ARBORICULTURAL CONSULTANTS

ARBORICULTURAL IMPACT ASSESSMENT

AT

29 PARLIAMENT HILL,

LONDON,

NW3 2TA.

SEPTEMBER 2020.

SUMMARY

The purpose of this report is to provide a consideration of the arboricultural implications created by the proposed development. In accordance with the specifications and recommendations of BS5837:2012 "Trees in Relation to Design, Demolition, and construction – recommendations", I have inspected all the trees on and near the site that could be affected by the development and list their details in Appendix A.

The application is for the erection of 2 x replacement single storey rear outbuildings. As a result, ten trees and one linear group were inspected. The implications of the proposal are:

1. The removal of three trees and one line of four Conifers is proposed as part of this planning application. The three trees have been described as Category U and are of short-term potential.

2. Trees 1 to 3 within the rear garden of the property will be retained with tree protection to BS 5837:2012 specification installed prior to development works commencing.

3. Trees 7 to 10 are within the neighbouring rear gardens. Tree 7 will be retained with tree protection to BS 5837:2012 specification installed prior to development works commencing. The proposed development does not require works within the RPAs of trees 8 to 10.

This report includes guidance on tree protection measures and providing these are adhered to there will be no adverse impact on the long-term potential on the retained trees.

1. Introduction

1.1. Instructions

1.1.1. We are instructed to inspect and report on trees in the vicinity of a proposed development within the rear garden of 29 Parliament Hill, London. We are to report on the current condition, amenity value, suitability for retention and comment on any potential impacts on the trees from proposed development and provide guidance on any necessary tree protection.

1.2. Drawings and Documents

1.2.1. We confirm sight of the following documents and drawings prior to the commencement of this report:

- Location and site plans. Drawing number 4112-X.101 at scales 1:500 & 1:1250@A3 dated August 2020.
- Existing plan. Drawing number 4112-X.101 at scale 1:100@A3 dated September 2020.
- Existing plan and elevations. Drawing number 4112-X.103A at scale 1:100@A3 dated July 2020.
- Proposed plan and elevations. Drawing number 4112-P103B at scale 1:100@A3 dated July 2020.
- Existing and proposed roof plans. Drawing number 4112-XP104A at scale 1:100@A3 dated July 2020.

2. Report on site visit

2.1. General

2.1.1. The site was inspected on 22nd September 2020 by F. Critchley of Arboricultural Solutions LLP. All arboricultural data contained in this report was recorded at that time. Weather conditions were clear and sunny with light winds and good visibility.

3. Tree inspection and methodology

3.1. Inspection

3.1.1. Trees likely to be affected by any developments were identified and inspected from ground level only and were not climbed. No invasive examination technique (such as increment boring, or internal decay detection) was carried out. As the inspection was visual only, no guarantee, either expressed or implied, of the internal condition of the wood of these trees can be given.

3.2. Marking

3.2.1. The existing site plan (drawing number 4112-X.101) provided was converted for use in Arbortrail tree data collection software. Any additional trees not included on the existing plan were plotted by triangulation from set points (using a laser rangefinder Leica Disto D510). Crown measurements were taken using a laser rangefinder. The trees surveyed were referenced with a number corresponding to the particular tree on the site plan.

3.2.2. Each reference number on the plan refers to a survey sheet entry completed on site to show the following data:

- Sequential tree reference number (recorded on tree survey plan)
- Species - Common name followed by the Latin name for the first entry of each different species
- Height in metres
- Trunk diameter in millimetres, measured in accordance with Annex C of BS 5837:2012
- Crown radius measured at the four cardinal points – where only one measurement is given, the crown is symmetrical
- First significant branch height and direction of growth
- Crown clearance above ground level
- Life stage (young, semi-mature, early mature, mature, over-mature, veteran)
- General observations, particularly of structural and/or physiological condition, and/or preliminary management recommendations
- Estimated remaining contribution in years (less than 10, 10+, 20+, more than 40)
- Category U or A to C grading, to be recorded on the tree survey plan

3.2.3. Survey sheet entries are shown at Appendix A of this report.

3.3. Tree categorisation

3.3.1. Trees vary in, size, age, and landscape importance. All trees were categorised in accordance with the British Standard Trees in relation to design, demolition and construction - recommendations BS 5837: 2012. BS Categories have been entered in the tree schedule and are as follows:

U – **Trees unsuitable for retention**. Trees 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.

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

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

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

3.3.2. The existing site plan was edited to show the above and below ground constraints relative to the existing site and potential conflicts with the proposed development (refer to drawing TCP_29PARLMNTHILL_1 Rev A). The root protection areas (RPAs) have been calculated using Trees in Relation to Design, Demolition and Construction - recommendations BS 5837: 2012 (refer to Appendix A). The RPAs of the trees implicated in the design proposal have not been adjusted in shape to shape to take into account site topography. The trees are growing within residential rear gardens and can be considered to be 'open grown'. The full RPA has been retained to show the areas where special precautions are required to prevent potential damage to the roots. Whilst roots are likely to be present beneath hard surfacing and paths, experience suggests they would be of low number/density.

3.3.3. The trunk diameter circle and crown outline show the BS Category in the following colours:

Category U	**Dark red**
High Quality (A)	**Light green**
Moderate Quality (B)	**Mid-blue**
Low Quality (C)	**Grey**

3.3.4. Trees in Relation to Design, Demolition and Construction - Recommendations BS 5837: 2012 do not include arguments for or against development, or for the removal or retention of trees. Where development is likely to occur, the standard provides guidance on how to decide which trees are appropriate for retention.

4. Brief Site Description

4.1. General

4.1.1. 29 Parliament Hill stands on the northwest side of the road. The surrounding locality is characterised by substantial semi-detached villas in the Victorian Gothic Revival Style and the area is immediately adjoined by Parliament Hill/Hampstead Heath Open Space.

4.1.2. The house is approximately southeast facing and situated on a plot that slopes gently downhill from the north. The proposed development area is within the 'back to back' rear gardens of properties in Parliament Hill and South Hill Park Gardens.

Photograph 1 showing proposed area from within the rear garden of 29 Parliament Hill.

4.2. Statutory Tree Protection

4.2.1. The Town and Country Planning (Tree Preservation) (England) Regulations 2012 allows for trees either as groups, or individuals, or as woodlands, to be protected by Tree Preservation Orders (TPO). These have the effect of preventing the cutting down, topping, lopping, uprooting, wilful damage or wilful destruction of trees except in certain circumstances, other than with the consent of the local planning authority.

4.2.2. A Conservation Area (CA) is an area designated by the Local Planning Authority as one of "special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance". Special controls exist regarding demolition and alteration of buildings; Listed Building Consent must also be obtained for any demolition, even if the building is not itself listed. Similarly, trees are given some protection with the requirement for the local authority to be given six weeks written notice before carrying out any work on trees; this gives the authority time to decide if a TPO is necessary.

4.2.3. The site is within South Hill Park Conservation Area and the trees surveyed are not protected by TPO.

4.3. Development Proposal

4.3.1. The proposal is for the erection of 2 x replacement single storey rear outbuildings within the rear garden of the property.

4.3.2. This report has been produced to reflect the current design layout and the potential impacts on the tree population. Where significant conflicts exist, the removal of trees of generally good condition and landscape value may be acceptable following negotiation

with the council planning department providing the submitted landscape plan has provision for high quality replacements of long-term potential.

5. Tree Population

5.1. Tree schedule

5.1.1. Refer to appendix A for detailed records of individual trees and drawing Tree Protection Plan (drawing number TCP_29PARLMNTHILL_1 Rev A) for the location of trees surveyed. Trees that have been surveyed and included as groups have not been included in the following tree population analysis.

5.2. Species diversity

Species	Number
Bay	1
Elder	1
Hawthorn	1
Hornbeam	2
Golden Locust	1
Japanese Flowering Cherry	1
Leyland Cypress	1
Pear	1
Wild Cherry	1
Total:	**10**

5.2.1. The tree population comprises eight genera and there are no rare or unusual species present. The tree population is relatively diverse for a small area although there are only one or two representatives present of each species.

5.3. Age distribution

Age class	Number
Semi-mature	0
Early mature	6
Mature	4
Young	0
Dead	0
Total:	**10**

5.3.1. The age of the trees is skewed towards mature trees with a life expectancy of 20 to 40 years. While the existing trees would be likely to continue to contribute to the tree cover in the medium term, there are no younger trees to provide long-term continuity of canopy cover.

5.4. Grade classification

Tree grade	BS5837:2012 Definition	Number
A	High	0
B	Moderate	2
C	Low	5
U	Remove	3
	Total:	**10**

5.4.1. Three trees have been categorised as U and are considered to be trees 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.

5.4.2. There are two trees of category B within the adjacent rear garden of 27 Parliament Hill. The other trees surveyed are considered to be low category reflecting their small size and limited amenity value.

6. Arboricultural Impact Assessment Summary of Impacts Table

Impact	Reason	Low value (Cat C & U) trees	Moderate value (Cat B) trees	High value (Cat A) trees	Potential design & mitigation techniques
Trees to be removed	Building construction and/or surfacing	Trees 4, 5, 6 and group 1	N/A	N/A	Tree removals to allow ground levels to be lowered to create area for construction.
	Arboricultural reasons	Trees 4, 5, 6	N/A	N/A	Trees are of poor structural form and/or partially uprooted. Trees of short-term potential that would require removal regardless of development.
Retained trees to be managed	Enabling works/space for development	Trees 3 and 7	N/A	N/A	Minor facilitation crown pruning to clear development area and allow construction access.
Retained trees that may be damaged	Removal of existing structures	Tree 3	N/A	N/A	All tree protection to be installed before demolition commences.
	Removal of existing surfacing	Tree 3	N/A	N/A	The removal of the existing surfacing will be undertaken by use of hand tools only within the RPAs of retained trees.
	Material storage/washing areas/welfare areas	N/A	N/A	N/A	All material storage/washing areas/welfare areas to be located away from the RPAs.
	Temporary access to construction areas	Trees 1 to 3 inclusive	N/A	N/A	All tree protection to be installed before construction commences. The existing hard surface around the house and across the garden can be used for access. If required, this can be reinforced with additional ground protection appropriate to the likely loading.
	Installation of new structures	Trees 3 and 7	N/A	N/A	All excavations within 1 metre of the RPAs to be undertaken by hand-digging or use of Air Spade only.
	Installation of new surfacing	Tree 3	N/A	N/A	Construction of any new paths or hard surfaced areas within RPAs to be undertaken using hand tools only and all roots over 25mm protected & retained. All new surfacing within RPAs is likely to be timber decking of 'no-dig' porous design to maintain soil-water relations around roots
	Excavations or ground level changes	Trees 3 and 7	N/A	N/A	All excavations within 1 metre of the RPAs to be undertaken by hand-digging or use of Air Spade only.
	Installation of services*	Trees 1 to 3 inclusive	N/A	N/A	The service runs will be positioned outside the RPAs of the retained trees across the centre of the rear garden.
	Landscaping works	All retained trees	All retained trees	All retained trees	Landscaping within the RPAs including grass to be carried out using hand tools – no mechanical cultivators to operate within the RPAs.

6.2. Impact on Retained Trees

6.2.1. Existing trees are an important factor on construction sites, whether on or near the working areas. BS5837:2012 – "Trees in relation to design, demolition and construction – Recommendations" is intended to assist decision-making with regard to existing and proposed trees in the context of design, demolition and construction. Root systems stems and canopies, with allowance for future movement and growth, need to be taken into account.

6.2.2. BS5837:2012 - Trees in relation to design, demolition and construction – recommendations have been used to calculate the RPAs. It should be noted that this method is primarily used to calculate the volume of soil required to maintain healthy growth based on the trunk diameter of the tree. In practice, roots may extend beyond this area, and in some cases the spread may be less.

6.2.3. Trees 1 (Pear), 2 (Japanese Flowering Cherry) and 3 (Bay tree) are within the rear garden and will be retained. Trees 1 and 2 are not within the proposed development area and the development will not impact on the root protection areas of these trees. Construction access will be required across the RPAs, mainly on the existing pathway. This will require further ground protection depending on the likely usage and loading.

Photograph 2 showing tree 1 (Pear) and 3 showing tree 3 (Bay) and tree 10 (Golden Locust).

6.2.4. The RPA of tree 3 (Bay) encroaches slightly into the front left-hand corner of the proposed new building. However, as this area is currently within the footprint of the existing building it is likely that the root growth is minimal beneath the building, and the proposed new building will not have a significant impact of the long-term potential of this tree.

Photograph 4 showing tree 2 (Japanese Flowering Cherry) and tree 7 (Wild Cherry) behind.

6.2.5. Group 1 (Leyland Cypress), trees 4 (Elder), 5 (Hawthorn) and 6 (Leyland Cypress) are growing in an unmanaged raised area at the northwest end of the garden. The proposal will require the removal of the part of the raised area within the footprint of the new building to facilitate the construction. A new retaining wall will be constructed approximately 0.5 metres from the rear boundary and retaining the RPA of tree 7 where it extends into the rear garden.

6.2.6. Trees 4 to 6 inclusive have been categorised as U due to their poor structural form (trees 5 and 6 have partially uprooted) and short-term potential. These trees along with the line of Leyland Cypress within Group 1 will be removed. They are of little arboricultural merit as individual trees. They are not visible to the public and so have little landscape amenity value.

6.2.7. Tree 7 (Wild Cherry) is within the adjacent rear garden and will be retained. It was not possible to fully assess this tree due to the overgrown nature of the garden and the boundary fencing. The circular representation of the RPA of this tree extends into the rear garden of 29 Parliament Hill though it will be restricted to the east by the existing boundary wall. The development has been designed to minimise the impact on this tree and to retain the existing levels within the RPA with a new retaining wall. This will provide a new area that can be planted to provide screening and canopy cover in the future. The new garden shed will be erected on the footprint of the existing shed.

6.2.8. Trees 8 to 10 inclusive are within the adjacent rear garden at 27 Parliament Hill and will be retained. The RPAs of these trees do not extend into the proposed development area and so the new building will not impact on the long-term health and condition of these trees.

Photograph 5 showing tree 7 (Wild Cherry).

7. How Trees Are Damaged

7.1. Threats to trees during development

7.1.1. These may be listed, in general terms as:

- Compaction of ground
- Covering rooting areas with impervious surfaces
- Excavations for foundations
- Excavation for service runs
- Alterations in ground level
- Access and movement of machinery
- Need for temporary site storage
- Crown damage by passage of high-sided vehicles

7.1.2. British Standard 5837 (1991) 'Trees in relation to construction' provided useful guidance for the assessment and formulation of measures for the mitigation of such threats. Using the experience gained from this Standard, it was revised and upgraded to 'Recommendation' status as British Standard 5837 'Trees in Relation to Construction' (2005). This British Standard was withdrawn on 30th April 2012 and replaced with Trees in Relation to Design, Demolition and Construction - Recommendations BS 5837: 2012. To assist in the prediction of the likely impact of development on retained trees, a model is used. This model is based on the age, vitality and size of individual specimens.

7.1.3. The British Standard relies heavily on the creation of a protected zone (RPA) around each tree. This area should be protected from disturbance "in order to avoid unacceptable

damage to the tree as a result of severance or asphyxiation of the root system." The recommended minimum area (m²) for each tree to avoid potentially harmful disturbance have been calculated for all the trees on site and entered into the tree schedule (appendix A).

7.1.4. BS 5837: (2012) acknowledges that the shape of the tree root system may be affected by several factors and that the shape of the RPA should reflect this. Any deviation in the RPA from the original circular plot should take account of the following factors whilst still providing adequate protection for the root system:

a) The morphology and disposition of the roots, when influenced by past or present existing site conditions (e.g. the presence of roads, structures and underground apparatus).

b) Topography and drainage.

c) Likely tolerance of the tree to root disturbance or damage based on factors such as species, age, condition and past management.

7.2. Root Damage

7.2.1. Trees that are growing satisfactorily have achieved equilibrium with their surroundings. Any construction work that affects this equilibrium could be detrimental to health, future growth and the safety of the tree.

7.2.2. The part of the tree most susceptible to damage is the root system, which, because it is not immediately visible, is frequently ignored. Damage or death of the root system will affect the health, growth, life expectancy and safety of the rest of the tree. The effects of such damage may only become evident several years later.

7.2.3. The majority of a tree's root system is generally considered to be in the top 600mm of the soil, extending radially in any direction for distances frequently in excess of the tree's height. However, roots are adventitious and if conditions are suitable for root development to a greater depth, then roots may extend as deep as conditions will allow; this may exceed depths of 3m or more. Works within this area are liable to damage the roots.

7.2.4. Close to the trunk are the main structural roots that develop in response to the tree's need for structural stability. Beyond these major roots, the root system rapidly subdivides into smaller diameter roots; off this main system a mass of fine roots develop.

7.2.5. Tree root systems can be damaged in a number of ways during construction works:

- **Root severance**. The severance of a root will destroy all parts of the root beyond that point. Even roots less than 10mm diameter may be serving a mass of fine roots over a large area. The larger the root severed, the greater the impact on the tree.

- **Damage to root bark.** The bark protects the root and is essential for further root growth; it is loosely attached and easily damaged. If damage extends around the whole circumference, the root beyond that point will be killed.

- **Compaction of the soil.** Compaction of the ground reduces the space between soil particles, particularly in clay soils. A single passage of heavy equipment or the storage of materials can cause significant damage. Compaction can restrict or even prevent gaseous diffusion through the soil and thereby asphyxiate the roots. The roots must have oxygen for survival, growth and effective functioning.

- **Alterations in ground levels.** Lowering the level will strip out the mass of roots near to the surface. Raising the ground levels will have the same effect as compaction.

- **Capping over roots.** Covering the rooting area with impervious surfaces. This prevents natural diffusion of gases between the soil and the atmosphere and can lead to oxygen depletion in the soil.

- **Toxicity.** Direct toxicity of some materials. For instance, petrol or diesel spillage or lime in cement can kill underlying roots.

- **Wounding.** Minor wounds to root bark can allow pathogens into the tree root system that can lead to a further impairment of water absorption. The general debilitation of trees due to root severance can make them more susceptible to invasion by some decay fungi such as Armillaria.

- **Fine roots.** Damage to the fine roots by severance of a main root, or by compaction, or by alteration of levels, will prevent the fine roots absorbing the water and nutrients essential for tree growth. The effects of damage from different causes will be cumulative.

7.2.6. The effects of tree root damage may not be immediately apparent. If the root system is capable of rapid regeneration, the tree may recover without noticeable ill effects, though usually symptoms take several years to develop. The range of symptoms varies from minor branch dieback, to deterioration and ultimate tree death depending on the severity of the damage and the ability of the roots to regenerate.

7.2.7. The default position should be that structures are located outside the RPAs of trees that are to be retained. The cumulative effects of incursions into the RPA e.g. from excavations for utility apparatus are damaging and should be avoided. Where there is evidence that a tree has been previously subjected to damage by construction activity this should be taken into account when considering the acceptability of further activity within the RPA.

7.3. Above Ground Trunk & Crown Structures

7.3.1. Trees have a single or multi-stemmed trunk supporting a framework of branches and twigs. These structures are protected by a layer of bark, the purpose of which is to protect the

functional tissues immediately beneath.

7.3.2. Above ground parts of the tree can be damaged in a number of ways during construction works:

- Direct impact by plant or machinery
- Fire and scorching
- Poor pruning
- Abrasion by overhead apparatus
- Chemicals and fuel oils
- Storage of materials within the Prohibited and Precautionary Zones.

8. Outline Arboricultural Method Statement

8.1. Phase 1: Undertake Approved Tree Works.

8.1.1. All tree removal works should be undertaken prior to any site works commencing. Motorised vehicles will be restricted to areas of existing compacted/hard surfaces, or where ground protection is in place, and should not be taken onto un-surfaced areas within the root protection areas as shown on drawing TPP_29PARLMNTHILL_2 Rev A.

8.1.2. Refer to plan TPP_29PARLMNTHILL_2 Rev A. for the locations of the tree to be removed. All tree works are to be undertaken in line with current recommendations and in accordance with BS3998:2010 Tree work – Recommendations and should comply with the current Arboriculture and Forestry Advisory Group (AFAG) or applicable Forestry Industry Safety Accord advice published by the Health and Safety Executive (HSE) or FISA.

8.1.3. Tree works are to be planned to ensure protection of people, property and wildlife. If the works are to be undertaken during the bird nesting season, then advice is to be sought from an Ecologist prior to undertaking tree works.

Tree No.	Recommended Works
T4 to T6 inclusive and Group 1	Fell to ground level and remove stumps.

NB: Plant and machinery must not enter the RPAs of retained trees unless ground protection is in place and the works supervised.

8.2. Phase 2: Tree protection with barriers and ground protection.

8.2.1. The retained trees 1, 2, 3 and 7 will be protected by barriers as shown on the tree protection plan TPP_29PARLMNTHILL_2 Rev A. This must be constructed as defined in Trees in relation to design, demolition and construction - recommendations BS 5837: 2012. The fencing will consist of a scaffold pole frame mounted with solid hoarding; the frame must be cross braced to prevent accidental movement.

8.2.2. Trees 8 to 10 inclusive are within the adjacent rear garden. The existing boundary fencing prevents construction access within the RPAs of these trees and additional protective fencing is not considered necessary. Protective fencing in the form of chestnut paling will be installed to protect the existing herbaceous elements of the mature garden.

8.2.3. Where construction access is required across the RPAs the areas will be subject to ground protection restrictions. Refer to TPP_29PARLMNTHILL_2 Rev A for location of ground protection within the RPAs of trees 1 to 3. The ground protection must be appropriate to the likely loading and in this case, the use of a proprietary ground protection system such as Eve Trakway or Groundtrax would be suitable as temporary ground protection and provides flexibility in positioning panels.

8.2.4. All tree protection measures **must** be erected before any works commence or materials or machinery is brought onto site. Once erected, barriers and ground protection are sacrosanct, and **must** not be moved or altered without prior consultation with the arboriculturalist or Local Authority Tree Officer. Fencing will remain in place throughout the following processes:

- Contractor occupancy
- Plant and materials delivery
- Demolition/construction works
- Installation of utilities
- Completion of development

8.2.5. All materials storage and mixing will be confined to areas outside the RPAs of the trees. Where mixing of materials is undertaken close to the RPAs, this should be on an impervious surface with no run-off to prevent chemical contamination of the RPA from spillage.

8.2.6. Once the construction exclusion zone (CEZ) has been protected by barriers and/or ground protection, demolition/construction can take place. Inside the Construction Exclusion Zone (CEZ) of the protective fencing, the following prohibitions shall apply:

- No mechanical digging or scraping
- No hand digging
- No storage of plant, equipment or materials
- No vehicular or plant access
- No fire lighting
- No washing down of vehicles or machinery
- No handling, discharge or spillage of any chemical substance, including cement washings
- No action likely to cause localised waterlogging
- No change in ground levels
- No construction of a hard surface
- No earthworks

8.3. Demolition of the existing buildings.

8.3.1. All tree protection must be in place before the existing buildings are demolished. These are of timber construction and will be dismantled by use of hand tools only onto the existing decking area.

8.4. Excavations to Lower Ground Levels.

8.4.1. Any work close to RPAs **must** be carried out with care as set out in Appendix C section 1.6. On this site special precautions **must** be taken near retained trees, particularly tree 7 (refer to Appendix C section 1.12 and drawing TPP_29PARLMNTHILL_2 Rev A. for locations of Special Precaution Areas).

8.4.2. Excavation works will be undertaken from the existing ground level of the rear garden working towards the rear boundary. The excavation should be carried out by hand within 1 metre of the RPA of tree 7 until it can be confirmed that no roots are present within the proposed excavation footprint, to prevent roots being pulled out of the ground beyond the maximum extent of the excavation. Soil removal must be undertaken with care to prevent disturbance of the roots beyond the immediate area of the excavation. All exposed roots to be removed should be cut cleanly with a sharp saw or secateurs approximately 20cm back from the face of the final excavation.

8.4.3. The outer face of all concrete foundations or concrete for the retaining wall will be sheathed to protect the soil and adjacent roots from the potential toxic effects of concrete.

8.5. Excavations for Foundations

8.5.1. All foundation excavations should be carried out by hand within the RPA of tree 3 until it can be confirmed that no roots are present within the proposed excavation footprint, to minimise root damage and severance beyond the maximum extent of the excavation. Soil removal must be undertaken with care to prevent disturbance of the roots beyond the immediate area of the excavation.

8.5.2. Clumps of roots less than 25mm diameter (including fibrous roots) will be retained in situ without damage. Where a mass of flexible roots is encountered, it may be possible either to displace the roots to another location temporarily or permanently to avoid areas of excavation. All exposed roots to be removed should be cut cleanly with a sharp saw or secateurs approximately 20cm back from the face of the final excavation.

8.5.3. The outer face of all foundations within the RPAs will be sheathed to protect the soil and adjacent roots from the potential toxic effects of concrete.

8.5.4. Backfilling of trenches should be carried out using the excavated soil, which should be worked in around roots and lightly "tamped" not compacted and preserving the original soil profile.

8.6. Installation and/or upgrading of existing services

8.6.1. Where possible, existing services into the building should be utilised keeping all new services outside RPA's. Where existing services within RPAs require upgrading or new services installed, care must be exercised to minimise any disturbance. All excavation within the RPAs of retained trees must be undertaken by hand and roots retained undamaged. Refer to Appendix C 1.7 for further information.

8.7. Changes of Surface

8.7.1. Removal of existing surfacing (any hard surface used as a vehicular road, parking or pedestrian path including tarmac, solid stone, crushed stone, compacted aggregate, concrete and timber decking; this does not apply to compacted soil with no hard covering) is a high risk to any adjacent tree roots and guidance in Appendix B section 1.7 **must** be followed.

8.8. Lightly founded structures

8.8.1. Where new fencing, gates or boundary walls are planned within the RPAs of retained trees, the excavations for supporting posts/foundations should be excavated by hand to ensure no roots are present. If significant roots >than 25mm diameter are found it may be possible to cut them under advice from a suitably qualified arboricultural professional. If the roots have to remain, the design should be suitably flexible to allow repositioning of any foundation structure. Any design involving concrete must utilise an impermeable membrane in the excavation to prevent concrete leachates contacting roots. Boundary walls can be constructed on surface beams set on micro-piles to avoid large roots and reduce excavations within the RPAs.

8.9. Landscaping

8.9.1. An opportunity the create a new planting area is formed by the clearance of the vegetation within the raised area at the northwest end of the rear garden within the RPA of tree 7. All retained trees near new soft landscaping may be adversely affected by this activity. All landscaping activities within the RPAs has the potential to cause significant damage and any impact must be minimised. The use of mechanical cultivars within the RPAs is not allowed. All planting must be carried out using hand tools. No herbicides should be used to clear weeds as this will be taken up by the tree roots and likely lead to long-term damage.

8.10. Other tree-related site works

8.10.1. **Pre-commencement site visit:** This is a small-scale development not requiring specialised construction methods or significant tree protection measures and therefore it is not considered necessary to arrange site meetings for this aspect. Any modifications to the proposed development may require that the tree report is updated.

8.10.2. **Site supervision:** Site visits by the project arboriculturist may be required by the local planning authority, particularly if works are proposed within the RPAs of retained trees. Once the site is active, the project arboriculturist will ensure compliance with arboricultural conditions and advise on tree problems or any modifications that may arise. The developer must ensure that all conditions of the arboricultural method statement and any amendments are known and fully understood by all site personnel. All personnel engaged in works near trees must have access to written copies of the method statement and understand the content before working near trees.

9. General

9.1.1. Limitations of report: This report is based on a supplied indicative layout for the development of the site and is intended to highlight to developers the constraints imposed on the site by the existing tree population and potential conflicts whilst providing guidance on the techniques required to ensure the long-term health of retained trees. The content may require revision if the design layout is altered and as the scheme evolves.

9.1.2. Arboricultural Standards: Any tree works should be done in accordance with the British Standard Recommendations for Tree work, BS 3998 as modified by later research. Works should be undertaken by properly qualified and experienced tree contracting company as recommended by a local authority or one approved by the Arboricultural Association. A Register of Contractors is available from:
The Arboricultural Association
The Malthouse
Stroud Green
Standish
Stonehouse
Gloucestershire GL10 3DL
UKTel +44 (0) 1242 522152
Fax +44 (0) 1242 577766
Email: admin@trees.org.uk.

9.1.3. Statutory wildlife implications: Wildlife in this country is afforded protection under the Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000. Statutory protection is given to birds, bats and other species that inhabit trees. Tree work is governed by these statutes and advice should be sought from an ecologist before undertaking any works that may constitute an offence.

Fiona Critchley B. Sc. (Sp. Hons), Ad Dip. F. Arbor. A, Tech Cert. (AA), R.F.S Cert Arb
LANTRA Professional Tree Inspector

Checked by G. M. Causey B. Sc. (Hons), RFS (Cert. Arb), F. Arbor. A. LANTRA accredited Professional Tree Inspector

APPENDIX A TREE SCHEDULE 29 Parliament Hill NW3 2TA.

Tree No.	Species	Height (m)	DBH (mm)	Crown radius (m)				Number of stems	Life stage	General observations	Est. Rem'ing contrib'n	BS Cat	RPA (m^2)	RPA as circle of radius (x)m
				N	E	S	W							
1	Pear	7	400	3.5	1.5	3	3.5	1	M	Declining condition. Low vitality. Cavity on stem. Epicormics on stem. Stem divides above 1.5m. Previously crown reduced. Root plate undermined. Bark necrosis on trunk. Decay pockets in pruning wounds. Light deadwood in crown. Storm damaged with shed limbs. Low bud/leaf density. Screen value. Appropriate to location.	10-20	C2	72.4	4.8
2	Japanese Flowering Cherry	3.5	210	2	1.7	1.5	1	1	EM	Declining condition. Low vitality. Exposed roots. Exudation on stem. Light deadwood in crown. Crown becoming sparse. Dieback in crown. Low bud/leaf density. No particular landscape value.	<10	C2	20	2.52
3	Bay	6	120	1.5	1.5	1.5	1.5	7	EM	Average condition. Normal vigour. Multiple stems at ground level. Screen value. Appropriate to location.	20+	C2	45.4	3.8
4	Elder	1.6	100	1	3	1	0	3	M	Average condition. Poor shape & form. Suppressed growth. Root spread restricted.	<10	U	13.6	2.08

										Rooted in top of retaining wall. Ivy on stem. Unable to inspect due to undergrowth. Multiple stems below 1.5m. Rubbing branches causing damage. Light deadwood in crown. Mutually suppressed crown. Unbalanced crown shape. No particular landscape value.				
5	Hawthorn	2	170	2	2	1	1	1	M	Declining condition. Poor shape & form. Low vitality. Root spread restricted. Exposed roots. Tree has uprooted in the past & is growing across shed roof Overgrown by climbing plants. Unable to inspect due to undergrowth. Stem divides at ground level. Light deadwood in crown. Crown distorted due to group pressure. No particular landscape value.	<10	U	13.1	2.04
6	Leyland Cypress	5	200	3	1	0	1	1	EM	Dead leaning tree. Partially uprooted. Unable to inspect due to undergrowth.	<10	U	18.1	2.4
7	Wild Cherry	7	330	3	3	3	3	1	M	Diameter estimated. Canopy estimated. In neighbouring property. Average condition. Normal vigour. Exposed roots. Unable to inspect stem due to Ivy. Stem divides above 1.5m. Rubbing branches causing damage.	20+	C2	49.3	3.96

										Light deadwood in crown. Mutually suppressed crown. Crown distorted due to group pressure. Screen value. Appropriate to location.				
8	Hornbeam	8	300	4.5	4	1	4	1	EM	Diameter estimated. Canopy estimated. In neighbouring property. Good condition. Normal vigour. Root spread restricted to east by retaining wall. Ivy on stem. Stem divides above 1.5m. Light deadwood in crown. Mutually suppressed crown. Screen value. Appropriate to location. Contributes to general amenity of area.	40+	B2	40.7	3.6
9	Hornbeam	8	260	2	4	4	4	1	EM	Diameter estimated. Canopy estimated. In neighbouring property. Good condition. Normal vigour. Root spread restricted to east by retaining wall. Stem divides above 1.5m. Light deadwood in crown. Mutually suppressed crown. Screen value. Appropriate to location. Contributes to general amenity of area.	40+	B2	30.6	3.12
10	Golden Locust Tree	9	140	1.5	1.5	1.5	1.5	1	EM	Diameter estimated. Canopy estimated. In neighbouring property. Average condition. Normal vigour. Stem divides above 1.5m. Included bark present in main fork. Light deadwood in crown.	20+	C2	8.9	1.68

										Crown distorted due to group pressure. Appropriate to location.				
G1	Leyland Cypress	4	180	1	1	1	1	1	SM	Line of 4 x trees. Average condition. Poor shape & form. 1x tree leaning to north. Suppressed growth. Unable to inspect due to undergrowth. Part of linear group. Ivy on stem. Previously crown reduced. Mutually suppressed crown. Screen value.	10+	C2	14.7	2.16
S1	Unknown	2	300	1	1	1	1	1	M	Dead Ivy-covered stump. Retain for screening.	<10	U		

KEY

Y = Young
SM = Semi-mature
EM = Early-mature
M = Mature
OM = Over-mature
V = Veteran

H = Hedge
G = Group
B = Shrubs
K = Small tree
W = Woodland

TREE QUALITY ASSESSMENT CASCADE CHART

Category and definition	Criteria (including subcategories where appropriate)		
Trees unsuitable for retention **Category U**	Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low-quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve*	
Trees to be considered for retention	**1 Mainly arboricultural qualities**	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), 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
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

APPENDIX B TREE PROTECTION

1.1. Pre-commencement site meeting.

1.1.1. A pre-commencement site meeting is advised prior to any works commencing on site, to agree all the approved processes with the relevant concerned parties.

1.2. Protective fencing and ground protection.

1.2.1. All trees to be retained on site should be protected by barriers and ground protection where applicable. Barriers should be in place before any materials or machinery is brought onto site. Once in place, barriers and ground protection should be considered sacrosanct and should not be altered or removed without prior recommendation by an arboriculturist and approval of the local planning authority. Barriers should be fit for excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.

1.2.2. The protective fencing is to be erected prior to any site works or demolition works.

1.2.3. The barrier is to comprise of a vertical and horizontal framework (Figure 1 below), well braced to resist impacts, with vertical tubes spaced at a maximum interval of 3m. Weldmesh panels, such as Heras, should be securely fixed with wire or scaffold clamps to this framework. Weldmesh panels on rubber or concrete feet are not resistant to impact and should not be used. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a freestanding scaffold support framework.

1.2.4. Where retained trees are near the existing buildings, a higher specification hoarding will be required to prevent damage from falling rubble. In place of the weldmesh, panels solid hoarding should be used, for example, scaffold boards.

1.2.5. Where the site circumstances and associated risk of damaging incursion into the RPA do not necessitate the default level of protection, an alternative specification should be prepared by the project arboriculturist and, where relevant, agreed with the local planning authority. For example, 2 m tall welded mesh panels on rubber or concrete feet might provide an adequate level of protection from cars, vans, pedestrians and manually operated plant. In such cases, the fence panels should be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The distance between the fence couplers should be at least 1 m and should be uniform throughout the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins (Figure 2 below). Where the fencing is to be erected on retained hard surfacing or it is otherwise unfeasible to use ground pins, e.g. due to the presence of underground services, the stabilizer struts should be mounted on a block tray

1.2.6. It is advised that a plan be pinned up on site in highly visible areas such as in the site huts, so that all ground staff involved in the demolition and construction works have a point of reference for tree protection issues. All demolition and construction workers should be briefed on the importance of tree protection prior to works commencing. Special attention must be paid to ensure that protective fencing remains rigid and complete during all works.

1.2.7. Where it is agreed that vehicular or pedestrian access for construction purposes is necessary within the RPA, ground protection measure will be required to prevent damage to the soil structure within the RPA.

1.2.8. For pedestrian access within the RPA, the installation of ground protection in the form of a single thickness of scaffold boards over a compressible layer laid onto a geotextile, or supported by scaffold, is likely to be acceptable.

1.2.9. For wheeled or tracked vehicle, access within the RPA the ground protection should be designed by an engineer to accommodate the likely loading and may involve the use of proprietary systems or reinforced concrete slabs. The structure must use a no dig design (see methodology described in 1.7 below) to prevent root severance and must prevent localised soil compaction by distributing the load across the track width. Such a system may include the use of three-dimensional cellular confinement systems (CCS) as a component of the sub-base, to act as a load suspension layer.

1.2.10. New permanent hard surfacing should not cover more than 20% of the RPA or be wider than 3m within it; it should be constructed to be permeable to moisture and gas.

1.3. Construction exclusion zone

1.3.1. Once the construction exclusion zone (CEZ) has been protected by barriers and/or ground protection, demolition/construction can take place.

Inside the Construction Exclusion Zone (CEZ) of the protective fencing, the following prohibitions shall apply:

- No mechanical digging or scraping
- No hand digging
- No storage of plant, equipment or materials
- No vehicular or plant access
- No fire lighting
- No washing down of vehicles or machinery
- No handling, discharge or spillage of any chemical substance, including cement washings
- No action likely to cause localised waterlogging
- No change in ground levels
- No construction of a hard surface
- No earthworks

1.3.3. To inform site personnel of the purpose of the fencing, information notices shall be fixed to the fencing at 5m intervals. These notices shall be of all-weather construction and shall be in the form of the example provided at Figure 4 below and replaced as and when necessary.

1.3.4. In addition to the above, further precautions are necessary adjacent to trees outside the CEZ:

- Materials that will contaminate the soil, e.g. concrete mixing, diesel soil and vehicle washings, should not be discharged within 10 metres of the tree stem. This should take into consideration the topography of the site and slopes to avoid materials such as concrete washings running towards trees.

- Fires should not be lit in a position where their flames can extend to within 5m of foliage, branches or trunk. This will depend on the size of the fire and the wind direction.

- Notice boards, telephone cables or other services should not be attached to any part of the tree.

1.4. New Services

1.4.1. **Service connections:** The location of all new service routes should ideally be outside of the root protection zones of the trees to be retained to avoid damage to tree roots. All proposed service installations should be carried out in accordance with the guidelines set out in NJUG Publication No.10, and Section 11.3.5 and 11.7 of BS5837:2005. Great care should be taken to preserve and work around roots greater than 25mm in diameter, and clusters of smaller roots avoiding damage to bark. Where it is necessary to sever roots greater than 25mm in diameter, arboricultural advice must be sought. Where smaller roots must be severed, they should be cut back cleanly using secateurs or a sharp pruning saw. Where possible, services laid through protected areas need to be installed at a depth preferably not less than 750mm deep in order to preserve the maximum number of roots and avoid conflicts between the tree roots and the utility service run. The trench should be kept as narrow as possible to reduce the potential amount of root severance. Backfilling of trenches should be carried out using the excavated soil, which should be worked in around roots and lightly "tamped" not compacted and preserving the original soil profile. The backfill should be left proud of surrounding levels to allow for settlement. Trenches must not be left open overnight, and arboricultural supervision should be provided during excavation of trenches through protected zones. If the trench is to remain open for any period during the day to prevent the roots from drying out, it is advised that moist Hessian sacking be wrapped around the exposed roots, and/or trench to prevent desiccation from occurring. All existing site services that are already within the root protection areas that are to be made redundant will still need to comply with the above to prevent any damage to roots within these areas.

1.5. Removing Surfacing in RPAs

1.5.1. Roots are frequently found beneath or adjacent to existing surfacing or built structures and care is needed. Damage to the roots may be by direct physical damage or compaction of the soil from the weight of plant and machinery or repeated pedestrian movement. This is generally not a problem whilst surfacing is in place as the load is spread and additional protection is not required. However, once the existing surface is removed and the soil below exposed significant damage can occur to the soil structure and directly to the roots in a very short time. The following rules must be followed:

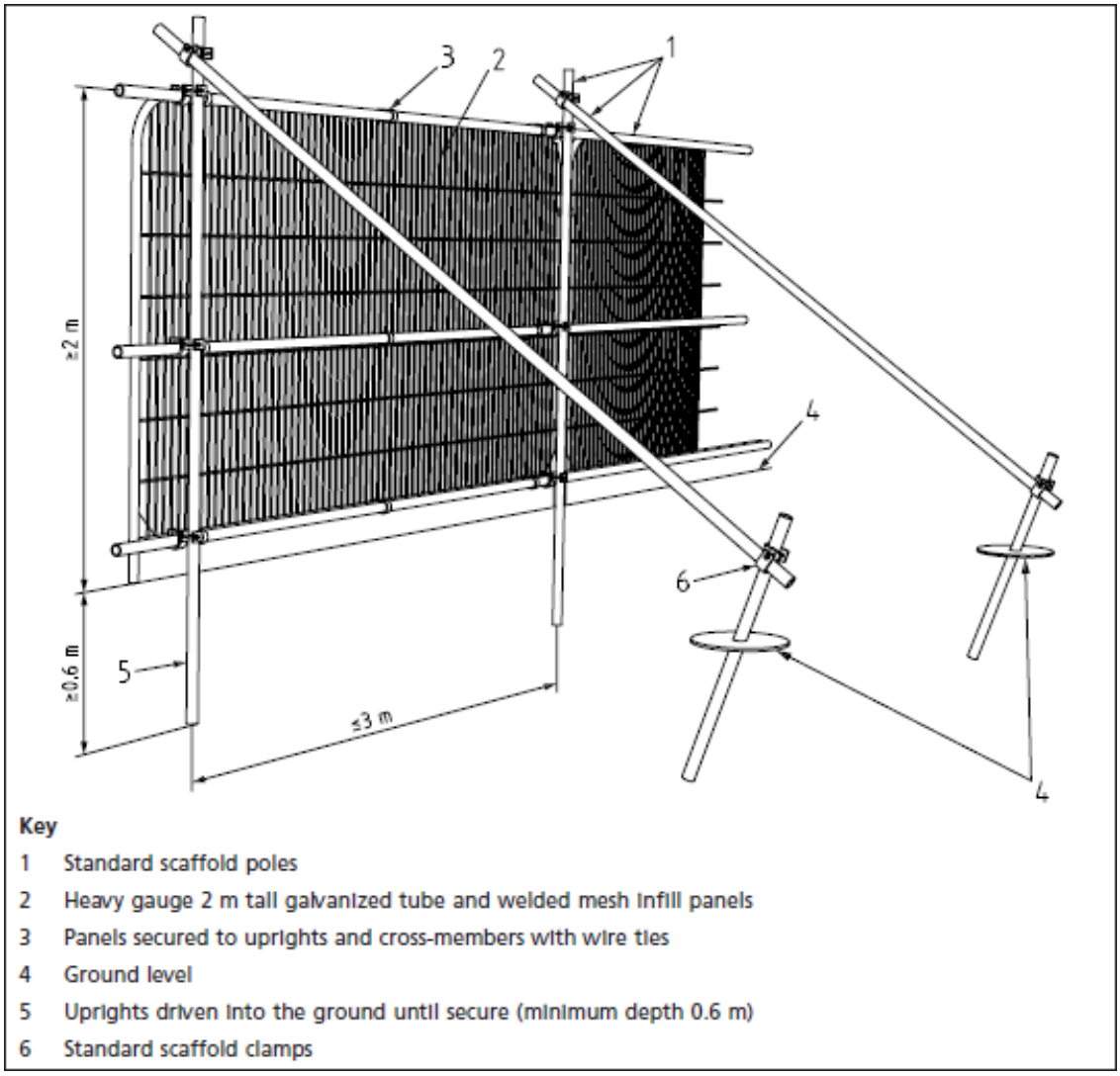
1. No vehicular activity or repeated pedestrian access into the RPAs unless on existing hard surfacing or custom designed ground protection, this must be designed for anticipated loads.
2. Regular vehicle and pedestrian access routes must be protected from compaction by temporary ground protection.
3. RPAs exposed by the works must be protected as set out in BS 5837:2012 until there is no risk of damage from construction activity

Appropriate tools for manually removing debris may include a pneumatic breaker/drill, crow bar, sledgehammer, pick, mattock, shovel, spade, trowel, fork and wheelbarrow. Secateurs and a bow saw must be available to deal with any exposed roots that have to be cut. Machines with a long reach may be used if they can work from outside RPAs or from areas protected by ground protection designed for the loading within the RPA. Debris to be removed from RPAs manually must be moved across existing hard surfacing or temporary ground protection to prevent compaction damage. If possible, leaving below ground structures in place should be considered if their removal may cause excess root disturbance.

1.6. Soft Landscaping

1.6.1. Soft landscaping includes the re-profiling of existing soil levels and covering the soil surface with new plants or an organic covering (mulch). It does not include the construction/installation of solid structures or compacted surfacing. No significant excavation or cultivation, especially by rotovators, should be carried out within the RPAs. Where new designs require levels to be increased to tie in with new structures or the removal of an existing structure has left a void below the surrounding ground level, good quality and relatively permeable top soil should be used for the fill. It should be firmed into place but not over compacted in preparation for turfing or careful shrub planting

Figure 1: Tree Protective fencing



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Figure 2: Tree Protective fencing (alternative)

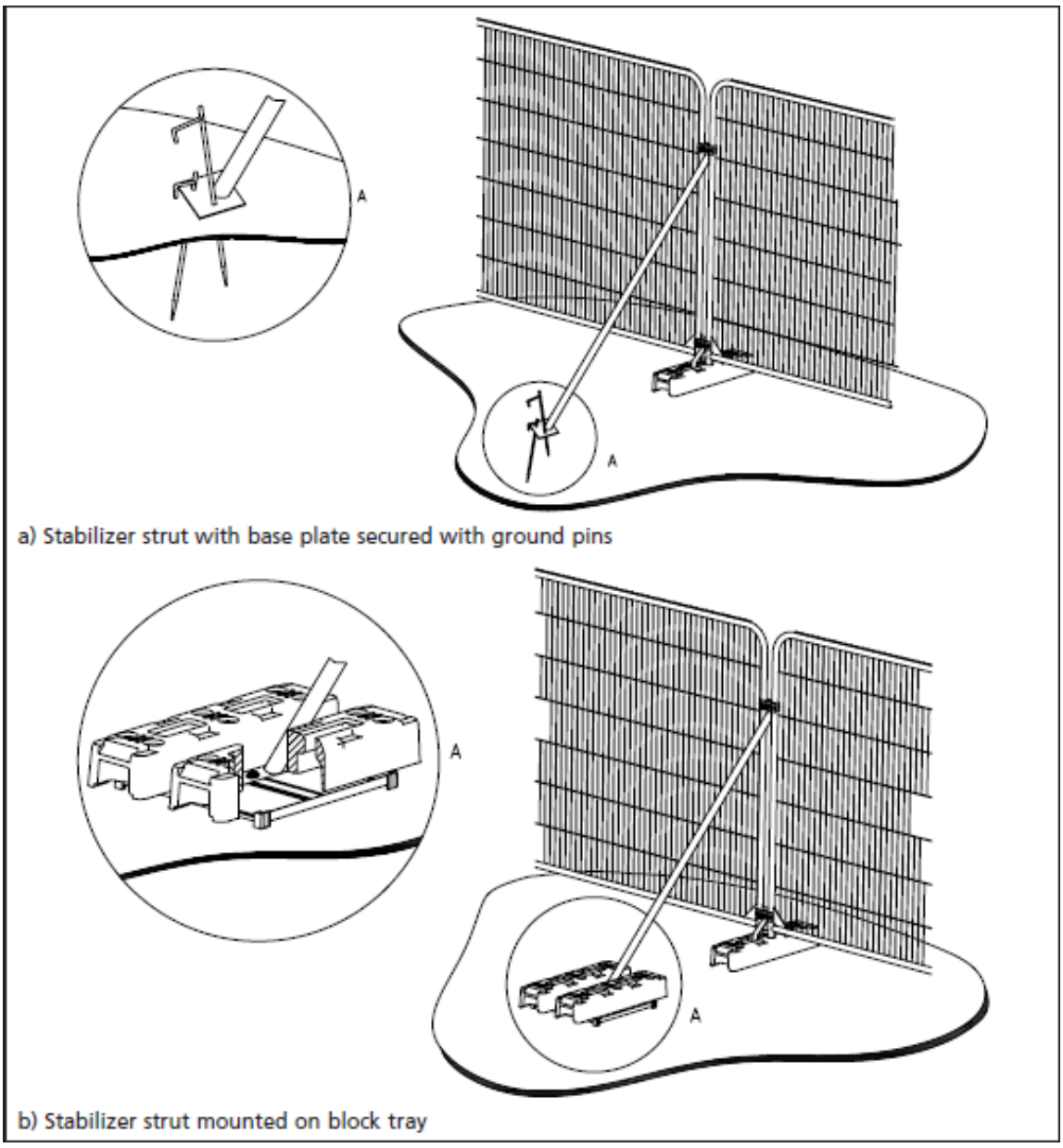
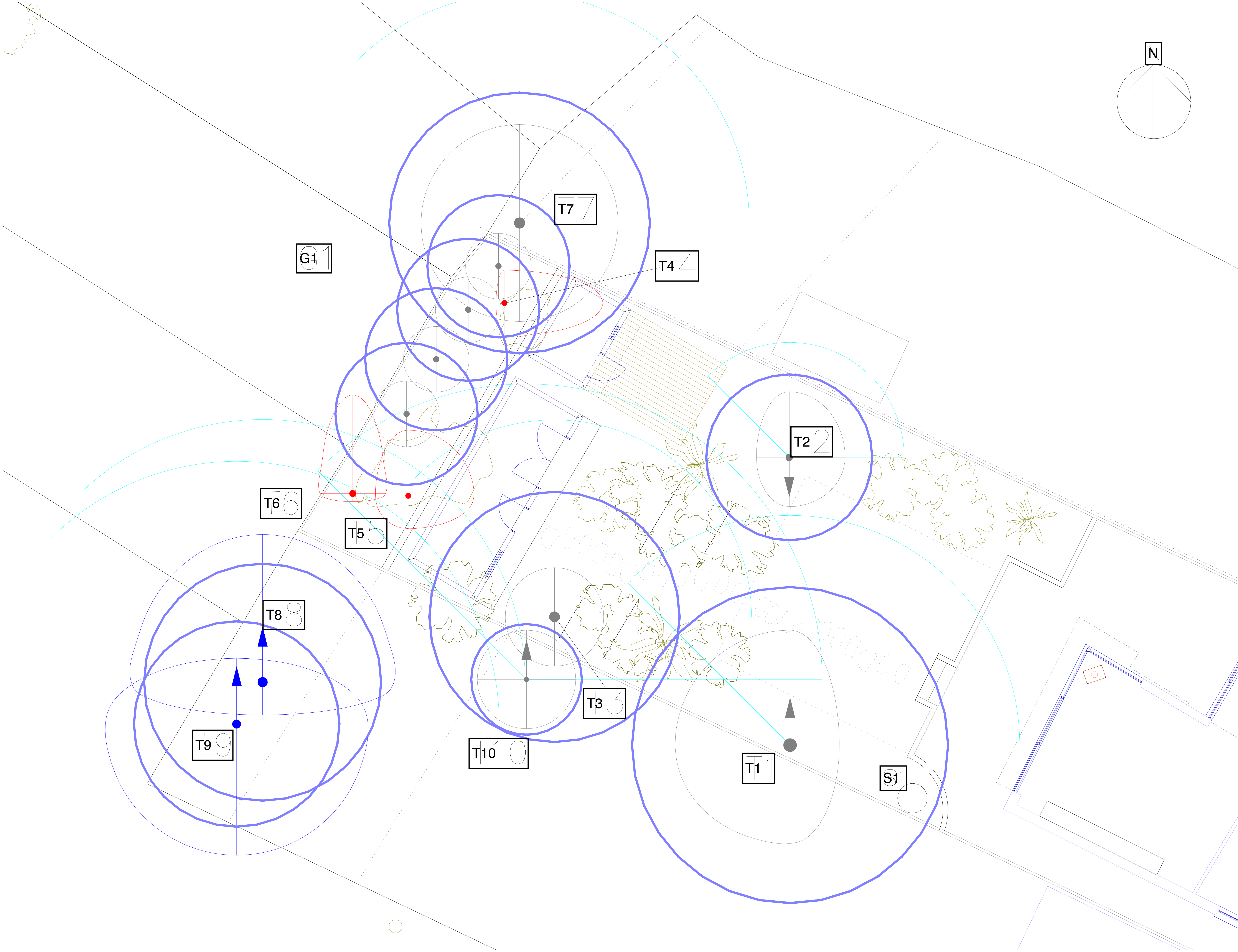


Figure 3: Example of warning notice



ARBORICULTURAL SOLUTIONS LLP

3 WALNUT CLOSE

KEY

- BS CAT B
- BS CAT C
- BS CAT U
- ROOT PROTECTION AREA

DRAWING TITLE

TREE CONSTRAINTS PLAN

EXISTING SITE

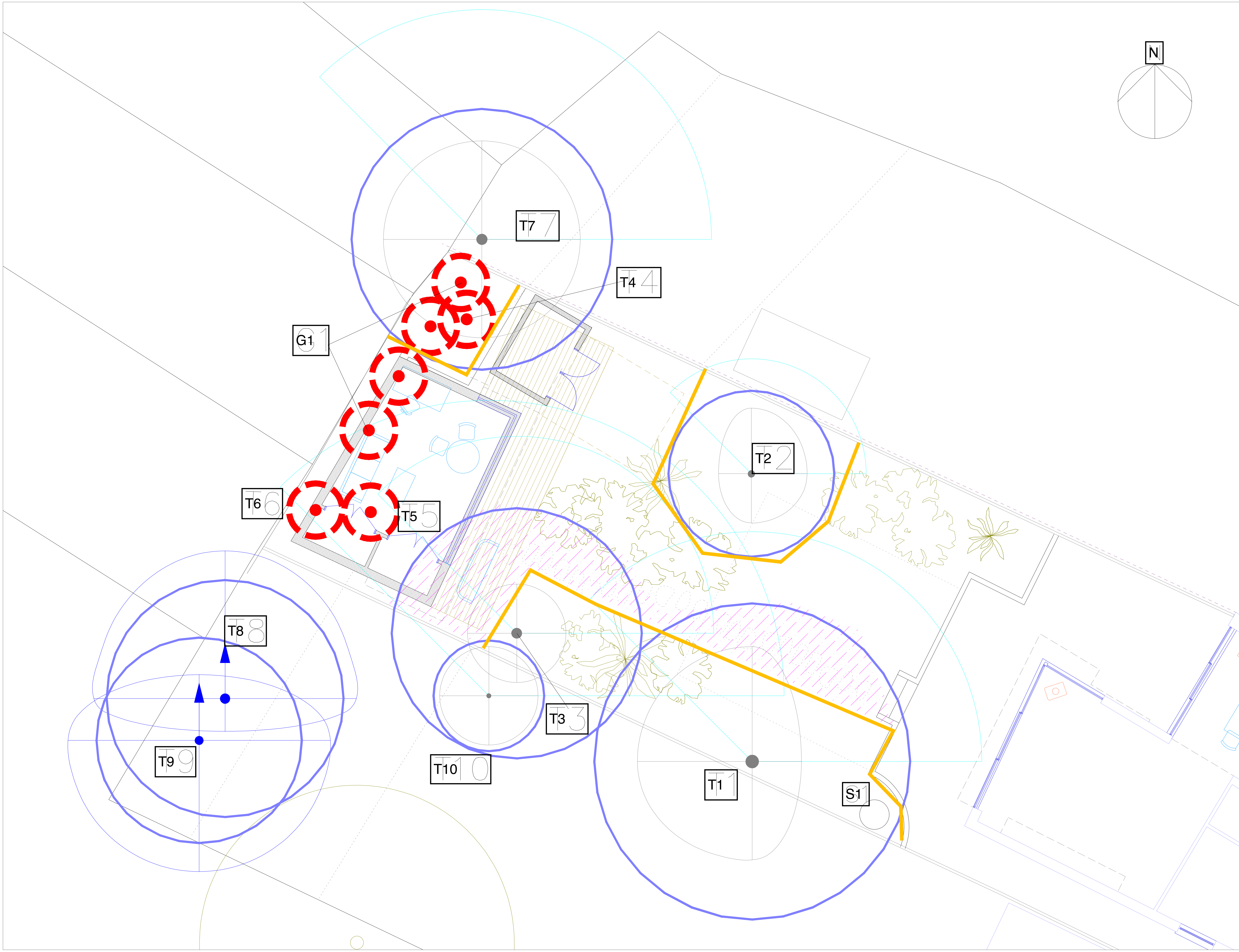
PROJECT

29 PARLIAMENT HILL
PROPOSED STUDIO

CLIENT

SCALE	1:100@A3		
DATE OF ISSUE	SEP 2020		
SURVEYOR	FC	DATE	
DRAWN BY	GMC		
DRAWING No.	TCP_29PARLMNTHILL_1	REV	A

No.	DATE	REVISION



ARBORICULTURAL SOLUTIONS LLP

3 WALNUT CLOSE
PETERBOROUGH, PE7 1LL
TEL: 01733 208661
EMAIL: grahamcausey@gmail.com
fionacritchley2016@gmail.com

3 WALNUT CLOSE

KEY

- BS CAT B
- BS CAT C
- BS CAT U
- ROOT PROTECTION AREA
- TREE REMOVED
- PROTECTIVE FENCE
- GROUND PROTECTION & SPECIAL PRECAUTIONS

DRAWING TITLE

TREE PROTECTION PLAN

PROPOSED SITE

PROJECT

29 PARLIAMENT HILL
PROPOSED STUDIO

CLIENT

SCALE	1:100@A3		
DATE OF ISSUE	SEP 2020		
SURVEYOR	FC	DATE	
DRAWN BY	GMC		
DRAWING No.	TPP_29PARLMNTHILL_2	REV	A

No.	DATE	REVISION