agb ENVIRONMENTAL

Arboricultural Impact Assessment

5A Fitzroy Road, London NW1 8TU

Client Name: Carla Buzasi & Toby Morris

Project Number: P2353.1.3

Date: 6 October 2015

ENABLING DEVELOPMENT

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1 Report Summary

The site is the rear garden of a residential basement flat, located at the northern end of a terrace, bordered to the north, east and south by other residential gardens. The only access to this rear garden is via the basement flat.

The construction of a cabana, a separate single storey permanent structure, is proposed within the rear garden. This is to be supported using a system of bearing pads, with a void beneath its base. The cabana will be provided with mains electricity. A new path will be created linking it with the house, with further paving in front of the cabana.

The development has potential to adversely affect two offsite trees, most notably T1, the larger of the two. The impacts arise from:

- The installation of bearing pads to support the building, including both that from excavation and materials storage/delivery;
- Providing the connection to mains electricity;
- Laying of new paving, and;
- The obstruction of rainwater, nutrients and air to roots beneath the building and path.

Any impact arising from use of the building is considered to be minimal, given the current use of that area as residential garden.

The impacts can be mitigated by:

- Using hand excavation and a reduced-dig approach to install the bearing pads, setting these at or just within the current ground level to minimise the impact on roots beneath;
- Using hand excavation to identify suitable bearing pad locations that avoid major roots, in conjunction with an engineering design that allows a degree of flexibility for their location;
- Routing the electrical connection along the northern boundary, so it can enter the building via the corner not within the RPA of T1, negating the need for any excavation within it;
- Using a reduced-dig construction approach for all new paving within the RPA of either tree;
- The use of ground protection for all onsite sections of both trees' RPA, and;
- Creating a void beneath the building to allow gaseous exchange, and limited water and nutrient flow, to continue for roots beneath.

Cumulatively the total loss of unsurfaced ground is assessed at 18% for T1 and no more than 10% for T2, both below the maximum acceptable loss within the guidance. The impact of this loss of unsurfaced ground is mitigated by the void beneath the cabana and the paving design.

The restricted access to the development area means that the space available within the rear garden, not within either RPA, is sufficient for all materials storage and working space requirements.

On the basis of the above, it is considered that the development can be permitted without adverse impact on retained trees.

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2 Introduction

2.1 Brief and Proposals

agb Environmental Ltd was commissioned by Enric Torner on behalf of Carla Buzasi and Toby Morris to undertake an Arboricultural Survey at Fitzroy Road, London, to accompany a planning application. The purpose of the survey was to identify:

- Tree age, condition class, general health, dimensions and 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:

- 002-GAex - Topographical Survey;
- 002-GA00-P1 General Arrangement Proposed Ground Floor Plan;
- Ecospace – Procedures Guarantees;
- BS5837:2012 Trees in Relation to Design, Demolition & Construction - Recommendations.

2.3 Survey Details and Constraints

The survey was undertaken on the 16th February 2015. The survey was undertaken 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 (VTA) method as developed by Mattheck and Breloer (1994).

The survey obtained data upon two 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 the rear garden of a residential ground floor and basement flat, located at the northern end of a terrace. The only access to this rear garden is via the basement flat.

The area of garden closest to the flat has a small section of decking, beyond which is a small lawn, then an area of informal paving and mixed vegetation. The garden is generally flat but rises slightly towards the far end. Due to the presence of tall buildings that surround the garden, although visible from nearby residential properties, it has no wide-scale public visibility.

The garden contains a few mature shrubs and perennials, mostly located towards the rear section, together with a few small elder and a single small conifer, right on the rear boundary. None of these is of sufficient size to warrant inclusion in the survey.

The rear garden is bounded by walls to the north and south, and a fence to the east, with other residential gardens beyond. Two mature trees stand in the rear garden to the south, with crowns that overhang the site.

3.2 Existing Tree Stock Summary

T1 is a large, mature tree, believed to be a Tree of Heaven, standing approximately one metre south of the site boundary, with a crown spread that extends virtually across the full width of the site (**Plate 1**). It is a tall tree, the upper crown of which is visible, with some difficulty, from surrounding publicly-accessible areas. The tree has been subject to some crown reduction, focussed on managing the tree's height. Lower limbs have been removed back to the trunk, providing extensive ground clearance, presumably to reduce shading to adjacent properties.

The tree is in apparent good health, with regrowth of good vitality. No major structural defects were visible, although direct access to the tree was restricted due to its offsite location.

T2 is a much smaller flowering cherry, again located approximately one metre south of the site boundary in the adjacent garden. The upper crown development is largely horizontal, resulting in considerable spread that partially overhangs the site, but meaning that it has little amenity contribution and no public visibility beyond the rear of nearby properties (**Plate 2**).

The tree has typical form for the variety and appears to have good health. Access to fully inspect the tree was restricted due to its offsite location.

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**.

4 Statutory Tree Protection

It has been confirmed that the site is located within the Primrose Hill Conservation Area (CA), which will provided statutory protection for both trees within this report. At this stage it is considered that T1 is subject to a Tree Preservation Orders (TPO), with the Local Planning Authority (LPA) confirming that a TPO has been served on a Tree of Heaven at no. 7 Fitzroy Road.

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 plans provided within **Appendices 4 & 5**. Full tree tables are included as **Appendix 3**.

5.1 Development Proposals

The construction of a cabana, a separate single storey permanent structure, is proposed within the rear garden. This is to be supported using a system of bearing pads, with a void beneath its base. The cabana will be provided with mains electricity. A new path will be created linking the cabana with the house, with further paving in front of the cabana.

All construction access will be via the front of the building, remote from any trees. Some use of the rear garden is anticipated for temporary materials storage and working space, but no plant will be able to access this area.

5.2 Tree Removals and Reduction

No tree removal or reduction is required, either for reason of condition or to facilitate the development. Sufficient clearance is already present beneath the crowns of both offsite trees to accommodate the cabana.

5.3 Tree Interface with Proposals

5.3.1 Hard Surface Interface

New hard surfaces are proposed within the root protection area (RPA) of both trees. The path linking the cabana with the house will pass through the RPA of T2 and into part of T1. The paved area to the front of the cabana will be entirely within the RPA of T1.

The use of reduced-dig construction techniques would be suitable to minimise any impact on tree roots, laying paving on the current ground level. The sub-base requirements for this technique will provide greater resilience against future incremental root expansion beneath the path, allowing increased root retention and minimising the potential for damage to the path.

In relation to the total unsurfaced area of the RPA of both trees, paving will result in a loss of approximately 10%. This is mitigated by the design of the path and paved area, providing spaces between slabs that will allow water, nutrients and air to continue to reach roots beneath the paving.

5.3.2 Building Interface

The cabana has potential to affect T1 both during its construction and following completion. During construction installation of the bearing pads could damage roots through excavation, construction access and materials storage could compact and contaminate soil, and the installation of underground services within the RPA could lead to root severance.

Following construction the footprint of the building will act as a barrier to water, nutrient and gas flow. The crown spread of T1 over the cabana may cause concern over shading and debris, possibly increasing pressure to reduce the crown.

The impact of bearing pad installation can be mitigated in two ways. Installing these at or just within the existing ground level will minimise excavation and so the potential for root damage. As a consequence the base of the cabana will be raised above the ground, leaving a void

beneath that allows for continued gaseous exchange for roots beneath. This also means that new paving laid on the current ground level can have its surface at a similar level to the cabana.

The impact could be further mitigated by using a system that provides a degree of flexibility for the location of all bearing pads. Such an approach means that locations can be adjusted to avoid large roots that would otherwise require removal or reduction.

Ground protection can be used to prevent soil compaction from materials and plant when operating within the RPA of both trees. This protection will need to be installed across the entire RPA within the site. Work can then commence from the rear of the garden, working towards the house and removing ground protection for pad and paving installation as required.

Use of the rear garden for temporary materials storage or working space has potential to adversely affect to roots of both trees through soil compaction and contamination. Given that all access will be via the front of the building, any space requirements to the rear can be expected to be minimal. The use of ground protection for a section of T1 not within the footprint of the cabana, together with the section of T2's RPA within the site, will offer protection for the roots. Space outside of both RPAs is available, closer to the house and southern boundary, likely to be sufficient for the purposes of this construction.

The underground electrical connection should be located along the northern boundary to avoid the RPA of T2. This route also provides a direct connection to the section of the cabana not within the RPA, offering potential for the connection to enter at that point, which would negate the need to excavate within the RPA.

The impact of the base can be mitigated by leaving a void beneath the base of the cabana and the soil below. This would then allow for some rain water and nutrients to enter the covered section of RPA, at least round the perimeter. The void would allow for continued gas exchange for roots.

In relation to the total unsurfaced area of the RPA of T1, the cabana's base will result in a loss of approximately 8%. This is mitigated by the void beneath the base, which will allow for continued gaseous exchange, whilst also permitting a degree of water and nutrient flow to roots beneath.

T1 has been subject to previous reduction and crown lifting, presumably due to its impact on surrounding properties. Periodic repetition of this work can be anticipated to prevent the failure of regrowth, irrespective of development. The change of use of the garden as a result of development is considered to be minor: it is already has residential use and this will continue. Therefore the potential for development to increase pruning pressure on the tree is considered to be minimal. In any event, the tree is subject to TPO and therefore the LPA has considerable control over any work proposed.

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

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	**Toby Morris and Carla Buzasi**	5A Fitzroy Road Primrose Hill NW1 8TU	toby.morris@hotmail.com
Agent	**Enric Torner**	3rd 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 Protection

Due to the constrained space in which development is occurring, together with the offsite location of both relevant trees, the use of protective fencing is not considered to be appropriate for this development. Existing boundary fencing is sufficient to protect the trunks and those sections of the RPA external to the site. Development or construction access is required within all sections of the RPA within the site.

6.4 Ground Protection

Before any works commence on site, ground protection shall be immediately installed in accordance with the Tree Protection Plan (TPP) in **Appendix 5** and specification in **Appendix 6.** This will be required within the onsite sections of RPA of both trees. This should comprise a geotextile membrane laid directly onto the ground, followed by a layer of sharp sand of minimum 50mm depth or bark of minimum 100mm depth, on which sheets of plywood or similar are laid.

All ground protection must remain in place throughout the entire development, with the exception of those areas in which permanent construction will replace ground protection. Specifically these areas are:

- The footprint of the cabana;
- New paving to the front of the cabana, and;
- The new path connecting the cabana to the house.

Impact on roots within the footprint of the cabana is likely to arise from excavation for the bearing pads, and the storage and transportation of materials. All materials must be delivered via areas of ground protection at all times when required within the RPA.

6.5 Construction Access/Materials Storage

All construction access, tool and materials delivery will be via the front of the building, through the basement flat. Some temporary storage of materials may be expected in the rear garden, but due to the need for all materials to be carried through the basement flat, the extent of such use is likely to be minor. Delivery of large quantities of materials to the rear is not possible unless craned in.

Similarly, any excavated material will be removed via the front of the building and no temporary storage is expected in the rear garden due to the impact this would have on working space.

Use of the rear garden has potential for contamination of the soil via material spillage, during storage or construction. Material storage and mixing must not take place within the RPA of either tree, even with ground protection in place. Where potential contaminants are required within the working space provided in the RPA, the temporary use of an impermeable covering over the ground protection is required, for the duration of any activities that require their use. It is important that any fall provided on the ground protection directs any spillages or rainwater away from the RPA.

The limitations on materials storage are those given under General Guidance in **6.9**.

6.6 Provision of New Hard Surfaces and Foundations within RPAs

The location of bearing pads for the cabana must be directed by the presence of large roots, in excess of 25mm diameter. Hand excavation must be used to minimise the potential for root damage, excavating only the loose surface soil until firm ground is uncovered. Where roots below 25mm diameter are encountered, these may be removed and must be cut cleanly using a sharp saw.

In the event that roots exceeding 25mm diameter are encountered, alternative locations must be sought for pads. If suitable alternative locations cannot be found, no severance of roots exceeding 25mm diameter 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.

Where new paving is required within the RPA of retained trees, this should be constructed using reduced-dig techniques, minimising excavation. The use of a proprietary three-dimensional cellular confinement system and permeable wearing surface is recommended, to ensure continued permeability for water, nutrients and gaseous exchange, and accommodate future root expansion. Details are provided in **Appendix 7**.

For ease of operation, bearing pad installation should commence from the rear boundary of the garden, removing only sufficient ground protection to allow for exploratory excavation and pad installation to occur. Once pads at the rear have been installed, work should move towards the house with further sections of ground protection removed as before, repeating this process until all pad installation within the RPA is completed. Once completed, the cabana can be installed, thus providing protection for roots for the remainder of the development.

New paving to the front of the cabana should be laid following installation of the cabana, retaining ground protection for access for cabana construction. Paving installation must take place either working off sections of ground protection, or from newly laid sections of paving. Sections of ground protection can be removed, sufficient only to allow paving to be laid, with no materials storage taking place on unprotected ground.

New paving for the connecting path can be laid following completion of the cabana. Ground protection along the course of the new path can be removed in one go, with ample space available to allow work within the RPA of T1 and T2 to take place working off adjacent ground protection, facing T2.

6.7 Service Installation within RPAs

Currently no excavation is anticipated within the RPA of either tree for service installation, as the electrical connection can be routed along the northern boundary, avoiding the RPA.

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	Installation of all ground protection in accordance with the TPP.	Site Manager & Project Arboriculturist.
2	Excavation of bearing pad locations, including selective removal of ground protection.	Site Manager & Project Arboriculturist.
3	Construction of the cabana.	Site Manager.
4	New hard surface construction, including selective removal of ground protection.	Site Manager.
5	Soft landscaping	Project Landscape Architect.
6	Removal of remaining ground 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.

The scope and frequency of supervision visits would be determined by the LPA by way of appropriate planning condition.

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 contained within the National Joint Utilities Group Volume 4 (Guidelines For The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2, 2007); http://www.njug.org.uk/ accessed 12/4/10) 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 any RPA, whether in a skip or on the ground.
- No vehicles shall be parked or operate within the RPA of a retained tree.

7 Conclusions

The development has potential to adversely affect two offsite trees, most notably T1, the larger of the two. The impacts arise from:

- The installation of bearing pads to support the building, including both that from excavation and materials storage/delivery;
- Providing the connection to mains electricity;
- Laying of new paving, and;
- The obstruction of rainwater to roots beneath the building.

Any impact arising from use of the building is considered to be minimal, given the current use of that area as residential garden.

The impacts can be mitigated by:

- Using hand excavation and a reduced-dig approach to install the bearing pads, setting these at or just within the current ground level to minimise the impact on roots beneath;
- Using hand excavation to identify suitable bearing pad locations that avoid major roots, in conjunction with an engineering design that allows a degree of flexibility for their location;
- Routing the electrical connection along the northern boundary, so it can enter the building via the corner not within the RPA of T1, negating the need for any excavation within it;
- Using a reduced-dig construction approach for all new paving within the RPA of either tree;
- The use of ground protection for all onsite sections of both trees' RPA, and;
- Creating a void beneath the building to allow gaseous exchange, and limited water and nutrient flow, to continue for roots beneath.

Cumulatively the total loss of unsurfaced ground is assessed at 18% for T1 and no more than 10% for T2, both below the maximum acceptable loss within the guidance. The impact of this loss of unsurfaced ground is mitigated by the void beneath the cabana and the paving design.

The restricted access to the development area means that the space available within the rear garden, not within either RPA, is sufficient for all materials storage and working space requirements.

On the basis of the above, it is considered that the development can be permitted without adverse impact on retained trees.

8 References

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

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

Compass Bearing:
N = north; S = south; E = east; W = west;

Tree Number:
This is the number used to indicate the trees approximate position on the plans inserted as **Appendix 4**.

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 below 1.5m 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 'est' will appear in the column.

Height
The height of the tree measured to the nearest metre.

Age Class:
Assessed as either:

Sapling or newly established (S) = 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;

Ancient (A) = exceptionally old for the species, the crown may be retrenching, provides many opportunities for wildlife and is likely to be an important habitat.

Health:
Good = normal growth and twig extension-no notable defects.

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

Poor = small internodes, the canopy may be thinning and contain dead twigs and/or branches in the outer canopy, older branch wounds that haven't occluded may be decaying and forming cavities;

Dead=Dead

Retention Category & Remaining Life Expectancy
The retention category assessed using the guidance in Table 1 of BS 5837:2012

(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 included as A Cat, but are 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 a 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 which should, in the current context be removed for reasons of 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).

Appendix 2 Tree Photos

Plate 1 (left). T1 suspected Tree of Heaven, showing evidence of past crown clearance and crown reduction work.

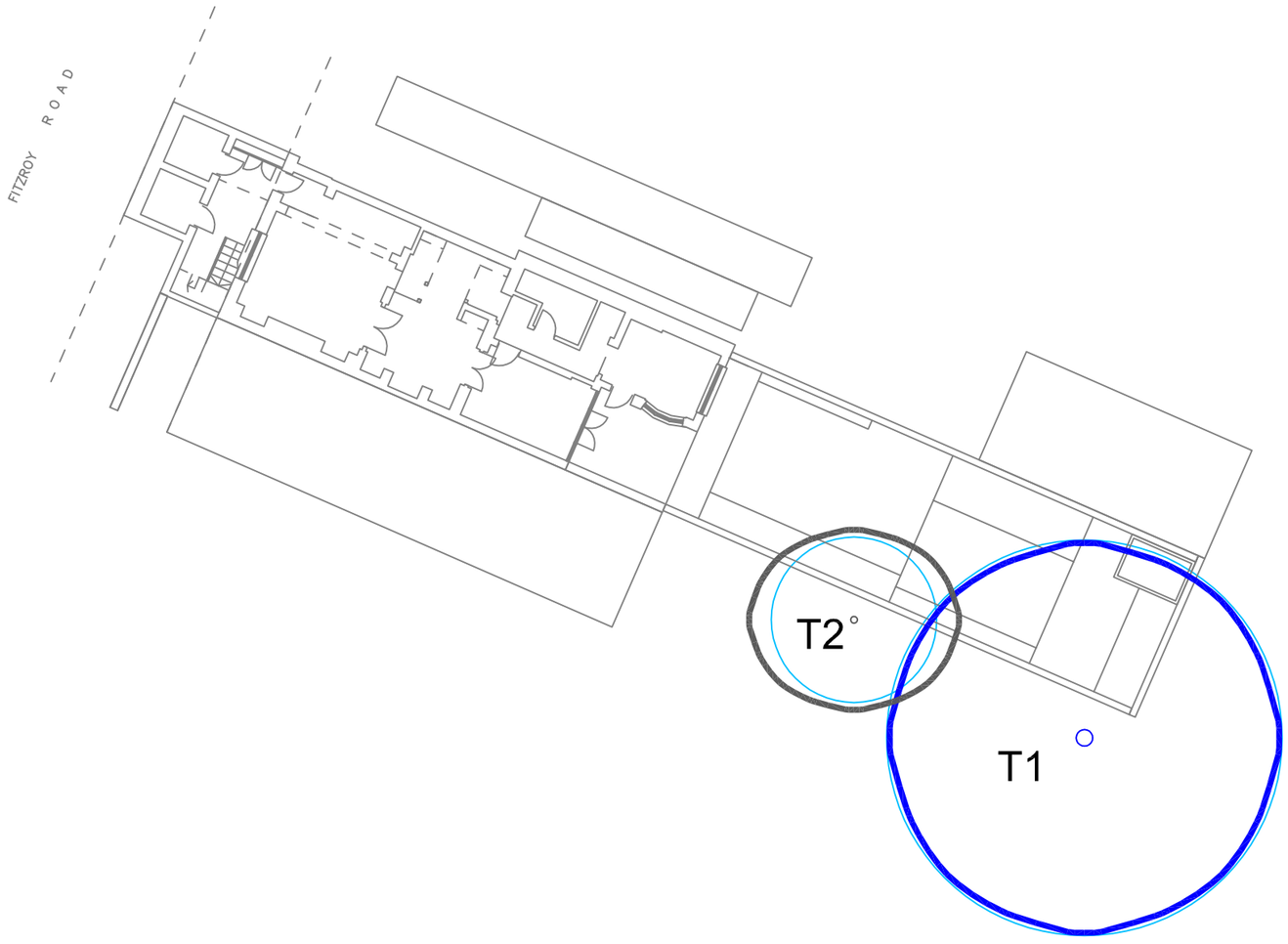
Plate 2 (below). T2 cherry, showing horizontal growth of upper crown and low height.

Appendix 3 Tree Survey Table

Tree No.	Species	Age	Condition	Height (m)	Spread (m)				Crown Clearance (m)	DBH (mm)	Comments	Recommendations	BS 5837 Category	Remaining Life Span (est.)	RPA (m) Radius
					N	S	E	W							
T1	Suspected to be Tree of Heaven *Ailanthus altissima*	M	Good	21	6.5	6.5*	6.5*	6.5*	8.0	550*	The tree has been subject to previous high crown reduction and the regrowth is showing good response.	No work.	B1	20-40	6.60
T2	Cherry *Prunus* sp.	M	Good	5.0	3	3*	3.5	3.5*	2.0	230*	The upper crown has largely horizontal development.	No work.	C1	10-20	2.76

* Indicates value estimated due to access constraints.

Appendix 4 Tree Constraints Plan



REV	DATE	DESCRIPTION

LEGEND

- Category U
- Category A
  Trees of high quality
- Category B
  Trees of moderate quality
- Category C
  Trees of low quality
- RPA using formula in
  accordance with BS5837:2012

LOCATIONS ARE APPROXIMATE.

PROJECT

5A FITZROY ROAD, NW1 8TU

TITLE

TREE CONSTRAINTS

CLIENT

ENRIC TORNER

Trees categorised in accordance with BS5837:2012 "Trees in relation to design, demolition and construction – Recommendations"

The original of this drawing was produced in colour – a monochrome copy should not be relied upon

agb Environmental Ltd
341 Exning Road, Newmarket, CB8 0AT
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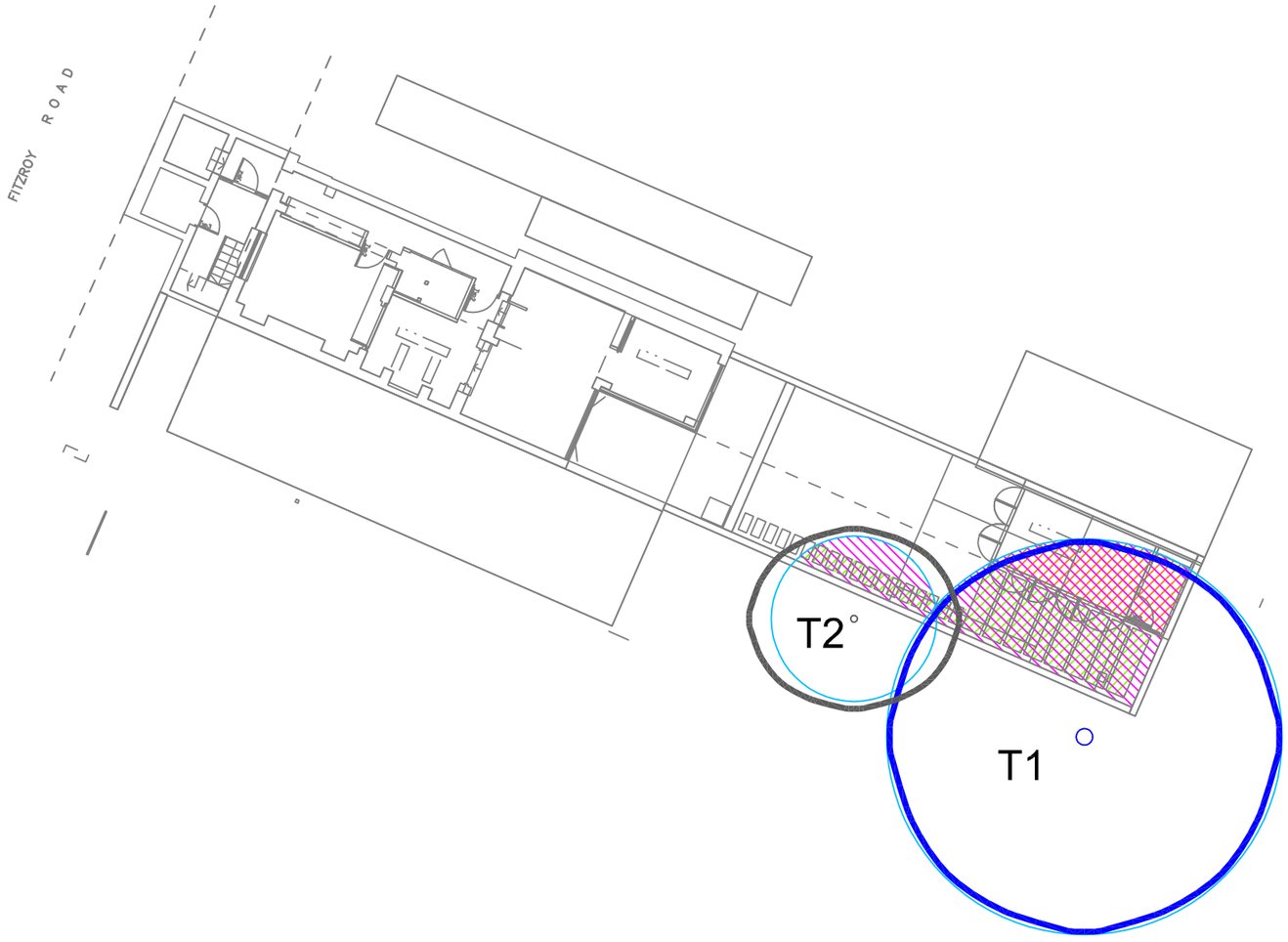
DATE 17/02/15
SCALE 1:200

PROJECT NUMBER . DRAWING NUMBER

P2353.1 . 001 revA

Appendix 5 Tree Protection Plan



REV	DATE	DESCRIPTION

LEGEND

- Category A
  Trees of high quality
- Category B
  Trees of moderate quality
- Category C
  Trees of low quality
- RPA using formula in accordance with BS5837:2012
- Ground protection
- Reduced dig construction methodology and permeable surface
- Specialist foundation area within cabana footprint only - mark as 'reduced-dig bearing pad installation'

LOCATIONS ARE APPROXIMATE.

PROJECT

5A FITZROY ROAD, NW1 8TU

TITLE

TREE PROTECTION

CLIENT

ENRIC TORNER

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DATE 17/02/15
SCALE 1:200

Trees categorised in accordance with BS5837:2012 "Trees in relation to design, demolition and construction – Recommendations"

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PROJECT NUMBER . DRAWING NUMBER

P2353.1 . 002 revB

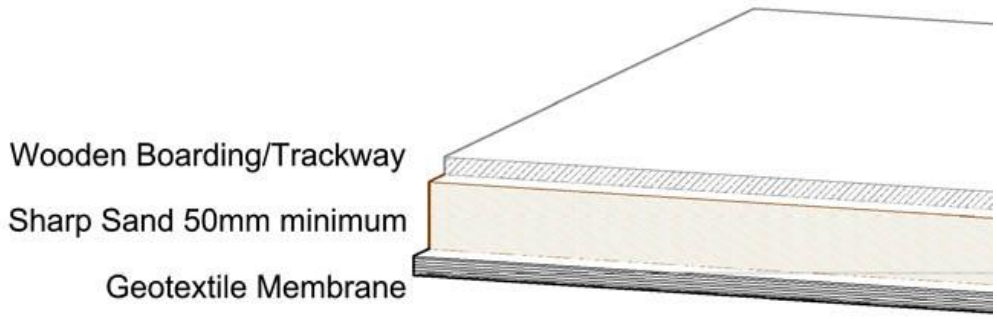
Appendix 6 Ground Protection Details

Specifications:

Ground protection should be laid directly onto the existing ground level with no excavation, prior to the commencement of all development, and in accordance with the details provided in the Tree Protection Plan.

Ground protection should be installed as follows:

- A geotextile membrane is laid directly on the soil surface;
- Onto this is laid a minimum depth of 50mm sharp sand, or 100mm bark;
- Boards or protective trackways are then laid onto the sand/bark layer.



Ground protection example

All ground protection shall remain in place for the duration of all development activities, or until replaced by new permanent surfaces using reduced-dig construction techniques.

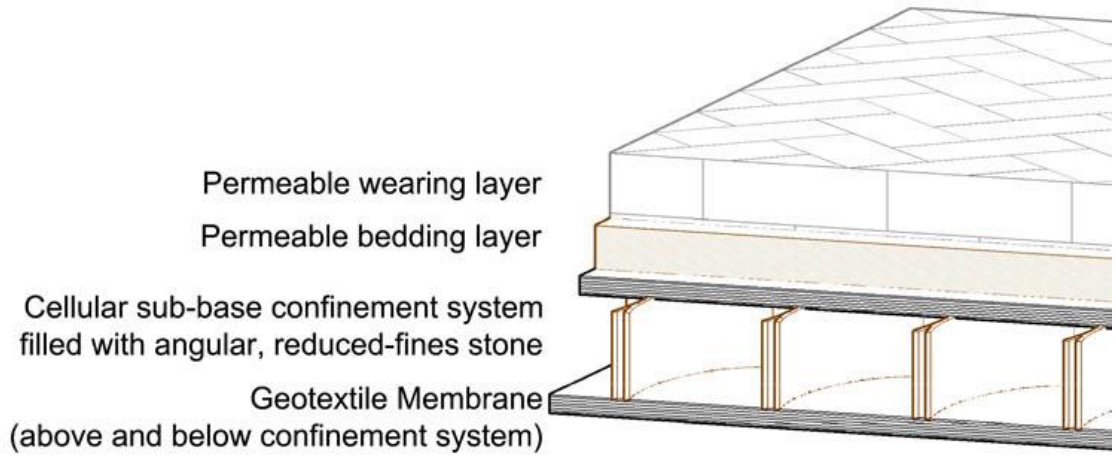
Appendix 7 Reduced-Dig Construction Details

Specifications:

All construction should take place at or with minimal excavation of the existing ground level. All excavation should be by hand.

A geotextile membrane should be laid directly on to the ground. Onto this is placed a three-dimensional load-bearing containment system, filled with angular, reduced-fines stone. A second geotextile membrane is laid on top of this, followed by the permeable bedding layer, then the permeable wearing layer forming the visible surface.

The depth of the sub-base, bedding layer and wearing layer may be dependent upon the intended surface use. This should be determined by the project engineer.



Reduced-dig construction example

The use of this technique has four key aims:

- To minimise the extent of root damage through excavation;
- To evenly spread loading to avoid soil compaction beneath the new surface;
- To allow continued flow of water and nutrients, together with gaseous exchange, to roots beneath;
- To accommodate future incremental expansion of roots and reduce the potential for root related damage to occur.