone (CEZ)** as part of a **Tree Protection Zone (TPZ)** to protect the roots and aerial parts as recommended in BS5837:2012 – further details upon requ. Within this area, retained trees need to be protected from the effects of site changes and in particular excessive root severance, soil level changes or soil compaction.

Appropriate site organisation and management are essential following the adage of '*Prevention is better than Cure*'. Unfortunately, tree damage can easily occur and although it is costly to repair, it comes with few guarantees.

Inside the exclusion area of the fencing, the following actions need to be avoided: -

**No linear mechanical excavation whatsoever.**

**No excavation by any other means without arboricultural site monitoring.**

**No hand digging without a written Method Statement having first been approved in writing by the consulting arboriculturist.**

**No lowering of levels for any purpose (except removal of grass sward by hand).**

**No construction of a sealed hard surface (except where agreed with the arborist)**

**No storage of plant or materials.**

**No storage or handling of any chemical, including cement washings.**

**No vehicular access.**

**No fire lighting.**

In addition to the above, further precautions are necessary adjacent to trees: -

**A 10m separation distance shall be observed between any tree and substances injurious to tree health, including fuel, oil, bitumen, cement (including cement washings), builders' sand, concrete mixing and other chemicals.**

**No fire shall be lit such that flames come within 5m of tree foliage; this shall be taken to mean a fire separation distance of 20m from any tree's canopy.**

**Protective Fencing:** Based on tree survey data, **Root Protection Area (RPA)** have been calculated for the trees identified for retention and included in the tree schedule in Appendix C. The RPA's are designed to protect at least a functional minimum of tree root mass in order to ensure that the trees survive the construction process. Tree protection will need to

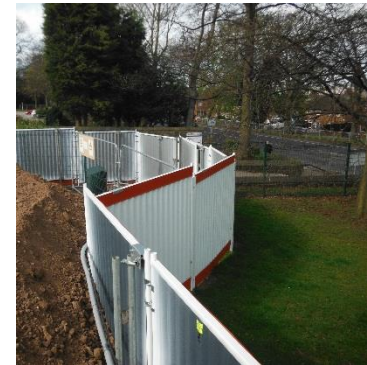
be installed following the initial tree works and before the onset of any demolition or ground works. The RPA should remain in position for the whole of the construction and demolition phase.

Protection fencing is highlighted on the Impact assessment Plan.



#### **Severe Risk Area's - Stem Protection (TST).**

To be protected from impact damage by Boarding or Plywood Boxes constructed clear of the stem. Boxes are to contain compressible material to absorb shock loading. To be located where vehicles may come into direct contact with existing trees.



#### **High Risk - Tree Protection Fencing (TPF1)**

Alternative TPF1 – upon agreement only.

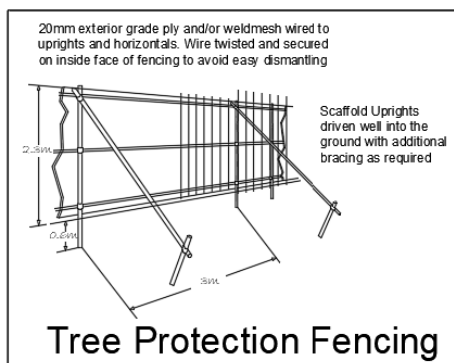
Ideal for where space is limited. Posts are fixed into ground.

#### **High Risk - Tree Protection Fencing (TPF1)**



#### **Protection Fencing (TPF2)**

This is to be erected as a temporary barrier to protect areas designated for later construction or landscaping the Precautionary Zone. This shall consist of Heras type panels mounted onto rubber/concrete 'boots' as shown opposite.



This is to be provided by Braced Heras Fencing or solid panels. Post-holes shall be excavated by powered hand auger or low ground-pressure plant working of ground protection or outside the Precautionary Zone. Alternative more traditional post supports such as the Heras Steadfast system with an additional brace can be used where this can be pinned into position and fitted with an **Anti-Tamper Coupler**.



### **Low Risk - Protection Fencing (TPF3)**

This is to be erected as a visual barrier to protect areas designated for no or later construction. Consisting either stock fencing, post and rail fencing, Chnut Pale fencing or Orange Extruded Plastic Netting.

**Ground Protection (Temporary):** Access across the RPA, if this is required this can be achieved for the duration of the development phase in such a way, which will reduce the potential negative effects of compaction.



### **No Dig-Ground Protection GP1 - Option 1**

**For lower traffic areas, where heavy vehicles are expected, substitute compacted stone infill with a temporary above ground Trackway.** This avoids the need for excavation and limits the weight of material build up and limits compaction when installed with compressible sub-surface.



### **Ground Protection GP2 - Option 1**

**Where** pedrian-operated plant up to a gross weight of 2t are forecasted, proprietary, interlinked ground protection boards are available, such as **DuraDeck** or **Ground Guard**. These can limit compaction when installed with compressible sub-surface.



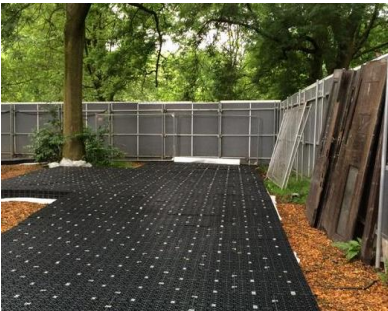
### **Ground Protection GP2 - Option 2**

For more permanent small plant and pedrian movements ground protection in the form of a single thickness of scaffold boarding supported by scaffold, as opposite, can be adopted to bridge areas and avoid compaction.



### **No Dig-Ground Protection GP1 - Option 2**

For high use areas or where heavy vehicles are expected, substitute traditional dig out and compacted stone infill with an above ground **Cellweb or similar**, to avoid the need for excavation and limit compaction – may be retained as a porous sub base for hard Surfacing within the scheme.



### **No Dig-Ground Protection GP1 - Option 3**

Void forming system such as **Permavoid** or **ArborRaft** act as a protection to the tree roots and avoid the need for excavation. These systems also limit the weight of material build up and can be installed with compressible sub-surface. – may be retained as a porous subbase for hard surfacing within the scheme.



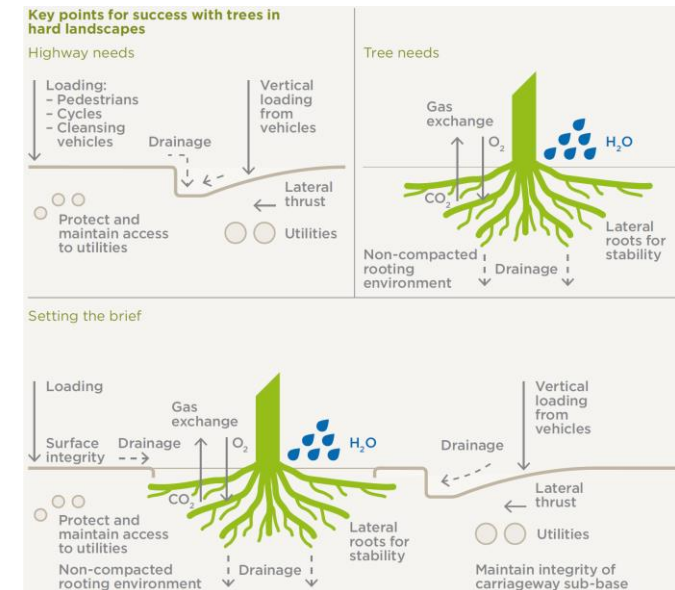
### **Ground Protection GP3**

For Pedrian movements ground protection in the form of a single thickness of scaffold boards or plywood on top of a compressible layer (Woodchip) laid onto a geotextile, or supported can be used to form the access or provide a sub base to other ground protection.

**Ground Protection (Permanent):** The creation of Hard Surfacing within or close to trees offers a risk to trees through compaction, excavation, soil level changes or contamination and these need to be avoided or appropriately defended as indicated opposite, so that underlying soils can continue to allow the ingress of water and exchange of gas between the soil and the atmosphere. Protective measures can be adopted successfully to help retain trees and this information should be agreed within Arboricultural Method Statement.

To counter risks, all hard surfacing shall be above the existing ground within the Root Protection Area using a porous sub-base or by bridging to support f a permanent porous surface/wearing course. This will maintain continued gaseous exchange and water ingress as outlined in the opposite brief copied from Tree in the Hard Landscape (TDAG).

On the majority of sites, **substituting traditional compacted stone infill with ArborRaft or Cellweb as described above will provide appropriate protection. Alternatives may include grates, a suspended pavement or road by installing pre-cast elements avoiding largescale excavation and limiting the weight of material build up. Alternatively, a cast concrete slab or above ground concrete deck supported by piles can be adopted for sites with difficult access, soils or strata as shown in the examples below.**



**Construction within the Root Protection Area:** The creation of structures within or close to trees offers a risk to trees through compaction, excavation, soil level changes or contamination and again these need to be avoided or appropriately defended so that underlying soils can continue to allow the ingress of water and exchange of gas between the

soil and the atmosphere. Protective measures can be adopted successfully to help retain trees and this information should be agreed within Arboricultural Method Statement. The work is in line with best practice guidance detailed in section 7.5.2 and 7.5.5 of **BS5837:2012 Trees in relation to design, demolition and construction – Recommendations**, that states:

**Section 7.5.2 recommends Root damage can be minimized by using:**

- piles, with site investigation used to determine their optimal location whilst avoiding damage to roots important for the stability of the tree, by means of hand tools or compressed air soil displacement, to a minimum depth of 600 mm.
- beams laid at or above ground level, and cantilevered as necessary to avoid tree roots identified by site investigation.

**In section 7.5.5 the standard states** - Where piling is to be installed near to trees, the small practical pile diameter should be used, as this reduces the possibility of striking major tree roots, and reduces the size of the rig required to sink the piles. If a piling mat is required, this should conform to the parameters for temporary ground protection given in **6.2.3**. Use of the small practical piling rig is also important where piling within the branch spread is proposed, as this can reduce the need for access facilitation pruning. The pile type should be selected bearing in mind the need to protect the soil and adjacent roots from the potentially toxic effects of uncured concrete, e.g. Sleeved bored pile or screw pile.

**Example 1 -Screw Piles.** Using the hydraulic rotation motor, the screw pile can be installed from outside the outside the Root protection area. Usually, heavy buildings that need several piles to be installed use this method of installation before being joined by a beam.



**Example 2 – Thrust or Bored Piles.** Small plant piles can be installed within Root protection area. To enable heavy buildings to be supported several smaller piles can be connected to form a pile cap providing improved support as shown below.



## APPENDIX – PLANS

# Tree Impact Appraisal Plan – BA24208AIA (A1 Plan Attached)

## TREE MANAGEMENT REQUIRED TO ENABLE SCHEME: REFER TO BA24208AIA

|                  | Tag No. | Name         | Age | Height (m) | Height (m) | North (m) | South (m) | East (m) | W (m) | Condition | Life Exp (Yrs) | BS5837 Category | Diameter (mm)                   | Stem No. | Tree Works to enable the scheme                                                                                                     | Arboricultural Impact and Protection Measures.                                                                                                                   | Risk          | Rootplate (m) | Root Protection Radius (m) | Root Protection Area (m²) |
|------------------|---------|--------------|-----|------------|------------|-----------|-----------|----------|-------|-----------|----------------|-----------------|---------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|----------------------------|---------------------------|
| Pos, DBH, Spread | T1      | Sycamore     | M   | 16         | 1.5        | 8         | 9         | 8        | 8     | Good      | 20 or more     | B2              | 350<br>350<br>350<br>400<br>400 | 5        | Crown Lift to 5m above the highway to facilitate heavy goods vehicle clearance in line with BS3998:2010 limiting wound size to 50mm | RPA Infringement of surfacing estimated at 41%.<br><br>Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone. | Insignificant | 3.32          | 9.95                       | 311.07                    |
| Pos, DBH, Spread | T2      | Common Alder | E M | 10         | 2.5        | 2         | 2.5       | 3.5      | 2     | Dead      | 1 or less      | U               | 250                             | 1        | Remove due to safety                                                                                                                | Loss of a poor tree.                                                                                                                                             | Moderate      | 1             | 3                          | 28.28                     |
| Pos, DBH, Spread | T3      | Common Ash   | M   | 16         | 5          | 3.5       | 6         | 4        | 3.5   | Fair      | 10 or less     | C2              | 150<br>250<br>400               | 3        | Crown Lift to 5m above the highway to facilitate heavy goods vehicle clearance in line with BS3998:2010 limiting wound size to 50mm | RPA Infringement of surfacing estimated at 29%.<br><br>Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone. | Minimal       | 1.98          | 5.94                       | 110.86                    |

|                         | Tag No. | Name                          | Age | Height (m) | Height (m) | North (m) | South (m) | East (m) | W (m) | Condition | Life Exp (Yrs) | BS5837 Category | Diameter (mm) | Stem No. | Tree Works to enable the scheme                                                                                                                                                                                | Arboricultural Impact and Protection Measures.                                                                                                                   | Risk          | Rootplate (m) | Root Protection Radius (m) | Root Protection Area (m <sup>2</sup> ) |
|-------------------------|---------|-------------------------------|-----|------------|------------|-----------|-----------|----------|-------|-----------|----------------|-----------------|---------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|----------------------------|----------------------------------------|
| Pos, DBH, Spread        | T4      | Common Ash                    | M   | 16         | 5          | 5         | 9         | 11       | 2     | Fair      | 10 or less     | C2              | 500           | 1        | Crown Lift to 5m above the highway to facilitate heavy goods vehicle clearance in line with BS3998:2010 limiting wound size to 50mm<br><br>Lateral reduction away from structure to facilitate 2.5m clearance. | RPA Infringement of surfacing estimated at 32%.<br><br>Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone. | Minimal       | 2             | 6                          | 113.11                                 |
| Pos, Group Numbers, DBH | G5      | Sycamore, Common Ash          | E M | 12         | 1.5        | 4         | 4         | 4        | 4     | Good      | 20 or more     | B2              | 300           | 1        | Pruning as required to install security fence.                                                                                                                                                                 | Infringement from fence. Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone.                               | Minimal       | 1.2           | 3.6                        | 40.72                                  |
| Pos, DBH, Spread        | T6      | Pedunculate Oak               | E M | 14         | 1.5        | 9         | 9         | 5        | 5     | Good      | 20 or more     | B2              | 400           | 1        | Crown Lift to 5m above the highway to facilitate heavy goods vehicle clearance in line with BS3998:2010 limiting wound size to 50mm                                                                            | RPA Infringement of surfacing estimated at 26%.<br><br>Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone. | Minimal       | 1.6           | 4.8                        | 72.39                                  |
| Pos, Spread, DBH, Group | G7      | Common Alder, Common Hawthorn | E M | 14         | 2          | 3         | 3         | 3        | 3     | Fair      | 10 or more     | C2              | 250           | 1        | Pruning as required to install security fence.                                                                                                                                                                 | Infringement from fence. Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone.                               | Insignificant | 1             | 3                          | 28.28                                  |

|                  | Tag No. | Name        | Age | Height (m) | Height (m) | North (m) | South (m) | East (m) | W (m) | Condition | Life Exp (Yrs) | BS5837 Category | Diameter (mm) | Stem No. | Tree Works to enable the scheme                                                                                         | Arboricultural Impact and Protection Measures.                                                                                                                   | Risk          | Rootplate (m) | Root Protection Radius (m) | Root Protection Area (m <sup>2</sup> ) |
|------------------|---------|-------------|-----|------------|------------|-----------|-----------|----------|-------|-----------|----------------|-----------------|---------------|----------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|----------------------------|----------------------------------------|
| Pos, DBH, Spread | T8      | Sycamore    | E M | 16         | 2          | 1         | 5         | 6        | 6     | Good      | 20 or more     | B2              | 400           | 1        | None                                                                                                                    | Infringement from fence. Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone                                | Minimal       | 1.6           | 4.8                        | 72.39                                  |
| Pos, DBH, Spread | T9      | Sycamore    | E M | 16         | 2          | 1         | 4         | 3        | 6     | Good      | 20 or more     | B2              | 450           | 1        | None                                                                                                                    | Infringement from fence. Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone                                | Minimal       | 1.8           | 5.4                        | 91.62                                  |
| Pos, DBH, Spread | T10     | Sycamore    | E M | 16         | 2          | 5         | 6         | 3        | 6     | Good      | 20 or more     | B2              | 450           | 1        | None                                                                                                                    | Infringement from fence. Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone                                | Minimal       | 1.8           | 5.4                        | 91.62                                  |
| Pos, DBH, Spread | T11     | Goat Willow | E M | 10         | 1.8        | 2         | 3         | 5        | 4     | Fair      | 10 or more     | C2              | 250           | 1        | Crown Lift to 5m above the highway to facilitate vehicle clearance in line with BS3998:2010 limiting wound size to 50mm | RPA Infringement of surfacing estimated at 22%.<br><br>Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone. | Insignificant | 1             | 3                          | 28.28                                  |
| Pos              | T12     | Common Ash  | S M | 8          | 2          | 1.5       | 1.5       | 1.5      | 1.5   | Poor      | 10 or less     | U               | 100           | 1        | Remove due to safety                                                                                                    | Loss of a poor tree.                                                                                                                                             | Minimal       | 0.4           | 1.2                        | 4.52                                   |

|     | Tag No. | Name     | Age    | Height (m) | Height (m) | North (m) | South (m) | East (m) | W (m) | Condition | Life Exp (Yrs) | BS5837 Category | Diameter (mm)     | Stem No. | Tree Works to enable the scheme                                                                                         | Arboricultural Impact and Protection Measures.                                                                                                                   | Risk    | Rootplate (m) | Root Protection Radius (m) | Root Protection Area (m <sup>2</sup> ) |
|-----|---------|----------|--------|------------|------------|-----------|-----------|----------|-------|-----------|----------------|-----------------|-------------------|----------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------|----------------------------|----------------------------------------|
| DBH | T13     | Sycamore | E<br>M | 14         | 1          | 4         | 2         | 3        | 5     | Good      | 20 or more     | B2              | 350               | 1        | Crown Lift to 5m above the highway to facilitate vehicle clearance in line with BS3998:2010 limiting wound size to 50mm | RPA Infringement of surfacing estimated at 33%.<br><br>Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone. | Minimal | 1.4           | 4.2                        | 55.42                                  |
| DBH | T14     | Sycamore | E<br>M | 14         | 1          | 2         | 2         | 5        | 5.5   | Good      | 20 or more     | B2              | 350               | 1        | Crown Lift to 5m above the highway to facilitate vehicle clearance in line with BS3998:2010 limiting wound size to 50mm | RPA Infringement of surfacing estimated at 36%.<br><br>Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone. | Minimal | 1.4           | 4.2                        | 55.42                                  |
| DBH | T15     | Sycamore | E<br>M | 14         | 1          | 1         | 3         | 5        | 4     | Good      | 20 or more     | B2              | 300<br>300<br>100 | 3        | Crown Lift to 5m above the highway to facilitate vehicle clearance in line with BS3998:2010 limiting wound size to 50mm | RPA Infringement of surfacing estimated at 37%.<br><br>Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone. | Minimal | 1.74          | 5.23                       | 85.94                                  |

|                  | Tag No. | Name                                                      | Age | Height (m) | Height (m) | North (m) | South (m) | East (m) | W (m) | Condition | Life Exp (Yrs) | B55837 Category | Diameter (mm) | Stem No. | Tree Works to enable the scheme                | Arboricultural Impact and Protection Measures.                                                                                     | Risk          | Rootplate (m) | Root Protection Radius (m) | Root Protection Area (m <sup>2</sup> ) |
|------------------|---------|-----------------------------------------------------------|-----|------------|------------|-----------|-----------|----------|-------|-----------|----------------|-----------------|---------------|----------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|---------------|---------------|----------------------------|----------------------------------------|
| Pos, DBH, Spread | G16     | Sycamore, Common Hawthorn, Common Ash, Goat Willow, Elder | E M | 12         | 0          | 3         | 3         | 3        | 3     | Fair      | 10 or more     | C2              | 200           | 1        | Pruning as required to install security fence. | Infringement from fence. Tree Precautionary Zone Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone. | Insignificant | 0.8           | 2.4                        | 18.1                                   |
| Pos, DBH         | G17     | Sycamore, Common Hawthorn, Elder                          | S M | 5          | 0          | 0.5       | 0.5       | 0.5      | 0.5   | Fair      | 10 or more     | C3              | 75            | 1        | None                                           | Existing fence to be used as Tree Protection Fencing Construction Exclusion Zone.                                                  | Minimal       | 0.3           | 0.9                        | 2.55                                   |



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## TREE SURVEYS

Health & Safety Surveys  
Risk Assessments  
Homebuyer (Mortgage and Insurance)  
Veteran & Venerable Trees  
Legal & Law (TPO & Valuations)

## ADVANCED ASSESSMENTS

Decay & Defect Scans  
Tree Stability Checks  
Tree & Plant Health Care  
Root Detection & Mapping  
Aerial Inspections

## PLANNING & DEVELOPMENT

BS5837 Tree Surveys  
Impact Assessments  
Method Statements  
Planning Conditions  
CAD Plans (2D & 3D)

## LANDSCAPE ARCHITECTURE

Commercial Landscape Design  
LVIA (Landscape Visual Impact Assessments)  
Landscape Management  
Garden Design  
Green Infrastructure

