BS 5837 Arboricultural Report

Impact Assessment & Method Statement

at
3a Upper Park Road
London
NW3 2UN

Dated
7th October 2024

CROWN
Tree Consultancy
Branching out through England and Wales

Contents

1. Introduction

1.1. Instruction

1.1.1. We are instructed by Studio MCW to:

- Undertake a Tree Survey to BS 5837 at 3a Upper Park Road and assess all trees potentially within influencing distance of proposed development within the site.
- Plot the trees on a Tree Constraints Plan and record the data in a Tree Data Schedule.
- Provide an overview of the site and any management recommendations.
- Assess the potential impact of the development proposals and provide guidance as to appropriate mitigation measures.
- Produce an Arboricultural Impact Assessment for submission to the local authority.
- Produce a Tree Protection Plan and Arboricultural Method Statement specifying how the retained trees will be protected from accidental damage by demolition or construction activity.

1.2. Purpose of this Report

1.2.1. This report is produced according to the guidance and recommendations within *BS 5837: 2012 - Trees in Relation to Design, Demolition, and Construction.* It is tailored to accompany a planning application. It assesses the impact of all proposed construction works on the tree population. Tree removal, canopy pruning, and the impact upon roots from various groundworks are all considered in detail. Best practice mitigation is specified wherever appropriate.

1.2.2. The accompanying Arboricultural Method Statement specifies how the trees shall be protected from accidental damage by demolition and construction activities. It is designed to be enforceable and may be conditioned upon the granting of planning permission.

1.2.3. This document should not be used to inform management decisions relating to liability or risk management. Such decisions should be based on a more detailed inspection of the trees than was carried out for this report.

1.3. References

1.3.1. We have liaised with the project architect and studied topographical surveys to attain an adequate understanding of the project to enable us to carry out an accurate assessment of the proposals and to specify suitable tree protection measures.

1.4. Survey Details

1.4.1. A visual ground-level assessment of all trees was undertaken on the 7th February 2024 by Carl Lothian. No climbed inspections or specialist decay detection were undertaken. Details of how the survey was undertaken can be found in Appendix 1.

1.4.2. The tree locations shown on the accompanying drawings are based on a measured drawing of the site supplied to Crown Tree Consultancy. This drawing had the tree positions already plotted. Where applicable, additional trees have been plotted by us according to measurements taken on-site.

1.5. Author

1.5.1. This report was compiled by Emma Hoyle FDSc (Arboriculture), ED (Forestry & Arboriculture), M. Arbor. A. Details of the author's experience that qualify her to produce such a report are detailed in Appendix 4.

2. Site Overview

2.1. Brief Site Description

2.1.1. Number 3a Upper Park Road is a residential property with gardens to the front and rear.

2.1.2. The front garden is occupied by a driveway and planting beds. A mature Retention Category B London Plane (T1) and two Retention Category C Limes (T2 and T3) grow at the front of the property; these trees are situated on third party land.

2.1.3. The rear garden is accessed via a path leading down the side of the dwelling. The rear garden is predominantly occupied by artificial grass. A mature Horse Chestnut (T4) and a Retention Category C Pear tree (T5) grow adjacent the rear boundary in an area of soft, raised ground.

2.1.4. In an adjacent garden to the rear of the property is a Retention Category C Bay tree (T6).

2.1.5. The Tree Constraints Plan and Tree Data Schedule (see Appendix 6) should be referred to for descriptions and locations of all trees.

2.2. Coordinates

2.2.1. The site coordinates are 0° 9'40.13"W / 51°32'58.69"N, and the altitude is approximately 62m above sea level[1].

2.3. Survey Extent

2.3.1. The area indicated below[2] shows the extent of our survey.

[1] To access satellite imagery and street views of the site these co-ordinates may be entered into: http://maps.google.co.uk/

[2] Image taken from Google Earth and may not be current

3. Vegetation Overview (independent of proposals)

This section summarises all the recommendations within the Tree Data Schedule regardless of whether trees are to be retained, felled or pruned to facilitate the proposed development. It does not specify works that may be required to facilitate the development proposals.

3.1. Preliminary Management Recommendations

3.1.1. The following recommendations are made in order to maintain the trees in an acceptable condition:

3.1.2. No significant defects were observed to T4; however, the adjacent retaining wall has collapsed and has consequently left its roots exposed.

3.1.3. T5 has significant bark wounds to its stem, although it is considered to be in an acceptable condition at present. It is recommended the condition of this tree be monitored.

3.1.4. All other trees were deemed to be in satisfactory condition.

3.2. Work Priority and Future Inspections

3.2.1. The table below suggests a schedule for completing the works recommended in the Tree Data Schedule based on the perceived risk:

Work Priority	Definition	Tree Number
Urgent	As soon as possible	None
Very High	Within 1 Month	None
High	Within 3 Months	None
Moderate	Within 1 year	T5
Low	Within 3 years	None

3.2.2. The table below suggests a schedule of future inspections based on the condition and location of each tree:

Inspection Frequency (years)	Tree Number
0.5	None
1	T1, T2, T3 and T4
1.5	T5
3	T6

3.2.3. The trees should be inspected sooner if there is a noticeable decline in their condition or following extreme weather events.

3.3. Statutory Protection

3.3.1. We are not instructed to determine whether the trees are protected by a tree preservation order or grow within a conservation area.

3.3.2. Before undertaking most works on trees protected by a tree preservation order, consent needs to be formally obtained from the local authority. Where trees are in a conservation area (but not protected by a TPO), works are generally not permitted without first giving the local authority six weeks' notice of intention. Unauthorised works to protected trees, or trees in a conservation area, may result in criminal prosecution and a fine. Where works are required to implement a fully approved development, no such consent or notice is required.

3.4. Species Present – Additional Information

3.4.1. The table below contains general information about the tree *species* (rather than the actual tree *specimens*) included in the survey. Its purpose is to assist readers who are unfamiliar with the characteristics of the various species.

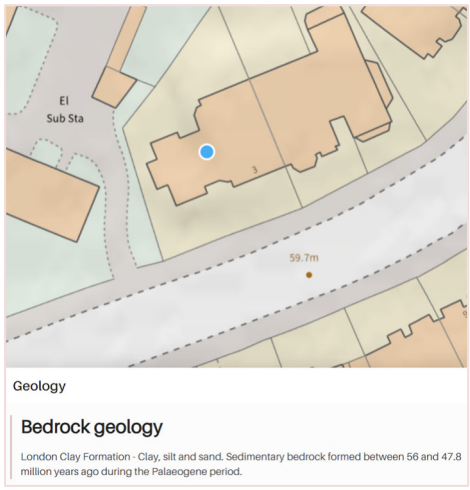
Species	Typical Height at Maturity (m)	Typical Canopy Spread at Maturity (m)	General Notes
Bay Laurel	10	8	Dense evergreen tree native to the Mediterranean area and used to flavour sauces in cooking. Leaves easily identified by their wavy margin and unique smell. Often managed by regular trimming. Usually found as a small, neat tree with a well-structured crown and a domed canopy. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Laurus+nobilis for more info.
Horse Chestnut	25	18	Deciduous tree native to Albania and N Greece. Naturalised throughout the UK. Iconic landscape tree. Susceptible to attack by Bleeding Canker, as well as Leaf Miner and Leaf Blotch. Should be inspected regularly if located close to high public use areas. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Aesculus+hippocastanum for more info.
Lime	25	12	Very common street tree. Several species exist; the one most often found in woods is 'common lime' which produces a mass of suckers at the stem base, making it very cheap to propagate. Limes have non-symmetrical heart shaped leaves which are much loved by aphids (hence the sticky honeydew on cars parked beneath). Limes are tolerant of heavy pruning and are often managed as pollards. Old limes tend to support a lot of small dead branches. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Tilia+x+europaea for more info.
London Plane	30	20	Deciduous tree arisen in cultivation probably as a cross between the Oriental Plane and the American Buttonwood. Has attractive bark which peels off in small plates leaving a multicoloured flecked pattern. Very common as a street tree, especially throughout London where it dominates the streetscape. Often managed as a pollard in order to constrain its large size to more manageable proportions, especially where there are clay soils and adjacent buildings. Somewhat susceptible to the decay fungus Innonotus hispidus. Visit http://en.wikipedia.org/wiki/Platanus for more info.
Pear	8	8	Deciduous tree native across Europe and W Asia. Hundreds of cultivars available due to its popular fruit. White flowers in spring along with bright green foliage. More upright growth habit than most apples.

The figures quoted regarding typical height and canopy spread should be treated as approximate. Actual heights and spreads vary according to several environmental factors such as soil conditions, climate, and the presence of competing vegetation. The figures quoted are not the maximum dimensions that the species may attain.

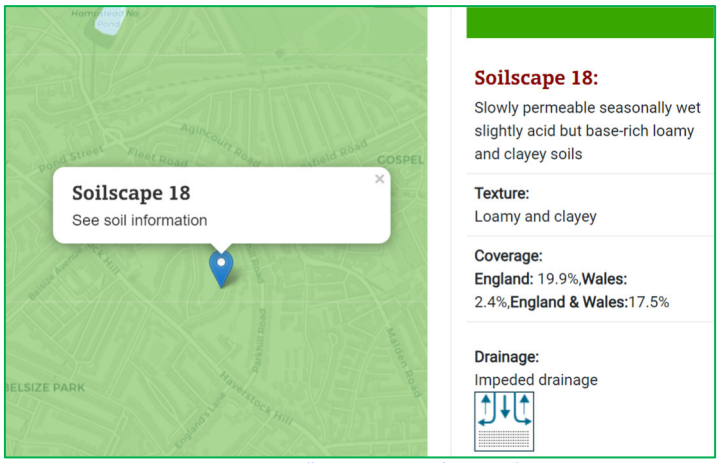
4. Local Geology and Soils

4.1. Desktop Research

4.1.1. Desktop research into local geology based on the postcode **NW3 2UN** obtained the following results:



Source: https://geologyviewer.bgs.ac.uk/?_ga=2.100849601.1777485.1660229567-1737936254.1660229567



Source http://www.landis.org.uk/soilscapes/

4.2. Site Investigations

4.2.1. Site investigations have been carried out which indicate the site is directly underlain by London Clay Formation. Please refer to the LBHGEO BIA Report, Ref: LBHGEO4711bid, dated September 2024, for info.

4.3. Conclusion and Relevance

4.3.1. Based on the information above and provided by LBHGEO, the local soils are assumed to have a loamy & clayey texture.

4.3.2. Loamy soils contain a mixture of clay and sand. Soil compaction may occur due to vehicular activity on building sites, so ground protection is recommended wherever vehicles operate. Most tree species will grow well in loamy soils.

4.3.3. Clay soils may be especially prone to compaction and slurrying caused by general construction activity. Both of which significantly impair root function. This must be guarded against using boards to protect any soils where roots are growing. When planting new trees, species should be selected that can tolerate heavy soils.

5. Arboricultural Impact Assessment

5.1. Overview

5.1.1. It is proposed that the existing basement be extended, and new above-ground extensions be installed as indicated on the drawings in Appendix 6. The existing layout is indicated in black, and the footprint of the proposed layout is indicated in Blue and Pink on the accompanying drawings.

5.1.2. The table below summarises the potential impact on trees due to various activities.

Activity	Trees Potentially Affected
Tree Removal	None
Tree Pruning	T6
RPA: Basement Foundations	T1 and T4
RPA: Other Foundations	T1 and T4
RPA: New Hard Surface	None
RPA: Replace Existing Hard Surface	T1
RPA: Underground Services / SuDS	T1, T2, T3 and T4
RPA: Change of Ground Levels	T4 and T5
RPA: Soil Compaction	T1, T2, T3, T4 and T5 (preventable by installing tree protection measures)

5.1.1. Other potentially damaging activities often associated with construction sites include demolition or the careless use of plant machinery, hazardous materials, or fires. All of the above potential impacts are considered in detail throughout this Section.

5.1.2. The accompanying Arboricultural Method Statement (duplicated in Appendix 6) specifies the measures proposed to minimise all possible potential risks of damage to the retained trees.

5.2. Tree Removal

5.2.1. No trees are to be removed to facilitate the proposal.

5.3. Impact on Tree Canopies

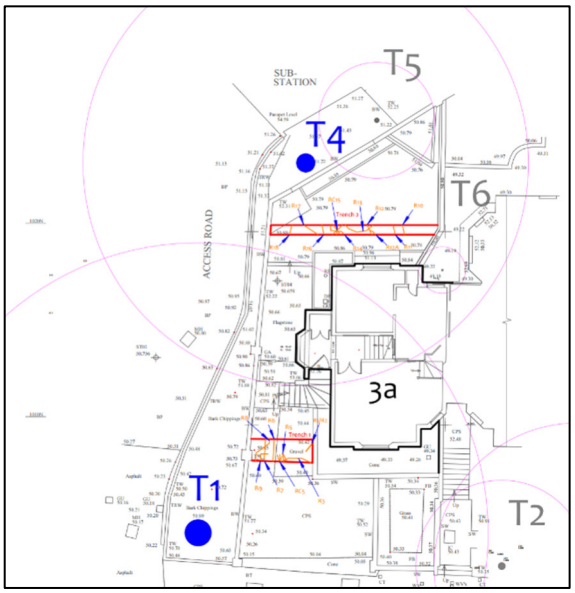
5.3.1. It is proposed that the overhanging foliage of T6 (a Bay Laurel) be pruned back to the boundary. T6 is located in the rear, neighbouring garden. Such pruning shall not have a significant impact on tree health or local visual amenity.

5.3.2. All other retained tree canopies are sufficiently far from proposed building works and high over access routes such that they should not be impacted by construction activity. Consequently, no further pruning works are required to enable the build. The accompanying Arboricultural Method Statement specifies protection measures throughout the site to ensure that no canopies are accidentally damaged.

5.4. Impact on Tree Roots

5.4.1. Trial excavations were undertaken at the site to assess the extent of rooting activity in the vicinity of the proposed basement extensions. Two trenches were excavated: Trench 1 at the front of the property to determine rooting activity from T1, and Trench 2 at the rear of the property to assess rooting activity from T4.

5.4.2. Crown Tree Consultants attended the site on the 7th May 2024 to catalogue the roots encountered after the excavations had taken place. We measured the diameter of the roots and recorded their location and their depth below ground level. A report was produced detailing the findings. Screenshots from the report are shown below and are replicated on the accompanying Impact Assessment Plan.



Trench 1

Root No.	Diameter (mm)	Depth (mm)	Comments
R1	40	1270	
R2	40	1400	
R3	240	760	
R4	45	870	
RC5	25, 30, 60	107	Root cluster.
R6	35	700	Branches off into a cluster of <25mm roots.
R7	150	680	A 30mm root protrudes from R7.
R8	50	370 – 750	
R9	50	1040	

Trench 2

Root No.	Diameter (mm)	Depth (mm)	Comments
R10	25	400	
R11	20	400	
R12	40	400	
R12A	20	320	Protrudes from R12
R13	20	300 - 650	
R14	25	200	
RC15	20, 30, 40	350 - 700	Root cluster
R16	20	250	
R17	60	700	
R18	30	850	

Basement Foundations:

5.4.3. The new basement is to be extended to the front, side and rear of the property (see the areas shaded in yellow on the accompanying Impact Assessment Plan). The Root Protection Areas of T1 and T4 shall be affected by the proposed excavations. The front basement extension is to be installed beneath the existing lower ground floor. Excavation at the front of the property is required to a depth of circa 2.5m. Excavation for the basement extensions to the side and rear of the property is required to a depth of circa 4m.

5.4.4. Roots of T1, which likely require severing to facilitate basement excavations, include R1, R2, R4, RC5 and R6. These roots were measured within Trench 1 at 40mm, 40mm, 45mm, 25mm, 30mm, 60mm and 35mm in diameter (respectively). One large root emanating from T1 was encountered within Trench 1 (240mm diameter). It is anticipated that this large root will be avoided when undertaking basement excavations in this area; however, if this root is encountered, it is imperative that it is retained and unharmed.

5.4.5. Roots of T4, which likely require severing to facilitate basement excavations, include R10, R11, T12, R12A, R14, T15, R16, R17 and R18. These roots were measured within the trench at sizes of 20mm, 25mm, 40mm, 20mm, 25mm, 20mm, 30mm, 40mm, 20mm, 60mm and 30mm (respectively).

5.4.6. It is recommended that the basement excavations be overseen by the appointed arborist, who shall undertake the required root pruning. Any root to be pruned should be neatly severed using clean, sharp tools.

5.4.7. The canopies of T1 and T4 have previously been managed by pollarding, which means that they will require less rooting volume than their theoretical RPAs suggest; their theoretical RPAs have been calculated according to their stem diameter and do not take into account their reduced canopies.

5.4.8. Tree rooting systems are dynamic and continually respond to changing site conditions by promoting root growth in areas where rooting conditions are favourable and allowing roots to die back where supplies of nutrients and water have been exhausted. Hence, the loss of some roots is naturally tolerated throughout a tree's life. Growing trees naturally maintain a balance between the size of the canopy and the root system. This ensures a functional equilibrium between the demand for resources by above and below-ground plant organs. The balance between the shoot and root systems ensures that the resources supplied by each can meet the demand of the other.

5.4.9. If the ratio is upset for any reason, for instance, by damage or pruning either the roots or shoots, the tree will seek to readjust back to the original relationship, either by enhanced growth if this can be achieved or the

dieback of tissue which is in surplus[3]. Research has shown that healthy trees of most species are able to withstand the loss of some roots (to a maximum of about 20% of the rooting area) with no long-term detrimental impact[4].

5.4.10. Nevertheless, to ensure the new basement does not impact more of the Root Protection Areas than absolutely necessary and to ensure soil disturbance is kept to the minimum amount possible, the basement is to be installed via hit-and-miss underpinning. Please refer to Section 7 of the LBHGEO Basement Impact Assessment for further details.

5.4.11. Post-construction soil amelioration (see Section 5.4.21) and cyclical reduction of the canopies of T1 and T4 are recommended.

Lower Ground Floor Foundations:

5.4.12. The existing lower ground floor is to be extended to the front corner of the property. A small portion of T1's theoretical RPA shall be affected. Excavation is required to a depth of circa 1.2m.

5.4.13. It is anticipated that roots encountered within Trench 1 that will require severing include R4 and R6 (45mm and 35mm diameter, respectively) and potentially RC5; however, these roots will already require severing to facilitate basement excavations. All other tree roots recorded in the trench are either located at a depth beneath the proposed excavation or are located outside of the footprint of the lower ground floor extension.

5.4.14. It is recommended that excavations for the lower ground floor extension be overseen by the appointed arborist, who shall undertake any required root pruning. Any root to be pruned should be neatly severed using clean, sharp tools.

Upper Ground Floor Foundations:

5.4.15. The existing upper ground floor is also to be extended to the side and rear of the property (see the areas shaded in turquoise on the accompanying Impact Assessment Plan). Portions of T1 and T4's RPAs shall be affected.

5.4.16. In order to ensure the potential impact is minimised as best possible, a shallow raft or beam foundation is proposed, which is to be supported by narrow screw piles. The upper soils should be probed with a garden fork (or similar) to ensure no significant tree roots are present directly beneath the surface before committing to the pile locations. The screw piles should be positioned to avoid tree roots, especially those with a diameter greater than 25mm. Excavation for the raft/beam should not exceed 200mm.

5.4.17. A section of the existing boundary wall is to be replaced with the (side) extension wall. If the existing wall foundations require replacement, no excavation is to occur beyond the depth of the existing foundation unless screw piles require installation. In this case, the screw piles will be installed to avoid any significant tree roots, as detailed above.

New Refuse Store Foundations:

5.4.18. A new refuse store is to be installed at the front of the property. Excavation is required within a raised planter to create level access from the level of the existing driveway. So long as excavation does not exceed a depth of 350mm and a shallow slab foundation is installed, the potential impact on T1 is considered to be minor. Hand tools only should be used for the excavation to minimise soil disturbance.

Other Foundations:

5.4.19. Any other garden walls constructed for raised planters or the like should be excavated using hand tools only. If any significant tree roots are encountered with a diameter greater than 25mm, a shallow beam should be incorporated into the design to ensure that roots excess of 25mm are retained intact wherever possible.

---

3 Ref: P.G. Biddle (1998) "Tree Root Damage to Buildings: Vol. 1 causes, diagnosis and remedy" Willowmead Publishing Ltd.

4 Helliwell, *D.R. and Fordham, S.F. (1992) Tree Roots and Tree Growth. Reading Agricultural Consultants, Didcot, UK

5.4.20. Where timber posts are to be installed to support the proposed timber patio decking in the rear garden (see Section 5.4.29), posts will be positioned to avoid all tree roots over 25mm in diameter.

Ameliorating Rooting Conditions:

5.4.21. In order to mitigate the impact on T1 and T4 due to the proposed excavations, soil amelioration is proposed. To create ideal conditions for tree roots, the following are recommended:

- Reduce the amount of grass and other competing vegetation. This will allow tree roots better access to oxygen, precipitation and soil nutrients. The vegetation should be replaced with conditions that best imitate a woodland floor. This can be achieved by spreading leaf litter to a depth of at least 50mm and placing an organic mulch (such as semi-composted woodchip) to a depth of 100mm above the leaf litter. Mulching in this manner will conserve soil moisture and slowly release nutrients to the roots below.
- Install worm colonies into the soils beneath the leaf litter. *Lumbricus terrestris* should be introduced at a rate of five colonies per square metre. Over time, the worms will improve soil conditions by aerating, composting and taking the leaves down into the soil. See also https://www.wormsdirectuk.co.uk/blog/introducing-worms-to-a-newly-created-garden/
- The soils may also be aerated in the short term by terraventing. This process involves the injection of air at high pressure into the soils. This is not usually considered necessary unless the soils have been compacted by traffic or excessive pedestrian activity.
- Mycorrhizal fungi may also be added to the soils. These fungi form a symbiotic relationship with the woody roots. The tree supplies the fungi with carbohydrates. In return, the fungi supply nutrients to the tree from a much greater volume of soil than woody roots can efficiently exploit. Fungi may be applied during the terraventing process (mixed in the air), or applied separately. It should be noted that mycorrhizal fungi will tend to grow of their own accord without the need for human provision so long as the soil conditions are favourable.

5.4.22. The application of chemical fertilisers is not recommended as this may inhibit mycorrhizal relationships, and any benefits will be short-lived and may even be detrimental over the longer term.

5.4.23. The method of soil amelioration should be agreed upon with the local authority tree officer.

New Surfaces:

5.4.24. The front driveway is to be replaced by permeable paving underlain by porous stone storage. The ground level is to be slightly raised to accommodate the new surface, and a gentle ramp shall be created from the existing access. No excavation besides the removal of the existing driveway surface is proposed, and the installation of permeable surfacing shall maintain rooting conditions. Removal of the existing driveway should be undertaken sympathetically and lifted using hand tools. Please refer to the LBHGEO SuDS Assessment, Ref: LBHGEO 4711suds, dated September 2024, for further information.

5.4.25. The existing surface in the rear garden is also to be replaced. Please see Section 5.4.29 for further details.

Underground Services / SuDS:

5.4.26. A new underground attenuation tank is to be installed in the area of raised soft ground in the front garden, as indicated on the accompanying drawings. The attenuation tank requires excavation to a depth of 450mm within small portions of the theoretical RPAs of T1, T2 and T3. Excavation should be undertaken using hand tools only. If any tree roots greater than 50mm in diameter are encountered, the project arborist should be consulted before severance of the root occurs.

5.4.27. A 100mm deep surface channel is also to be installed within the site. The precise location is yet to be confirmed; however, the following mitigation is recommended to ensure impact is kept to the minimum amount possible:

- Excavation shall be undertaken using hand tools, and an air spade (if necessary).
- Excavation should be overseen by the project arborist.
- All roots in excess of 25mm in diameter should be retained wherever possible.
- Exposed roots should be protected by damp sacking whilst exposed.

5.4.28. Please also refer to the LBHGEO SuDS Report, page 28, which shows a schematic plan of the proposed SuDS features for the site.

Changes in Ground Levels:

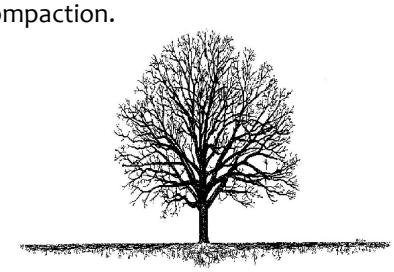
5.4.29. It is proposed to raise the level of the rear garden by installing timber patio decking. No excavation is to occur besides the installation of supporting timber posts, and an open void shall be maintained beneath the patio decking to ensure rooting conditions are maintained; consequently, the roots of T4 and T5 shall not be starved of oxygen and rainwater. Consequently, the potential impact is considered to be minor.

Soil Compaction:

5.4.30. The majority of tree roots lie within the upper soil horizons. This is because the availability of oxygen decreases with depth, and roots need to breathe to stay alive. In addition, nutrients are more readily available in the form of organic matter close to the soil surface.

5.4.31. Healthy soils contain about 25% air space between solid particles. Increased loading of the soil caused by construction activity causes air to be squeezed out as the soil becomes compacted, preventing roots from breathing. Even an increase in pedestrian activity may cause some soil compaction.

5.4.32. Therefore, ground compaction and soil disturbance over Root Protection Areas should be avoided. This may be done by installing protective fencing and ground protection measures as recommended within the accompanying Arboricultural Method Statement.



5.5. Demolition Activities

5.5.1. No demolition is proposed particularly close to trees; however, the tree protection measures specified within the accompanying Arboricultural Method Statement should be installed prior to the commencement of all demolition activities (including soil stripping) to prevent any detrimental impact on tree health.

5.6. Waste and Materials Storage

5.6.1. All hazardous materials (including cement and petrochemical products) will need to be controlled according to COSHH regulations in order to ensure there is no detrimental impact on tree health. Provision shall need to be made to ensure that cement spillage avoids all Root Protection Areas.

5.6.2. Areas designated for the storage of building materials and waste products will need to be approved by the local authority. Root Protection Areas should be avoided. Where this is not possible, suitable ground protection measures will need to be installed.

5.7. Cabins and Site Facilities

5.7.1. Consideration should be given to the location of any site welfare facilities in terms of potential impact on trees. Where it is proposed to install cabins or site facilities in RPAs, the project arborist should be consulted, and approval should be obtained from the local authority.

5.7.2. There is limited room for the siting of cabins and storage of materials / spoil during the construction phase, so the logistics of the development shall need to be well organised to ensure that there is adequate space outside of the Tree Protection Zones for construction activity.

5.8. Boundary Treatments

5.8.1. As part of the proposed development, the existing (western) boundary wall is to be replaced. If possible, the existing foundations should be utilised. However, if it becomes necessary to replace the existing foundations, no excavation will occur beyond the depth of the existing foundation. If any tree roots are encountered if/when replacing the boundary wall foundation, they will be retained intact, and a beam will be incorporated into the design to span over the roots.

5.8.2. Demolition of the existing wall in the vicinity of T1 shall be undertaken using hand tools only, and all brickwork will be pulled in a direction away from the adjacent tree.

5.9. Impact of Retained Trees on the Development

5.9.1. The foundations and any new surfaces should be designed to accommodate all potential impacts due to future tree-rooting activity. These include potential vegetation-related subsidence, vegetation-related heave, and lifting of surfaces / light structures due to direct root pressure.

5.10. Summary

5.10.1. No trees are proposed for removal.

5.10.2. One Retention Category C tree requires pruning which shall have minimal impact on tree health.

5.10.3. Excavation is required within the RPAs of T1, T2, T3, T4 and T5 for foundations, replacement of surfaces, and/or a new underground attenuation tank.

5.10.4. Trial excavations have been undertaken to help inform our assessment of the potential impact on trees and relevant parties (architects, engineers etc) have been consulted throughout the design process to ensure that impact on trees will be minimised as best possible.

5.10.5. Soil amelioration and tree canopy management is recommended to mitigate impact on trees.

5.11. Arboricultural Method Statement

5.11.1. The accompanying Arboricultural Method Statement specifies restrictions on construction activities to ensure minimal impact on retained trees. All of the potential impacts noted in this section are accounted for in the Arboricultural Method Statement.

6. Photographs

Refer also to the Tree Constraints Plan for photo locations.

Photo 1.

Photo 2.

Photo 3.

Photo 4.

Photo 5.

Photo 6.

Appendix 1: BS 5837: 2012 – Guidance Notes

This Standard prescribes the principles to be applied to achieve a satisfactory juxtaposition of trees and structures. It sets out to assist those concerned with trees in relation to design, demolition and construction to form balanced judgements.

It acknowledges the positive contribution trees may offer to a site, as well as the negative aspects of retaining inappropriate trees. It addresses the negative impacts that construction activity may have upon trees and offers mitigation strategies to minimise these impacts.

The Standard suggests a three stage approach to ensure best practice is followed when developing close to trees:

A1.1 Stage 1: Survey Details and Notes

A ground level visual survey was undertaken. No climbed inspections or specialist decay detection were undertaken. Only trees with a stem diameter over 75mm, which lie within the site boundary or relatively close to it, were included.

Where applicable, trees with significant defects have been highlighted and appropriate remedial works have been recommended. However, this report should not be seen as a substitute for a full *Safety Survey* or *Management Plan* which are specifically designed to minimise risk and liability associated with responsibility for trees.

Wherever practicable dimensions were obtained using diameter tapes, logger's tapes, distometers and clinometers. Where obstacles prevent accurate measurement, dimensions are estimated. Trees on privately owned third party are surveyed from the best available vantage point and observations relating to the condition of these trees should be treated accordingly. All height measurements should be regarded as approximate.

Data is recorded for each tree and is presented in a Tree Data Schedule. Each tree is allocated a ***Retention Category*** according to its size, amenity value, condition and safe useful life expectancy. The categories are allocated independently of development proposals. Our interpretation of the Retention Categories is explained below:

A1.1.1 Retention Categories

A Category: Trees of high quality and amenity value. Usually, mature trees with a significant life expectancy which would enhance any development. Retention of these trees is strongly encouraged.

B Category: Trees of moderate quality and amenity value. Usually these are maturing trees or younger trees with exceptional form. Retention of these trees is desirable though the removal of occasional specimens may be acceptable.

C Category: Trees of low quality or small specimens with a relatively low amenity value. These trees are not considered to be a material planning constraint and their removal will generally be seen as acceptable in order to facilitate development.

U Category: Trees of such low quality that their removal is recommended regardless of development proposals.

Occasionally trees are borderline and do not fall neatly into one of the categories A, B or C. In such cases we apply a superscript (**+/-**) such that:

C^{+} Indicates borderline C/B, though Category C is deemed to be most appropriate.

B^{-} Indicates borderline C/B, though Category B is deemed to be most appropriate.

The British Standard suggests that each of the A, B and C categories may be further subdivided (A1, A2, A3, B1, B2, B3 etc) such that subcategory 1 denotes mainly arboricultural values, subcategory 2 denotes mainly landscape values and subcategory 3 denotes mainly cultural values (including conservation). Multiple subcategories may be used.

Our experience suggests that these subdivisions lack clarity and can be confusing. Within this report subcategories are **not** denoted. Where appropriate, the use of phrases such as '*Part of a formal group*', or '*Has a high ecological value*', or '*Offers good screening to the site*' are incorporated into the observation section of the Tree Data Schedule. We believe this conveys all relevant landscape and cultural information without any confusion.

Tree Constraints Plan (TCP). This indicates the position, crown spread, Retention Category and Root Protection Area of each tree. It is used to inform where development may proceed without causing damage to trees.

Root Protection Area (RPA). This is the area around each tree likely to contain the majority of roots. It should ideally remain undisturbed to avoid a detrimental impact on tree health. For single stemmed trees It is calculated according to the formula "radius of RPA" = "12 x stem diameter". Where a tree has more than one stem, the equivalent-single-stem diameter is usually recorded. This is calculated by adding the squares of the stems and then finding the square root of this total. The radius of the Root Protection Area is then calculated by multiplying the equivalent-stem-diameter by 12.

Shade Constraints. The previous Standard (BS 5837 2005) suggested that shade constraints should be indicated on the TCP. This are denoted as a circle-segment drawn northwest to due east with a radius equal to the height of the tree. These do not represent the actual shade pattern which varies through the seasons. Rather, they indicate the area most shaded by the tree throughout the course of the year. Ideally habitable room windows should be located outside of these shade constraints. Where we consider it appropriate, we will include shade constraints information on our Impact Assessment Plan or Proposed Layout Plan.

A1.2 Stage 2: Arboricultural Impact Assessment

After the initial survey and the production of the Tree Constraints Plan, arborists and designers are encouraged to work together to establish a design proposal with minimal impact on the high quality trees. An assessment should be made of all possible impacts including the impact that the trees may have upon the proposal. The arborist may recommend mitigation strategies to minimise these impacts and help achieve a more harmonious juxtaposition between buildings and trees.

A1.3 Stage 3: Arboricultural Method Statement

This type of report specifies the measures necessary to protect trees against damage from construction activity. The Method Statement should be written in a manner that it may be conditioned and enforced by the local authority upon granting of planning permission. The site manager should be familiar with all aspects of the Method Statement and should ensure that all persons working on the site are aware of those aspects which appertain to their work. This includes service installation engineers and operators of plant machinery.

Appendix 2: Survey Methodology

Ground level visual surveys are carried out using the *Visual Tree Assessment* technique described by Mattheck and Broeler (1994) and endorsed by the Arboricultural Association (LANTRA Professional Tree Inspection course, 2007).

Structural condition is assessed by inspecting the stem and scaffold branches from all angles looking for weak branch junctions or symptoms of decay. Particular attention is paid to the stem-base. Cavities are explored using a metal probe in order to assess the extent of any decay. If this is not possible further inspection is recommended in the form of a climbed inspection or using specialist decay detection equipment.

The physiological condition is assessed by inspecting the stem, branches and foliage for symptoms of disease. The overall vigour of the tree is also taken into account.

Where significant defects are observed, recommendations are made according to a scale of priority in order to reduce the likelihood of structural failure. The position of the tree and its potential targets are taken into account.

Measurements are obtained using a diameter tape, clinometer, distometer and loggers tape. Where this is not practical measurements are estimated.

Some trees are surveyed as groups, though this is usually avoided close to areas likely to be developed.

Finally, a *Retention Category* is allocated as described in Appendix 1.1.1.

Appendix 3: Glossary of Tree Data

This section explains the terms used in the **Tree Data Schedule** (see Section 3 and Appendix 6).

A2.1 General Observations

Numbering System: Each item of vegetation has its own unique number prefixed by a letter such that T1=Tree 1, G2=Group 2, H3=Hedge 3 and W4=Woodland 4, S5=Shrub 5.

Age Categories:

Young	Usually less than 10 years old.
Semi-Mature	Significant future growth to be expected, both in height and crown spread (typically below 30% of life expectancy).
Early-Mature	Full height almost attained. Significant growth may be expected in terms of crown spread (typically 30-60% of life expectancy).
Mature	Full height attained. Crown spread will increase but growth increments will be slight (typically 60% or more of life expectancy).
Veteran	A level of maturity whereby significant management may be required in order to keep the tree in a safe condition.
Over Mature	As for veteran except management is not considered worthwhile.

Species: Common names and Latin names are given.

Height: Measured from ground level to the top of the crown.

Stem Diameter: Taken at 1.5m above ground level where possible. On multi-stemmed trees this measurement may be taken at ground level, though usually an indication of the number of stems and average diameter is given, e.g. 3 x 30cm.

Crown Height: Measured from ground level to the height at which the main crown begins. Where the crown is unbalanced it is measured on the side deemed to be most relevant. This is usually the side facing the area of anticipated development.

Tree Diagram: This scaled drawing is computer generated based on measurements taken for stem diameter, crown height and spread, and overall height. It is designed to help the reader rapidly assess the data. It is not an accurate representation of the form of the tree.

Crown Spread: Measured N, E, S & W, taken from the centre of the stem and usually rounded up to the nearest metre.

Observations: If a tree's position is considered to be relevant it will be commented upon (e.g. overhanging a children's play area). Tree form and pruning history are also recorded along with an account of any significant defects. Defects and descriptive terms are dealt with in more detail at the end of this section.

Recommendations: Usually based on any defects observed and intended to ensure that the tree is in an acceptable condition.

Priority Scale: Depending upon the threat posed by the tree, and the likelihood of failure, recommendations should be carried out according to the following priority scale:

Urgent	To be carried out as soon as possible.
Very High	To be carried out within 1 month.
High	To be carried out within 3 months.
Moderate	To be carried out within 1 year.
Low	To be carried out within 3 years.

Inspection Frequency: An interval of 6 months, 1 year, 1.5 years or 3 years is allocated before the next inspection is due. Wherever practical, consideration should be given to seasonal changes so that deciduous trees are not always surveyed in winter when they have no leaves, or in summer when leaves may obscure branches within the upper crown.

Vigour: An indication of growth rate and the tree's ability to cope with stresses:

High	Having above average vigour.
Moderate	Having average vigour.
Low	Having below average vigour.
Very Low	Tree is struggling to survive and may be dying.

Physiological Condition:

Good	Healthy and with no symptoms of significant disease.
Fair	Disease present or vigour is impaired.
Poor	Significant disease present or vigour is extremely low.
Very Poor	Tree is dying.

Structural Condition:

Good	Having no significant structural defects.
Fair	Some defects observed though no high priority works are required.
Poor	Significant defects found. Tree requires monitoring or remedial works.
Very Poor	Major defects which will usually require significant remedial works or tree removal.

Amenity Value:

Very High	Exceptional specimen, observable by a large number of people.
High	Attractive specimen, observable by a significant number of people.
Moderate	One of the above factors is not applicable.
Low	Unattractive specimen or largely hidden from view.

Life Expectancy: The estimated number of years before the tree may require removal. Classified as (<10), (10 – 20), (20 – 40), or (40+).

Retention Category: These are explained in detail in Appendix 1.

A2.2 Evaluation of Defects

Cavities, wounds, deadwood etc are all evaluated as follows:

Major	Such that structural integrity is, or will become, compromised and the tree is, or will inevitably become, hazardous.
Significant	A defect that may over time become a major defect, though not necessarily so. This will depend on the vigour of the tree and its ability to deal with decay etc.
Minor	A defect thatis unlikely to develop into a major defect.

Appendix 4: Arborist's Qualifications

Qualifications & Experience of Emma Hoyle FDSc (Arboriculture), ED (Forestry & Arboriculture), M. Arbor. A.

Emma is a qualified Arboricultural Consultant educated to Level 5 in Arboriculture at Askham Bryan College, is a professional member of the Arboricultural Association and is a LANTRA accredited *Professional Tree Inspector*. She has worked for Crown Consultants since 2015 and has since written numerous reports relating to all aspects of arboriculture including; planning and development, vegetation related subsidence, tree preservation orders and tree risk assessment. Emma regularly attends seminars and events in order to keep abreast with current knowledge and best practise in Arboriculture.

Prior to becoming an arboricultural consultant, Emma worked for two reputable tree surgery firms from 2008 and became an NPTC Qualified tree surgeon after completing a Level 3 Extended Diploma in Forestry and Arboriculture at Askham Bryan College. Emma also has experience in other areas of arboriculture such as forest clearance, tree planting, tree maintenance and landscaping.

Qualifications & Experience of Carl Lothian – BSc (Hons) (Arboriculture).

Carl began his career undertaking a Level 3 extended diploma in arboriculture and forestry at Merrist Wood College in 2015. Upon completion of his diploma, Carl worked with several tree surgery firms completing a range of arboricultural works. In 2018 Carl began his BSc (Hons) in arboriculture and urban forestry, graduating with a first-class degree and attaining the Institute of Chartered Foresters student of the year award.

After graduating, Carl worked as a TreeRadar technician where he carried out tree root and decay surveys with specialist ground-penetrating radar equipment. During this time Carl was fortunate enough to work at prestigious sites, such as the Palace of Westminster and the National Maritime Museum.

Whilst working at Crown, Carl has undertaken a range of tree surveys and written reports relating to development, safety, subsidence, and decay detection. Carl is a professional member of the Consulting Arborist Society and an associate member of the Institute of Chartered Foresters.

Appendix 5: Further Information

Building Near Trees – General

National Joint Utilities Group publication # 10 (1995), *Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees. Downloadable at www.njug.demon.co.uk/pdf/NJUG%20Publication10.pdf*

NHBC Standards Chapter 4.2., *Trees and Buildings.*

Horticulture LINK project 212. (*University of Cambridge,* 2004), *Controlling Water Use of Trees to Alleviate Subsidence Risk.*

Tree Planting and aftercare

See www.trees.org.uk/leaflets.php# for downloadable leaflets on selecting a garden tree, planting, aftercare and veteran tree management.

British Standards

BS 5837: 2012. Trees in Relation to Design, Demolition and Construction – Recommendations.
Bs 3998: 2010. Recommendations for Tree Work.
BS 3936: 1992. Nursery Stock. Part 1: Specification for Trees and Shrubs.
BS 3936: 1992. Nursery Stock. Part 10: Specification for Groundcover Plants.
BS 4043: 1989. Transplanting Root-balled Trees.
BS 8004: 1986. Foundations.
BS 8103: 1995. Structural design of Low-Rise Buildings.
BS 8206: 1992. Lighting for Buildings.
BS 8545:2014. Trees: From nursery to independence in the landscape – Recommendations
BS 3882: 2015. Topsoil.
BS 4428: 1989. General Landscaping Operations (excluding hard surfaces).

Permission to do Works to Protected Trees / Tree Law

Forestry Commission (Edinburgh, 2003), *Tree Felling – Getting Permission.* Country Services Division - Forestry Commission. Downloadable at www.forestry.gov.uk/website/pdf.nsf/pdf/wgsfell.pdf/$FILE/wgsfell.pdf

Transport and the Regions (Department of the Environment, 2000), *Tree Preservation Orders, A Guide to the Law and Good Practice.* Downloadable at www.communities.gov.uk/publications/planningandbuilding/tposguide

C. Mynors, *The Law of Trees, Forests and Hedgerows* (Sweet and Maxwell, London, 2002)

Communities and Local Government website with numerous downloadable documents, from:
http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/

Lighting Levels

P.J. Littlefair, *B.R.E. 209: Site layout planning for daylight and sunlight A guide to good practice.* B.R.E. Bookshop, London.

British Standards Institution. Code of practice for day lighting. *British Standard* BS 8206: Part 2 (1992).

Chartered Institution of Building Services Engineers. *Applications manual: Window Design* (London, 1987).

NBA Tectonics. A study of passive solar housing estate layout. *ETSU Report* S-1126. Harwell, Energy Technology Support Unit (1988).

I.P. Duncan; D. Hawkes, Passive solar design in non-domestic buildings. *ETSU Report* S-1110. Harwell, Energy Technology.

P. J. Littlefair, Measuring Daylight, *BRE Information Paper 23/93 f3.50.* (Advises on measuring daylight under the real sky or an artificial sky, allowing for the changing nature of sky light).

High Hedges

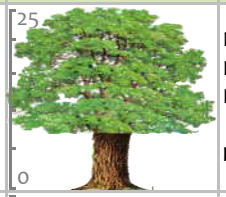
Communities and Local Government website with numerous downloadable documents, from:
http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/

Tree Specific Websites

www.crowntrees.co.uk	Crown Consultants site containing useful information
www.trees.org.uk	Arboricultural Association
www.rfs.co.uk	Royal Forestry Society of England, Wales and N. Ireland
www.treehelp.Info	The Tree Advice Trust
www.woodland-trust.org.uk	The Woodland Trust
www.treecouncil.org.uk	The Tree Council

Appendix 6: Tree Data Schedule and Drawings

The Tree Data Schedule and any drawings accompanying this report follow this page. They are also provided as separate documents for ease of printing and screen viewing.

Reference G = Group H = Hedge	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N W E S	Scaled Tree Diagram (m) 9 0 9	Notes	Recommendations (Independent of any development proposals) Priority / Inspect Freq (yrs)	Vigour Physiological Condition Structural Condition	Amenity Value Life Expectancy (yrs) Retention Category
T1	Mature **London Plane** Platanus x hispanica.	25	8	137	N 11 W 11 E 11 S 8.5		Position: Situated on third party land. Form: Multi-stemmed at 6m with a balanced crown. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: No significant defects observed.**	No action required. n/a / 1	Moderate Good Good	High 40+ **B +**
T2	Semi-Mature **Lime** Tilia sp.	9.5	6	37	N 2 W 2 E 2 S 2		Position: Situated on third party land. Form: Multi-stemmed at 6m with a balanced crown. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: No significant defects observed.**	No action required. n/a / 1	Moderate Good Good	Low 40+ C
T3	Early-Mature **Lime** Tilia sp.	12	5	62	N 1.5 W 2 E 5 S 6		Position: Situated on third party land. Form: Triple-stemmed at 3m with an unbalanced crown & leaning. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: Poor unions where multi-stemmed.** Other: Acceptable condition at present due to heavy reduction. Tree displacing boundary wall.	No action required. n/a / 1	Moderate Good Fair	Low 40+ C
T4	Mature **Horse Chestnut** Aesculus hippocastanum.	16	3	96	N 6 W 6 E 6 S 3		Position: Currently situated on third party land, adjacent rear boundary. Form: Multi-stemmed at 3m with a balanced crown. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: No significant defects observed.** Other: Retaining wall adjacent tree has collapsed in the past leaving roots exposed.	No action required. n/a / 1	Moderate Good Fair	Moderate 20-40 **B**
T5	Semi-Mature **Pear** Pyrus sp.	5	3	25	N 5 W 1 E 3.5 S 2		Position: Situated on third party land. Form: Single stemmed and leaning with an unbalanced crown. History: No evidence of significant pruning. **Defects: Significant bark wounds to stem (acceptable condition at present).**	Monitor. Moderate / 1.5	Moderate Fair Fair	Low 20-40 C
T6	Semi-Mature **Bay Laurel** Laurus nobilis.	5	1.5	10	N 4 W 4 E 1.5 S 1.5		Position: Situated on third party land. Form: Twin-stemmed at 3m with an unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects.** Other: Limited inspection, dimensions estimated.	No action required. n/a / 3	Moderate Good Good	Low 40+ C

Tree Data Schedule

Reference (T = Tree, G = Group, H = Hedge)	Age & Species	Height (m)	Crown Ht (m)	Diameter (m)	Crown Spread (m) N W E S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals) Priority	Inspect freq (yrs)	Vigour Physiological Condition / Structural Condition	Amenity Value Life Expectancy (yrs) / Retention Category
T1	Mature **London Plane** *Platanus x hispanica.*	25	8	137	11 / 11 / 11 / 8.5		Position: Situated on third party land. Form: Multi-stemmed at 6m with a balanced crown. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: No significant defects observed.**	No action required.	n/a	Moderate / Good	High / 40+ / **B +**
T2	Semi-Mature **Lime** *Tilia sp.*	9.5	6	37	2 / 2 / 2 / 2		Position: Situated on third party land. Form: Multi-stemmed at 6m with a balanced crown. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: No significant defects observed.**	No action required.	n/a	Moderate / Good	Low / 40+ / **C**
T3	Early-Mature **Lime** *Tilia sp.*	12	5	61	1.5 / 2 / 6 / 5		Position: Situated on third party land. Form: Triple-stemmed at 3m with an unbalanced crown & leaning. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: Poor unions where multi-stemmed.** Other: Acceptable condition at present due to heavy reduction. Tree displacing boundary wall.	No action required.	n/a	Moderate / Good / Fair	Low / 40+ / **C**
T4	Mature **Horse Chestnut** *Aesculus hippocastanum.*	16	3	96	6 / 6 / 6 / 3		Position: Currently situated on third party land, adjacent rear boundary. Form: Multi-stemmed at 3m with a balanced crown. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: No significant defects observed.** Other: Retaining wall adjacent tree has collapsed in the past leaving roots exposed.	No action required.	n/a	Moderate / Good / Fair	Moderate / 20-40 / **B**
T5	Semi-Mature **Pear** *Pyrus sp.*	5	3	25	5 / 1 / 3.5 / 2		Position: Situated on third party land. Form: Single stemmed and leaning with an unbalanced crown. History: No evidence of significant pruning. **Defects: Significant bark wounds to stem (acceptable condition at present).**	Monitor.	Moderate 1.5	Moderate / Fair	Low / 20-40 / **C**
T6	Semi-Mature **Bay Laurel** *Laurus nobilis.*	5	1.5	10	4 / 4 / 1.5 / 1.5		Position: Situated on third party land. Form: Twin-stemmed at 3m with an unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects.** Other: Limited inspection, dimensions estimated.	No action required.	n/a	Moderate / Good	Low / 40+ / **C**

Photographs

Photo 1.

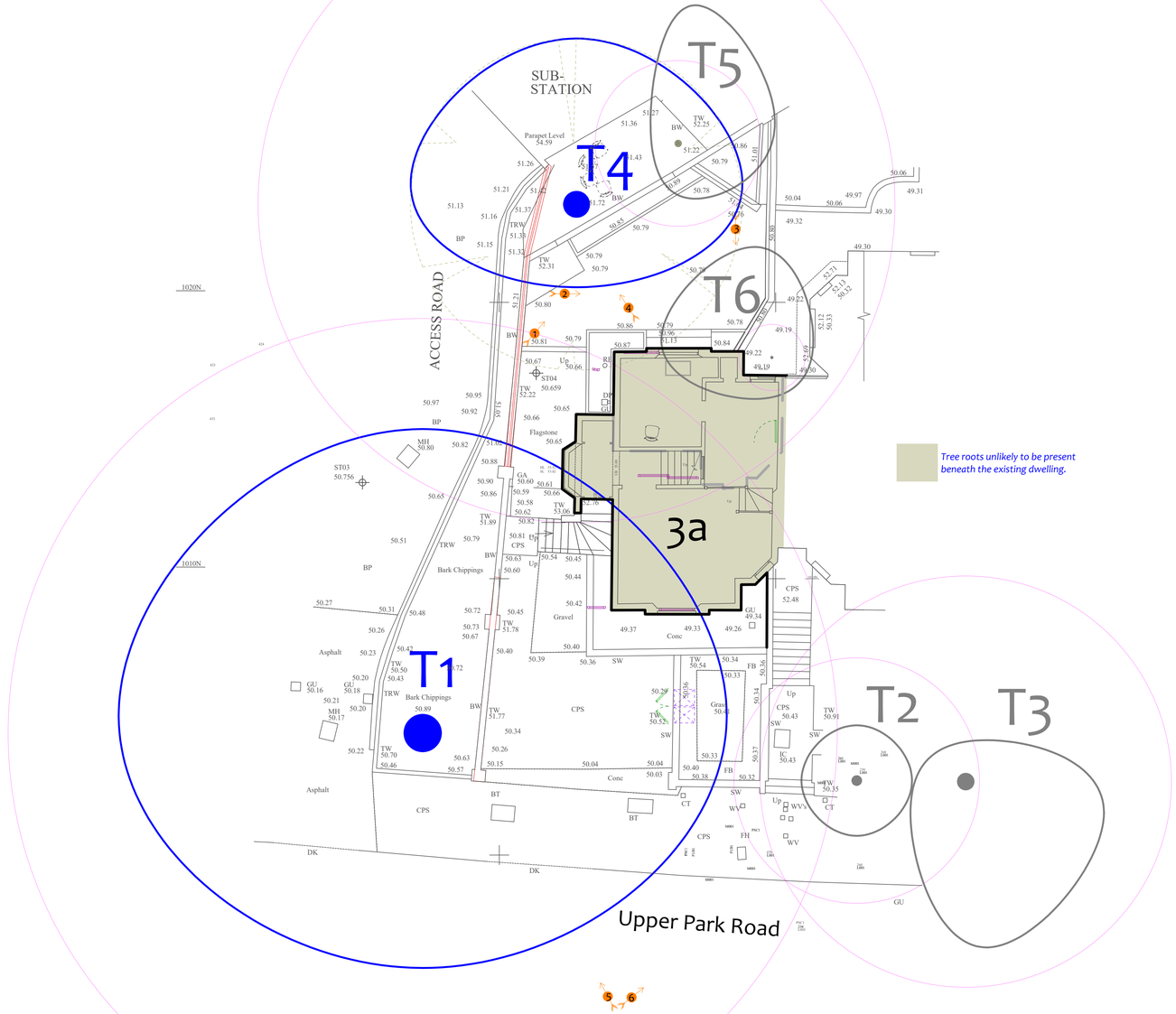
Photo 2.

Photo 3.

Photo 4.

Photo 5.

Photo 6.



Drawing No:	CCL 11774 / TCP	Rev: 1
Title:	Tree Constraints Plan (Existing Layout)	
Site:	3a Upperpark Road NW3 2UN	
Scale:	1:100	Paper Size: A1

CROWN
Arboricultural Consultants
01423 316660

Tree Retention Categories
Stems & canopies shown

Category A tree	Trees of high quality with an estimated life expectancy of 40+ years. Usually large trees with significant presence or smaller trees with excellent form. Retention of these trees is highly desirable.
Category B tree	Trees of moderate quality with a life expectancy of 20+ years. Usually maturing trees, or younger trees with good form. Retention of these trees is desirable though less than Category A trees
Category C tree	Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.
Category U tree	Trees unsuitable for retention due to their very poor condition.

Tree Constraints Plan

Status: Final

BS 5837 Root Protection Area (radius = 12xstem diameter)

Root Protection Area needing amendment due to site conditions, e.g. presence of exising road or building.

Root Protection Area having been amended to account for for site conditions

T1 = Tree No 1 G2 = Group No 2 H3 = Hedge No 3

1 Photo 1

MN = Measured North:

Canopy spreads are sometimes measured to an approximate N defined by site features. Often more accurate, especially where rows of trees are not aligned N-S or E-W.

Tree Ref.	Species	Height (m)	Root Protection Area Radius (m)	m²	Square (m)
T1	London Plane	25	16.4	849	29.1
T2	Lime	9.5	4.4	62	7.9
T3	Lime	12	7.4	174	13.2
T4	Horse Chestnut	16	11.5	417	20.4
T5	Pear	5	3.0	28	5.3
T6	Bay Laurel	5	1.2	5	2.1

Areas where excavation is proposed for the basement.
Proposed excavation depth = c. 4m

Trench 2 *Trial Excavation Results*

Root No.	Diameter (mm)	Depth (mm)	Comments
R10	25	400	
R11	20	400	
R12	40	400	
R12A	20	320	Protrudes from R12
R13	20	300 - 650	
R14	25	200	
RC15	20, 30, 40	350 - 700	Root cluster *Potentially requires severing.*
R16	20	250	*Potentially requires severing.*
R17	60	700	*Potentially requires severing.*
R18	30	850	*Potentially requires severing.*

Roots likely require severing to facilitate the proposed basement:
RC15 (20mm, 30mm & 40mm dia), R16 (20mm dia),
R17 (60mm dia), R18 (30mm dia).

It is proposed to raise the level of the rear garden
by installing timber decking.
Timber posts installed to avoid tree roots
with a diameter greater than 25mm.

Basement Excavation
Proposed excavation depth = c. 4m

Trench 2 *Trial Excavation Results*

Root No.	Diameter (mm)	Depth (mm)	Comments
R10	25	400	*Requires severing.*
R11	20	400	*Requires severing.*
R12	40	400	*Requires severing.*
R12A	20	320	Protrudes from R12 *Requires severing.*
R13	20	300 - 650	
R14	25	200	*Requires severing.*
RC15	20, 30, 40	350 - 700	Root cluster *Potentially require severing.*
R16	20	250	
R17	60	700	
R18	30	850	

Roots of T4 that require severing to facilitate basement excavations:
R10, R11, R12, R12A, R14, and potentially RC15.
All roots to be severed within the trench are less than 50mm in diameter.

Upper Ground Floor Foundations
It is proposed to install a shallow
raft/beam supported on screw piles.
Screw piles to be positioned to avoid
any tree roots >25mm diameter encountered.
Raft/beam excavation should not exceed 200mm.

Basement Excavation.
Proposed excavation depth = c. 4m.

Trench 1 *Trial Excavation Results*

Root No.	Diameter (mm)	Depth (mm)	Comments
R1	40	1270	*Likely requires severing.*
R2	40	1400	*Likely requires severing.*
R3	240	760	
R4	45	870	*Potentially requires severing.*
RC5	25, 30, 60	107	Root cluster. *Potentially requires severing.*
R6	35	700	Branches off into a cluster of <25mm roots. *Potentially requires severing.*
R7	150	680	A 30mm root protrudes from R7.
R8	50	370 – 750	
R9	50	1040	

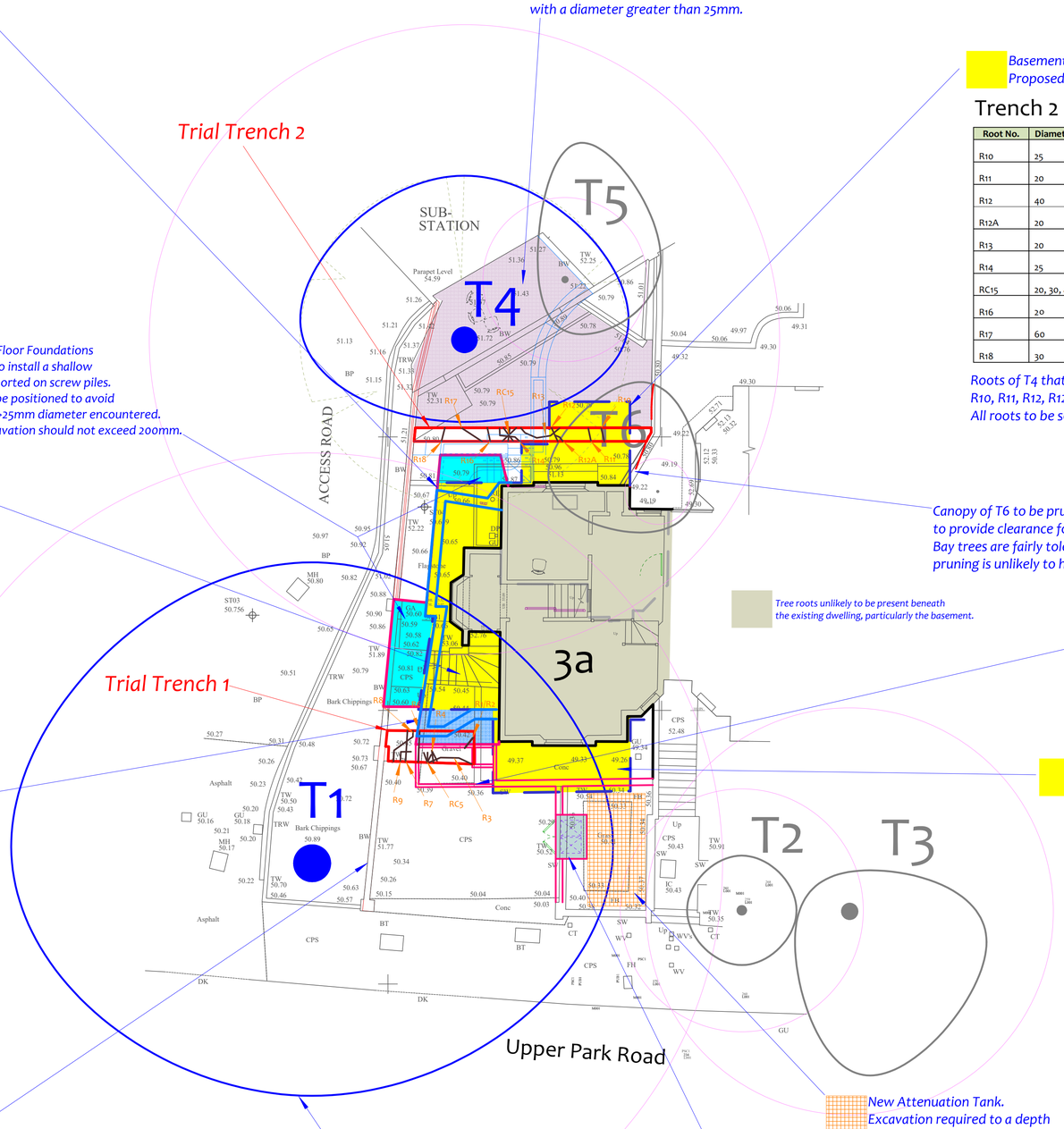
Roots likely require severing to facilitate the proposed basement:
R1 (40mm dia), R2 (40mm dia), R4 (45mm dia), RC5 (25, 30 & 60mm dia)
and R6 (35mm dia).

Lower Ground Floor
Excavation depth required: c. 1.2m

Trench 1 *Trial Excavation Results*

Root No.	Diameter (mm)	Depth (mm)	Comments
R1	40	1270	
R2	40	1400	*Requires severing.*
R3	240	760	*Likely requires severing.*
R4	45	870	
RC5	25, 30, 60	107	*Requires severing.* Root cluster.
R6	35	700	Branches off into a cluster of <25mm roots.
R7	150	680	A 30mm root protrudes from R7.
R8	50	370 – 750	
R9	50	1040	

R4 and R6 require severing to facilitate the proposed lower ground floor.
RC5 is also likely to require severing; however, these roots already
likely require severing to facilitate the basement excavations.



Canopy of T6 to be pruned back to the boundary
to provide clearance for construction.
Bay trees are fairly tolerant of pruning and such
pruning is unlikely to have a detrimental impact.

Tree roots unlikely to be present beneath
the existing dwelling, particularly the basement.

Any garden walls to be constructed for raised planters
should be excavated using hand tools only.
If any tree roots are encountered with a diameter greater
than 25mm, a shallow beam should be incorporated into
the design to span over any tree roots.

Basement Excavation.
Proposed excavation depth = c. 2.5m.
It is imperative that the large root (R3)
remains unharmed, if it is encountered.
Excavation in this area is to be overseen
by the project arborist.

Trial Trench Excavations were undertaken at the end of April 2024.
A member of Crown Tree Consultancy attended site at the beginning
of May 2024 to record the findings of the excavations.
The diameter of the roots were measured, and their depth below
ground level recorded. Two trenches were excavated; Trench 1 at the
front of the property, and Trench 2 at the rear of the property.
Trench locations, and the roots encountered are shown on this drawing.

Roots which likely require severing which emanate from T1 include:
R1, R2, R4, RC5 and R6.

Roots which likely require severing which emanate from T4 include:
R10, R11, R12, R12a, R14, RC15, R16, R17 and R18.

Both trees have been managed by pollarding in the past, meaning that
they likely require less rooting volume than their theoretical RPAs suggest
(the RPAs shown are based on their stem diameter).

It is recommended that the trees are continually managed by cyclical
pollarding.
Post construction soil amelioration is recommended to mitigate impact.

New Attenuation Tank.
Excavation required to a depth
of 450mm and only hand tools should
be used for the excavation to ensure
impact is kept to a minimum.

Existing boundary wall to be replaced.
If the existing foundation needs replacing,
excavation should not exceed the depth
of the existing foundations. Wall to be
demolished in a direction away form T1.

The overall height of the proposed extension is 6.4m.
The canopy of T1 begins at circa 8m above ground level.
Consequently, no canopy pruning is required to facilitate
the proposed extension.

Proposed Basement Layout (Dashed Blue)
Proposed Lower Ground Floor Layout (Pink)
Proposed Upper Ground Floor Layout (Light Blue)

New Refuse Store.
Excavation should not exceed a depth
of 350mm and only hand tools should
be used for the excavation to ensure
impact is kept to a minimum.

Drawing No: CCL 11774 / IAP Rev: 1
Title: Impact Assessment Plan
Site: 3a Upperpark Road NW3 2UN
Scale: 1:100 Paper Size: A1

CROWN Arboricultural Consultants 01422 316660

Tree Retention Categories
Stems & canopies shown

- Category A tree — Trees of high quality with an estimated life expectancy of 40+ years. Usually large trees with significant presence or smaller trees with excellent form. Retention of these trees is highly desirable.
- Category B tree — Trees of moderate quality with a life expectancy of 20+ years. Usually maturing trees, or younger trees with good form. Retention of these trees is desirable though less than Category A trees
- Category C tree — Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.
- Category U tree — Trees unsuitable for retention due to their very poor condition.

Impact Assessment Plan

Status: Final - for submission

BS 5837 Root Protection Area (radius = 12xstem diameter)
Root Protection Area needing amendment due to site conditions, e.g. presence of exising road or building.
Root Protection Area having been amended to account for for site conditions

T1 = Tree No 1 G2 = Group No 2 H3 = Hedge No 3

X Tree to be removed to facilitate the proposal
X Tree to be removed due to its low quality
Proposed pruning

MN = Measured North:
Canopy spreads are sometimes measured to an approximate N defined by site features. Often more accurate, especially where rows of trees are not aligned N-S or E-W.

Tree Ref.	Species	Height (m)	Root Protection Area Radius (m)	m²	Square (m)
T1	London Plane	25	16.4	849	29.1
T2	Lime	9.5	4.4	62	7.9
T3	Lime	12	7.4	174	13.2
T4	Horse Chestnut	16	11.5	417	20.4
T5	Pear	5	3.0	28	5.3
T6	Bay Laurel	5	1.2	5	2.1

Arboricultural Method Statement

CROWN Tree Consultancy 08000 14 13 30

Site: 3a Upper Park Road, London, NW3 2UN

Author: Emma Hoyle FDSc (Arboriculture), ED (Forestry & Arboriculture), M. Arbor. A

Date: 07 / 10 / 2024 Revision: 2 CCL ref No: 11774

Client: Studio MCW

Tree Protection Barriers

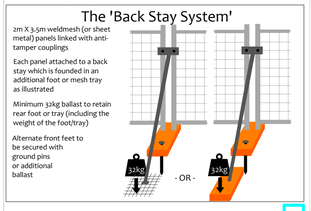
The purpose of tree protection barriers is to keep construction activity away from Restricted Activity Zones or Construction Exclusion Zones. They must be appropriate to the nature and proximity of activity within the site. The barriers must be erected prior to the commencement of all activity including demolition, soil stripping and delivery of materials and demolition (except where existing structures require demolition to enable the barriers to be installed). Barrier systems are specified below and are to be installed according to the legend on the Tree Protection Plan.

The Back-Stay System

This system will be installed where indicated by a purple line on the Tree Protection Plan. It is more practical over existing hard surfaces or where the fencing needs to be moved to enable permitted activities within a Restricted Activity Zone. This system is able to withstand occasional knocks by machinery and must not be relocated except with the consent of the site manager and the approval of the local authority.

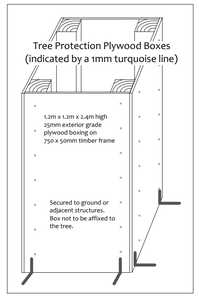
Within this system, weldmesh fencing panels (minimum height 2m) are affixed into rubber or concrete feet and clipped together with anti-tamper couplers. Two couplers should be used, spaced at least 1m apart. Alternate panels will be attached to a diagonal back stay connected to an additional foot or baseplate secured with ground pins or additional ballast. Where ground pins are not used, the total weight of the foot/plate plus ballast must total no less than 32kg.

Where it is not possible to install diagonal struts (such as very close to a hedge) then the front feet will be secured using ground pins or ballast.



Stem Protection – Timber Boxing

Where indicated by a turquoise square on the Tree Protection Plan, robust plywood boxing will be installed around the stem of T1. The plywood boxing specification is indicated in the diagram below. The actual size of the plywood boxing will be determined by the extent of the root flare at the base of the stem. The box shall be large enough to avoid contact with any part of the tree that it surrounds. No fixings shall be attached to any part of the tree. Instead, it shall be free standing or attached to the ground or adjacent structures (e.g. adjacent walls or fences).



Notices

Suitable weather-proof notices are to be displayed to identify tree protection zones. They must state the purpose of the fencing and that it will not be moved, or traversed, other than by authorised personnel.

Removal of Tree Protection Barriers

Removal of protective fencing or ground protection measures will only be done after all major construction work is complete and their removal has been approved by the appointed arborist.

Ground Protection Measures

Within Restricted Activity Zones, soils containing roots may be subject to compaction due to general construction activity (including pedestrian activity and use of plant machinery). In order to minimise compaction, it is proposed to ensure that a suitable load-spreading surface is in place at all times.

Any existing hard surfacing may be retained where engineers consider it adequate to spread the load of construction traffic. Otherwise, it will be reinforced or replaced with adequate ground protection measures.

Unless specified otherwise, ground protection will consist of 24mm OSB boards laid at double thickness and screwed together to prevent slippage. The ground will be made even by raking, and by adding a 100mm of sand or woodchip, wherever vehicular access is proposed. Where only pedestrian traffic will occur, boards or planks may be laid directly onto the ground.

Where engineers consider OSB boards to be inadequate (e.g. for large plant machinery) sturdier ground protection measures will be installed such as road plates, or 100mm of 7–40mm angular gravel installed in 3D cellular confinement system (e.g. Cellweb TM).

If a piling mat is required, specifications will be agreed between engineers and the project arborist.

The ground protection measures will be installed and approved before commencement of demolition and construction activity and before the arrival of plant machinery or materials. They will remain in place until all heavy construction activity is complete.

Construction Exclusion Zones

Within Construction Exclusion Zones the following restrictions apply:

- Tree Protection Barriers will be erected and maintained throughout the entire project as indicated on the Tree Protection Plan and under the header - *Tree Protection Barriers*.
- These will remain in place at all times until all construction work is complete. The tree protection measures at the rear of the site will only be removed to enable landscaping works and installation of the proposed timber decking. At such times, ground protection measures will be installed, and excavation shall be limited to that required for new timber post holes.
- No other construction activity or excavation will occur unless agreed otherwise by the project arborist and local authority.
- No vehicles or plant machinery will be driven or parked.
- No tree works, other than those specified on this document will be undertaken.
- No alterations of ground levels or conditions will occur.
- No chemicals or cement washings will be permitted.
- No temporary structures will be installed.
- No spoil will be stored.
- No fires will be permitted.
- All hazardous materials (including non-essential cement products) are forbidden.

Tree Works Specification

The following table specifies the tree works which will be required prior to the commencement of construction activity:

Tree Reference	Action Required	Notes
T6	Prune canopy back to the boundary.	Branches to be pruned back to a suitable branch junction or the branch collar wherever possible.

The pruning works should be undertaken sympathetically, working to BS 3998 guidelines.

CROWN Tree Consultancy 01422 316660

Timing of Operations

Activity within the site shall be phased according to the following chronology

Order	Phase	Activity
1st.	Pre-Construction Phase	Planning conditions relating to trees to be identified and discussed with the Project Arborist and Site Manager.
2nd.		All specified tree pruning to be undertaken (see Header -*Tree Works Schedule*).
3rd.		Install the tree protection barriers (fencing and ground protection boards - see Headers -*Tree Protection Barriers* and *Ground Protection Measures*).
4th.		Pre-Commencement site meeting: Tree protection barriers inspected. Additional protection measures to be agreed. Variances to be agreed. Location of underground services to be agreed. Boundary treatments to be agreed. Extents of excavation to be agreed. Scaffold restrictions to be agreed. Scope of future inspections / monitoring to be agreed.
5th.		Arboricultural Method Statement to be revised and approved (if necessary).
		Protection measures confirmed acceptable by the Local Authority
6th.	Demolition and Construction Phase	Demolish existing structures and remove existing surfaces where applicable.
7th.		Install new buildings, hard surfaces and services taking into account restricted activities as specified in this Arboricultural Method Statement.
8th.		Site meeting with Project Arborist. Landscaping restrictions to be agreed. Condition of retained trees to be assessed and mitigation agreed. Ground conditions to be assessed and ground remediation / soil amelioration to be agreed.
9th.	Post-Construction Phase	Remove protective barriers (fencing and ground protection measures as applicable).
10th.		Undertake restricted landscaping operations within Root Protection Areas, including (where applicable) boundary treatments, pedestrian surfaces, new timber decking and any proposed tree planting.

Site Monitoring Schedule

Inspection	Site Attendees	Comments
Pre- Start Desk-top To occur prior to any works taking place on the site.	N/A.	Project Manager and Site Manager to study this Method Statement & contact the Project Arborist to clarify all protection measures.
Pre-Start Meeting After tree works completed & tree protection barriers / ground protection measures installed and prior to any other activity, inc. demolition & soil stripping.	Project Manager, Site Manager, Project Arborist, relevant contractors. Tree Officer invited.	Tree protection fencing locations & specification checked. Ground protection measures checked. Contractors to be inducted to all relevant aspects of the Arboricultural Method Statement. Responsibilities checked and acknowledged. Adherence to the Arboricultural Method Statement to be discussed and agreed. Report on findings to be provided by the arborist and sent to the local authority tree officer by the project manager.
Monthly Inspection and Reporting To occur once per calendar month throughout the entirety of the project until the local authority agree that tree protection measures may be removed.	Site Manager and Project Arborist.	Tree protection fencing locations & specification checked. Ground protection measures checked. Past month, present and future month – activities and adherence to Arboricultural Method Statement discussed and checked. Report on findings to be provided by the Project Arborist and sent to the local authority by the Project Manager.
Overseeing Basement Excavations in Restricted Activity Zone B. Excavations to be overseen by the project arborist.	Site Manager and Project Arborist.	Two weeks' notice to be given prior to commencement. Excavation to be as specified in this Method Statement. Roots to be retained or pruned as specified in this Method Statement. Mitigation measures to be employed specified by the project arborist. Activities to be recorded and photographed. Report on findings to be provided by the Project Arborist and sent to the local authority by the Project Manager.
Overseeing Excavations in Restricted Activity Zones C and D. Initial Excavation to to be overseen by the project arborist.	Site Manager and Project Arborist.	Two weeks' notice to be given prior to commencement. Excavation to be as specified in this Method Statement. Roots to be retained or pruned as specified in this Method Statement. Mitigation measures to be employed specified by the project arborist. Activities to be recorded and photographed. Report on findings to be provided by the Project Arborist and sent to the local authority by the Project Manager.
Any other ground disturbance in Restricted Zones & Construction Exclusion Zones Including demolition, soil stripping, removal of hard surfaces, excavation for new surfacing, foundations, service trenches etc.	Site Manager, Project Arborist.	Two weeks' notice to be given prior to commencement. Excavation to be as specified in this Method Statement. Excavations to be recorded and photographed. Mitigation measures to be employed specified by the project arborist.
Post-Construction Meeting Post external construction activity but prior to removal of fencing & landscaping operations.	Site Manager, Project Arborist. Tree Officer invited.	Retained trees inspected. Ground conditions assessed and mitigation measures agreed where appropriate. Further landscaping operations and restrictions to be agreed.

Personnel and Accountability

This table should be completed at the Pre-Start Meeting or earlier

Position	Name	Contact Phone & email	Roles
Project Manager	TBC at Pre-Start Meeting	Insert Details	Liaising with site manager & project arborist regarding any potential issues relating to trees (including pre-start clarification of the Arboricultural Method Statement). Scheduling of meetings, excavations and inspections (including project arborist and local authority tree officer where applicable). Overseeing this monitoring schedule. Instructing the project arborist and arranging access. Liaising with local authority regarding discharge of planning conditions and variances to the Arboriculturral Method Statement. Reporting to the local authority following site inspections and any variation or incidents.
Site Manager	TBC at Pre-Start Meeting	Insert Details	Day to day monitoring of tree protection measures. Induction of all contractors. Reporting to the Project Manager and the Appointed Arborist of any incidents or potential variations to the agreed tree protection measures.
Project Arborist	Crown Tree Consultancy	08000 14 13 30 0203 797 7449 info@crowntrees.co.uk	Liaising with LPA Tree Officer over technical arboricultural matters. Upon instruction the arborist shall inspect the tree protection barriers including ground protection measures and produce a short report for the project manager to submit. Upon instruction the arborist shall attend any specified site visits and inspections and produce a short report for the project manager to submit.
Additional Contact	Insert Details	Insert Details	Insert Details

Tree Data Schedule

Reference (C = Group, H = Hedge)	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N	W	E	S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals) Priority	Impact Freq (yrs)	Vigour Physiological Condition	Structural Condition	Amenity Value Life Expectancy (yrs)	Retention Category
T1	Mature **London Plane** Platanus x hispanica.	25	8	157	11	11	11	8.5		Position: Situated on third party land. Form: Multi-stemmed at 6m with a balanced crown. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: No significant defects observed.**	No action required.	n/a	Moderate	Good	High	40+	B +
T2	Semi-Mature **Lime** Tilia sp.	9.5	6	37	2	2	2	2		Position: Situated on third party land. Form: Multi-stemmed at 6m with a balanced crown. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: No significant defects observed.**	No action required.	n/a	Moderate	Good	Low	40+	C
T3	Early-Mature **Lime** Tilia sp.	12	5	62	5	5	5	6		Position: Situated on third party land. Form: Triple-stemmed at 3m with an unbalanced crown & leaning. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: Poor unions where multi-stemmed.** Other: Acceptable condition at present due to heavy reduction. Tree displacing boundary wall.	No action required.	n/a	Moderate	Good	Low	40+	C
T4	Mature **Horse Chestnut** Aesculus hippocastanum.	16	3	98	6	6	6	3		Position: Currently situated on third party land, adjacent rear boundary. Form: Multi-stemmed at 3m with a balanced crown. History: Managed by cyclical pollard. Occasional pruning wounds due to crown lifting (healing well). **Defects: No significant defects observed.** Other: Retaining wall adjacent tree has collapsed in the past leaving roots exposed.	No action required.	n/a	Moderate	Fair	Moderate	20-40	B
T5	Semi-Mature **Pear** Pyrus sp.	5	3	25	3	3	3	3.5		Position: Situated on third party land. Form: Single stemmed and leaning with an unbalanced crown. History: No evidence of significant pruning. **Defects: Significant bark wounds to stem (acceptable condition at present).**	Monitor.	Moderate	Moderate	Fair	Low	20-40	C
T6	Semi-Mature **Bay Laurel** Laurus nobilis.	5	1.5	10	4	4	4	1.5		Position: Situated on third party land. Form: Twin-stemmed at 3m with an unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects.** Other: Limited inspection, dimensions estimated.	No action required.	n/a	Moderate	Good	Low	40+	C

Restrictions in Specific Zones

Restricted Activity Zone A

Within this zone, tree roots are likely to be present where access is required to facilitate construction. The following restrictions shall apply:

- No vehicles or plant machinery will park or operate unless a suitable load spreading surface is in place. The load spreading surface will be installed and/or maintained as specified under the heading **Ground Protection Measures**. This will remain in place throughout the entire demolition and construction phase or until any new permanent hard surfacing is installed. Any pedestrian activity will also require a suitable load-spreading surface.
- Removal of existing structures such as walls, steps and hard surfaces (where applicable) will be undertaken using hand tools only. The existing boundary wall adjacent T1 will be carefully demolished and pulled in a direction away from T1.
- When replacing the existing western boundary wall, no excavation will occur beyond the depth of the existing foundations. If foundations require replacing, all tree roots in excess of 25mm will be retained.
- Excavation for the proposed refuse store will be undertaken using hand tools only. Excavation will not exceed a depth of 350mm.
- Excavation for the proposed underground attenuation tank will not exceed a depth of 450mm and will be excavated using hand tools only.
- Excavation for the surface channel will not exceed a depth of 100mm, without prior consultation with the project arborist and a methodology agreed and approved by the local authority. Excavation to be undertaken using hand tools only.
- The existing driveway is to be replaced with permeable surfacing and stone storage. No excavation will occur beyond the removal of the existing surface.
- Any garden/planter walls to be installed will be constructed on a shallow pile and beam type foundation. Excavation will be undertaken using hand tools, and any tree roots with a diameter over 25mm will be retained intact and spanned over.
- Excavation for timber patio post holes shall be undertaken using hand tools only and will be positioned to avoid tree roots in excess of 25mm diameter. A void will be maintained between the underside of the decking and the ground to maintain rooting conditions. See further restrictions under the header: *New Decking Posts*.
- No further changes to ground levels will occur.
- No further excavation will occur in this zone.
- No new permanent or temporary structures will be erected other than those shown on the planning application documents unless approved by the local authority.
- If roots are encountered in excess of 25mm diameter, they will be retained wherever possible and protected with damp sacking during times that they are unearthed. Any roots in excess of 10mm that need to be severed will be pruned with secateurs.
- Storage of materials and spoil will be avoided in these areas unless it has been agreed with the project arborist that the ground protection measures are adequate to ensure no soil compaction or contamination occurs.
- All hazardous materials (including non-essential cement products) will be forbidden.
- No fires will be permitted.

Restricted Activity Zone B

Within this zone it is proposed to excavate for the basement. Either contiguous piling (or sheet piling) shall be installed along the edge of the basement, or an alternative method shall be adopted which does not disturb soils beyond the footprint of the basement (e.g. pinning). The specific method adopted will vary between contractors. However, the following restrictions will apply and must be adhered to:

- No excavation or ground disturbance will occur beyond the footprint of the basement.
- Where an excavator is used, it should operate from within the footprint of the basement, or from a suitable load-spreading surface.
- The excavator or piling rig shall be marshalled to ensure no contact is made with any tree canopy.
- Any piling mat required shall need to be installed entirely above ground. If this requires additional stabilisation, using screw piles for example, trial excavation shall be undertaken in the presence of the project arborist to determine where such piles may be located to avoid all significant roots (i.e. roots over 25mm in diameter).
- In the case of pinning, the project arborist shall oversee the initial 1m of excavation and shall ensure that any roots encountered are neatly pruned.

Restricted Activity Zone C

Within this zone it is proposed to excavate for the lower ground floor to a depth of 1.2m. The following restrictions will apply:

- No excavation or ground disturbance will occur beyond the footprint of the lower ground floor.
- The appointed arborist will oversee the initial excavation, to a minimum depth of 800mm along the edge of the proposed footprint, which should be undertaken using hand tools only.
- Any root severance that is required will be undertaken by the arborist present, who will use clean, sharp tools.
- If an excavator is required for the remainder of the excavation, it will operate from a suitable load-spreading surface. The excavator will also be marshalled to ensure no contact is made with any tree canopy.

Restricted Activity Zone D

In this zone, excavation is required for the upper ground floor extension. A section of the existing boundary wall is to be demolished and replaced with the outer-facing wall of the extension. The following restrictions will apply:

- No excavation will occur beyond the depth of the existing wall foundation.
- The new extension is to be constructed on a shallow raft/beam foundation.
- Excavation for the raft/beam will not exceed a depth of 200mm.
- Excavation and removal of any existing surfaces will be undertaken using hand tools.
- The raft/beam will be supported on screw piles. Before installing the screw piles, their approximate location will be decided, and the upper soils will be probed to ensure there are no significant tree roots directly beneath the surface.

General Restrictions

Preparatory Works

No demolition, removal of surfaces, or soil stripping will commence until the protective fencing and ground protection measures are installed to the satisfaction of the local authority.

Fires

No fires will be permitted beneath any tree canopy or within 5m of any tree stem, branch or foliage. No fires will be permitted within any Construction Exclusion Zone or Restricted Activity Zone. No fires will be permitted in the vicinity of any exposed tree roots.

Canopy Protection

In order to protect tree canopies the following restrictions will apply throughout the site:

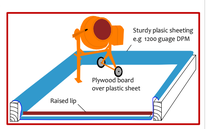
- No machinery in excess of 2m will pass beneath the canopy of any tree without being carefully marshalled in order to ensure that no branches are damaged.
- If materials require installation or delivery beneath tree canopies, this will be done without the use of overhead cranes.
- If materials are to be installed or delivered close to tree canopies (but not beneath them) and a crane is required, they will be carefully marshalled in order to ensure that branches are not accidentally damaged.

Storage of Spoil and Materials

Storage of materials and spoil will be avoided in any Construction Exclusion Zones and Restricted Activity Zones unless it has been agreed with the project arborist that the ground protection measures are adequate to ensure no soil compaction or contamination occurs. All hazardous materials (including non-essential cement products) will be forbidden.

Hazardous Materials

Any mixing of cement based materials will take place outside the Construction Exclusion Zones and Restricted Activity Zones. Where cement is to be mixed at considerable distances from trees and water run-off cannot enter Root Protection Areas, then no further special measures are required. Otherwise, provision will be made to ensure that the mixing area is contained so that no water run-off enters the Root Protection Area of any trees (see diagram for example). Mixers and barrows will be cleaned within this area.



All other chemicals hazardous to tree health, including petrol and diesel, will be stored in suitable containers as specified by current COSHH Regulations, and kept away from Root Protection Areas.

Underground Services

Except for those detailed under Restricted Activity Zone A, no further underground services will be installed in any part of the Construction Exclusion Zones or Restricted Activity Zones, unless done so in a manner detailed in a specific Method Statement and approved by the local authority.

Site Hoarding

If site hoarding shall be installed over the Root Protection Area of any tree, the following restrictions will apply:

- Ground levels will be maintained as existing.
- Post holes will not exceed 300mm x 300mm.
- No post hole will be excavated within 1.5m of any tree stem.
- Post holes will be excavated using hand tools or by a post-hole auger attached to plant machinery sited outside of Root Protection Areas.
- Roots in excess of 25mm will be retained wherever possible.
- Roots in excess of 10mm will be pruned with sharp secateurs.
- Pruning will be minimal and only undertaken where absolutely necessary to facilitate the site hoarding. It will be undertaken by a reputable tree surgeon working to BS 3998 (2010).

Site hoarding may be installed in place of the specified tree protection measures subject to the approval of the local authority with regard to its location and specification.

Siting of Cabins

Cabins will be located outside of Construction Exclusion Zones and Restricted Activity Zones unless agreed otherwise by the project arborist. Where this is being considered, the project arborist will be consulted, and specific tree protection measures agreed. The following general restrictions will apply:

- All services to and from site cabins will be installed above ground through any Root Protection Areas.
- No excavation will occur within Root Protection Areas to enable cabins to be installed.
- The cabins will be founded on a suitable load spreading surface.

New Decking Posts

Where new decking is to be installed within Root Protection Areas, the following restrictions will apply:

- All post holes will be excavated by hand and kept as narrow as possible (maximum diameter 300mm).
- Exploratory post holes will be dug before committing to post / panel positions. If any roots in excess of 25mm are encountered, they are to remain intact and the post hole will be relocated slightly. The fencing system must permit such flexibility (i.e. where fixed panel widths are used, all post holes must be excavated before committing to the final location).
- Any roots in excess of 10mm which are severed will be neatly pruned back with secateurs. This shall encourage healing and reduce the likelihood of infection.

Tree Protection Plan

CROWN Arboricultural Consultants 01422 316660

BS 5837 Root Protection Area (Sometimes not included on the Tree Protection Plan to avoid confusion with restricted Zones)

T1 = Tree No 1 G2 = Group No 2 H3 = Hedge No 3

Tree Retention Categories
Stems & canopies shown

Category A tree	Trees of high quality with an estimated life expectancy of 40+ years. Usually large trees with significant presence or smaller trees with excellent form. Retention of these trees is highly desirable.	
Category B tree	Trees of moderate quality with a life expectancy of 20+ years. Usually maturing trees, or younger trees with good form. Retention of these trees is desirable though less than Category A trees	
Category C tree	Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.	
Category U tree	Trees unsuitable for retention due to their very poor condition.	

Drawing No: CCL 11774 / TPP Rev: 2

Title: Tree Protection Plan (Existing Layout with Proposals Overlaid)

Site: 3a Upper Park Road, London, NW3 2UN

Scale: 1:100 Paper Size: A1