



Arboricultural Impact Assessment

77 Lawn Road, Camden NW3 2XB

Client Name: Laura Bolohan & Xavier Menguy.

Project Number: P2468.1.0

Date: 18 March 2016

Client:	Laura Bolohan & Xavier Menguy
Agent:	Enric Torner
Site:	77 Lawn Road, Camden NW3 2XB
Report ref.:	P2468.1.0
Prepared by:	Richard Parmee BSc MSc Tech Cert (ArborA) MArborA
Reviewed by:	Alex Brearley BSc (Hons)
Approved by:	Richard Parmee BSc MSc Tech Cert (ArborA) MArborA
Date:	18 March 2016
Version:	FINAL

agb Environmental Ltd has prepared this document in accordance with the instructions of Enric Torner on behalf of Laura Bolohan and Xavier Menguy for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

© agb Environmental Ltd 2016
Newmarket Business Centre
341 Exning Road, Newmarket, CB8 0AT
Tel: 01638 663226
www.agbenvironmental.co.uk



agb Environmental Ltd

1 Report Summary

This Arboricultural Impact Assessment has been prepared to support a planning application for development at 77 Lawn Road, Camden.

The site is a residential property. It is proposed to increase the accommodation by enlarging the basement area and constructing an extension above ground. This would also require changes to the driveway, together with new steps and a path at the front, and a new patio to the rear. Development will require some tree removal and reduction. Development may have both direct and indirect impacts on retained trees.

The potential impacts and proposed mitigation measures are set out in the table.

Potential Development Impact	Trees Affected	Proposed Mitigation Measures
Removal and crown reduction of trees due to incompatibility with the development, or residential use of the site.	T1, T7, T8	All trees affected are of small size and low quality, with little or no public visibility.
Removal of existing walls and hard surfacing. Excavation for altered driveway gradient, enlarged basement and steps. Construction of new foundations, retaining walls and steps.	T8, T10	<p>Long-term presence of retaining walls and hard surfacing is likely to reduce root growth in the areas of excavation.</p> <p>Use hand tools only for all surface, wall and foundation removal, and excavation, to minimise accidental damage and allow root removal with clean cuts.</p> <p>Provide temporary ground protection for the driveway to maintain access until the new surface is constructed.</p> <p>Design foundations to tolerate the presence of trees.</p> <p>Design the layout with due cognisance to the impacts of trees on site use.</p>
Construction of new path, leading to root damage and removal, crown reduction and tree removal.	T10	Use reduced-dig methodology to minimise excavation, retain permeability and provide a resilient construction.
Damage to tree roots from compaction and contamination from construction activities. Damage to tree stems and crowns from construction activities.	All retained trees.	<p>Erect protective fencing to encompass all sections of tree crowns and RPAs, whichever is the greater, with this erected prior to the commencement of development and maintained in place until such time as all development is complete.</p> <p>Install ground protection where working space is required within any RPA.</p>

At the time of the report, it is understood that there is statutory tree protection (Tree Preservation Orders) affecting tree T10, and that all trees are subject to statutory protection as the site is within a Conservation Area.

This report sets out tree removal and reduction to allow space for viable development, together with methodology for construction and tree protection requirements. It is considered that the impact of tree removal and reduction from development will have minimal visual impact. Any development impacts on retained trees can be effectively mitigated through the use of tree protection and methodology set out within the report.

Contents

1	Report Summary.....	2
2	Introduction.....	5
2.1	Brief and Proposals.....	5
2.2	Documents and Information.....	5
2.3	Survey Details and Constraints.....	5
3	Site and Surrounding Area Context.....	6
3.1	Site Description.....	6
3.2	Soil Assessment.....	6
3.3	Existing Tree Stock Summary.....	6
4	Statutory Tree Protection.....	7
5	Principal Survey Findings and Arboricultural Impacts.....	8
5.1	Development Proposals.....	8
5.2	Tree Removals and Reduction.....	8
5.2.1	Removal and Reduction for Reasons of Condition.....	8
5.2.2	Removal and Reduction for Reasons of Incompatibility.....	8
5.2.3	Assessment of Proposed Tree Removal and Reduction.....	8
5.3	Tree Interface with Proposals.....	8
5.3.1	Hard Surface Interface.....	8
5.3.2	Building Interface.....	9
6	Arboricultural Method Statement.....	11
6.1	Guidance Utilised.....	11
6.2	Contact Details.....	11
6.3	Tree Works.....	11
6.4	Tree Protection.....	12
6.5	Construction Access/Materials Storage.....	12
6.6	Provision of New Surfaces within the RPA of T10.....	12
6.7	Provision of New Supporting Walls and Steps within RPAs.....	13
6.8	Schedule of Works and Supervision.....	13
6.9	General Guidance.....	14
7	Conclusions.....	15
8	References.....	16

Appendix 1 Explanatory Notes for Term Use in Appendices 3, 4 & 5

Appendix 2 Tree Photos

Appendix 3 Tree Survey Table

Appendix 4 Tree Constraints Plan

Appendix 5 Tree Protection Plan

Appendix 6 Tree Protective Fencing Specification

Appendix 7 Ground Protection Details

Appendix 8 Reduced-Dig Construction Details

2 Introduction

2.1 Brief and Proposals

agb Environmental Ltd was commissioned by Enric Torner on behalf of Laura Bolohan and Xavier Menguy to undertake an Arboricultural Survey at 77 Lawn Road, Camden to accompany a planning application. The purpose of the survey was to identify:

- Tree age, condition class, general health and dimensions;
- Root Protection Area;
- Constraints and potential tree removals in respect of the proposed layout;
- The location and means of protecting retained trees;
- Preliminary methodology for implementing the proposed layout.

2.2 Documents and Information

The following documents were utilised in the preparation of this report:

- 15112_Topographical_Final;
- Lwn-GA00;
- BS5837:2012 *Trees in Relation to Design, Demolition & Construction - Recommendations*.

2.3 Survey Details and Constraints

The survey was undertaken on the 19th October 2015 by the agb Environmental Principal Arboricultural Consultant, in adherence to the principles of BS5837:2012 *Trees in Relation to Design, Demolition & Construction - Recommendations*. Tree inspections have been undertaken from ground level using non-invasive techniques only, in accordance with the principles of the Visual Tree Assessment method developed by Mattheck and Breloer (1994).

The survey obtained data upon twelve individual trees. Trees with a stem diameter below 75mm, when measured at 1.5m above ground level, were not included. The terms used to explain the data recorded are provided in **Appendix 1**.

Comments on tree condition and safety relate to the condition of trees at the time of survey. It should be recognised that tree condition is subject to change in response to a range of factors. This report does not take into account potential extreme climatic events not normally expected in this locality, which could include, but aren't restricted to, severe windstorms, floods or drought. This report also doesn't take into account potential outbreaks of pests or diseases.

This report contains recommendations concerning work that should be carried out to manage the risks posed to and by the trees responsibly, and reduce them to an acceptable level. Even after the recommended work has been carried out some trees could still fail, but it is unlikely that they will cause significant harm unless the weather conditions are extreme and/or there are major hidden defects.

This report considers the potential for trees to influence soil in such a way as to cause the proposed development, or other buildings, to suffer tree related subsidence or heave damage, but does not attempt to quantify this. Operations carried out in the vicinity of the trees, either in the past or future, could affect their health and stability; such operations could include, but aren't restricted to, trenches dug for the installation or repair of utilities.

3 Site and Surrounding Area Context

3.1 Site Description

The site is a semi-detached dwelling on the west side of Lawn Road, Camden. Surrounding land use is predominantly residential, with mature tree cover typical of the area.

Vehicular access is via the driveway along the northern boundary, with pedestrian access central between the two semi-detached properties. The site slopes up from the road to the house, with a level raised lawn area between the path and driveway. The house sits centrally, with a patio area directly to the rear, leading to a level rear lawn, containing mature trees and shrubs. Access to the rear garden is via the house or side path along the north boundary.

3.2 Soil Assessment

Information from the Geology of Britain viewer (British Geological Survey, 2015) indicates that the bedrock geology local to the property is London Clay Formation – Clay, Silt and Sand. Clay soils generally have a high potential for volume change in response to soil moisture change, possibly resulting from the presence of trees.

An assessment of the soil conditions within the site will be required to inform foundation construction. This assessment must be made by a qualified structural engineer or geotechnical consultant.

3.3 Existing Tree Stock Summary

Photographic plates are provided in **Appendix 2**. Details of all trees surveyed are provided in the Tree Survey Table in **Appendix 3**, with locations in relation to the site in the Tree Constraints Plan (TCP) in **Appendix 4**.

The largest tree within the site is T10, sycamore, which stands on the road frontage and is the only tree in the front garden. Dense sucker growth surrounds the lower trunk, preventing full visual inspection, but with no significant defects visible, this tree is considered to be of moderate quality, category B.

Within the rear garden are four trees. T4, holly, is the only tree considered to be category B, with all other onsite trees placed in category C, of low quality. For T7, this categorisation is due to small size. For T1, cherry, and T2, apple, the categorisation is due to poor form and the presence of significant defects, considered to greatly limit retention time.

A number of offsite trees are included due to their proximity to the site. The crowns of T3, eucalyptus, T6, Pissard plum, and T8, yew, all overhang the rear garden boundary. T8 is of low quality due to small size, with the other two both of moderate quality, having a degree of local prominence. Also included is T5, Dawn redwood, a large, impressive tree of good form and high prominence, the only tree considered to be of high quality, category A. Though its crown does not overhang the site, it is included due to its root spread, expected to extend into the site.

Two neighbouring street trees are included. Neither has any crown overhang of the site, though the roots of T9, ash, are anticipated to extend into the site. T11, sycamore, is likely to be too remote from the site to be within influencing distance. Both trees are of moderate quality.

4 Statutory Tree Protection

It has been confirmed with the London Borough of Camden that the site is located within the Parkhill Conservation Area (CA). Tree T10, sycamore, is subject to Tree Preservation Orders (TPO 36H). This should be confirmed with the Local Planning Authority (LPA) prior to any works on the trees taking place.

Where statutory tree protection is in place, this provides the LPA with a degree of control over tree work. Anyone wishing to carry out work to protected trees will need to contact the LPA prior to commencing any work, with the process dependent on the nature of tree protection in place. The presence of statutory tree protection may prevent work that would otherwise be rightfully conducted, such as reducing overhanging branches from a neighbour's tree back to the boundary.

For trees within a CA, statutory protection is relevant to any tree species with a stem diameter of 75mm or above, when measured at 1.5m above ground level. Anyone wishing to carry out work to such trees is legally required to notify the LPA a minimum of six weeks before commencing. The LPA may treat the notification as a planning application, including a public consultation and a site visit from an officer. If the LPA objects to the proposed work, it must serve a TPO during the six-week period to prevent it taking place. If the six-week period lapses without a TPO having been served, the work may then proceed, normally to be completed within two years of notification, beyond which a new notification is required.

Where trees are subject to TPO, work requires written permission from the LPA. Applications must be submitted using the standard form, normally available from their website or on request. This is treated as a planning application, with a period of public consultation and a visit from an officer. The LPA must normally determine the application within eight weeks, issuing a decision letter. The applicant has a right of appeal if dissatisfied with the decision.

In both circumstances, work required in an emergency is exempt from the above process, though anyone carrying out such work should contact the LPA to advise them that this is the case prior to commencing.

If this report is submitted to accompany a planning application, any tree work specified, relating to trees subject to statutory tree protection, will be considered as part of that application. Therefore, if planning permission is subsequently granted, this would normally provide permission for all tree work. Clarification may be sought from the LPA over this.

5 Principal Survey Findings and Arboricultural Impacts

The main findings are summarised in the following section. For ease of reference, it is recommended that this section is cross referenced with the information and plans provided within **Appendices 3, 4 & 5**.

5.1 Development Proposals

The proposal is to increase the accommodation by enlarging the basement to the north, east and west, and above ground extending the building to the north and west. The work would require excavation to the front and north sides of the house to create new accommodation, including an underground garage with a green roof. External changes would see an enlarged rear patio area and changes to the driveway, with this sloping down from the road to the underground garage.

5.2 Tree Removals and Reduction

Details of all tree work and tree removals are provided in **Table 6.2** and illustrated on the Tree Protection Plan (TPP) provided in **Appendix 5**.

5.2.1 Removal and Reduction for Reasons of Condition

No tree removal is recommended for reasons of condition. The removal of basal growth from T10 is recommended to allow full visual inspection of the tree's lower trunk.

5.2.2 Removal and Reduction for Reasons of Incompatibility

T1, cherry, and T7, pittosporum, will require removal due to direct conflict with the proposed layout.

The overhanging section of the crown of T8, yew, will require reduction back to the boundary, due to conflict with the layout. The extent of crown removal is significant, possibly 40 percent. However, yew is a species known to be tolerant of extensive reduction, and capable of regenerating fresh growth from bare wood, so this reduction is not considered to be detrimental to the tree's long-term retention.

5.2.3 Assessment of Proposed Tree Removal and Reduction

Both T1 and T7 have little, if any, public visibility, with views external to the site limited to those from the immediate neighbouring properties. Reduction of the crown of T8 will only be noticeable from within the site.

5.3 Tree Interface with Proposals

5.3.1 Hard Surface Interface

The roots of tree T10 will have an interface with new paving and the altered driveway along the north and west of its Root Protection Area (RPA). Surface construction and presence has potential to lead to root damage and loss as a result of:

- Excavation for construction – severing or damaging roots;
- Exposure and desiccation of exposed roots following excavation – leading to root death;
- Construction activities (material delivery, storage and spillage) compacting and contaminating soil – leading to root death;
- The loss of unsurfaced ground, obstructing the passage of water, nutrients and air to roots beneath;

- Future incremental root expansion leading to surface distortion and damage – potentially requiring root removal to alleviate/prevent further damage.

To mitigate these potential impacts, the following is proposed:

- Reduced-dig construction methodology should be used where the new path is proposed within the front garden, with excavation limited to the removal of turf and any loose material, to produce a firm soil surface on which the path will be constructed. Any difference between the path's wearing layer and surrounding ground levels will be made up by grading topsoil to meet the height of the wearing layer;
- Hand tools only must be used to remove the existing driveway within the RPA, to minimise damage to roots beneath. The surface must be pulled back away from the tree to allow work and removal to take place from surface for later removal, until the entire RPA is cleared;
- Hand excavation must be used for the section of driveway within the RPA to minimise root damage. Where roots require removal, cuts must be made using a clean, sharp saw to minimise wound size;
- Where roots are exposed as a result of excavation, these must be provided with temporary protection using either dampened hessian or washed sharp sand, until such time as the new sub-base is installed. As continuous access may be required along the driveway, temporary ground protection will be required within the RPA until such time as the new surface is constructed;
- The sub-base system for the path and driveway should be constructed to provide good resilience against future incremental root expansion to prevent distortion or damage of the surface;
- Protective fencing will be erected round the entire front garden area in which no development is proposed, to prevent use of unprotected ground for construction access and material storage.

The long-term presence of the driveway, Lawn Road and retaining wall will have influenced the root growth of T10. It is considered likely that the tree is pre-dated by these structures and root growth will favour unsurfaced ground within the front garden and adjacent front garden to the south. Therefore, the following assumptions are made:

- Root growth beneath the driveway will be minimal, with the retaining wall foundations acting as a barrier to growth to the north;
- Root growth towards the front of the house will be more extensive than the RPA suggests.

Therefore, excavation for the new driveway gradient will result in a lower level of root loss than the RPA may indicate, whilst path and steps construction beyond the RPA is likely to result in root loss. As a consequence, protection and construction measures for T10 will need to extend to the eastern-most extent of the basement extension, beyond the indicated RPA.

5.3.2 Building Interface

New wall and steps construction will take place within the RPAs of T8 and T10, where excavation is required for the enlarged basement, steps and altered driveway gradient. In addition, construction access will be required within a section of the RPA of T6. Construction has potential to adversely affect trees as a result of:

- Excavation for construction – severing or damaging roots;
- Construction activities (material delivery, storage and spillage) compacting and contaminating soil – leading to root death;
- Future incremental root expansion and the influence of roots on soil moisture content, leading to structural distortion and damage – potentially requiring root or tree removal to alleviate/prevent further damage.

The same consideration to the long-term presence of structures and surfaces on the root growth of T10. This consideration is extended to T8, the roots of which are likely to have been restricted to the south due to the boundary wall and lower surfaced ground level within the site. Again, the root growth of this tree is expected to have favoured unsurfaced ground within the adjacent garden, so excavation for the enlarged basement is unlikely to result in the level of root loss suggested by the RPA.

For T10, where retaining wall construction takes place alongside the driveway, this will be in the same area position as the existing wall. Foundation depth may be deeper, but existing foundations are likely to have acted as a barrier to root growth, so any root loss from this work is likely to be minor.

Where excavation and retaining wall construction takes place for the enlarged basement and new steps, this has potential to lead to root loss on the eastern edge, within and beyond the RPA of T10.

For all excavation, to minimise adverse impacts, the following is proposed:

- All removal of existing walls and foundations takes place using hand tools to minimise accidental root damage and loss;
- All additional excavation must be by hand for the closest 300mm to T8 or T10, to minimise the potential for accidental root damage and loss;
- Where root removal is required, this must be carried out using a clean, sharp saw to minimise wound size;
- All new structures must be designed and constructed with full cognisance of the presence of trees, able to tolerate their presence at mature size without suffering direct or indirect structural damage.

6 Arboricultural Method Statement

The information in this section has been provided on the basis of the plans provided at the time the report was prepared. Should the site layout alter in the future, the advice provided may have reduced relevance and need to be revised prior to the commencement of the development.

6.1 Guidance Utilised

This section provides a site specific Arboricultural Method Statement (AMS), based on guidance provided within:

- BS5837:2012 *Trees in Relation to Design, Demolition & Construction - Recommendations.*
- BS3998:2010 *Tree work - Recommendations.*
- Volume 4 - *NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees* (Issue 2, 2007).

6.2 Contact Details

The details of all the principal points of contact are provided in the table below.

Table 6.1. Principal Contact Details

Contact	Name	Address	Contact Details
Local Planning Authority	Tree and Landscape Officer	London Borough of Camden 5 Pancras Square c/o Town Hall Judd Street London WC1H 9JE	020 7974 4444
Client	Laura Bolohan & Xavier Menguy	77 Lawn Road Camden NW3 2XB	
Agent	Enric Torner	3 rd Floor Flat 87D Dancer Road SW6 4DU	07577 016437 enrictorner@icloud.com
Arboricultural Consultant	Richard Parmee Principal Arboricultural Consultant	agb Environmental Newmarket Business Centre 314 Exning Road Newmarket Suffolk CB8 0AT	01638 663226 richard@agbenvironmental.co.uk

6.3 Tree Works

Tree works should be the first activity on site to prevent accidental damage during clearance/demolition/construction and to enable sufficient vehicular clearance such that the proposals can be implemented.

Tree work is a potentially dangerous occupation. All tree work contractors should be required to provide evidence that they are competent to undertake the required works and are adequately insured. The contractor should also be asked to provide a site specific risk assessment prior to commencement of any tree works. All tree works should be in accordance with BS 3998:2010 *Tree work - Recommendations*.

Details for all tree work are given in **Table 6.2**.

Table 6.2: Tree Works

Tree No.	Species	Work Required Irrespective of Development	Work Required to Facilitate Development
T1	Cherry	None.	Remove due to direct conflict with the layout.
T7	Pittosporum	None.	Remove due to direct conflict with the layout.
T8	Yew	None.	Reduce southern crown spread to site boundary.
T10	Sycamore	Remove basal growth to allow full visual inspection of the base of the trunk.	None.

6.4 Tree Protection

Following tree works and before any other works commence on site, tree protective fencing shall be immediately installed in accordance with the Tree Protection Plan (TPP) in **Appendix 5** and specification in **Appendix 6**, and signed accordingly with warning notices. It shall be located on the outer edge of the RPAs except where working space is required within RPAs.

Ground Protection will be required in proximity to new buildings and surfaces where the required working space is within the RPAs of retained trees. Where this is specified, ground protection shall be installed in accordance with the TPP in **Appendix 7**. This should comprise a geotextile membrane laid directly onto the ground, followed by a layer of sharp sand or bark of minimum 50mm depth, on which sheets of plywood or similar are laid.

Once all protection is in place and before any works commence on site, it is recommended that this be viewed and signed off, by the project arboriculturist or the LPA's Tree Officer. All protection shall be in place during the entire construction phase of the development.

6.5 Construction Access/Materials Storage

All access will be from Lawn Road. It is assumed that the main access route will be via the driveway, giving access to the rear, with the pedestrian path providing limited access to the front of the property only.

Tree protective fencing means that the front garden area will not be available for use for materials storage. Space is available in the rear garden, subject to those areas excluded by protective fencing. The limitations on materials storage are those given under **General Guidance** in **6.9**.

6.6 Provision of New Surfaces Within the RPA of T10

Hand tools only must be used for the removal of existing driveway surface and for all excavation. Removal of the existing surface and excavation for the driveway must commence from the point closest to T10, pulling back the surface and excavating as required from sections of driveway for later removal, until the entire RPA is cleared. If the new surface construction does not commence immediately, temporary protection will be required within the RPA. The use of ground protection, in accordance with the specifications in **Appendix 8** is appropriate, both to prevent desiccation and prevent damage from construction access.

Excavation for the new path must be limited to the removal of turf and loose soil only, to provide a firm surface on which the path can be constructed. Excavation and construction must proceed from the outer edge of the RPA, rolling out the surface across, so that work can be carried out from sections of surface already installed.

The use of reduced-dig construction is recommended, both to provide a robust path, able to tolerate future root growth beneath, and a permeable surface, reducing the impact of the loss of unsurfaced ground. Details on reduced-dig construction are provided in **Appendix 7**.

6.7 Provision of New Supporting Walls and Steps Within RPAs

Hand tools only must be used for the removal of existing walls and foundations, and for excavation of the closest 300mm horizontally to T8 and T10, to minimise the potential for root damage. Where roots below 25mm diameter are encountered, these shall be cut cleanly using a sharp saw. In the event that roots exceeding 25mm diameter are encountered, no severance must take place without first consulting the project arboriculturist or LPA's Tree Officer. All excavation and root severance should be supervised by the project arboriculturist.

All new walls and foundations must be constructed to tolerate the presence of trees at their mature size. To prevent direct damage from incremental root expansion, a compressible material must be installed between the wall and soil for retention. The design of the wall must be provided by the project's structural engineer, taking into consideration the tree species present, their potential maximum size and zone of influence, and the local soil type, in particular its potential for volume change in response to changes in moisture content.

6.8 Schedule of Works and Supervision

The recommended schedule of works and points at which supervision is required are set out in **Table 6.3**. This schedule is intended to minimise the potential for development to result in damage to retained trees, providing a logical sequence of works.

Table 6.3. Schedule of Works and Supervision.

Sequence	Activity	Supervision Responsibility
1	All tree works and removals.	Project Arboriculturist.
2	Installation of all tree protection in accordance with the TPP.	Site Manager & Project Arboriculturist.
3	Hard surface removal and excavation for the driveway within the RPA of T10, including provision of temporary root protection and/or ground protection. Retaining wall removal within the RPAs of T8 and T10. Excavation within the RPA of T8 and T10 for basement enlargement and new steps.	Site Manager & Project Arboriculturist.
4	Main development phase for basement and extension, including new retaining wall and step construction.	Site Manager.
5	Construction of new path in the RPA of T10.	Site Manager & Project Arboriculturist.
6	Removal of all tree protection following completion of all development.	Site Manager.
7	Assessment of tree condition post-development	Project Arboriculturist.

Supervision is recommended for key stages where these have greatest potential to result in tree damage if carried out incorrectly. This supervision should be provided by the designated project arboricultural consultant. Following supervision, a photographic report would be presented to the LPA.

Arboricultural supervision may be made a requirement of the development by way of appropriate planning conditions. A proposed schedule detailing the scope and frequency of arboricultural supervision visits is detailed below. However, the LPA may request an alternative schedule within any planning conditions.

6.9 General Guidance

The following general precautions must also be taken during the construction phase.

- No materials or fuel shall be stored close to or within the RPAs of trees to be retained or where new trees are to be established.
- There shall be no bonfires within 10m of the outer edge of the crown or RPA of a tree to be retained.
- Mechanical equipment must not be refuelled within the RPAs of retained trees or areas where new trees are to be established.
- No cement shall be mixed or stored within the RPAs of retained trees or areas where new trees are to be established.
- Cement mixers must not be washed within or uphill of the RPAs of retained trees or areas where new trees are to be established.
- The soil level within the RPA of a retained tree must not be raised or lowered without the agreement of the local authority Tree Officer.
- No plant shall be operated within the RPAs of retained trees unless the soil is suitably protected against compaction.
- Excavation should not take place within the RPAs of retained trees unless an arboricultural consultant or the local authority Tree Officer is supervising the work.
- The guidance provided by NJUG (2007) should be followed when installing underground services within the RPAs of retained trees.
- Surface water runoff must not be redirected into or out of the RPA of a retained tree.
- No materials shall be dumped within the RPA of a tree, whether in a skip or on the ground.
- No vehicles shall be parked or operate within the RPA of a retained tree.

7 Conclusions

Development will require the removal of two trees: T1, cherry, and T7, pittosporum. Reduction will be required of the section of crown of T8, yew, that overhangs the site boundary. All removal and reduction work will have negligible impact on local amenity, with little or no public visibility of any of the trees.

The impact of crown reduction of T8 is considered to be readily tolerable by the species.

Excavation for the basement, steps and new paving has potential to damage the roots of T8, yew, and T10, sycamore. For both trees, it is assumed that root development will not be in accordance with the circular RPA calculated, due to the long-term presence of retaining walls and hard surfaces within the site, with root growth favouring unsurfaced ground away from areas of development. Therefore, the loss of roots is anticipated to be low.

The use of hand tools for all wall and surface removal, and excavation, will minimise accidental damage of retained roots. Reduced-dig construction methodology will be used for the section of new path to minimise root loss and allow continued growth beneath.

Construction activities that have potential to damage trees will be excluded from all other crown spreads and RPAs via the use of tree protective fencing. Where construction access is required, ground protection shall be used, or existing hard surfacing retained, to protect roots beneath

Arboricultural supervision is specified for key stages in the development that have potential impacts upon trees, to ensure correct implementation of all methodology and protection. Subject to correct implementation, it is considered that all arboricultural impacts arising from development can be effectively mitigated.

8 References

British Geological Survey. (2016) *Geology of Britain viewer* [online]. <http://mapapps.bgs.ac.uk/geologyofbritain/home.html> (Accessed 14th March 2016).

Mattheck, C. and Breloer, H. (1994) *The body language of trees*. London: TSO

National Joint Utilities Group. (2007). Volume 4 *NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees* (Issue 2) [online]. Available at: <http://www.njug.org.uk/document-download/?URL=http://www.njug.org.uk/wp-content/uploads/V4-Trees-Issue-2-16-11-2007.pdf> (Accessed 23 July 2015).

Appendix 1 Explanatory Notes for Terms Used in Appendices 3, 4 & 5

Compass Bearing

N = north; S = south; E = east; W = west;

Tree Number

Number used to indicate the approximate position on plans inserted as **Appendices 4 & 5**.

Species

The species identification is based on visual observations.

Diameter at Breast Height (DBH)

Trunk diameter 1.5m above ground level recorded in millimetres measured with a diameter tape. If branches emerge below 1.5m, or if the trunk divides at or close to this height, the trunk diameter will be measured at a different height above the ground and this height will be mentioned. More than one figure indicates that the individual has a number of stems. Many stems are indicated with an 'M'. If the DBH has been estimated this will be marked with an asterisk (*) in the column.

Height

The height of the tree measured to the nearest metre, or half-metre if below ten metres.

Age Class

Sapling or newly established (Y) = a size which could be easily transplanted;

Semi-mature (SM) = prior to seed bearing age and could be transplanted with care;

Early Mature (EM) = maturity, not fully grown but of seed bearing age and may have achieved mature height;

Mature (M) = fully grown, annual growth is much reduced;

Old Mature (OM) = old for the species, possibly starting to decline;

Veteran (V) = often old for the species, the crown may be retrenching or displaying damage, containing features that provide many opportunities for wildlife, likely to offer important habitat.

Crown Clearance

The existing height of the first significant branch or section of canopy, to the nearest half-metre, to inform on ground clearance, crown/stem ratio and shading.

Condition

The physiological condition of the tree:

Good = normal growth and twig extension showing good vitality - no notable indication of ill health.

Fair = reduced twig extension, minor deadwood, but other than that few signs of ill health;

Poor = small internodes and low vitality, the canopy may be thinning and contain dead twigs and/or branches in the outer canopy, discoloured, misshapen or wilting foliage, obvious presence of disease or infection;

Dead = Dead

Category & Remaining Contribution

The category assessed using the guidance in Table 1 of BS 5837:2012 and the potential for safe tree retention based on the current context.

(A) (light green) Trees of high quality and value: in such condition as to be able to make a substantial contribution (a minimum of 40 years is suggested);

- A1 - Exemplary arboricultural specimens
- A2 - Trees of particular visual importance as arb/landscape features
- A3 - Significant conservation/historical value.

(B) (mid blue) Trees of moderate quality and value: those in such a condition as to make a significant contribution (a minimum of 20 years is suggested);

- B1 - Might have been A Cat, but downgraded because of impaired condition.
- B2 - Present in numbers - reduced value as individuals but higher as a collective group.
- B3 - Trees with material conservation or other cultural value.

(C) (grey) Trees of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150mm;

- C1 - Unremarkable tree, limited merit/impaired condition.
- C2 - Trees present in groups/woodlands without inferring greater collective value.
- C3 - Tree with no material or other cultural value.

(U) (dark red) Trees in such a condition that any existing value would be lost within 10 years and should, in the current context, be removed under sound arboricultural management.

Crown Radius

The distance from the tree trunk to the most relevant of the four cardinal points of the compass, measured in metres.

Radius of the RPA

The radius of a circular Root Protection Area (RPA) in metres as specified using the guidance contained in BS 5837:2012.