



Arboricultural Impact Assessment BS5837:2012

Address:

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Apex Environmental Ltd

A: 3 Lawrence Way, Lichfield, WS13 6RD

T: 0121 249 1235

E: info@ael-treeconsultants.co.uk

W: www.ael-treeconsultants.co.uk

Author: Reuben Hayes

Project ref: AEL-18617



Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



Contact details

Client	Address	108-110 Colney Hatch Lane, Muswell Hill, N10 1EA
	Name	XP Property
	Contact	
Architect	Company	Aura Homes
	Address	3 Lion Yard, Tremedoc Road, Clapham, London, SW4 7NQ
	Contact	
	Email	

Report History					
Version	Date	Author	Checked by	Reason	Status
0.1	17/10/2022	RJH	RJH	Approval	Draft
A	17/10/2022	RJH	RJH	Submission	Final
B	07/03/2023	RJH	RJH	Amendment	Final

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



Table of Contents

1.	Summary.....	3
2.	Particulars of instruction.....	5
3.	Caveats.....	7
4.	Scope of report	8
5.	Documents supplied.....	8
6.	Legal and policy information.....	8
7.	Site description	10
8.	Tree and vegetation findings	12
9.	Constraints posed by existing trees	15
10.	Arboricultural Impact Assessment	16
11.	Concluding statement.....	21
12.	Heads and terms of Arboricultural Method Statement	22
13.	Arboricultural terms	23
	Appendix I – Tree survey.....	25
	Appendix II – Photographs	31
	Appendix III – Tree categorisation table (BS5837:2012).....	33
	Appendix IV – Bibliography	35
	Appendix V – About the author	36

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes

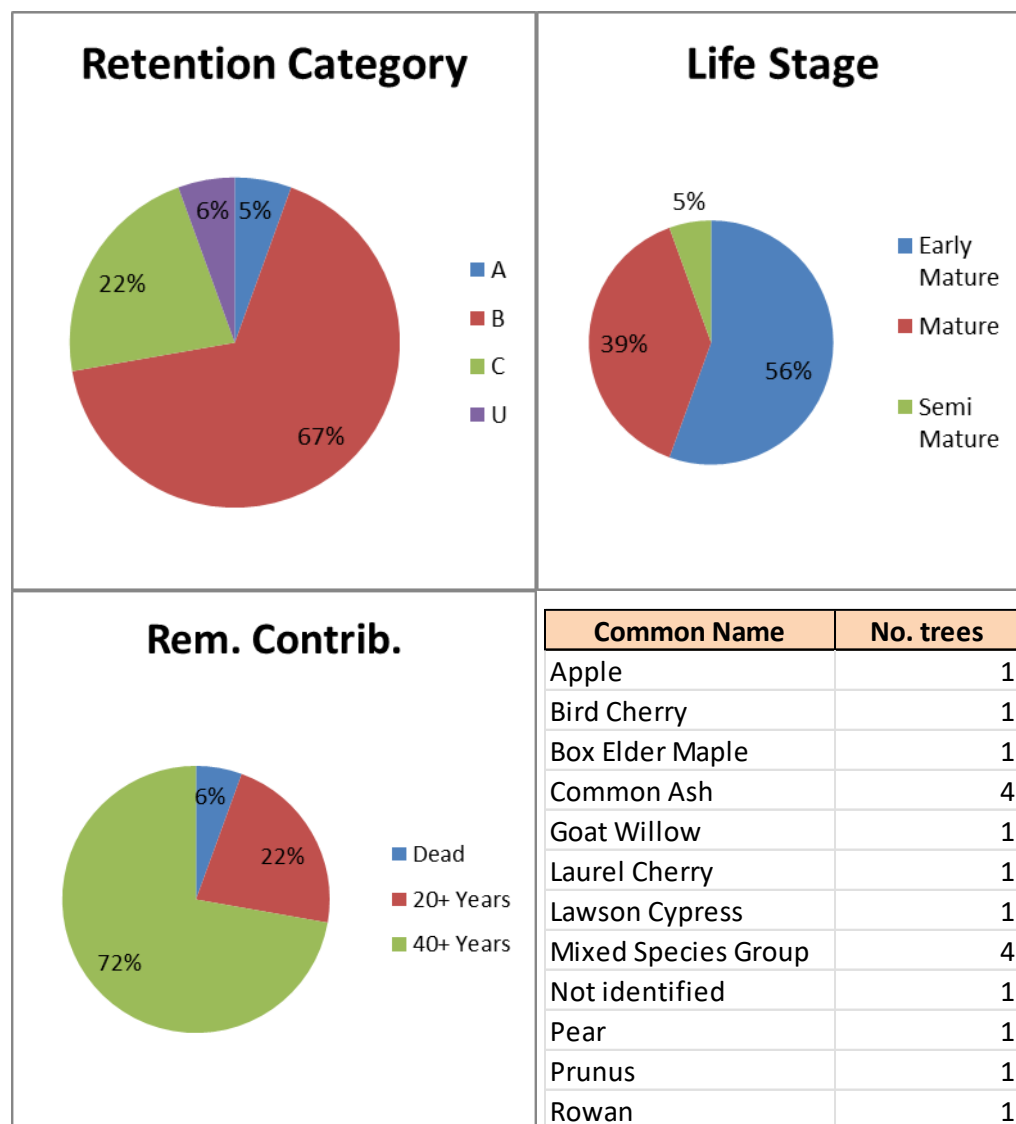


1. Summary

1.1 Outline of proposal

Extensions and internal changes to buildings including new basement area.

1.2 Summary of trees



Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



1.3 Works required

Tree reference number	Species	Category grading	Works required	For Development	For Arboriculture
H1	Laurel Cherry (<i>Prunus laurocerasus</i>)	B2	Remove laurel hedge between two properties	Yes	
T01	Common Ash (<i>Fraxinus excelsior</i>)	B1	Remove tree	Yes	
T02	Common Ash (<i>Fraxinus excelsior</i>)	B1	Remove tree	Yes	
T03	Common Ash (<i>Fraxinus excelsior</i>)	B1	Remove tree	Yes	
T04	Common Ash (<i>Fraxinus excelsior</i>)	B1	Remove tree	Yes	
T12	Not identified (<i>Not identified</i>)	U	Remove Stump	Yes	Yes



2. Particulars of instruction

- 2.1 This report has been prepared to discharge the instruction of the client, XP Property 'The Client' in respect of detailed planning permission at 108-110 Colney Hatch Lane, Muswell Hill, N10 1EA
- 2.2 The Client has commissioned a tree survey in compliance with *BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations* to prepare a tree survey, Arboricultural Constraints Assessment, Arboricultural Impact Assessment, Tree Protection Plan and heads and terms of a Method Statement for the trees at the site.
- 2.3 The site survey was carried out on the 6th October 2022. The relevant qualitative and quantitative tree data and information was recorded to assess the condition of the trees and their constraints upon the proposed development and to provide a summary of any proposed protection and construction specification required.
- 2.4 I have based this report on my site observations and the information I have been provided with, and I have come to conclusions in the light of my experience as an arboriculturist. I include a summary of my experience and qualifications in Appendix V.

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



- 2.5 All information given is in accordance with *BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations*.
- I. Identification of tree by number value (collates with the associated plans)
 - II. Common tree species
 - III. Height (m)
 - IV. Stem diameter (mm) at 1.5m above ground using a DBH tape (or as per BS5837 fig C.1)
 - V. Branch spread to the four cardinal points (m)
 - VI. Existing height above ground of first branch and direction (m)
 - VII. Existing height above ground of canopy (m)
 - VIII. Life stage (Young, Semi Mature, Early Mature, Mature, Over Mature)
 - IX. Estimated remaining contribution (yrs) <10, 10+, 20+, 40+
 - X. General observations, condition and preliminary management recommendations, physical condition and structural defects
 - XI. Category (as per BS5837 Table 1)
 - XII. Root Protection Area (RPA) radius (m)
 - XIII. Root Protection Area (RPA) m²

3. Caveats

This advice and all appendices are subject to the following caveats:

- 3.1. This report is nullified if any remedial works are undertaken on any area of the site, on or after the date of study/survey.
- 3.2. The report is only valid on the date on inspection and any deletion, editing or alteration will void it in its entirety.
- 3.3. Apex Environmental Ltd does not assume responsibility for any works undertaken on the basis of the recommendations in this report or for any legal matters that may arise as a consequence.
- 3.4. The report is not valid in adverse or unpredictable weather conditions or for any failure due to *force majeure*.
- 3.5. Apex Environmental Ltd does not assume liability for any misuse, misinterpretation or misrepresentation of information contained in this report.
- 3.6. This report has been compiled using only the information made available to the author at the date of inspection.
- 3.7. Unless described as 'detailed', this assessment is of a preliminary nature. It was conducted from ground only, the tree(s) were not climbed or inspected below ground level (including roots). There was no use of decay detection equipment, and only basic surveying instruments were used.
- 3.8. At the time of writing, the author did not have any information as to the integrity of the main structure, its annexes or the drainage system.
- 3.9. Water supply/drainage systems, if damaged, can allow roots to penetrate. However, if the system is sound, or after repair, roots have little capacity to access/damage underground services.
- 3.10. Any doubt as to the structural condition of properties on site would require the advice of a structural engineer.

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



4. Scope of report

- 4.1 The aim of this report is to give guidance under *BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations*. This will help to facilitate a harmonious and sustainable situation and long-term development.
- 4.2 The report will identify the value and quality of the woody vegetation on and within impacting distance of the site. All data gathered will be used to identify and address the impact that vegetation will have on the proposed development and the impact the development will have on the vegetation.

5. Documents supplied

Document title	Document Ref	Format	By whom	Date given
Topographical Survey	4 4789	DWG	Client	22/09/2022
Working file	21552	DWG	Client	22/09/2022

6. Legal and policy information

6.1. Tree Protection

Protection	Status	Comments
Tree Preservation Order	No	Online check on Haringey council
Conservation Area	No	Online check on Haringey council
Other		

6.2. Wildlife protection

Under the Wildlife & Countryside Act 1981 and the Countryside and Rights of Way Act 2000, it is a criminal offence under normal circumstances to disturb or destroy – whether intentional or unintentional - the nesting sites of wild birds or the roost sites of bats. You should therefore avoid carrying out significant tree works during the bird nesting season [mid- March to end of July], and you should ensure that trees are professionally surveyed for signs of bat roosts and/or bat activity before starting any tree work. Further advice on protected species can be obtained from the local office of Natural England.

6.3. Felling licence

Tree felling can also be restricted under the Forestry Act 1967. Under this act, there is an exemption from the need for a felling licence for 'Felling necessary for the prevention of danger or the prevention or abatement of a nuisance'.

If full planning consent is granted for the current proposal, then any trees that need to be felled in order to implement the approved plans are exempt from this statutory protection. It should also be considered that any proposed tree works detailed in the tree schedule are also implemented as part of the planning decision consent.

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

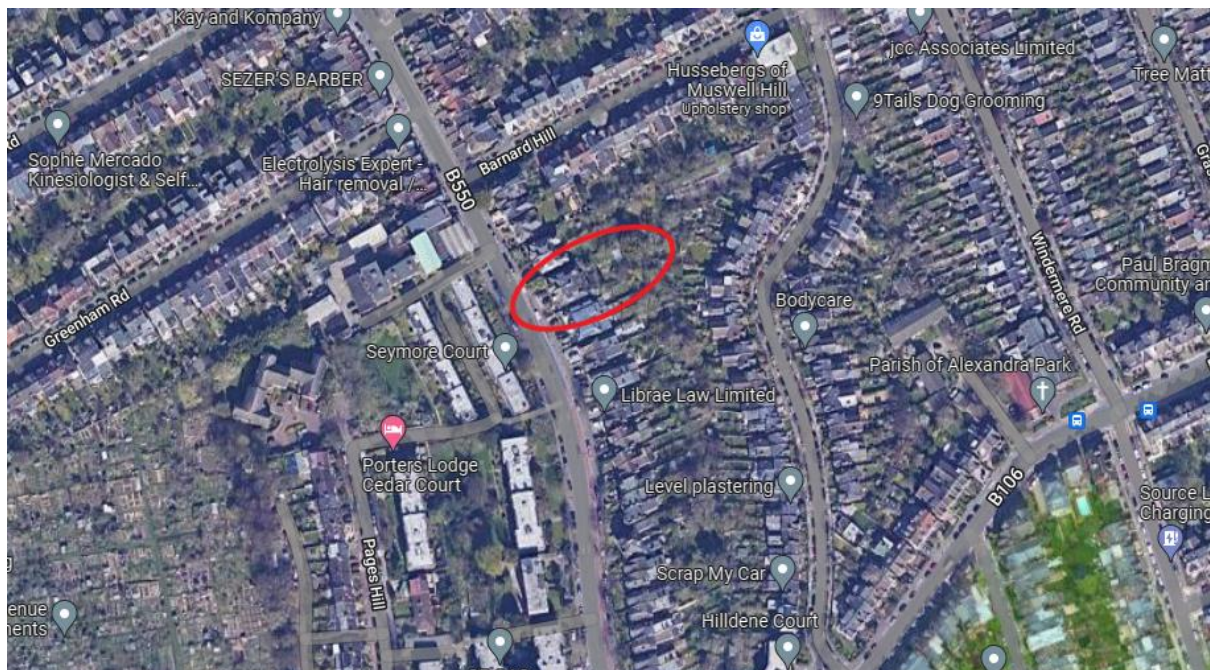
Ref: AEL-18617

Reuben Hayes



7. Site description

- 7.1 The site is two separate properties which are semidetached and have been used as a house of multiple occupancy.
- 7.2 Currently the land houses two houses with a single driveway area to the front and a shared garden area.
- 7.3 The property is accessed from the public highway to the front and there is open access. A Local Authority Street tree is to the front so care will be needed for the bringing in of materials.
- 7.4 The site location is shown in red.



Source: www.google.com

7.5 Soil assessment

The assessment determines whether the soil is shrinkable. If it is, trees and other vegetation have the potential to cause indirect damage to structures. In such cases, further assessments should be carried out and the design of foundations should be considered by a structural engineer.

No information has been supplied on the soil assessment, details of which will need to be obtained and passed to the arboricultural consultant and structural engineer before the submission of any Arboricultural Method Statement.

7.6 Levels

The topographical survey has located the levels to the rear garden and also to the front. The rear garden is abrupted with a patio.

7.7 Trees surveyed

There is a total of 18 trees have been inspected. This report has only listed the trees in connection to the main development on the site.

8. Tree and vegetation findings

8.1 The tree survey has been carried out in accordance with *BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations*, Section 4.4.

8.2 Tree categorisation method

The purpose of this method is to identify the quality and value of the existing tree stock, allowing informed decisions to be made about which trees should be removed or retrained in the event of development occurring.

A full tree survey has been included in appendix I.

Category U – Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

Category C – Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.

Category B – Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.

Category A – Trees of high quality with an estimated remaining life expectancy of at least 40 years.

8.3 Any works with regards to the overall application have been listed in this report.

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



8.4 Findings

Young	Semi Mature	Middle Aged	Early Mature	Mature	Over Mature	Dead	TOTAL
	1		10	7			

A	B	C	U
1	12	4	1

Review of trees on site

There are a number of Ash trees within the garden and some are starting to show signs of ADB and their overall future retention is unlikely. The other trees on site are dotted around the rear garden.

There are trees T01, T02, T03, T04 and T11 are all growing close to the existing patio and will need to be removed for long term management.

Ref.	Species	General Observations	Retention Category
G1	Mixed Species Group x4 (Group, mixed species)	4x conifer species (dominant within group); Sycamore; Ash	B1
H1	Laurel Cherry (<i>Prunus laurocerasus</i>)	Hedge between two properties	B2
T01	Common Ash (<i>Fraxinus excelsior</i>)	Dense undergrowth preventing full inspection (diameter is estimated - marked with #); Ivy in stem and on the crown; Good vitality otherwise	B1
T02	Common Ash (<i>Fraxinus excelsior</i>)	Minor deadwood; Scattered instances of brown retained keys which could be indicative of Ash Die Back / physiological stress in the tree; Generally good condition with a single upright stem; bird box	B1
T03	Common Ash (<i>Fraxinus excelsior</i>)	Twin stem from 0.4m AGL; Ivy on stem; minor deadwood in crown; bird box	B1
T04	Common Ash (<i>Fraxinus excelsior</i>)	Dense undergrowth at base preventing fuller inspection - estimated dbh; Multistem - two dominant stems with two smaller / subordinate stems; nest in upper canopy	B1

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



T05	Lawson Cypress (<i>Chamaecyparis lawsoniana</i>)	Dense ivy throughout canopy preventing further inspection; estimated dbh	C1
T06	Box Elder Maple (<i>Acer negundo</i>)	Ivy on stem; Previously reduced (historical) at 2m and 2.5m AGL; Some decay in reduction points at 2m	B1
T07	Pear (<i>Pyrus sp.</i>)	Full, vigorously fruiting tree; Stem in good condition; minor deadwood in canopy; Stubs from previous poor technique pruning	A1
T08	Goat Willow (<i>Salix caprea</i>)	Companion growing with T9; Multi-stem from ground level, 8x distinct stems; Pruned to boundary with neighbouring property (southern aspect)	C1
T09	Apple 'Cooking' (<i>Malus sp.</i>)	Companion growing with T8; Bifurcated stem at 1.2m AGL; Branch loss wound with signs of decay in union - callousing well; minor deadwood	B1
T10	Bird Cherry (<i>Prunus padus</i>)	Co-dominant stem at 0.6m AGL, tight 'V-shaped' union with included bark; Crown partially suppressed by adjacent conifer group	C1
T11	Prunus (<i>Prunus sp.</i>)	Multi-stemmed - 3x stems at #100mm diameter; Dense undergrowth preventing fuller inspection	C1
T12	Not identified (<i>Not identified</i>)	Stump in front garden	U
T13	Rowan (<i>Sorbus aucuparia</i>)	Street tree growing in planting pit outside of property.	B1

Tree works due to arboricultural concerns

Removal of T12.

Removal of all Ash trees as part of a long term management plan.

9. Constraints posed by existing trees

The RPA and category of the trees retained on site are listed within the Tree Constraints Plan. This information is taken from above-ground site observations. Inspection chambers or other features that may hinder direct root growth have been indicated within the plan, and the indicated RPA has been amended as per *BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations*, Section 5.2.1.

Further constraints imposed by trees include:

- I. Current and ultimate height and spread of tree(s).
- II. Species characteristic, including canopy type, density of foliage and species susceptibility to external factors such as honey dew, branch drop and fruit fall.
- III. Shading on property and gardens, or excessive light to rooms (as indicated within the Tree Shadow Plan).
- IV. The presence of Tree Preservation Orders and the presence of Conservation Areas or other regulatory protection.
- V. Potential incompatibilities between the layout and trees.
- VI. Working and access space needed for the construction of the proposed development. This might involve assess facilitation pruning, or the use of a height restriction to prohibit tall vehicles accessing a site containing trees with low canopies
- VII. The effect that construction requirements might have on the amenity value of trees, both on and near the site, including the effects of pruning to facilitate access and working space.
- VIII. The requirement to protect the overhanging canopies of trees where they could be damaged by machinery, vehicles, barriers or scaffolding, where it will be necessary to increase the extent of the tree protection barriers to contain the canopy.
- IX. Infrastructure requirements in relation to trees, e.g. easements for underground or above-ground apparatus, highway safety and visibility splays, and other infrastructural provisions, such as substations, refuse stores, lighting, signage, solar collectors, satellite dishes and CCTV sightlines
- X. The proposed end use of the space adjacent to retained trees.
- XI. The potential for new planting to provide mitigation for any losses.

10. Arboricultural Impact Assessment

10.1 Amenity value of the trees on site

The trees are mainly to the rear of the property and do not afford any visual amenity value from any public location.

10.2 Facilitation works

It will be necessary to remove some trees for the scheme. These have been listed within the tree works plan. No other tree works will be necessary.

10.3 Storage of materials, siting of welfare units and contractor parking

The Tree Protection Plan (TPP) has indicated the most suitable location for the contractors parking and the storage of materials while the main development takes place.

10.4 Background to incursions between layout (foundations) and the trees for retention

The default position should be that structures are located outside of the RPA of trees to be retained. However, where there is an overriding justification for construction within the RPA, technical solutions might be available that prevent damage to the tree(s), as per *BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations*, Section 5.3.1.

It should be demonstrated that the tree(s) can remain viable and that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA, and that a series of mitigation measures to improve the soil environment that is used by the tree for growth can be implemented.

On this basis and under previous BS5837 standards, it is sometimes acceptable to allow for encroachment of up to 10%. It should be possible to have viable grow areas on the other sides of the RPA which exceed 20%, thus compensating for the loss of viable rooting area. It would also be possible to carry out decomposition to the soils and add minerals and nutrients to aid root development in the viable areas.

10.5 Background to incursions between layout (drives, parking areas, paths, landscaping) and the trees for retention

Where permanent hard surfacing within the RPA is considered unavoidable, site-specific and specialist arboricultural and construction design advice should be sought to determine whether it is achievable without significant adverse impact on the trees.

The design should not require excavation into the soil, including through lowering of levels and or scraping, other than the removal, using hand tools, of any turf layer or other vegetation.

The structure of the hard surface should be designed to avoid localised compaction by evenly distributing the load.

New permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.

In order to maintain the soil volume moisture, the surface should be of permeable hard material (unless there is a risk of water logging of soils). The design should incorporate a three-dimensional design such as 'no-dig' Cell Web. Any 'no-dig' specification has been included within the Tree Protection Plan.

10.6 Understanding foundation techniques

The use of tradition strip footings can result in extensive root loss and should be avoided within the RPA. Specially engineered structures within RPAs should be justified if this enables the retention of good quality trees such as category A and B.

Root damage can be minimised by using piles, with site investigations used to determine their optimal location (avoiding damage to roots important for the stability of the tree). This should be carried out to a minimum depth of 600mm and can be undertaken either by hand tools or compressed air soil displacement.

The piles should be the smallest practical pile diameter to reduce the possibility of striking major tree roots. This also reduces the size of the rig requirements. When selecting the pile type, the need to protect the soil and adjacent roots from the potentially toxic effects of uncured concrete should be considered.

The beams should be laid at or above ground level and cantilevered as necessary to avoid tree roots identified by site investigations.

Following any approval decision, details and specifications will be included within a full Arboricultural Method Statement.

Where a slab for a minor structure such as sheds or garden rooms is to be formed within the RPA, it should bear on existing ground level and should not exceed an area greater than 20% of the existing unsurfaced ground.

10.7 Incursions on this project

Tree reference number	Species	Category grading	RPA m²	Building Incursion (m²)	Paths Incursion (m²)	TOTAL %	Significance	Comments
T01	Common Ash (<i>Fraxinus excelsior</i>)	B1	15		15	100	Significant	New layout of patio will be over the stem of tree and will require removal.
T02	Common Ash (<i>Fraxinus excelsior</i>)	B1	11		1	1	Insignificant	The rooting system will only be impacted on by a small amount from the new patio.
T03	Common Ash (<i>Fraxinus excelsior</i>)	B1	88	5	2	8	Insignificant	The rooting system will only be impacted on by a small amount from the new patio.
T04	Common Ash (<i>Fraxinus excelsior</i>)	B1	137	6	8	10	Significant	The rooting system of the tree has been extended in to the garden due to the patio area and the roots are likely to extend along the original footprint. This means that the tree will be impacted on by the bike storage area and the infill of the patio area. There is also an incursion from the house extension. The trees stem will be close to the patio and the use of the bike store will be hindered by the tree. The tree will need to be removed.
T05	Lawson Cypress (<i>Chamaecyparis lawsoniana</i>)	C1	25	2		8	Insignificant	The roots will only be impacted by a small amount from the bike store area.
T11	Prunus (<i>Prunus sp.</i>)	C1	14	5		36	Significant	The tree will have a significant impact on the rooting system by the bike storage area. The tree will also be within a closed off area and a new patio close by.
T12	Not identified (Not identified)	U	163		163	100	Significant	This is a stump and will need to be removed regardless of the application.

The main impact will be to 4 Ash trees which have some signs of possible ADB and due to their location near to the house, it is likely that the trees will need to be removed regardless of the application in order to protect the house and open up the garden area.

The stump T12 will need to be removed regardless of the application.

10.8 Inclusion of new infrastructure requirements

No details have been given, however it is likely that all services will be routed back to existing services and there should be no requirements for additional service runs.

10.9 Canopy issues on the new development

Shading of buildings by trees can be a problem, particularly where there are rooms that require natural light such as living rooms, conservatories and kitchens with dining areas. The proposal should take the existing trees and their ultimate size and canopy density into account. Open spaces such as gardens and sitting areas should be designed to meet the normal requirement for direct sunlight for at least a part of the day.

10.10 Tree works

Tree reference number	Species	Category grading	Works required	For Development	For Arboriculture
H1	Laurel Cherry (<i>Prunus laurocerasus</i>)	B2	Remove laurel hedge between two properties	Yes	
T01	Common Ash (<i>Fraxinus excelsior</i>)	B1	Remove tree	Yes	
T02	Common Ash (<i>Fraxinus excelsior</i>)	B1	Remove tree	Yes	
T03	Common Ash (<i>Fraxinus excelsior</i>)	B1	Remove tree	Yes	
T04	Common Ash (<i>Fraxinus excelsior</i>)	B1	Remove tree	Yes	
T12	Not identified (<i>Not identified</i>)	U	Remove Stump	Yes	Yes

10.11 Potential tree removal to facilitate the development

It will be necessary to remove 6 trees as part of the development. These are T01, T02, T03 and T04.

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



T12 is a stump and has not regrown. H1 is set between the two properties.

10.12 Mitigation of tree loss and new planting

It will be possible to carry out mitigation planting of 1:1 within the rear garden.

10.13 Potential for future direct damage

There will be no future direct damage to the house from the trees.

10.14 Future seasonal nuisances

There will be no future seasonal nuisances from the trees.

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



11. Concluding statement

Having appraised the proposals and balanced the Standard's thinking with the will of our client's proposals, the author of this report can fully support this application. (Reason): all reasonable concerns have been satisfied to the fullest standard.

This concludes the report. If I can be of further assistance, please do not hesitate to contact me.

Signature:



Date: 7th March 2023

Reuben Hayes M.Arbor.A; CMgr MCMI
Managing Director for and on behalf of Apex Environmental Limited

12. Heads and terms of Arboricultural Method Statement

12.1 Tree Protection Plan

The Tree Protection Plan has been produced in accordance with *BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations*, Section 5.5. The plan has indicated the location of protection barriers to be erected, which will form the construction exclusion zone around the retained trees. It also shows the extent and type of ground protection, where necessary. All measurements for the protective fencing and temporary access within the construction exclusion zone have been indicated. Other considerations included are site construction access, contractors' car parking and storage areas.

12.2 Phasing of onsite works

The phasing of the works will take place as follows:

- a. Pre-contract meeting
- b. Tree works
- c. Installation of tree protection fencing
- d. Siting of welfare units and storage of materials
- e. Demolition of existing structures
- f. Undertaking and completing construction works
- g. Undertaking external landscape works to areas outside of the tree protection fencing
- h. Removal of tree protection fencing
- i. Undertaking external landscaping works within the tree protection fencing area
- j. Sign off from the construction company and arboricultural consultant (no further involvement is required)

13. Arboricultural terms

- 13.1 An 'arboriculturist' is a person who has, through relevant education, training and experience, gained recognized qualifications and expertise in the field of trees.
- 13.2 A 'competent person' is someone who has had training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task in question. A competent person is expected to be able to advise on the best means by which the recommendations of *BS5837:2012 – Trees in relation to design, demolition and construction – Recommendations* may be implemented.
- 13.3 A 'tree survey' in the context of planning and development is taken to mean an assessment of the tree stock on site (or within the area shown where appropriate), as individuals or groups. (This is undertaken independent of and prior to any knowledge of a scheme being produced). Management recommendations in the tree survey schedule reflect the structural and physiological condition of the trees only. It is essential that the trees are assessed objectively and without reference to site layout proposals.
- 13.4 The 'construction' is a site-based operation with the potential to affect existing trees.
- 13.5 A 'Root Protection Area', or 'RPA', is a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. The RPA area is worked out on a mathematical basis. It is listed in appendix III
- 13.6 'Construction Exclusion Zone', or '(CEZ)', is based upon the RPA and forms the exclusion zone to which access is prohibited during the project phase.
- 13.7 A 'Tree Constraints Plan', or TCP, is a scaled plan prepared by an arboriculturist showing the RPA and the accurate canopy spread of a tree, along with information to identify the tree by reference to a survey schedule. It will also identify any under and above ground constraints. The author of this report will produce this using AutoCAD.
- 13.8 An 'Arboricultural Impact Assessment', or 'AIA', is a study or report undertaken by the project arboriculturist. It is a detailed evaluation of the direct and indirect effects of the proposed development on the tree(s) and the potential future maintenance of the tree(s). Where necessary, it recommends mitigation. The assessment takes account of the effects of any tree loss required to implement the design, and any potentially damaging activities that are proposed in the vicinity of retained trees.

-
- 13.9 An 'Arboricultural Method Statement', or 'AMS', is a methodology for the implementation of any aspect of development that has the potential to result in loss of or damage to a tree. The AMS is likely to include details of an on-site tree protection monitoring regime.
- 13.10 A 'Tree Protection Plan', or 'TPP', is a scale plan that is superimposed on a layout plan. It is based on the topographical survey, showing all hard surfacing and other existing structures within the RPA. The plan indicates the precise location of protective barriers that need to be erected in order to form a construction exclusion zone around the retained trees.
- 13.11 Other plans and documents may be referred to and annexed where appropriate.
- 13.12 'Access facilitation pruning' is a one-off tree pruning operation, the nature and effects of which are without significant adverse impact on the trees' physiology or amenity value, which is directly necessary to provide access for operations on site.
- 13.13 'Services' are any above or below ground structure or apparatus required for utility provision. Examples include drainage, gas supplies, ground source heat pumps, CCTV and satellite communications.
- 13.14 'Stem' is the principal above-ground structural component(s) of a tree that supports its branches.
- 13.15 'Structures' are manufactured objects, such as a building, carriageway, path, wall, service runs, and built or excavated earthworks.
- 13.16 A 'veteran tree' is recognized by a criterion set by *BS2998:2010, Tree Work – Recommendations*. It must show signs of biological, cultural or aesthetic value that are characteristic of, but not limited to, individuals surviving beyond the typical age range for the species concerned.

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



Appendix I – Tree survey

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



Tree survey undertaken to *BS5837:2012 Trees in relation to construction – recommendations*

Tree No.	Tree identification method in sequential order – TXXX=Existing trees, GX=Group of trees, HX=Hedgerow
Species	Species
Height in (m)	Approximate height of tree in metres
DBH in (mm)	Stem diameter in millimetres taken at 1.5 metres above ground level. AV=average diameter (see appendix III)
Branch spread in (m) N - E - S - W	Branch spread in metres reflecting the spread at the four principal compass points. N/A= Not applicable in woodland settings
Existing height above ground in (m)	Height in metres of crown clearance above existing ground level. To include first significant branch and direction of growth (e.g. 2.5 – N) Height of lower form of Canopy to inform current ground clearance, crown/stem ratio and shading
Life stage	Age classification (Y=young, SM=semi-mature, EM=early-mature, M=mature, LM=late-mature, OM=over-mature)
Est. remain years	Approximate years remaining (+40=minimum of 40 years, +20=minimum of 20 years, +10=minimum of 10 years, <10 less than 10 years)
General observations	Condition of tree (good, fair, poor, dead), structural and/or physiological condition, and/or preliminary management recommendations
Preliminary management recommendations	Works needed in order to retain tree in current setting or where works would be needed in order to facilitate development
Physical condition and structural condition	Physiological condition (good, fair, poor, dead), to include structural defects such as the presence of any decay, fungal issues, pathogens and defects)
RPA in (m ²)	Area directly calculated from the DBH measurement (single stem/multiple stem variant, as outlined within the Standard, see appendix III)

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



Ref.	Species	Measurements	General Observations	Retention Category	RPA	Condition
G1	Species Group x4 (Group, mixed species)	Height (m): 14 4 stems, avg.(mm): 400 Spread (m): 2N, 2E, 2S, 2W Crown Clearance (m): 0 Lowest Branch (m): 0 Life Stage: Early Mature Rem. Contrib.: 40+ Years	r species (dominant within group); Sycamore; Ash	B1	87 sq m, plus a 1m buffer.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Fair Structural Cond: Fair Bat Habitat: None
H1	urel Cherry (<i>Prunus laurocerasus</i>)	Height (m): 4 Stem Diam (mm): 150 Spread (m): 1N, 1E, 1S, 1W Crown Clearance (m): 0 Lowest Branch (m): 0(E) Life Stage: Mature Rem. Contrib.: 40+ Years	dge between two properties	B2	61 sq m, plus a 1m buffer.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Good Structural Cond: Good Bat Habitat: None
T01	ommon Ash (<i>Fraxinus excelsior</i>)	Height (m): 12 Stem Diam (mm): 180 Spread (m): 1N, 4E, 2S, 5W Crown Clearance (m): 2 Lowest Branch (m): 1.5(W) Life Stage: Early Mature Rem. Contrib.: 40+ Years	se undergrowth preventing full inspection (diameter is estimated - marked with #); Ivy in stem and on the crown; Good vitality otherwise	B1	Radius: 2.2m. Area: 15 sq m.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Good Structural Cond: Good Bat Habitat: None
T02	ommon Ash (<i>Fraxinus excelsior</i>)	Height (m): 12 Stem Diam (mm): 160 Spread (m): 1N, 3.5E, 1.5S, 4W Crown Clearance (m): 2 Lowest Branch (m): 3.5(E) Life Stage: Early Mature	eadwood; Scattered instances of brown retained keys which could be indicative of Ash Die Back / physiological stress in the tree; Generally good condition with a single upright stem; bird box	B1	Radius: 1.9m. Area: 11 sq m.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Fair Structural Cond: Good

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



		Rem. Contrib.: 40+ Years				Bat Habitat: None
T03	Common Ash (<i>Fraxinus excelsior</i>)	Height (m): 13 2 stems, avg.(mm): 310 Spread (m): 3N, 3E, 1S, 4W Crown Clearance (m): 2 Lowest Branch (m): 7(E) Life Stage: Early Mature Rem. Contrib.: 40+ Years	Stem from 0.4m AGL; Ivy on stem; minor deadwood in crown; bird box	B1	Radius: 5.3m. Area: 88 sq m.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Fair Structural Cond: Good Bat Habitat: None
T04	Common Ash (<i>Fraxinus excelsior</i>)	Height (m): 12 Stem Diam (mm): 550 Spread (m): 3.5N, 3E, 2S, 3.5W Crown Clearance (m): 2.5 Lowest Branch (m): 2.5(W) Life Stage: Early Mature Rem. Contrib.: 40+ Years	Overgrowth at base preventing fuller inspection - estimated dbh; Multistem - two dominant stems with two smaller / subordinate stems; nest in upper canopy	B1	Radius: 6.6m. Area: 137 sq m.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Fair Structural Cond: Good Bat Habitat: None
T05	Lawson Cypress (<i>Chamaecyparis lawsoniana</i>)	Height (m): 8.5 Stem Diam (mm): 230 Spread (m): 1N, 1E, 1S, 1W Crown Clearance (m): 1 Lowest Branch (m): 2(N) Life Stage: Early Mature Rem. Contrib.: 20+ Years	Ivy throughout canopy preventing further inspection; estimated dbh	C1	Radius: 2.8m. Area: 25 sq m.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Fair Structural Cond: Fair Bat Habitat: None
T06	Elder Maple (<i>Acer negundo</i>)	Height (m): 6.5 Stem Diam (mm): 340 Spread (m): 3N, 3E, 3.5S, 2.5W Crown Clearance (m): 2 Lowest Branch (m): 2(E) Life Stage: Mature	Stem; Previously reduced (historical) at 2m and 2.5m AGL; Some decay in reduction points at 2m	B1	Radius: 4.1m. Area: 53 sq m.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Good Structural Cond: Good

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



		Rem. Contrib.: 40+ Years				Bat Habitat: None
T07	Pear (<i>Pyrus sp.</i>)	Height (m): 7 Stem Diam (mm): 250 Spread (m): 2N, 2.5E, 3S, 2.5W Crown Clearance (m): 1.5 Lowest Branch (m): 1.5(E) Life Stage: Mature Rem. Contrib.: 40+ Years	proously fruiting tree; Stem in good condition; minor deadwood in canopy; Stubs from previous poor technique pruning	A1	Radius: 3.0m. Area: 28 sq m.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Good Structural Cond: Good Bat Habitat: None
T08	at Willow (<i>Salix caprea</i>)	Height (m): 6.5 Stem Diam (mm): 800 Spread (m): 3.5N, 3E, 2.5S, 3W Crown Clearance (m): 2 Lowest Branch (m): 2(E) Life Stage: Mature Rem. Contrib.: 20+ Years	n growing with T9; Multi-stem from ground level, 8x distinct stems; Pruned to boundary with neighbouring property (southern aspect)	C1	Radius: 9.6m. Area: 290 sq m.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Fair Structural Cond: Fair Bat Habitat: None
T09	Apple 'Cooking' (<i>Malus sp.</i>)	Height (m): 3.5 Stem Diam (mm): 280 Spread (m): 4N, 3E, 2S, 2.5W Crown Clearance (m): 2 Lowest Branch (m): 2(E) Life Stage: Mature Rem. Contrib.: 40+ Years	n growing with T8; Bifurcated stem at 1.2m AGL; Branch loss wound with signs of decay in union - callousing well; minor deadwood	B1	Radius: 3.4m. Area: 36 sq m.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Fair Structural Cond: Fair Bat Habitat: None
T10	ird Cherry (<i>Prunus padus</i>)	Height (m): 5 Stem Diam (mm): 270 Spread (m): 2.5N, 1.5E, 2.5S, 1W Crown Clearance (m): 2 Lowest Branch (m): 3(E) Life Stage: Mature	inant stem at 0.6m AGL, tight 'V-shaped' union with included bark; Crown partially suppressed by adjacent conifer group	C1	Radius: 3.2m. Area: 32 sq m.	Other Reference: Distance1: Distance2: Custom Number 3: Physiological Cond: Fair Structural Cond: Fair

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



		Rem. Contrib.: 20+ Years				Bat Habitat: None
T11	Prunus (<i>Prunus sp.</i>)	): 5.5 3 stems, avg.(mm): 100 Spread (m): 0.5N, 1E, 1.5S, 1W Crown Clearance (m): 2 Lowest Branch (m): 2.5(E) Life Stage: Early Mature Rem. Contrib.: 20+ Years	mmed - 3x stems at #100mm diameter; Dense undergrowth preventing fuller inspection	C1	Radius: 2.1m. Area: 14 sq m.	erence: Distance1: Distance2: Custom Number 3: Physiological Cond: Fair Structural Cond: Fair Bat Habitat: None
T12	Not identified (<i>Not identified</i>)	): 0 Stem Diam (mm): 600 Spread (m): 0N, 0S, 0W Crown Clearance (m): 0 Lowest Branch (m): 0 Life Stage: Mature	front garden	U	ue to Retention Category of U.	erence: Distance1: Distance2: Custom Number 3: Physiological Cond: Poor Structural Cond: Fair Bat Habitat: None
T13	Rowan (<i>Sorbus aucuparia</i>)	): 4.5 Stem Diam (mm): 140 Spread (m): 1N, 1E, 1S, 1W Crown Clearance (m): 2 Lowest Branch (m): 2(S) Life Stage: Semi Mature Rem. Contrib.: 40+ Years	e growing in planting pit outside of property.	B1	Radius: 1.7m. Area: 9 sq m.	erence: Distance1: Distance2: Custom Number 3: Physiological Cond: Fair Structural Cond: Fair Bat Habitat: None

Appendix II – Photographs



Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



**T4 canopy as viewed from lower
ground level**

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



Appendix III – Tree categorisation table (BS5837:2012)

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.	- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) - Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline - Trees infected with pathogens of significance to the health and/or safety of their trees nearby, or very low quality trees suppressing adjacent trees of better quality. <i>(note: Category U trees can have existing or potential conservation value which it might be desirable to preserve)</i>			
Trees to be considered for retention				
	1. Mainly arboricultural qualities	2. Mainly landscape qualities	3. Mainly cultural values, including conservation	
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years.	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), which that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality.	Trees with material conservation or other cultural value	
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	



Appendix IV – Bibliography

British Standards Institution (2010), *BS3998 Tree Work - Recommendations*

British Standards Institution (2012), *BS5837 Trees in relation to design, demolition and construction - Recommendations*

Appendix V – About the author

Author of this report: Mr Reuben Hayes, M.Arbor.A; CMgr MCMI

Qualifications

Quantified Tree Risk Assessment, 2018 – QTRA

CMI Management and Leadership (Level 5) – May 2015

Professional Tree Inspection, 2009 – Lantra

Higher National Diploma, Arboriculture (HND), July 2003 – Warwickshire College

National Diploma (Tree Management and Arboriculture), 2000 – Warwickshire College

Experience

Apex Environmental Ltd: May 2013 – Present

Cannock Chase Council: July 2010 – Present

RJH Silvicultural and Arboricultural Services Ltd: 2008 – 2010

London Borough of Camden: January 2005 – July 2010

Three Rivers District Council: March 2003 – January 2005

Forestry Commission: 1997 – 1998

National Trust

Membership of professional bodies

Professional Member of the Arboricultural Association

Professional Member of Consulting Arborist Society (CAS)

Associate Member of the Institute of Chartered Foresters

Fully accredited Chartered Manager of Chartered Management Institute (CMI)

Member of Institute of Directors (IoD)

Arboricultural Impact Assessment BS5837:2012

108-110 Colney Hatch Lane, Muswell Hill, N10 1EA

Ref: AEL-18617

Reuben Hayes



Apex Environmental Ltd

A: 3 Lawrence Way, Lichfield, WS13 6RD

T: 0121 249 1235

E: info@ael-treeconsultants.co.uk

W: www.ael-treeconsultants.co.uk

Author: Reuben Hayes, CMgr MCMI, M.Arbor.A