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Site Name: Arden House Animal Hospital

Site Address: 56 Pembroke Road, Ruislip, Middx, HA4 8NF

Prepared for: Arden House Animal Hospital

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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 56 Pembroke Road, Ruislip, Middx, HA4 8NF.

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

The AIA is required to demonstrate that development work proposed at the above address will not adversely impact on the physiological health, or structural condition of nearby on site and/or off site trees.

The development scheme relates to the proposed:

- Demolition of existing side and rear single storey extensions;
- Construction of a new integrated single storey, side and rear extension;
- Related internal refurbishment.

Instructions were to:

- Carry out a tree survey in accordance with the British Standard *BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations* to:
 - Undertake an Arboricultural Impact Assessment (AIA) to evaluate the potential direct and indirect effects of the proposed scheme and associated construction activity on nearby significant trees;
 - Categorise the 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;
 - Identify the above and below ground tree constraints to the development to assist with scheme feasibility, conception and design;
 - Highlight the arboricultural implications that the development process may have on the retained trees and provide a method statement to show the necessary controls required to mitigate identified implications;
 - Make recommendations for measures to be taken to protect the retained trees above and below ground level during the development process, to safeguard their short and long term health and condition;
 - Produce findings of the AIA survey in a written report including 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 used in the preparation of this report is assumed to be correct.

2.0 – Report Limitations

- Assessments of all trees have been conducted using Stage 1 of the Visual Tree Assessment (VTA) method of inspection. (See Section 2.4).
- All observations of tree condition 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 provided “Proposed Site Plan” of the proposal, which is based on a Topographical Survey of the site, has been used to create the Tree Constraints and Tree Protection Plans in the Arboricultural Impact Assessment (AIA) report.
- One additional tree has been added to the Proposed Site Plan (T3), which was not recorded on the Topographical Survey, but was assessed as part of the AIA. The additional tree location was manually measured at the time of the tree survey, as site conditions allowed.
- 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 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 by a laboratory.
- Assessing the potential influence of trees upon load-bearing soils beneath existing and proposed structures, resulting from water abstraction by trees on shrinkable soils, was not included in the contract brief and is not, therefore, considered in any detail in this report. Tree Sense Arboricultural Consultants cannot be held responsible for damage arising from soil shrinkage or heave issues related to the retention or removal of trees on site.
- 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 should be sought to clarify/confirm any observations on engineering or legal matters that this report may contain.
- The recommendations made in this report relate to the assessment of the trees and their surroundings at the time of inspection.
- Treatment recommendations assume that the client understands that tree management is a continuing process, requiring regular attention and that as part of this process the condition of the trees should be thoroughly reassessed at regular, timely intervals, with hazard checks after periods of likely tree stress, e.g. after periods of severe weather.
- Weather conditions were dry and bright on the day of the tree survey 31st July 2019).
- 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).
- 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 nearby trees.
- The AIA 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.
- 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.
- 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 for cross reference 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 a period of time. Therefore this report has 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.

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.

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.

3.0 – Process

The development proposal at Arden House Animal Hospital, 56 Pembroke Road, is currently in the feasibility, planning and design stage. 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 feasibility study at the planning stage of the process.

The elements of the AIA at this stage in the process were to undertake the tree survey, categorise the trees and identify the tree constraints to the development, with a view to assisting with the conceptual design and feasibility of the proposal.

The identified tree constraints should inform and assist with the scheme design, including advising on any necessary engineering solutions and demolition/construction methods which will need to be explored to minimise potential damage to retained trees in the short and long term, both above and below ground level. Additionally, the identified constraints will also later determine the specification and positioning of tree protection measures to be employed at the site, to safeguard the trees above and below ground 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.*

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 must also be 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;*
- c) Trees to be removed, also clearly identified (e.g. by number) and marked on a plan with a dashed outline or similar;*
- 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

Access to the front of the site from the Pembroke Road carriageway is gained via a wide vehicle crossover, located centrally between the properties at 54/56. The front driveway is completely hard surfaced with asphalt tarmac, with low hedging along the front boundary in front of the building and is used for staff and customer car parking.

The rear garden of the property can be accessed via a gated side entrance between the two buildings and via a gate situated along the boundary line between the two properties, allowing access into the rear garden at number 56.

The rear garden is predominantly lawn surfaced, with significant areas of vegetation growing around all of the boundaries. Much of the vegetation is mixed species shrub and small, self set juvenile tree species, with other climbing vegetation and bramble growing in abundance, creating dense hedging around the rear garden boundaries.

The rear garden of 56 features a standalone, detached garage structure located fairly centrally within the rear garden, which is to remain in situ. The current single storey side and rear extensions to the building are to be removed and replaced by the new proposed integrated extension works.

There are a number of significant trees towards the far rear (south) boundary; however, these were not recorded for the purpose of the Arboricultural Impact Assessment (AIA). For example, a number of Lombardy Poplar trees are located within the boundaries of the property at the far southern end of the garden, but were not assessed and recorded, as they are well in excess of 15m from the proposed development area. A total of three trees were recorded, which are closest to the development area.

Data recorded for trees T1 – T3 which are closer to the building, will firstly determine the feasibility of the proposed extension scheme and ultimately dictate the rear garden tree protection measures. As such, all trees further to the south of these trees will be wholly excluded and safeguarded against any adverse site related impact, by the installation of Construction Exclusion Zone (CEZ) fencing based on the data recorded for T1 – T3. (See Tree Protection Plan (TPP) in Section 9.1).

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.

The statutory protection status of the trees and the site is unknown. The presence of any Tree Preservation Orders (TPO) and/or the Conservation Area status of the site should be fully determined prior to any recommended tree surgery works advised in the AIA report being undertaken. If statutory protections do apply, no tree works are to be undertaken without all of the relevant permissions granted by the Local Authority. (See Section 12.0).

5.0 – Individual Tree Data

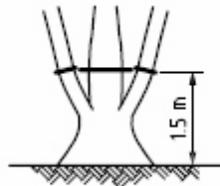
Tree No.	Species	Height (m)	Stem Diameter (mm)	Branch Spread (m)	First Significant Branch Height and Direction of Growth (m)	Canopy Height (m)	Life Stage	General Comments Inc. Physiological and Structural Condition	Preliminary / General Management Recommendations	Estimated Remaining Contribution (Years)	Category
1	<i>Wild Cherry</i> (<i>Prunus avium</i>)	13	400	N – 6 E – 5 S – 4 W – 5	1.5 – E	2	M	Physiological Condition – Fair Structural Condition – Fair Dead Ivy growth from stem base into the crown framework. Major and minor sized deadwood throughout the crown. Lateral growth extension towards garage structure.	Crown reduce by up to 30%; Remove hazardous deadwood and dead Ivy.	10+	C 2
2	<i>Wild Cherry</i> (<i>Prunus avium</i>)	9	1 – 150 2 – 100 3 – 100 SE – 200	N – 2 E – 5 S – 4 W – 2	2.5 – E	2	Y	Physiological Condition – Fair Structural Condition – Fair Abundant live ivy growth throughout the tree, restricting close structural assessment. Dominant eastern crown growth due to suppression from neighbouring trees and vegetation.	Remove Ivy from the tree to prevent acute colonisation.	10+	C 2
3	<i>Norway Maple</i> (<i>Acer platanoides</i>)	10	1 – 100 2 – 100 3 – 100 SE – 175	N – 3 E – 3 S – 3 W – 3	6 – E	6	Y	Physiological Condition – Good Structural Condition – Fair 3 co-dominant stems, 2 of which fused with included bark. Off site tree in the rear garden of number 58 and growing within the mixed species hedge line along the east side boundary of 56.	–	10+	C 1

5.1 - Key to Table 5.0

- 1) Height describes the height of the tree from ground level 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 measure.
- 3) Branch Spread is the average length of branch spread from the centre of the tree in the direction of each cardinal point 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 presence of structural defects. (*i.e. dead branches, cavities, splits, included bark etc.*)
- 8) Estimated Remaining Contribution is an indication of the minimum useful contribution the tree will provide.
- 9) Preliminary Management Recommendations detail any additional arboricultural practices to be undertaken before construction activity begins. 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 within The British Standard 5837:2012 Trees In relation to design, demolition and construction - Recommendations (See 6.0 below)

*= Stem diameter measurements:

T2 and T8 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

- Major deadwood = over 25m diameter, Minor deadwood = under 25mm diameter.

PMR = Preliminary Management Recommendation - i.e. VTA Stage 2/3, semi invasive tree condition investigations (Tomography/Resistograph testing etc.) or climbed 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 above 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 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 works recommended to be undertaken to off site trees which are outside of the management responsibility of the applicant, 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).

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 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		
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	<ul style="list-style-type: none"> Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <p><i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i></p>	See Table 2		
	1 Mainly arboricultural qualities	2 Mainly landscape qualities		
		3 Mainly cultural values, including conservation		
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), 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	Trees with material conservation or other cultural value	See Table 2
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 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 ^{A)}	RGB code ^{A)}
U	Dark red	127-000-000
A	Light green	000-255-000
B	Mid blue	000-000-255
C	Grey	091-091-091

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

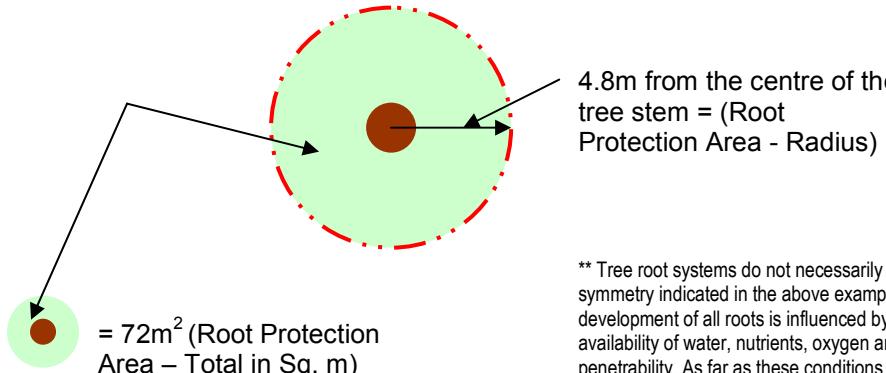
Once it has been established which trees can and are suitable to remain and are worthy of retention, necessary measures to protect them throughout the course of the development project must be undertaken.

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 patterns caused by crown density and spread which may affect light into newly developed buildings.

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.	RPA Radius (m)	RPA Area (m ²)
1	4.8	72
2	2.4	18
3	2.1	14

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 and construction activity 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.

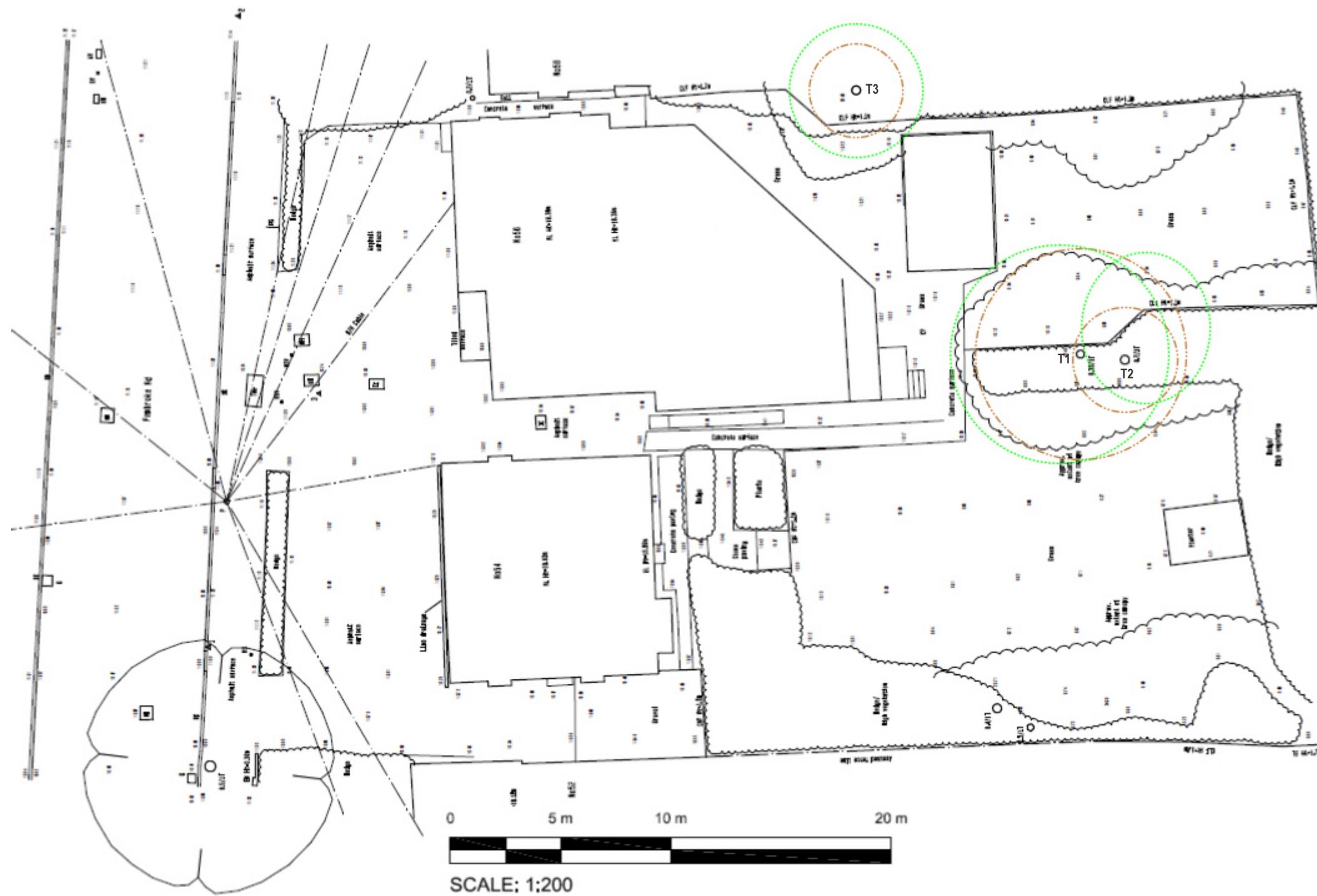
Shading issues should also be considered in respect of tree size, form and position in relation to the proposed new structure.

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 buildings.

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)



Key to Symbols

T# = Category A Tree

= Root Protection Area (RPA)

T# = Category B Tree

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

T# = Category C Tree

=

T# = Category U Tree

=

8.1 - Tree Constraints Plan (TCP) Notes:

The Tree Constraints Plan (TCP) in Section 8.0 is shown to approximate 1:200 scale based on the *Proposed Site Plan* provided by Goolden Designs LLP.

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

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

Only the RPA measurements 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 and ground protection at the site, unless otherwise detailed or advised in Sections 9.0-10.1.

As described in section 7.1 above, tree root systems do not necessarily show the symmetry indicated on the above Tree Constraints Plan, 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.

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 feasibility of the proposal and to later determine the layout of tree protection measures to create the Construction Exclusion Zones (CEZ) at the site.

Below is an assessment of the identified tree constraints in relation to the development proposal, following the tree survey undertaken on the 31st July 2019:

Below Ground – Root Protection Area (RPA) Incursion - (New rear/side extension)

- **Trees Affected:**
 - None.
- **Comments:**

The proposed new side/rear extension footprint does not incur on the calculated RPA for the retained trees, as shown on the Tree Constraints Plan (TCP) and Tree Protection Plan (TPP) in Sections 8.0 and 9.1 respectively.

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.

- **Arboricultural Impacts:**
 - None.
- **Controls:**
 - N/A.

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

- **Trees Affected:**
 - None.
- **Comments:**
 - No trenches for new underground services are proposed to be excavated inside any of the calculated RPAs for the retained trees.
- **Arboricultural Impacts:**
 - N/A.
- **Controls:**
 - N/A.

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

- **Trees Affected:**
 - None.
- **Comments:**
 - No new permanent hard surfaces in areas of currently unmade ground are proposed as part of the development.
- **Arboricultural Impacts:**
 - None.
- **Controls:**
 - N/A.

8.2 – Tree Constraints Assessment – Cont'd

Below Ground – Root Protection Area (RPA) Incursion in areas of unmade ground - (Site access & operations)

- **Trees Affected:**
 - T1, T2, T3.
- **Comments:**
 - T1, T2 and T3 exhibit RPA sectors within the development site boundaries (rear garden).
- **Arboricultural Impacts:**
 - Soil compaction of unmade ground inside RPAs – by plant machinery (if required) and/or pedestrian movements and operations over the existing unmade ground.
 - Soil compaction inside RPAs by storing bulk building materials on unmade ground.
 - Soil contamination inside RPAs – contaminate waste storage, spilt contaminates (fuels, cement etc.)
- **Controls:**
 - *(Refer also to the Tree Protection Plan (TPP) in Section 9.1).*
 - All site access will be via the central crossover from Pembroke Road and via the side passage between number 54 and 56.
 - All calculated RPA sectors which feature within the curtilage of the site can be wholly excluded by the installation of barrier fencing to create a rear garden Construction Exclusion Zone (CEZ). In the case of T3, the RPA is excluded from access by dense barrier planting (hedging).
 - *Other trees not recoded but located at the far southern end of the rear garden are in excess of 15m away from the development area and will be wholly excluded based on the fence positioning to create the CEZ in the rear garden. (See Tree Protection Plan (TPP) in Section 9.1)*
 - Suggested areas designated for material storage and preparation are indicated on the Tree Protection Plan (TPP) in Section 9.1. *(Front driveway and inside the existing garage structure in the rear garden).*
 - NO SITE ACCESS, STORAGE/PREPARATION OF MATERIALS OR WASTE IS PERMITTED INSIDE THE CEZ FENCING.
 - Waste management details were not available at the time of writing; however no waste materials, fuels or other construction related waste is permissible inside the Construction Exclusion Zones (CEZ) at any time.
 - A suggested area for skips to be sited is also indicated on the TPP, where collection and delivery of skips can safely occur without impact on trees.
 - 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:**
 - None.
- **Comments:**
 - The crown heights/crown spreads of all assessed trees do not pose an above ground constraint to the construction of the proposed single storey rear/side extension.
- **Arboricultural Impacts:**
 - None.
- **Controls:**
 - N/A.

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

- **Trees Affected:**
 - None.
- **Comments:**
 - No cranes are proposed to be in use at the site during the development phases.
 - 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.
 - Demolition works to remove the existing rear and side extensions may require the use of plant machinery.
- **Arboricultural Impacts:**
 - None.
- **Controls:**
 - Skips are to be positioned away from all on site /off site trees to allow skip lorry lifting gear to operate without impact on tree branches.
 - A suggested area for the siting of skips at the front of the site on the driveway will ensure that skips can be safely collected and delivered without impact on trees. (See Tree Protection Plan (TPP) in Section 9.1).
 - Demolition of the existing rear/side extensions is to be undertaken inwards within the footprint of the structure. I.e. using a “top down, pull back” method of demolition.
 - All rubble and debris following the existing extension demolition must be removed from the site at the earliest opportunity.
 - No plant machinery is permitted to operate or be stored inside the installed CEZ at any time.

8.2 – Tree Constraints Assessment – Cont'd

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

- **Trees Affected:**
 - T1, T2, T3
- **Comments:**
 - T3 is located along the rear garden east side boundary of number 56 and surrounded by dense, barrier planting (high hedging).
 - Stems and buttressing for T1 and T2 will be wholly excluded from access by the installed CEZ fencing.
- **Arboricultural Impacts:**
 - Direct impact damage to tree stems, buttressing and low hanging crown branches.
- **Controls:**
 - The stems and buttressing of T1 and T2 will be wholly excluded behind the installed CEZ fencing.
 - The stem and buttressing of T3 is excluded by dense barrier planting (hedging)
 - All Construction Exclusion Zone (CEZ) fencing must be installed at the start of the project before commencement of the works and remain in position and undisturbed until completion of the development project.

The above assessment summarises the above and below ground level tree constraints identified at the site in relation to the development proposal, with a 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 – Project Phasing

The following phasing of the development project is proposed:

- **Pre-development Phase 1** – Undertaking off all General Management Recommendations (GMR) tree surgery works (See Section 8.3.1 below).
- **Pre-development Phase 2** - Installation of all required tree protection measures (i.e. barrier fencing to create the on site Construction Exclusion Zones (CEZ) as required).
- **Development Phase 1** – Demolition of the existing rear & side extensions and construction of the new integrated single storey rear/side extension.
- **Post-development Phase 1** – Remove all construction tools, machinery, scaffolding, waste, materials, skips, temporary units (site huts etc.) and any other construction related apparatus.
- **Post-development Phase 2** – Dismantle and remove the Construction Exclusion Zone (CEZ) fencing and apparatus.

All tree surgery works recommended should be undertaken prior to commencement of the development phases and prior to the installation of the Construction Exclusion Zone (CEZ) fencing and temporary ground protection.

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.

- *T1 – up to 30% crown reduction / deadwood removal / ivy removal;*
- *T2 – ivy removal.*

N.B. The tree surgery recommendations detailed above are not in relation to the development project, but are made based on best practice guidelines for managing urban trees and the findings of the tree assessments during the survey. Having the above tree surgery works undertaken prior to commencement of the development is recommended.

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 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 the 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. 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.

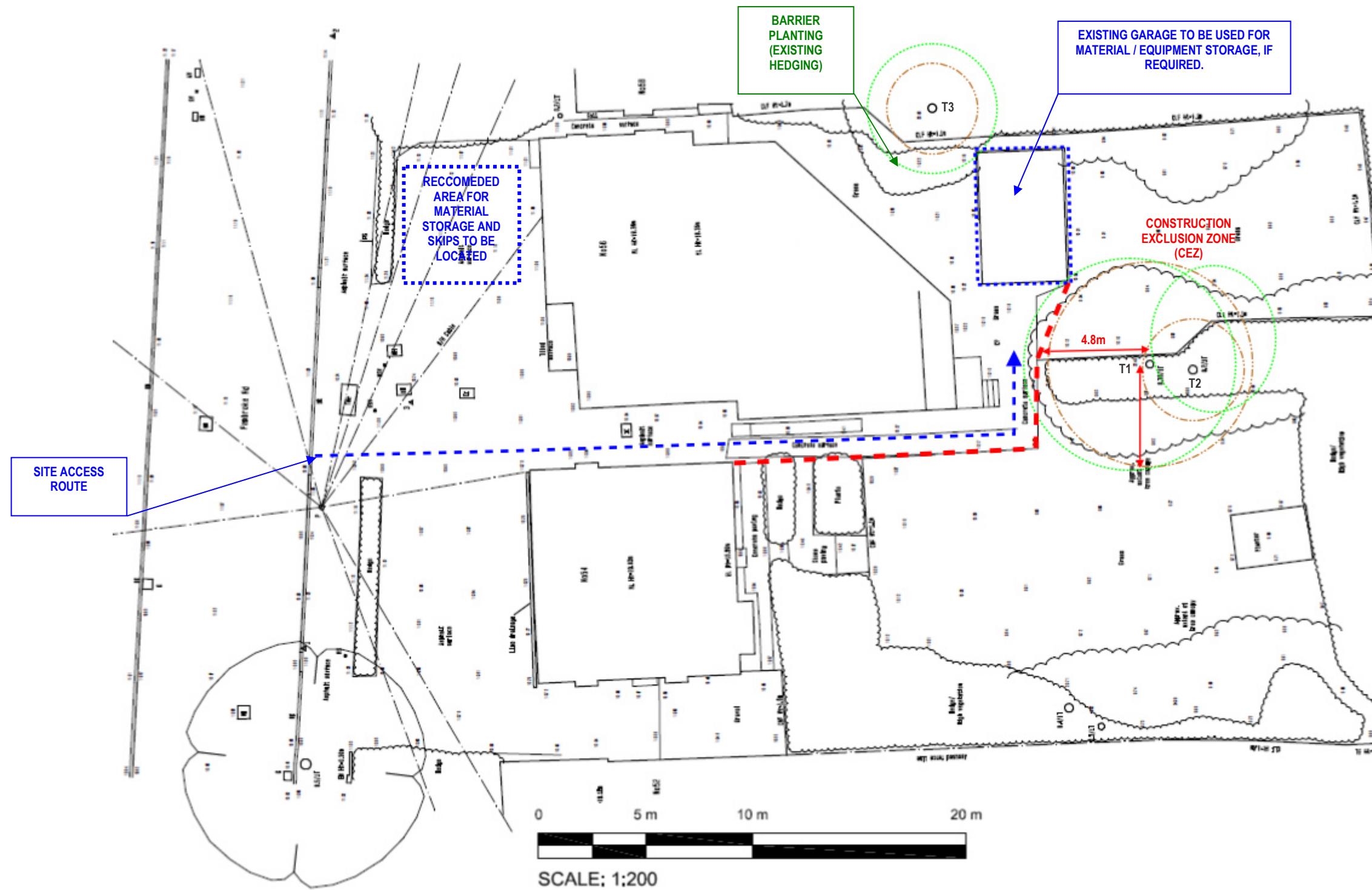
Fires on site should be avoided if possible. Where they cannot be avoided, they should not be lit where heat could affect foliage or branches. The potential size of the fire and wind direction should be taken into account when determining the fires location and it should be attended at all times until safe enough to leave. Notice boards, cables or other services must not be attached to the tree stems.

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".

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, to ensure that adequate clearance from trees is always maintained.

9.1 – Tree Protection Plan (TPP)



Key to Symbols

T# = Category A Tree

= Root Protection Area (RPA)

= Barrier Fencing – Construction Exclusion Zone (CEZ)

T# = Category B Tree

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

T# = Category C Tree

= Material Storage / Site Compound Etc. (Approx.)

T# = Category U Tree

9.1.1 – Tree Protection Plan (TPP) Notes

The Tree Protection Plan (TPP) in Section 9.1 is shown to approximate 1:200 scale based on the *Proposed Site Plan* provided by Goolden Designs LLP.

The TPP is provided only to indicate the position, category and numbering of the surveyed trees and provide an indication of the tree constraints by showing a graphic of the calculated Root Protection Areas (RPA) and relevant tree crown spreads.

Positions of barrier fencing to create Construction Exclusion Zones (CEZ) are shown on the plan as required and are to conform to the specifications detailed in Section 9.2. Site access routes and approximate locations for site compounds outside the CEZs are also indicated.

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

Measurements annotated on the TPP (which are based 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.

The indicated barrier lines to create the CEZs are suggested as the simplest and most effective layout to exclude all construction activity from the retained trees above and below ground level, throughout all development phases to completion.

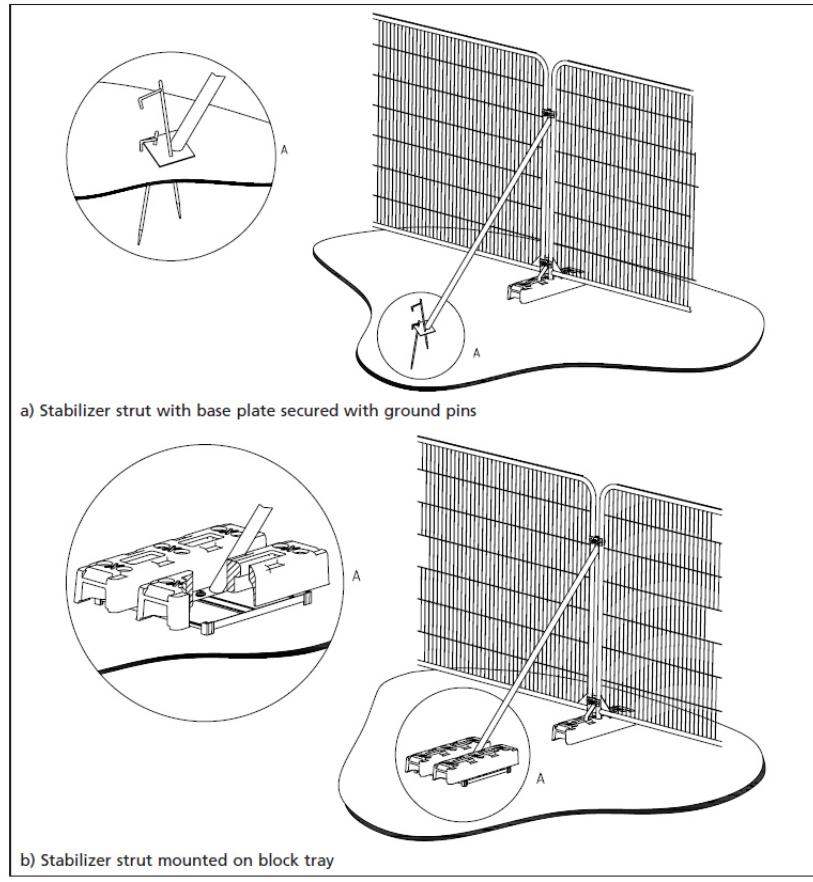
All required tree protection measures are to be installed before development work begins and after any Preliminary or General Management Recommendations have been completed. All tree protection measures are to remain in place and undisturbed throughout all development phases until completion.

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 56 Pembroke Road, with consideration paid to the development intensity and prevailing ground conditions, barrier fencing to the specifications shown in Figure 3a will be the most suitable to create the Construction Exclusion Zone (CEZ) at the rear of the site.

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 at 56.

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 annotated on the TPP.

No site related access is permitted beyond the fence lines or inside the CEZs 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.

The ground protection might comprise one of the following:

- a) For pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;
- b) For pedestrian-operated plant up to a gross weight of 2 t, proprietary, inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane;
- c) For wheeled or tracked construction traffic exceeding 2 t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

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. The use of a three dimensional cellular confinement system (CCS) acting as a load suspension layer is recommended and will avoid localized soil compaction by evenly distributing the carried weight over the track width and wheelbase of any vehicles that will use the access.

Temporary ground protection measures are not required at the site, as all calculated RPAs shown in unmade ground areas will be wholly excluded by barrier fencing to create Construction Exclusion Zones (CEZ).

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:

- **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 Construction Exclusion Zones);
- Areas where temporary ground protection measures are to be installed (If required).
- Suggested areas for site compounds and material/equipment storage etc.

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 Zones (CEZ)

- No site related access, material storage, waste storage, or construction works are to be undertaken inside any 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 barrier fencing to the correct specification as detailed in Section 9.2.
- The protective fencing is required to be sited in accordance with the Tree Protection Plan (TPP) in Section 9.1, based on measurements annotated on the plan, to ensure CEZ fencing is installed in the correct locations to offer effective protection.
- Additional trees towards the far southern boundary which were not individually recorded will be wholly excluded from access by the installed CEZ fencing. (See Tree Protection Plan (TPP) in Section 9.1).
- All protective fencing shall be erected and fully installed prior to the commencement of any site works. (E.g. before any construction materials, tools, or machinery are brought on site).
- The specification of protective fencing to create the CEZs in the rear garden will be minimum 2m high, steel mesh “Heras” panels with stabilizer struts secured with base plates and ground pins as detailed in Section 9.2 – (Figure 3a).
- 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.**
- Once installed the CEZ fencing must remain in place and undisturbed until completion of all development phases.
- Tree protection measures must be installed prior to any development works commencing and must be the last apparatus to be removed from the site on completion. The protective CEZ fencing may only be removed following completion of all construction work phases and must remain undisturbed throughout the entire development process.

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

Access Details

- All site access will be via the central vehicle crossover from Pembroke Road, the side access passage between the buildings and via the gate on the west side boundary into the rear garden.
- No personnel or plant/vehicle access is permitted beyond the installed CEZ fencing at any time throughout the course of the development phases.
- The purpose of the CEZ is to prevent all site access and operations from occurring inside tree RPAs or near trees above ground level.
- Where operational access would be unacceptably restricted by CEZ fencing, the fencing may be set back and a correct specification level of temporary ground protection installed where necessary. **(Subject to further consultation with the Project Arboriculturist).**

Contractors car parking

- Some car parking may be available on the front driveway/car park.
- Otherwise, unrestricted car parking can be found on Pembroke Road.

Site Welfare Facilities

- All temporary site welfare facilities, site office and storage areas for materials cannot be located within the curtilage of the rear garden, unless the garage is utilised for this purpose.
- Recommended Material Storage/Site Compound Areas 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 beyond the installed CEZ fencing at anytime.
- Areas of the existing hard surfaced driveway and the garage located within the rear garden (outside of the CEZ) have been recommended for material storage and material preparation.
- The existing garage structure to the rear of no.56 can be used for Site Compound purposes, if required.
- Recommended Material Storage/Site Compound Areas 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) was not available at the time of writing and should be requested directly from the applicant, if required.

Demolition works

- Demolition of the existing single storey rear and side extensions must employ a “top down, pullback” method of demolition, inwards within the footprint of the existing structure.
- All resulting rubble and debris following demolition works must be removed from the site at the earliest opportunity.

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

Construction within RPAs of retained trees

- The footprint of the new proposed single storey, rear/side extension does not impact on the RPAs calculated for the assessed trees.

Proposed new permanent hard surfaces

- No new permanent hard standings in areas of currently unmade ground are proposed as part of the development.

Underground Services

- No new underground services are proposed to be installed inside calculated RPAs for the retained trees.

Additional Precautions

- All Preliminary / General Management Recommendations for tree surgery works to on site trees must be undertaken prior to commencement of the development phases and prior to the installation of the Construction Exclusion Zone (CEZ) fencing and temporary ground protection.
- 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 Project Arboriculturist advised immediately.
- Any roots exposed over 25mm in diameter must not be severed without prior consultation with the Project 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 contaminates 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 or vehicles with extending booms/jibs are proposed to be in use at the site where tree canopies may be affected.
- Skips must be positioned where lorry lifting gear can operate without coming into contact with tree branches.
- Skips are to be sited on the east side at the front of the site, as shown on the Tree Protection Plan (TPP) in Section 9.1, where no trees are in close proximity. Skip lorries can operate in this area without constraint when collecting and/or delivering skips to the site.

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;
 - Be aware of (a) the Tree Protection Plan 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 AIA and AMS;
 - Keep on file all individual Site Personnel Induction forms which must be signed by all site operatives indicating they have read and understood the control measures detailed in the AIA report and AMS;
 - Maintain a written record of regular Tree Protection / Construction Exclusion Zone inspections, 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 are listed on the Title Page*)
- The Construction Exclusion Zone fencing, temporary ground protection 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 construction 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 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 31st July 2019.

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

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.

Full detailed specifications of the development project and engineering methods etc. will be supplied by the development team separately.

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.

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).

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Tree Sense Arboricultural Consultants

Appendix A – Construction Exclusion Zone Inspection Form

Construction Exclusion Zone Inspection Form

Site Address: _____

Client Name: _____

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:

Site Address:

Date:

Declaration	Tick to Confirm
<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 must 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: _____