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Arboricultural Impact Assessment (AIA)

Site Details: Flat 1, 86 Greencroft Gardens, London, NW6 3JQ

Prepared for: Mr J. and Mrs L. Chetrit

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Title: CHE\_86GG\_AIA\_001

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## **1.0 – Summary of Instruction**

An Arboricultural Impact Assessment (AIA) in accordance with *BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations* was commissioned by our client to be undertaken at 86 Greencroft Gardens, London, NW6 3JQ.

I have been instructed to provide an Arboricultural Impact Assessment (AIA) & tree protection strategy for a proposed development scheme at the above property.

The AIA seeks to demonstrate that the proposed development work will not adversely impact on the physiological health, or structural condition of retained on site and/or off site trees.

The AIA is also required to detail effective tree protection and control measures to be implemented at the site, to safeguard retained trees above and below ground level throughout all of the development phases.

The development scheme relates to the proposed:

- Construction of a single storey rear extension to the dwelling;
- Construction of a pergola in the rear garden.

The AIA process is followed in accordance with guidelines detailed in the British Standard *BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations* :

- Carry out a tree survey;
- Categorise surveyed trees at and adjacent to the site to ascertain their suitability for retention;
- Provide all relevant tree data including species identification, dimensions, life stage, condition assessments and make Preliminary/General Management Recommendations where necessary;
- Undertake an Arboricultural Impact Assessment (AIA) to evaluate the potential direct and indirect effects of the proposed development scheme and associated construction activity on nearby significant trees (on and off site as applicable);
- Identify the potential above and below ground tree constraints posed to the development proposal, to assist the development team with conception, design and scheme feasibility, (i.e. A *Tree Constraints Assessment*);
- Highlight the arboricultural implications that the development design and associated construction processes may have on retained trees;
- Provide tree protection information, methods, specifications and control measures to be employed at the site (*in conjunction with other specialist's input where necessary*), as required to mitigate impact and safeguard the retained trees above and below ground level throughout all of the development phases;
- Produce findings of the AIA survey in a written report including a Tree Protection Plan (TPP) and an Arboricultural Method Statement (AMS) for submission to the Local Planning Authority for approval.

The British Standard Institute publication *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations* is referred to throughout this report. This is a nationally recognised standard typically used by Local Planning Authorities to assess planning applications. It is frequently referred to in planning conditions to enforce protection or control of works that may be harmful to trees both on and off the site.

This report has been produced in accordance with *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations* for the sole use of our client (as detailed on the Title Page). Information provided by third parties for use in the preparation of this report is assumed to be correct. (i.e. *Proposed Site Plans, Construction Management Plans, Engineer Specifications etc*).

**This AIA report remains the property of Tree Sense Arboricultural Consultants and is not valid for official use, or supply to Local Planning Authorities (LPA) as supporting information until such time that payment has been made in full.**

## **2.0 – Report Limitations**

- Assessments of all trees have been conducted using Stage 1 of the Visual Tree Assessment (VTA) method of inspection, as appropriate in enough detail to inform the development project. (See Sections 2.3 and 2.4).
- All observations of tree conditions were undertaken from ground level, a visual assessment of external features only, assisted as required by the use of binoculars, a metal probe and a rubber mallet (used for audible resonance testing) where necessary. Below ground tree roots and buried parts were not inspected.
- The “Block Plan As Proposed” (Drawing No. SKA 08 0003 Rev D00) provided by SK Architects, which is not based on a Topographical Survey of the site has been used to create the Tree Constraints and Tree Protection Plans in the AIA report.
- In lieu of a Topographical Survey, tree locations were manually measured at the time of the tree survey, as site conditions allowed and their positions added to the plan.
- All measurements of tree heights, crown spreads and crown clearance from ground level are recorded to the nearest half metre for dimensions up to 10m and to the nearest metre for dimensions over 10m.
- Stem diameters are measured to the nearest 10mm, or where obscured / inaccessible, estimated based on the visible features and characteristics of the tree in question.
- Stem diameter measurements were recorded in accordance with methods detailed in Annex C (fig.C.1a-C.1f) as applicable for each individual tree and adjusted in accordance with Table D.1 of Annex D in BS 5837:2012 as required.
- Detailed background information is not known concerning the past history of the site, the soil type, geology or hydrology of the environs. No inspection material has been acquired by Tree Sense Arboricultural Consultants for assessment and no soil analysis information has been provided by third parties.
- Tree Sense Arboricultural Consultants cannot be held responsible for property damage arising from soil shrinkage or heave issues related to the retention or removal of trees on site.
- The AIA is only concerned with the safeguarding of retained trees against adverse development impacts, although other disciplines such as engineering and ecology may be mentioned where relevant.
- The author of the AIA report does not have formal qualifications in the areas of structural engineering or law. However, making comment on such matters from an arboricultural perspective is both within the normal scope of our instructions and also within the range of the author’s experience. Notwithstanding this, specialist professional advice must be sought to clarify/confirm any observations on engineering or legal matters that this report may contain.
- The tree management recommendations made in this report relate to the assessment of the trees and their surroundings at the time of inspection and in some cases, may be recommended within the context of the development proposal and the end land use. The tree survey undertaken is not a full tree risk assessment, but carried out as appropriate in enough detail to inform the development proposal.
- Weather conditions were dry and overcast on the day of the tree survey (9<sup>th</sup> March 2023).
- Where a tree is subject to a Tree Preservation Order (TPO) and/or stands within a designated Conservation Area, it will be necessary for the tree owner or his/her appointed agent to ensure appropriate compliance with planning requirements, before any recommended, non-urgent treatments can be undertaken. (See Section 12.0).
- BS 5837:2012 does not make a distinction between trees which are subject to statutory protection, such as a TPO, and those trees without. This is principally because all trees are a material consideration and full planning consent overrides any TPO protection. Therefore, we do not seek to offer any comparison between, or imply any difference in the quality or importance of trees covered by a TPO and other trees which are not statutory protected.
- The AIA report is provided to detail impartially the potential tree constraints posed to the development proposal as identified at the site and detail the tree protection measures and methodologies to be employed, in the interest of safeguarding the short and long term health of significant retained trees.
- The provision of the AIA does not guarantee that the associated Local Planning Authority (LPA) will agree with the opinion of the Consulting Arboriculturist, or grant planning consent based on the content and findings of the AIA report.
- This report is compiled into a single PDF file designed for electronic release. If printing this document, please note that the plan drawings may be a different size or orientation to the standard A4 / portrait of the rest of the report. Some PDF reader software may also automatically adjust the size of drawings included in this report. It is the responsibility of the user to ensure that resulting prints are to scale and that the scale bars on the plans measure correctly.
- The Tree Constraints Plan (TCP) and Tree Protection Plan (TPP) are drawn to the scale indicated in Sections 8.1 and 9.1.1 respectively and feature a scale bar on the drawings for cross reference and scaling purposes.

## **2.1 – Time Limits**

It should be understood that trees are not static objects, but growing, living organisms; and their condition, size and relationship to buildings and other trees can change significantly and sometimes unpredictably over the course of a full growing season and periods of dormancy. Trees can also be affected by pathogen attack and react to seasonal weather events, particularly strong wind conditions which have become more frequent in recent years.

Therefore, this report is given a validity period of 12 months from the date of publication and is subject to any suggested management recommendations being undertaken within the correct time frames. A re-assessment tree inspection survey will be required to enable re-validation of the AIA report if required after the 12 month expiry date of this publication.

## **2.2 – Severe Weather Limitations**

Impacts of severe drought, storm, inundation, land slip or subsidence are not covered by this report.

## **2.3 – Tree Safety Matters / Tree Risk Assessment**

The Arboricultural Impact Assessment (AIA) in accordance with *BS 5837:2012 (Trees in relation to design, demolition and construction - Recommendations)* is carried out in sufficient detail to gather data for and to inform the current project.

Our appraisal of the structural integrity of trees on and adjacent (if applicable) to the site is of a preliminary nature and sufficient only to inform the current development proposal. The tree assessment is carried out from ground level as is appropriate for this type of survey, without invasive investigation and is not a full Tree Risk Assessment.

The disclosure of hidden tree defects cannot therefore be expected. Whilst the survey is not specifically commissioned to report on matters of tree safety, we report obvious visual defects that are significant in relation to the existing and proposed land use. As such, General Management Recommendations (GMR) or Preliminary Management Recommendations (PMR) may be made regarding the assessed trees, in respect of good urban tree management.

## **2.4 – Visual Tree Assessment (VTA)**

The Visual Tree Assessment (VTA) method of inspection is an internationally recognised tree hazard assessment method developed by Prof. Claus Mattheck: *Body Language of Trees – a handbook for failure analysis (HMSO, 1994)*.

The basis of VTA is the identification of (external) symptoms which a tree produces in reaction to a weak spot or area of mechanical stress. These can then be interpreted in terms of potential direct impact hazard features within a tree.

The VTA method of inspection does not allow for opinions to be made concerning the risk of a trees potential to cause indirect impact on nearby structures. Indirect impact refers to potential problems caused by changes in soil moisture content in shrinkable soils (i.e. those soils with a high clay content); to which trees can be a contributing factor.

The tree inspection survey undertaken at the above site was conducted in accordance with Stage 1 of the VTA process, as appropriate to inform the development proposal.

### **3.0 – Process**

The Arboricultural Impact Assessment (AIA) in accordance with *BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations* was commissioned to be undertaken as part of the initial feasibility study at the planning stage of the process and seeks to provide supporting arboricultural information to the planning application.

Additionally, the AIA report is to be used by on site contractors and any related third parties, for instructions relating to the installation and management of tree protection apparatus at the site and control measures to be followed during construction operations.

The elements of the AIA at the initial Tree Constraints Assessment stage were:

- To undertake the tree survey;
- Categorise the trees;
- Identify the above and below ground tree constraints posed to the development, with a view to assisting with the conceptual design and feasibility of the proposal from an arboricultural perspective.

The identified tree constraints are to be used to inform and assist with the scheme design, including advising on any necessary engineering solutions and demolition/construction methods which may need to be explored to mitigate potential damage to retained trees in the short and long term, both above and below ground level.

Additionally, the identified constraints will also later assist in determining the specification and positioning of tree protection measures to be employed at the site, to safeguard retained trees above and below ground level throughout the development process to completion.

Following the identification of tree constraints, the AIA evaluates the identified direct and indirect effects of the proposed design in relation to nearby trees. The assessment will consider the effect of any tree loss or damaging activities proposed in the vicinity of retained trees. Activities such as:

- *Removal of existing structures or hard surfacing;*
- *Installation of new hard surfacing;*
- *The location and dimensions of all proposed excavations or alterations in ground levels;*
- *Construction of any new structures above ground level;*
- *Construction or alterations to any below ground utility infrastructure (i.e. for drainage, water, gas, electricity etc.).*

In addition to the permanent works, account should be taken to the buildability of the scheme in terms of access, plant machinery use, adequate operational space and provision for the storage of materials including topsoil, without inflicting damage to the retained trees. Post development pressure on nearby trees is also closely considered and assessed.

As well as an evaluation of the extent of the impact on existing trees, the AIA includes and details within this document:

*a) The tree survey data;*

*b) Trees selected for retention, clearly identified (e.g. by number) and marked on a plan with a continuous outline or similar;*

*c) Trees to be removed, also clearly identified (e.g. by number) and marked on a plan with a dashed outline or labelled / detailed as appropriate;*

*d) Trees to be pruned, including any access facilitation pruning, also clearly identified and labelled or detailed as appropriate;*

*e) Areas designated for structural landscaping that need to be protected from construction operations in order to prevent the soil structure being damaged;*

*f) Evaluation of impact of proposed tree losses (if applicable);*

*g) Evaluation of tree constraints and production of a draft tree protection plan including details of tree protection measures;*

*h) Issues to be addressed by an arboricultural method statement where necessary in conjunction with input from other specialists associated with the project.*

#### **4.0 – General Site Observations**

Flat 1, 36 Greencroft Gardens is the ground floor apartment within a three storey block, which includes the ownership of the rear garden.

The rear garden is broadly rectangular in shape with a central lawn area. A tiled patio surface features off of the existing rear elevation of the dwelling, with a similar tiled seating area located at the back of the garden which extends the full width between the east and west side boundaries. A footpath constructed of the same material runs from the patio to the seating area along the east side of the garden, adjacent to a shingle planting bed. The west side boundary also features a shingle planting bed.

The west side and rear boundaries are dictated by established walls of brick construction, standing approx. 1.5m in height. The east side boundary is dictated by timber fencing of a similar height. Above the rear boundary wall there is dense Ivy growth emanating from the neighbouring garden to approx. 500mm above the top of the wall.

The front garden does not allow for off street parking, with two small garden areas are present on either side of a central footpath which leads to the front doors of the apartment building.

A gated side access passage runs along the western side of the front garden and the building, allowing access into the rear garden of the property. Importantly, in terms of site access, this side passage is separated from the front garden by trellis fencing, allowing site access into the rear garden without having to enter the front garden area.

For the purposes of the Arboricultural Impact Assessment (AIA), four individual trees at the rear of the property were assessed and recorded overall, One on site tree (T1) and three off site trees (T2, T3 and T4).

Details of the individual tree surveyed for inclusion in the AIA can be found in the Individual Tree Data Table in Section 5.0 below, with additional tree data notes provided in Section 5.2.

## 5.0 – Individual Tree Data

Tree No.	Species	Height (m)	Stem Diameter (mm)	Branch Spread (m)	First Significant Branch Height and Direction of Growth (m)	Canopy Height (m)	Life Stage	General Comments Inc. Physiological and Structural Condition	Preliminary / General Management Recommendations	Estimated Remaining Life Expectancy (Years)	Category
T1	Eucalyptus	9	1 – 125 2 – 250 SE - 275	N – 3 E – 3 S – 5 W – 3	2 – E	4	Y	<p>Physiological Condition – Good Structural Condition – Fair</p> <p>Co-dominant stems at 1.5m (2).</p> <p>Historically pruned with young growth emerging from the previous pruning points. A branch stub remains where a branch has been removed at approx 2m on the north-west side of the crown framework, which is causing abrasion damage to one of the larger crown framework limbs.</p> <p>Good vitality with a southern growth bias.</p> <p>Poor location, considering the future growth potential of the tree, which is close to the building and the neighbouring building to the east.</p>	SEE TREE CONSTRAINTS SECTION 8.2.	20+	<b>B 1</b>
T2	Rhododendron	5	1 – 100 2 – 150 (Est.) SE – 175	N – 2 E – 2 S – 3 W – 3	3 – S	4	SM	<p>Physiological Condition – Good Structural Condition – Good</p> <p>Off site tree.</p> <p>Co-dominant stems at 1.5m (2).</p> <p>Full crown with good vitality.</p>	–	20+	<b>B 1</b>
T3	Ash	9	200 (Est.)	N – 3 E – 3 S – 3 W – 3	3 – W	6	Y	<p>Physiological Condition – Fair Structural Condition – Fair*</p> <p><i>* = Unable to assess as the lower third of the tree is not visible behind the rear boundary wall and Ivy growth.</i></p> <p>Off site tree.</p>	–	10+	<b>C 1, 2</b>
T4	Alder	10	300 (Est.)	N – 3 E – 4 S – 4 W – 4	3 – E	5	SM	<p>Physiological Condition – Fair Structural Condition – Fair*</p> <p><i>* = Unable to assess as the lower third of the tree is not visible behind the rear boundary wall and Ivy growth.</i></p> <p>Off site tree.</p> <p>Major and minor sized deadwood visible in the crown and climbing vine vegetation in the crown framework.</p>	–	10+	<b>C 1, 2</b>

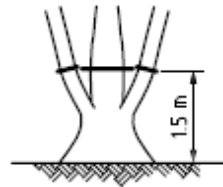


## 5.1 – Key to Table 5.0

- 1) **Height** describes the height of the tree from the base of the trunk/stem in metres.
- 2) **Stem Diameter** is the diameter of the trunk in millimetres, measured at 1.5m from ground level. For multi stemmed trees, a single stem diameter equivalent (SE) is calculated and indicated beneath the measurements of each separate stem. (Est.) indicates the stem diameter was estimated due to the tree being obscured and/or inaccessible to physically measure.
- 3) **Branch Spread** is the average length of branch spread from the centre of the tree in the direction of each cardinal point of the compass in metres.
- 4) **First Significant Branch Height and Direction of Growth** – Clearance height from the ground of the first major structural branch of the trees' crown and its direction of growth.
- 5) **Canopy Height** is the distance between the lowest visible canopy branches and ground level in metres.
- 6) **Life Stage** is represented as: Y= Young (*in first third of life expectancy*), SM = Semi Mature (*in second third of life expectancy*), M= Mature (*final one third of life expectancy*). Trees considered to be beyond their likely life expectancy are normally classed as OM = Over Mature or V = Veteran.
- 7) **Physiological Condition** relates to the vitality of the tree.  
**Structural Condition** relates to the mechanical integrity of the tree and assesses the presence of structural defects. (*i.e. dead branches, cavities, splits, cracks, included bark etc.*)
- 8) **Estimated Remaining Life Expectancy** is an estimate of the minimum life expectancy of the tree based on its condition and life stage at the time of assessment..
- 9) **Preliminary Management Recommendations (PMR)** detail any additional arboricultural practices to be undertaken, such as Stage 2/3 VTA, or climbed/aerial inspections.  
**General Management Recommendations (GMR)** may also be indicated and relate to tree surgery management works which are recommended in respect of good tree management and are not made in the context of a potential development project. (See Section 5.2).
- 10) **Category grading** is based on tree categorization guidelines provided in The British Standard *BS 5837:2012 Trees In relation to design, demolition and construction - Recommendations* (See 6.0 below).

### Stem diameter measurements:

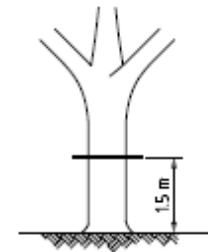
T1 and T2 feature more than one stem at 1.5m above ground level. As such, a single stem equivalent has been calculated and recorded for these trees, based on the measuring method shown in Fig. C.1f in Annex C of BS 5837:2012, as required.



f) Measurement of a tree with more than one stem at 1.5 m above ground level

T3 and T4 are assumed single stem trees at 1.5m based on the visible characteristics of both trees. (*off site trees with the lower third of the trees obscured from view by the rear boundary wall and dense Ivy growth*).

As such, stem diameter measurements are estimated at 1.5m above ground level, based on the measuring method shown in Fig. C.1a in Annex C of BS 5837:2012, as required.



a) Stem diameter measured at 1.5 m above ground level

- Major deadwood = over 25mm diameter, Minor deadwood = under 25mm diameter.
- \*= CODIT – (*Compartmentalisation of Decay in Trees*).
- PMR = Preliminary Management Recommendation - i.e. VTA Stage 2/3, semi invasive tree condition investigations (Tomography/Resistograph testing etc.) or climbed/aerial tree inspection.
- GMR = General Management Recommendation – i.e. Tree surgery management works (pruning, felling etc, including Access Facilitation Pruning). **For on site trees which are under the management control of the applicant.**
- GMR ADVISORY = General Management Recommendation – i.e. Tree surgery management works (pruning, felling etc, including Access Facilitation Pruning). **For off site trees which are NOT under the management control of the applicant.**

## **5.2 – Tree Data Notes**

The trees detailed individually in Section 5.0 are those which were considered in the Arboricultural Impact Assessment (AIA).

*General Management Recommendations – (GMR)* for tree surgery works may have been made in the interest of good tree management and are not necessarily required in relation to the proposed development project.

*Preliminary Management Recommendations – (PMR)* may have been made where \*further investigation into tree health and condition is required before a decision can be made concerning the safe retention of a tree.

*\*Further investigation normally refers to (but is not restricted to):*

- *Stage 2/3 of the Visual Tree Assessment (VTA) process, which involves semi invasive testing with Tomography, Resistograph and Fractometer equipment on areas of the tree where a significant internal structural defect is suspected following the Stage 1 VTA. Stage 2/3 VTA can determine in much greater detail the extent and severity of suspected internal wood decay and/or structural defects and also determine the strength of supporting wood tissue.*
- *Recommendations for a climbed/aerial inspection to be undertaken, to assess the upper sections of the tree stem or crown, where a significant structural defect is suspected but could not be quantified during the Stage 1 VTA undertaken from ground level.*

Any tree surgery work recommended must be undertaken following the correct procedures relating to trees protected by Tree Preservation Orders (TPO), or which are growing within a designated Conservation Area, where applicable to both on site and off site trees. (See Section 12.0).

Any *General Management Recommendation (GMR)* which may have been made to remove hazardous trees, deadwood from crowns, or removal of invasive climbing vegetation (such as Ivy) from TPO or Conservation Area trees does not require permission from the Local Authority before actioning. However, it is considered good practice to inform the Local Authority of any intended emergency tree removals and/or deadwood and Ivy removal works. In the case of complete tree removal emergencies, taking before and after photographs is strongly recommended.

*Advisory GMRs* are made if any works are recommended to be undertaken to off site trees which are outside of the management responsibility of the applicant.

*Advisory GMRs* must also be permissible by the tree owners, except in situations where Common Law allows. (The Statutory Protection process as above still applies where relevant).

*Advisory GMRs* are made in the interests of good tree management and should be brought to the attention of those who own or have the responsibility to manage the trees concerned.

All recommended tree work must be undertaken in accordance with guidelines set out in *BS 3998:2010 Tree work – Recommendations (As updated)*. (See Section 10.3).

The following sections provide information regarding the categorisation of the surveyed trees and the tree constraints which have been identified at the site.

## 6.0 – Tree Categorisation

The purpose of Tree Categorisation as detailed in *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*, is to identify the quality and value of existing tree stock, allowing informed decisions to be made concerning which tree(s) should be retained or removed should development occur. This process is the starting point of the tree survey, following a land survey and should ideally, be undertaken before any site design or layout is proposed.

Trees are given a category grading based on individual tree assessment, in line with the categorisation methodology as detailed in Table 1 of *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*. Table 1 is reproduced as an informative below:

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)	Identification on plan
<b>Trees unsuitable for retention (see Note)</b>		
<b>Category U</b> 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	<ul style="list-style-type: none"> <li>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)</li> <li>Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline</li> <li>Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality</li> </ul> <p><i>NOTE</i> Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</p>	See Table 2
	1 Mainly arboricultural qualities	2 Mainly landscape qualities
		3 Mainly cultural values, including conservation
<b>Trees to be considered for retention</b>		
<b>Category A</b> 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
<b>Category B</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), such 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
<b>Category C</b> Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	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
		See Table 2

To easily identify the category grading for each tree assessed for inclusion in the AIA, all tree identification numbers on the Tree Constraints Plan(s) and Tree Protection Plan(s) are shown in a colour which represents the tree's category grading. Table 2 below, again reproduced from *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*, details the identification colours to be used for each category grade:

Table 2 Identification of tree categories

Category (from Table 1)	Colour <sup>A)</sup>	RGB code <sup>A)</sup>
U	Dark red	127-000-000
A	Light green	000-255-000
B	Mid blue	000-000-255
C	Grey	091-091-091

<sup>A)</sup> Colours verified against <http://safecolours.rigdenage.com/palettefiles.html#files> [viewed 2012-03-26].

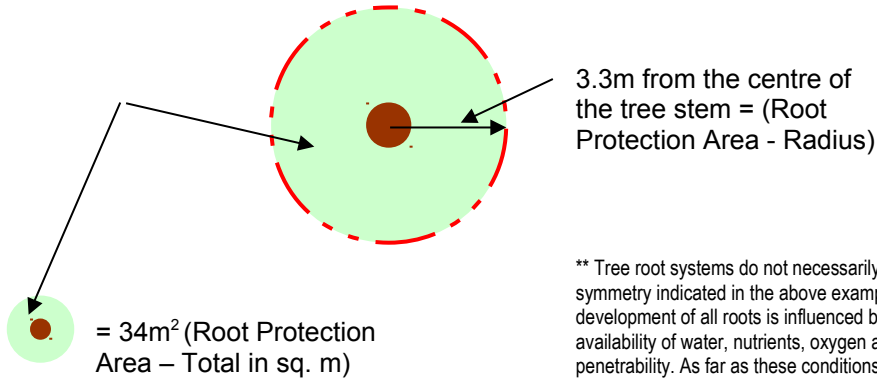
Once it has been established which trees can and are suitable to remain and are worthy of retention, necessary measures to protect them throughout the course of the development project must be undertaken.

## 7.0 - Tree Constraints

The tree constraints are the influences the trees will have below and above ground level in relation to the development proposal. The below ground constraints are represented by the trees Root Protection Area (RPA), the above ground constraints are represented by the trees size and position, including shading dominance caused by crown density and spread which may affect light into newly developed or extended buildings. The physical constraints posed by trees and their crown branching in relation to new proposed structures and construction apparatus (such as scaffolding) are also closely considered.

### 7.1 - RPA (Root Protection Area) – (Below Ground Constraints)

The nominal RPA radius is taken from the centre of the tree stem, encircling the tree to give the RPA Area (example based on T1 shown below) \*\*:



\*\* Tree root systems do not necessarily show the symmetry indicated in the above example, the development of all roots is influenced by the availability of water, nutrients, oxygen and soil penetrability. As far as these conditions allow, the root system tends to develop sufficient volume and area to provide physical stability.

The following table indicates the calculated Root Protection Areas (RPA) for the trees which were assessed as part of the Arboricultural Impact Assessment (AIA).

The RPAs have been calculated using stem diameter measurements (taken at 1.5m above ground level) collected at the time of the tree survey and are detailed in Table 5.0. RPA calculations are made using formulae detailed in *BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations* – Section 4.6 and Table D.1.

Tree No. (Category colour coded)	RPA Radius (m)	RPA Area (m <sup>2</sup> )
1	3.3	34
2	2.1	14
3	2.4	18
4	3.6	41

## **7.2 – Above Ground Constraints**

The above ground constraints caused by tree heights and the spread of branches can pose constraints to the development project in respect of demolition work, new building design, position and operational space requirements.

For example, if the lateral branch spread of a tree extends into areas where development activity is likely, there is a risk of potential direct impact from site machinery, installation of scaffolding and other construction related activities on the tree crowns which may cause damage to limbs and branches.

Tree stems and exposed buttress roots are also above ground constraints which need to be considered in respect of possible impact damage to them. Post development pressure is also of material consideration in respect of future tree pruning requirements and frequency following completion of the development.

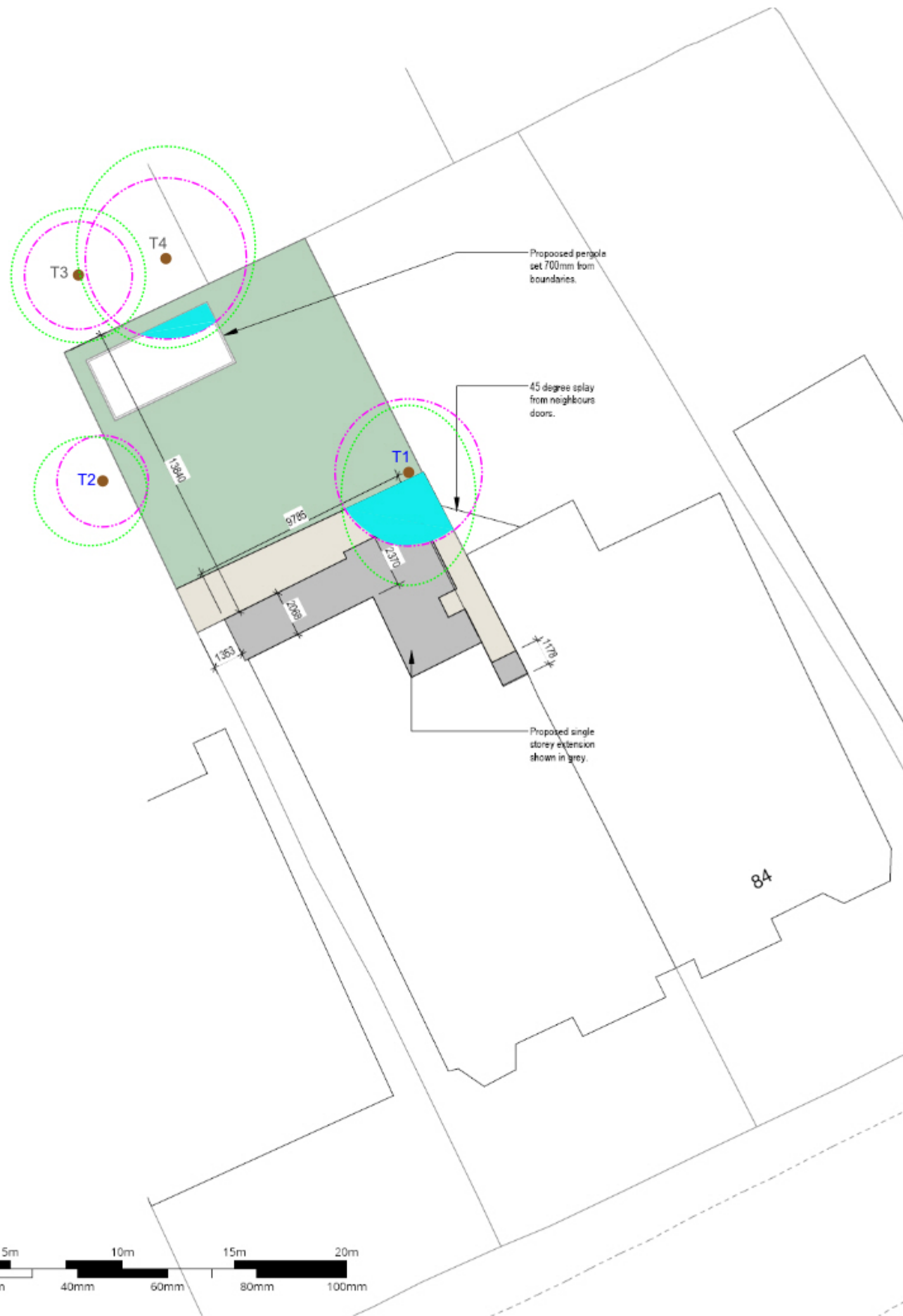
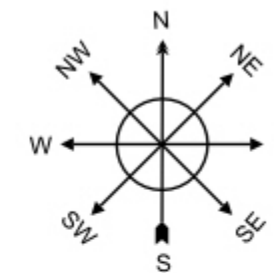
Shading issues are also considered in respect of tree size, form and position in relation to the proposed new structure and end use.

Species characteristics such as density of foliage, and whether trees are deciduous or evergreen are important factors to consider in respect of shading issues, which may affect light levels into new or extended buildings. If a shading issue is determined, details will be provided on the Tree Constraints Plan (TCP).

Any proposals for above ground service installations such as telecommunication cables should also be considered with close reference to the above ground constraints posed by the trees at the development site, their location and their crown spreads.

The Tree Constraints Plan (TCP) in Section 8.0 below indicates the above and below ground constraints of all relevant trees at and adjacent to the site, with comments relating to the identified constraints in Sections 8.1 and 8.2. Canopy heights (ground clearance) and crown spread measurements are recorded in the Individual Tree Data Table in Section 5.0.

8.0 – Tree Constraints Plan (TCP)



**TREE NUMBER COLOUR CODING:**

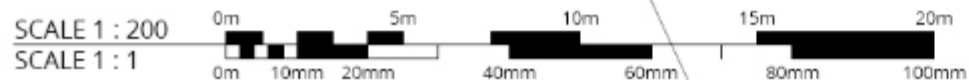
- RED = CATEGORY U
- GREEN = CATEGORY A
- BLUE = CATEGORY B
- GREY = CATEGORY C

**KEY TO SYMBOLS:**

- = Calculated Root Protection Area (RPA)
- = Crown spread (N, E, S, W)

**= RPA incursion areas:**

- T1 = 9.24m<sup>2</sup>**  
(Extension footprint and new patio surface)
- 9.24m<sup>2</sup> = 27.17% of Total RPA for T1 (34m<sup>2</sup>)**
- T4 = 2.50m<sup>2</sup>**  
(Pergola)
- 2.50m<sup>2</sup> = 6.1% of Total RPA for T4 (41m<sup>2</sup>)**



### **8.1 - Tree Constraints Plan (TCP) Notes:**

The Tree Constraints Plan (TCP) in Section 8.0 is shown to approximate 1:200 scale @ A3 based on the Block Plan As Proposed (*Drawing No. SKA 08 0003 REV D00*) provided by SK Architects.

The TCP is provided only to indicate the position, category and numbering of the surveyed trees and provide an indication of the identified tree constraints by showing a graphic of the calculated Root Protection Areas (RPA) and tree crown spreads. Where identified, RPA incursion areas are also shown on the TCP.

The TCP is for use to assist in the scheme design and determine the arboricultural feasibility of the proposal.

RPA measurements can be found in the RPA table in section 7.1, crown spread measurements can be found in Table 5.0 above.

Using the formula described in *BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations* (Section 4.6 of the standard), the calculated RPA should be shown as a nominal circle on the Tree Constraints Plan with a radius based on 12 times the stem diameter for a single stem tree.

## **8.2 – Tree Constraints Assessment**

*The identified constraints shown on the Tree Constraints Plan (TCP) in Section 8.0 were established following the tree survey, using data collected at that time.*

*The tree constraints are to be used to assist with the final design and arboricultural feasibility of the proposal and to later determine the layout of tree protection measures to create the Construction Exclusion Zones (CEZ) and ground protected areas at the site.*

*Below is a summary of the identified tree constraints in relation to the development proposal, following the tree survey undertaken on the 9<sup>th</sup> March 2023:*

### **Below Ground – Root Protection Area (RPA) Incursion - (New rear extension footprint and patio)**

- **Trees Affected:**
  - T1.
- **Arboricultural Impacts:**
  - Potential for major root severance / loss of feeder roots / soil compaction.
  - **RPA Incursion calculation:**
  - The proposed footprints of the new rear extension, plus the new rear patio surface incur inside the nominal RPA calculated for T1 by **27.17%**. **(9.24m<sup>2</sup> = 27.17% of the Total RPA (34m<sup>2</sup>) calculated for T1).**
- **Comments:**
  - The RPA incursion of 27.17% calculated is considered to be unacceptable, due to the potential for significant loss of major roots and the extended feeder root system, through excavations required for the extension foundations and constructing the sub base for the patio surface.
  - The patio sub base would also require compacting to allow for laying a level surface finish, which in turn would compact the underlying soil, creating an unfavourable environment for tree root function and development.
  - T1 is considered to be in a poor location so close to existing buildings. T1 is a young tree, which has the potential to grow to much greater size in the medium / long term. Additionally, Eucalyptus species are shallow rooted and as such can be susceptible to wind throw, particularly if the trees roots and rooting environment is compromised.
- **Controls:**
  - In the context of the development proposal, T1 is required to be removed. The evaluated impact on the root system is considered unacceptable and would result in an adverse impact on the physiological health of the tree, due to loss and compaction of feeder roots and also compromise the anchorage and safety of the tree if major roots are severed during excavation works.
  - Outside of the context of the development and due to the species, future growth potential and location of T1, it is recommended that T1 should also be removed while it is still young and relatively small, as the tree has yet to reach full maturity and is in close proximity to existing buildings and residential gardens. As the tree grows into maturity it will outgrow its location and as such, it is my opinion that retention of T1 would be misplaced.  
(See Arboricultural Method Statement (AMS) in Section 10.1).
  - The loss of T1 is to be mitigated by the planting of new trees in the rear garden as part of a soft landscaping proposal to be undertaken post development.

*N.B. The RPAs shown for retained trees are indicated on the Tree Constraints Plan (TCP) by a nominal circle around each tree. The circle is based on the RPA radius, as calculated using the stem diameter measurement for each tree, taken at 1.5m above ground level. RPA calculations for all assessed trees can be found in Section 7.1 above.*



## 8.2 – Tree Constraints Assessment – Cont'd

### Below Ground – Root Protection Area (RPA) Incursion - (New pergola)

- **Trees Affected:**
  - T4.
- **Arboricultural Impacts:**
  - Potential for negligible feeder root loss.
  - **RPA Incursion calculation:**
  - The proposed footprint of the new pergola structure incurs inside the nominal RPA calculated for T1 by 6.1%. ***(2.50m<sup>2</sup> = 6.1% of the Total RPA (41m<sup>2</sup>) calculated for T4).***
- **Comments:**
  - ***The RPA incursion of 6.1% calculated is considered to be acceptable, particularly as the tree is off site behind a well established brick wall along the rear boundary. The wall and its foundations will restrict lateral root distribution into the site.***
  - ***Additionally, the pergola will be constructed on individual concrete pad footings for the support posts, rather than traditional strip foundations, avoiding the need for extensive trench excavations.***
  - ***The potential loss of a small percentage of feeder roots is considered to be acceptable, as the feeder roots die off and regenerate seasonally to the needs of the tree.***
  - ***No major roots are likely to be discovered at this extremity of the nominal RPA, particularly due to the tree being off site behind a well established brick wall.***
- **Controls:**
  - As a precautionary measure, any excavations required to install footings for the pergola structure must be undertaken with care using manual hand tools only.
  - Should any woody roots be encountered measuring over 25mm diameter during excavation works, they must not be severed and the Consulting Arboriculturist contacted. (See Arboricultural Method Statement (AMS) in Section 10.1).

*N.B. The RPAs shown for retained trees are indicated on the Tree Constraints Plan (TCP) by a nominal circle around each tree. The circle is based on the RPA radius, as calculated using the stem diameter measurement for each tree, taken at 1.5m above ground level. RPA calculations for all assessed trees can be found in Section 7.1 above.*

### Below Ground – Root Protection Area (RPA) Incursion - (New underground services)

- **Trees Affected:**
  - None.
- **Arboricultural Impacts:**
  - N/A.
- **Comments:**
  - New trenches for installing new or altering existing underground utility apparatus to service the new extension are not proposed.
- **Controls:**
  - N/A.

## **8.2 – Tree Constraints Assessment - Cont'd**

### **Below Ground – Root Protection Area (RPA) Incursion - (New outside hard surfacing)**

- **Trees Affected:**
  - None.
- **Arboricultural Impacts:**
  - None.
- **Comments:**
  - Following the removal of T1, the new rear patio surface will not impact on any retained trees below ground level.
- **Controls:**
  - T1 is to be removed prior to commencement of the development.

### **Below Ground – Root Protection Area (RPA) Incursion - (Site access & operations)**

- **Trees Affected:**
  - T2 and T4.
- **Arboricultural Impacts:**
  - Soil compaction inside RPAs – by plant machinery and/or pedestrian movements/site operations;
  - Soil compaction inside RPAs by storing bulk building materials;
  - Soil contamination inside RPAs – contaminate waste storage, spilt contaminants (fuels, cement etc).
- **Comments:**
  - T2 and T4 are off site trees, which exhibit nominal RPA sectors calculated to fall inside the site boundaries.
- **Controls:**
  - *(Refer also to the Tree Protection Plan (TPP) in Section 9.1 and Arboricultural Method Statement (AMS) in Section 10.1).*
  - All site access into the rear garden will be via the side access passage on the western side of the building.
  - Construction exclusion Zone (CEZ) fencing will be positioned to exclude the RPA sector shown for T2 and exclude overhanging branches.
  - The nominal RPA sector shown for T4 is beneath existing hard surfacing (rear garden – paved seating area), which is to remain in situ, other than where the pergola footings are to be installed.
  - Paving is to be removed by hand and excavations for the pergola footings required inside the RPA sector are to be undertaken with care using hand operated tools only.
  - CEZ fencing specifications are detailed in Section 9.2 below.
  - Suggested areas designated for material storage and preparation (i.e. Site Compound Areas) are indicated on the Tree Protection Plan (TPP) in Section 9.1. **NO SITE ACCESS, STORAGE/PREPARATION OF MATERIALS, OR WASTE STORAGE IS PERMITTED INSIDE THE FENCED OFF CEZ AT ANY TIME.**
  - All Construction Exclusion Zone (CEZ) fencing must be fully installed at the start of the project prior to commencement of any development works and remain undisturbed and in position throughout all development phases until completion.
  - The CEZ fencing must be the first apparatus installed during site set up and the last apparatus to be removed from the site on completion of the development works.

## **8.2 – Tree Constraints Assessment – Cont'd**

### **Above Ground – Crown heights / Crown Spread - (New structures above ground level)**

- **Trees Affected:**
  - T1.
- **Arboricultural Impacts:**
  - Damage / loss of significant crown branches.
- **Comments:**
  - The southern spread of T1 branches overhang the area where the proposed rear extension is to be constructed, at a current crown height of 4m.
  - T1 is required to be removed to facilitate the extension and patio construction, due to the unacceptable impact on the tree root system by the necessary ground works for the extension foundations and construction of the new patio surface sub base.
  - Additionally, the above ground constraint posed by the southern growth bias of the tree and the crown spread over the new extension, is also considered to be unacceptable, particularly as the tree has not yet reached maturity and its crown growth would require frequent pruning to control and maintain the branch spread away from the building. Overly frequent pruning results in stress on the trees' physiological processes and can quickly spiral into the decline of the tree.
- **Controls:**
  - T1 is to be removed prior to commencement of the development works.
  - The loss of T1 is to be mitigated by the planting of new trees in the rear garden as part of a soft landscaping proposal to be undertaken post development.

### **Above Ground – Crown heights / Crown Spread - (The use of cranes, booms/jibs, skip lorries)**

- **Trees Affected:**
  - None.
- **Arboricultural Impacts:**
- **Comments:**
  - No cranes are proposed to be in use at the site during the development phases.
  - If required, skips must not be positioned in close proximity to any trees on or off site to allow for delivery and collection by skip lorries without impacting on tree crowns.
  - There is no driveway space available at the front of the property, therefore any skips required will need to be located on the carriageway, subject to all permissions being in place from the Local Authority.
  - No significant trees are present at the front of the property, therefore skip lorries can operate freely in collecting and delivering skips without adversely impacting on tree crowns.
  - At the time of writing no information was available regarding the use of plant machinery at the site. However, it is typical for plant such as mechanical diggers and dumpers to be in operation on most construction sites and as such; the use of plant machinery is assumed. No tree crowns will be affected by plant use around the development area, which will all be either excluded behind the CEZ fencing or exhibit crown ground clearance heights in excess of 5m (e.g.T3 and T4).
- **Controls:**
  - CEZ fencing to be installed to enclose the RPA sector and eastern crown spread of T2.
  - (See Tree Protection Plan in Section 9.0).

## **8.2 – Tree Constraints Assessment – Cont'd**

### **Above Ground – on/off site tree stems and buttressing - (All site activity)**

- **Trees Affected:**
  - None.
- **Arboricultural Impacts:**
  - N/A.
- **Comments:**
  - Following the removal of T1, no significant on site trees will be at risk of stem or buttressing damage.
  - T2, T3 and T4 are all off site trees, located behind boundary walls of brick construction.
- **Controls:**
  - N/A.

*The above assessment summarises the above and below ground level tree constraints identified at the site in relation to the development proposal, with a brief summary of tree protection control measures also provided. In terms of the associated construction works and site activity, all retained trees will need to be safeguarded by the installation of tree protection measures to prevent damage to them throughout the development phases. (See Tree Protection Sections 9.0 – 10.1 below).*

*The Arboricultural Method Statement (AMS) in Section 10.1 provides details of the tree protection and control measures to be employed at the site, to ensure the trees are safeguarded above and below ground level throughout the course of the development project and in the long term.*

## **8.3 – Arboricultural Phasing**

The following summarises the arboricultural phases prior to and post completion of the proposed development works:

- **Pre-development:**
  - Undertaking and completion of all General Management Recommendations (GMR) and access facilitation tree removals, tree pruning (as required).
  - Installation of all required tree protection measures (i.e. barrier fencing to create the on site Construction Exclusion Zones (CEZ)

### **Development Phases**

- **Post-development:**
  - Remove all construction tools, machinery, scaffolding, waste, materials, skips, temporary units (site huts etc.) and any other construction related apparatus from the site;
  - Dismantle and remove the Construction Exclusion Zone (CEZ) fencing.

### **8.3.1 – Tree Surgery Works**

*The following section summarises the recommended tree surgery works which should be undertaken prior to commencement of the Development Phases and installation of tree protection measures.*

- **Access facilitation tree surgery:**
  - T1 – Remove the tree to ground level and remove the stump using a stump grinder.

## **9.0 – Construction Exclusion Zone (CEZ) – (General)**

*Retained trees on and/or in close proximity to the site must be protected by barriers and/or suitable ground protection before any materials or machinery are brought onto the site, and before any demolition or construction work commences.*

*Where all activity can be excluded from the tree's Root Protection Area (RPA), vertical barriers are to be erected to create a Construction Exclusion Zone (CEZ). Where, due to site constraints construction activity cannot be fully or permanently excluded in this manner from all or part of a trees' RPA in unmade ground, suitable temporary ground protection is to be installed over exposed RPA sectors.*

*The RPA measurements of the surveyed trees (as shown in section 7.1 above) are used to help determine the Construction Exclusion Zone (CEZ) around the trees, protecting them during the construction phases to eliminate the possibility of damage above or below ground level.*

*The CEZ is created by fencing off the area and/or installing suitable ground protection that is fit for purpose, using the calculated distance of the trees' RPA Radius as shown in the table in Section 7.1 above.*

*The CEZ is required so that the calculated RPAs of trees remain undisturbed during the development process by excluding all activity from the area, or by protecting any exposed RPA sectors from pedestrian and vehicular traffic with suitable ground protection, if exposed outside of the barrier fencing. The CEZ should also be positioned to protect tree stems, buttress roots, surface roots and any low tree branches which may travel beyond the calculated RPA. In these cases, barrier fences should be extended to incorporate low hanging crown branches behind them if possible.*

*The storage of building materials also must not occur within any designated CEZ. An area for storage of materials, fuels, spoil and the mixing of cement and concrete will be determined during the planning phase to ensure the RPAs of the trees are not affected. (See Arboricultural Method Statement (AMS) 10.1 below).*

*Materials which can be considered as contaminants such as cement, concrete mixings, spoil and fuels, whose accidental spillage would cause damage to a tree, should be stored and handled well away from the outer edge of any tree RPA and in accordance with the Control of Substances Hazardous to Health Regulations 2002 (COSHH). This also includes vehicle washings and care must be taken to ensure that sloping ground will not allow for contaminants to travel into the CEZ.*

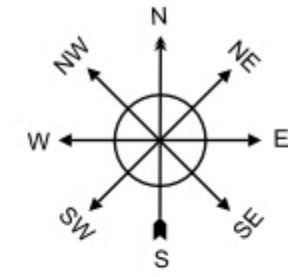
*Fires on site are not permitted. Notice boards, cables or other services must not be attached to the tree stems, limbs or branches.*

*The CEZ must be considered as sacrosanct and not removed or altered without prior consultation with a Tree Sense Arboriculturist. The fencing should also display a sign with words to the effect of "Construction Exclusion Zone – Keep Out". (See example in Appendix C).*

*Care must also be taken to ensure that any site activity involving any cranes or vehicles with booms, jibs and counterweights can operate without coming into contact with the protected tree(s). CEZ fencing should be extended to encapsulate low spreading branches if they travel beyond the calculated RPA.*

*Direct impact from vehicles with tree crowns and stems can cause irreparable damage and may make their safe retention impossible. Consequently, any transit or traverse of plant in proximity to trees should be conducted under the supervision of a banksman at all times, to ensure that adequate clearance from trees is always maintained.*

9.1 – Tree Protection Plan (TPP)



Excavations required to install pergola footings inside the RPA sector of T4 are to be undertaken using hand operated tools only.

(SEE ARBORICULTURAL METHOD STATEMENT (AMS) IN SECTION 10.1.)

TREE NUMBER COLOUR CODING:

RED = CATEGORY U or Removed Tree


GREEN = CATEGORY A

BLUE = CATEGORY B


GREY = CATEGORY C

KEY TO SYMBOLS:


 = Calculated Root Protection Area (RPA)


 = Crown spread (N, E, S, W)

RPA incursion areas:

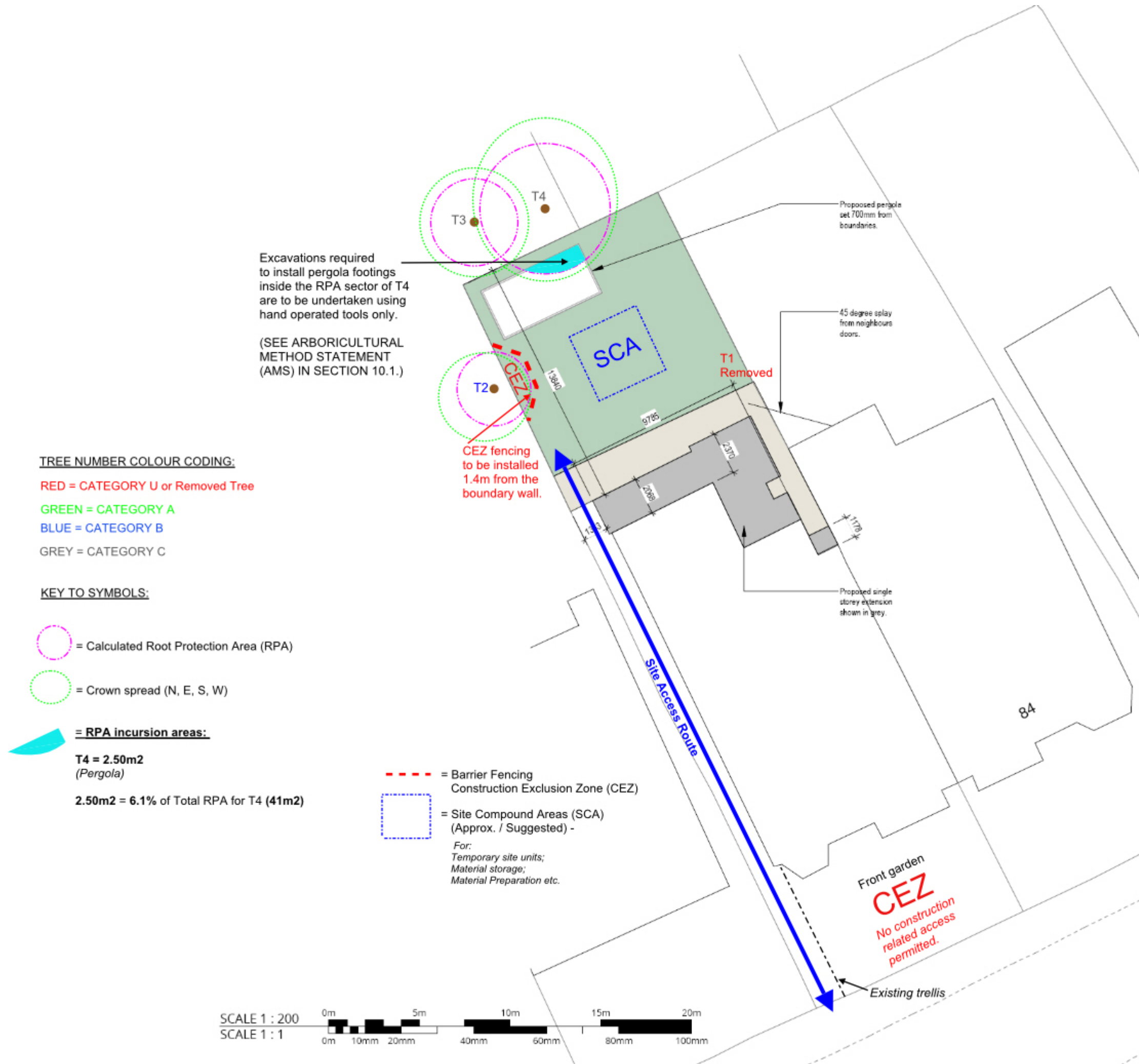
 T4 = 2.50m<sup>2</sup>  
(Pergola)

2.50m<sup>2</sup> = 6.1% of Total RPA for T4 (41m<sup>2</sup>)

 = Barrier Fencing  
Construction Exclusion Zone (CEZ)

 = Site Compound Areas (SCA)  
(Approx. / Suggested) -

For:  
Temporary site units;  
Material storage;  
Material Preparation etc.



### **9.1.1 – Tree Protection Plan (TPP) Notes**

The Tree Protection Plan (TPP) in Section 9.1 is shown to approximate 1:200 scale @ A3 based on the Block Plan As Proposed (*Drawing No. SKA 08 0003 REV D00*) provided by SK Architects.

Positions of barrier fencing and temporary ground protection measures (if required) are shown on the plan and are to conform to the specifications detailed in Section 9.2 and 9.3 respectively. Approximate locations for site compounds and site access routes are also indicated.

**Do not scale from this drawing, all tree dimensions to be checked on site using details provided in Sections 5.0 and 7.1.**

**Measurements and directions annotated on the TPP (which are based primarily on RPA calculations detailed in Section 7.1) are to be used to measure out and determine the positioning and installation of the Construction Exclusion Zone (CEZ) fencing at the site, unless otherwise detailed or advised.**

All required tree protection measures are to be installed before any development work begins and after any Preliminary or General Management Recommendations have been completed.

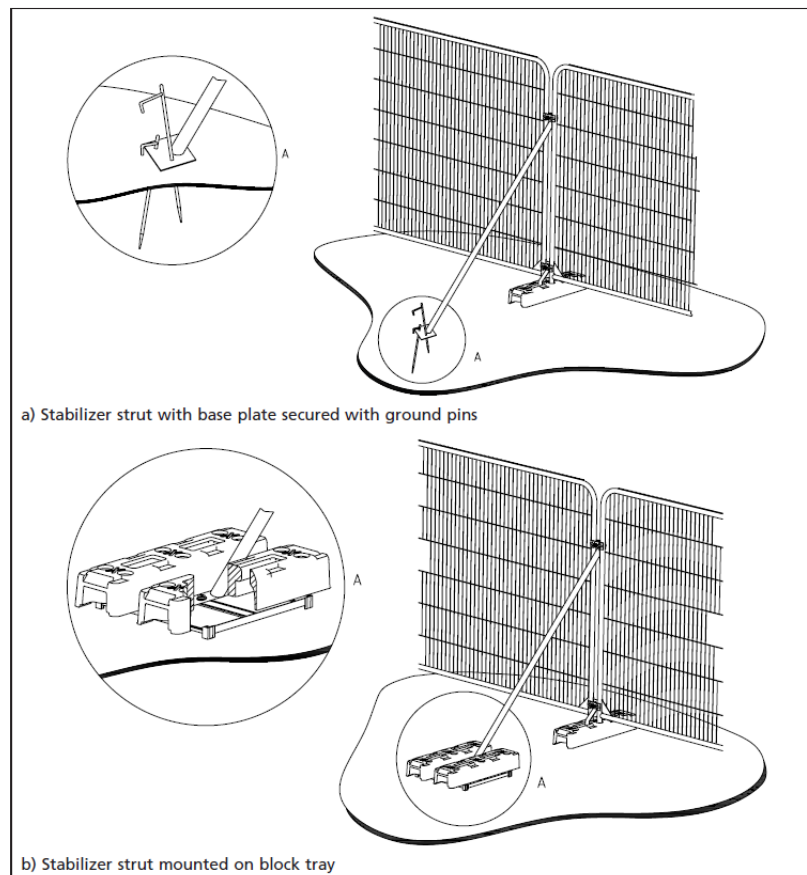
All tree protection measures are to remain in place and undisturbed throughout all development phases until completion and must be the last apparatus to be removed from the site.

The following sections detail the Construction Exclusion Zone fencing and ground protection specifications as detailed in BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.

## 9.2 - Protective Barrier Specification

*N.B - Barrier fencing should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work being undertaken around them.*

Figure 3 Examples of above-ground stabilizing systems



In the case of the development project at 86 Greencroft Gardens, with consideration paid to the prevailing soft ground conditions in the rear garden, barrier fencing to the specification shown in Figure 3a will be the most suitable to create the fenced off Construction Exclusion Zone (CEZ) around T2.

Steel mesh “Heras” type fencing (minimum 2m height) with stabilizer struts and base plates secured with ground pins (as shown in Figure 3a above), will be used to create the Construction Exclusion Zone (CEZ) in the rear garden.

The CEZ fencing is to be installed to the layout as shown on the Tree Protection Plan (TPP) in Section 9.1 and positioned based on measurements and directions annotated on the TPP.

The CEZ fencing set out as detailed will exclude all site related access from and protect T2 above and below ground level, whilst ensuring adequate access and operational space around the work area.

No site related access is permitted beyond the fence line or inside the CEZ once installed, throughout all development phases.

The CEZ fencing must be installed prior to any site works commencing and must be the last apparatus to be removed from the site on completion, along with the temporary ground protection.



### **9.3 - Ground Protection Specification**

*Where construction working space or temporary construction access is justified within the RPA, this should be facilitated by a set-back in the alignment of the tree protection barrier.*

*In such areas, suitable existing hard surfacing that is not proposed for re-use as part of the finished design should be retained to act as temporary ground protection during construction, rather than being removed.*

*Where the set-back of the tree protection barrier would expose unmade ground to construction damage, new temporary ground protection should be installed as part of the implementation of physical tree protection measures prior to work starting on site.*

*New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of underlying soil.*

*In all cases, the objective should be to avoid compaction of the soil, which can arise from the single passage of a heavy vehicle, especially in wet conditions, so that tree root functions remain unimpaired.*

*For wheeled or tracked movements, within a tree RPA, the ground protection should be designed by an engineer to accommodate the likely loading. A "no dig" solution must be used to avoid root loss due to excavation. In addition the structure of the hard surface should be designed to avoid localized soil compaction.*

**Temporary ground protection measures are not required at the site, as the calculated nominal RPA sector for T2 will be excluded by CEZ fencing.**

**Where the nominal RPA sector for T4 is shown to extend into the site, the area features existing hard standing in the form of patio paving (seating area), which in the main, is remaining in situ over the RPA sector. Paving is to be removed by hand to allow for the construction of the footings for the pergola support posts inside the RPA sector. All excavations for the footings are to be undertaken using hand operated tools only. (See Arboricultural Method Statement (AMS) in Section 10.1).**

**No areas of currently unmade ground where RPAs have been calculated will be outside of the CEZ fencing. (See Tree Protection Plan (TPP) in Section 9.1).**

### **10.0 – Arboricultural Implications**

The potential direct and indirect impacts on trees which may arise from the proposed development and related construction activity, (identified following the tree constraints assessment) are as follows:

- **Root severance / loss of feeder roots;**
- **Soil compaction in tree Root Protection Areas (RPA);**
- **Soil contamination;**
- **Direct damage to trees above ground level (stems and crowns);**

Site specific controls relating to mitigation measures to be implemented in respect of these implications can be found in the Arboricultural Method Statement 10.1 below.

## **10.1 – Arboricultural Method Statement (AMS)**

*Arboricultural Method Statement for tree protection throughout the duration of the proposed development works.*

*Control measures must be implemented as detailed below to safeguard all assessed retained trees above and below ground level against the potentially damaging effects of construction works and related site activity.*

The Arboricultural Method Statement (AMS) below is to be read and implemented with reference to the Tree Protection Plan (TPP) in Section 9.1, to identify:

- Trees to be retained – identified by a circle showing the stem position and individually numbered on the plan;
- Protective fence positions - (Therefore, the designated Construction Exclusion Zones);
- Areas where Temporary Ground Protection (TGP) measures are to be installed.

**A copy of this AMS and the Tree Protection Plan (TPP) shall be maintained on site at all times and must be made available to all site personnel to read and acknowledge.**

**A Site Personnel Induction Form (Template provided in Appendix B) must be completed and kept on file for all individual operatives working at the site, including sub contractors.**

### **Construction Exclusion Zone (CEZ)**

- No site related access, material storage, waste storage, or construction works of any kind are to be undertaken inside any designated Construction Exclusion Zone (CEZ) at the site.
- The Construction Exclusion Zones (CEZ) are to be afforded protection at all times and will be dictated by existing boundary fences/walls, or temporary barrier fencing to the correct specification as detailed in Section 9.2.
- The temporary protective fencing is required to be sited in accordance with the Tree Protection Plan (TPP) in Section 9.1, based on measurements and/or instructions annotated on the plan, to ensure CEZ fencing is installed in the correct locations to offer effective protection.
- The temporary CEZ fencing installed as detailed will allow adequate access and operational space around the work area without restriction.
- All temporary protective fencing shall be erected prior to the commencement of any site works. (e.g. before any construction materials, tools, or machinery are brought on site).
- Steel mesh “Heras” type fencing (minimum 2m height) with stabilizer struts and base plates secured with ground pins (as shown in Section 9.2, Figure 3a), will be used to create the Construction Exclusion Zone (CEZ) in the rear garden.
- The fencing must have weatherproof signs attached stating that this is a **Construction Exclusion Zone and that ALL ACCESS IS PROHIBITED within the fenced off area, or similar. (Example provided in Appendix C).**
- Once installed the CEZ fencing must remain in place and undisturbed until completion of all development phases.
- All tree protection measures must be fully installed prior to any development works commencing, remain undisturbed throughout all work phases and must be the last apparatus to be removed from the site on completion.

## **10.1 – Arboricultural Method Statement (AMS) – Cont'd**

### **Access Details**

- No personnel or plant/vehicle access is permitted beyond the installed CEZ fencing at the rear of the site, or within the front garden at the property at any time throughout the course of the development phases.
- All site access will be via the side access passage on the western side of the building. Existing trellising is in situ to separate the front garden from the side access passage.
- No construction related access or activity is permitted at any time within the front garden, which is to be designated as a Construction Exclusion Zone (CEZ).

### **Contractors car parking**

- Unrestricted parking is not available on Greencroft Gardens.
- Visitors Permits may be available from the applicant to allow contractor parking.

### **Site Welfare Facilities**

- If required, all temporary site welfare facilities, and site office units can be located within the curtilage of the rear garden, but must not enter the fenced off CEZ.
- Recommended Site Welfare/Site Compound Areas (SCA) are shown with a [blue hashed line](#) on the TPP in Section 9.1.

### **Storage Space & Waste Management**

- No storage of bulk construction materials or plant machinery is permitted inside designated CEZs at any time.
- Central areas of the rear garden outside of the CEZs have been recommended for material storage and material preparation (Site Compound Areas).
- Recommended Material Storage/Site Compound Areas (SCA) are shown with a [blue hashed line](#) on the TPP in Section 9.1.
- No dry or liquid waste is to be stored or discarded inside the installed CEZ fencing at any time.
- Contaminate materials such as oils, fuel, chemicals and gases will be stored and handled away from the CEZs and must be stored and handled in accordance with the *Control of Substances Hazardous to Health Regulations 2002 (COSHH)*.
- No soil, demolition debris, or any other waste materials will be stored beyond the CEZ fencing, within the RPAs or under canopies of the retained trees, whichever is the greater. All construction related waste is to be removed from the site at the earliest opportunity.
- A Construction Management Plan (CMP) detailing the frequency of visits for material deliveries, waste management etc. was not available at the time of writing and should be requested directly from the applicant, if required.

### **Demolition works**

- No significant demolition of existing structures are proposed.
- Alterations to the existing house elevations to facilitate the new rear extension and internal layouts will be undertaken without the use of demolition plant machinery.
- All resulting waste/rubble must be removed from the site at the earliest opportunity and must not enter the fenced off CEZ at any time.
- A Construction Management Plan (CMP) detailing demolition and construction methodologies was not available at the time of writing and should be requested directly from the applicant, if required.

## 10.1 – Arboricultural Method Statement (AMS) – Cont'd

### Construction within RPAs of retained trees

- **Rear Extension Incursion:**
  - Proposed footprint of the new extension incurs inside the RPA of T1 by **27.17%**. **(9.24m<sup>2</sup> = 27.17% of the Total RPA (34m<sup>2</sup>) calculated for T1).**
    - The RPA incursion as calculated above is considered unacceptable, as evaluated and detailed in the Tree Constraints Assessment Section 8.2.
    - T1 is to be removed prior to commencement of the development work.
    - T1 is to be removed to ground level and the stump removed using a Stump Grinder.
    - The loss of T1 is to be mitigated with new tree planting, proposed as part of soft landscaping plans in the rear garden post development.
    - (See Tree Constraints Assessment Section 8.2).
- **Pergola Incursion:**
  - Proposed footprint of the new pergola incurs inside the RPA of T4 by **6.1%**. **(2.50m<sup>2</sup> = 6.1% of the Total RPA (41m<sup>2</sup>) calculated for T4).**
  - Traditional strip foundations are not proposed for the pergola, rather the structure will be constructed on pad foundations for the support posts.
  - The RPA incursion as calculated above is considered acceptable for the use of pad foundations, with the following control measures employed:
    - **Excavations required inside the shown nominal RPA sector affected must be undertaken with care using hand operated tools only.**
    - **Any woody roots exposed over 25mm in diameter during the excavation works must not be severed without prior consultation with the Consulting Arboriculturist.**

### Proposed new outside hard surfaces

- The new patio to be constructed off of the extended rear elevation contributes to the evaluated adverse impact on T1 below ground level.
- T1 is to be removed prior to commencement of the development work.
- T1 is to be removed to ground level and the stump removed using a Stump Grinder.
- **(See Tree Constraints Assessment Section 8.2).**

### Changes to Existing Ground Levels

- There are no proposals to raise or lower existing ground levels at the site.

### Underground Utility Services

- At the time of writing no new trenches have been proposed to be excavated for the installation of new below ground utility infrastructure, or for alterations to the existing services.
- If required, details of all new services or changes to existing below ground infrastructure will need to be provided to allow evaluation of the potential adverse impacts on retained trees. **It will be necessary to ensure that any trenching or excavations required for installing or altering utility infrastructure will not occur within the shown RPAs for retained trees.**
- *A Construction Management Plan (CMP) providing details of any proposed new utility infrastructure, or alterations to existing services was not available for consideration at the time of writing and should be requested directly from the applicant.*

## **10.1 – Arboricultural Method Statement (AMS) – Cont'd**

### **Additional Precautions**

- All Preliminary / General Management Recommendations / Access Facilitation tree surgery works should ideally be undertaken prior to the installation of the Construction Exclusion Zone (CEZ) fencing and Temporary Ground Protection (TGP) apparatus.
- All Preliminary / General Management Recommendations / Access Facilitation tree surgery works must be completed prior to commencement of the development phases.
  
- Fires at the site are not permitted at any time.
  
- No notice boards, cables or other services will be attached to any tree stem, limb or branch.
  
- **Should any woody tree roots over 25mm in diameter be exposed during the course of any hard surface removals or excavation works, they must be immediately wrapped or covered in hessian cloth to prevent desiccation and protect from temperature changes whilst exposed and the Consulting Arboriculturist advised immediately.**
  
- **Any roots exposed over 25mm in diameter must not be severed without prior consultation with the Consulting Arboriculturist.**
  
- Consideration will be given at all times to ensure that sloping ground will not allow for any contaminating substances to travel into areas where tree RPAs may be affected.
  
- **Should spillages of contaminants occur, water is readily available on site and will be used to flush spilt materials through the soil and avoid contamination to tree roots. At the time of any spillage the main contractor will immediately contact the Consulting Arboriculturist for advice.**
  
- Any significant build up of dust or particulate material on tree foliage should be hosed down to prevent clogging of stomata in the leaves.
  
- No cranes are proposed to be in use at the site.
  
- Skips (if required) must be positioned where lorry lifting gear can operate without coming into contact with tree crowns/branches.

## **10.2 - Responsibilities**

- It will be the responsibility of the main contractor to ensure that the planning conditions attached to planning consent are adhered to at all times and that a monitoring regime in regards to tree protection is adopted on site.
- The main contractor must further assign tree protection monitoring duties to one or more individuals working at the site, who will be responsible for regular tree protection monitoring and supervision.
- **The individual(s) assigned tree protection monitoring duties must:**
- Be present on site for the majority of the time throughout the development phases;
- Be aware of (a) the Tree Protection Plan (TPP) and (b) the tree protection measures to be installed and maintained throughout the build;
- Be responsible for ensuring all tree protection measures are adhered to as detailed in the Arboricultural Impact Assessment (AIA) report and Arboricultural Method Statement (AMS);
- Ensure all site operatives without exception read and understand the tree protection and control measures detailed in the TPP and AMS;
- Keep on file all individual Site Personnel Induction forms (*see Appendix B*) which must be completed and signed by all site operatives indicating they have read and understood the control measures detailed in the TPP and AMS;
- Maintain a written record of regular Tree Protection / Construction Exclusion Zone inspections (*see Appendix A*), to be kept up to date by the person(s) who have been designated the inspection and monitoring duties;
- Have the authority to stop any work that is causing, or has the potential to cause, harm to any retention trees;
- Be responsible for ensuring that all site operatives including sub contractors are aware of their responsibilities toward on/off site trees and the consequences of the failure to observe these responsibilities;
- Make immediate contact with the Consulting Arboriculturist in the event of any tree related problems occurring, whether actual or potential. (*Contact details including telephone number and email address is listed on the Title Page*);
- The Construction Exclusion Zone (CEZ) fencing, Temporary Ground Protection (TGP) apparatus (if installed) and all signs must be maintained in position at all times and checked on a regular basis by the on site person(s) who have been designated that responsibility.
- The main contractor will be responsible for contacting the Local Planning Authority and the Consulting Arboriculturist at any time issues are raised relating to the trees on site.
- If at any time pruning works are required permission must be sought from the Local Planning Authority first and then carried out in accordance with *BS 3998:2010 Tree Work – Recommendations* (As updated).
- The main contractor will ensure the build sequence and phasing is appropriate to ensure that no damage occurs to the trees during the construction processes. Protective fences will remain in position and undisturbed until completion of ALL development works on the site.
- The main contractor will be responsible for ensuring sub-contractors do not carry out any process or operation that is likely to adversely impact upon any tree on site.

### **10.3 - Tree Work Standards**

All recommendations for tree surgery works made within this report have been done so in the interests of sound arboricultural management and to ensure tree surgery works are performed to a professional standard in accordance with *BS 3998:2010 Tree work – Recommendations*. (As updated).

All remedial tree surgery work which is suggested in this report must be undertaken to conform to standards and procedures set out in *BS 3998:2010 BS 3998:2010 Tree work – Recommendations*. (As updated)

- Tree Sense Arboricultural Consultants are happy to recommend a trusted tree surgery contractor if required, to ensure that all recommended tree surgery work is performed to a high standard.
- Tree Sense Arboricultural Consultants only recommend contractors who are approved by The Arboricultural Association to ensure that the highest standards of tree surgery work are met at all times.

### **11.0 - Report Summary**

This Arboricultural Impact Assessment (AIA) report has been produced following a tree survey conducted in accordance with *BS5837:2012 Trees in relation to design, demolition and construction – Recommendations*.

The information produced within the AIA report follows an initial tree survey conducted on the 9<sup>th</sup> March 2023.

The AIA report provides an assessment of the trees associated with the proposed development, based on information supplied by the development team and observations recorded at the time of the tree survey.

The AIA report is published to detail the findings from an arboricultural viewpoint within the context of the proposed scheme and to detail the necessary tree protection controls and methodologies required to safeguard retained trees in the short and long term.

The AIA concludes that if the recommendations made within this report are duly followed, the development is achievable in arboricultural terms and should be acceptable to the Local Planning Authority (LPA). It must be understood however, that the provision of this AIA report does not provide any guarantees that the associated Local Planning Authority (LPA) will agree with the opinion of the Consulting Arboriculturist, or grant planning consent based on the content and findings of the AIA report.

If any design changes are made to any aspect of the proposed development project due to the identified tree constraints, operational restrictions, geotechnical concerns or otherwise, revisions or additions to tree protection, damage mitigation measures and site layouts will need to be made and a revised report produced.

This is a Development Control, not a Building Control focused document. In regard to the latter, this deals with foundation depth and design in relation to trees using NHBC/Zurich national guidance. For advice, consult with the local council Building Control Officer or an approved NHBC inspector in order to gain Full Plans Approval or a Completion Certificate. The latter are governed by the Building Act 1984 and Building Regulations 2010. As such the above Building Control issues are outside the remit of a Consulting Arborist.

Detailed information regarding the site setup, plant use, waste management and construction methodology was not available at the time of writing and should be requested separately from the development team in a Construction Management Plan (CMP), as required.

The CMP must take fully into consideration and adhere to all required tree protection control measures, as detailed in the AIA report.

If necessary, referral back to the Consulting Arboriculturist will be required to evaluate any potential tree related impacts which have not already been considered at the time of publication of this AIA report and a revised AIA report produced. (i.e. utility service proposals or crane use etc).

## **12.0 – Legal and Planning Consents**

- Appropriate legal and planning consent should be gained before undertaking any tree work; for example if the tree(s) are subject to a Tree Preservation Order (TPO), permission must first be obtained from the Local Authority. Permission is not required for emergency tree work on dead, dying or dangerous TPO trees; however the Local Authority should still be advised.
- Six weeks notice is required to be given to the local authority via a Section 211 Notice for any proposed tree surgery work on trees situated within a designated Conservation Area. Permission is not required for emergency tree work on dead, dying or dangerous trees situated within a Conservation Area; however the Local Authority should still be advised.
- Tree owners have a responsibility as a common law duty of care, as well as responsibilities under statutory law, to ensure that trees growing within the boundaries of their property are maintained to reduce to an acceptable level the risk of potential harm befalling other people or property.
- In the course of undertaking any tree work, the client is advised to ensure that operational assessments and procedures are in place, and to take due consideration of the legal requirements.
- Key legislation includes (but is not restricted to):
  - The Wildlife and Countryside Act (1981)
  - Occupiers Liability Act (1957/84)
  - Highways Act (1980/86)
  - Town and Country Planning Act (1990/Regulations 1999/Amendment 2008/09)
  - Anti-Social Behaviour Act (2003) – Part 8 (High Hedges)
  - The Countryside Rights of Way Act (2000)
  - The Conservation (Natural Habitats etc.) Regulations (1994)
  - The Badgers Act (1992)

## **13.0 - Publications**

- Other publications which are relevant to the development proposal to which further reference is advised includes but is not restricted to:
  - National House Building Council (N.H.B.C) Chapter 4.2 – (Building near trees);
  - National Joint Utilities Group (NJUG) Volume 4 – (Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees).

Chris Wallis *Tech Cert (ArborA), AHort II (Arb.)*  
Tree Sense Arboricultural Consultants



**Appendix A – Construction Exclusion Zone Inspection Form**

**Construction Exclusion Zone Inspection Form**

**Site Address:** 86 Greencroft Gardens, London NW6 3JQ

**Client Name:** Mr and Mrs Chetrit

**Inspected By** \_\_\_\_\_

**Inspection Date & Time:** \_\_\_\_\_

**Construction Exclusion Zone – Barrier Fencing**

**Comments:**

**Action:**

**Construction Exclusion Zone – Temporary Ground Protection**

**Comments:**

**Action:**

**General Observations and Comments**

**Appendix B – Site Personnel Induction Form**

**Name:** \_\_\_\_\_

**Company:** \_\_\_\_\_

**Site Address:** 86 Greencroft Gardens, London, NW6 3JQ

**Date:** \_\_\_\_\_

<b>Declaration</b>	<b>Tick to Confirm</b>
<i>I have read and understand the Arboricultural Method Statement and the requirements to be employed / actioned at the site regarding tree protection.</i>	
<i>I understand that all tree protection measures (fencing and ground protection) must not be moved or disturbed throughout the development project without prior agreement with the Consulting Arboriculturist.</i>	
<i>I understand that certain operations may only be undertaken under supervision of the Consulting Arboriculturist and/or must not be undertaken without their approval.</i>	
<i>I acknowledge that any concerns I have regarding the protection of trees at and adjacent to the development site will be brought to the attention of the Site Manager/Supervisor.</i>	
<i>I acknowledge that I must not cause direct or indirect damage to any on site or neighbouring tree, either above or below ground level during the course of my daily operational duties.</i>	

**SIGNATURE:** \_\_\_\_\_

**Appendix C – Construction Exclusion Zone (CEZ) – Sign Format**

*Below is a suggested format for weatherproof warning signs to be attached to the barrier fencing which create the Construction Exclusion Zones (CEZ) at the site:*



**TREE PROTECTION AREA  
KEEP OUT !**

**(TOWN & COUNTRY PLANNING ACT 1990)  
TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY  
PLANNING CONDITIONS AND/OR ARE THE SUBJECTS OF A  
TREE PRESERVATION ORDER.**

**CONTRAVENTION OF A TREE PRESERVATION ORDER MAY  
LEAD TO CRIMINAL PROSECUTION**

**ANY INCURSION INTO THE PROTECTED AREA MUST BE  
WITH THE WRITTEN PERMISSION OF THE PROJECT  
ARBORICULTURIST**