

Trees and Construction

BS5837:2012 Tree Survey, Arboricultural Implications Assessment & Method Statement

Site: 2 St Paul's Crescent, NW1 9XS

Client: House of Design Architects

Ref: 241909/AIA/A2



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Revision	Description	Date
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1. INTRODUCTION

1.1 **Instruction:** This advice has been prepared for the client House of Design Architects (hereafter; client) and is in respect of the tree related planning considerations at 2 St Paul's Crescent, NW1 9XS (hereafter; site).

As the proposal relates to development works at site, the advice herein is produced in accordance with the British Standard 5837 : 2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations*' (hereafter; BS5837).

1.2 **BS5837:** The scope of BS5837 is to provide guidance on how trees and other vegetation can be integrated into construction and development design schemes. The overall aim is to ensure the protection of amenity by trees which are appropriate for retention.

1.3 **Scope of this advice:** This advice has been produced in accordance with BS5837 and is intended to demonstrate the site's realistic arboricultural constraints and assist with the design process. The objective is to systematically assess the site and provide suitable recommendations regarding the proposal's potential impact on trees and vice versa.

1.4 Following instruction the consultant surveyed the site on the 24th Oct 2024 where a site walkover and BS5837 tree survey were carried out; all trees on site and around the application boundary were surveyed from ground level and plotted as either an individual or a tree group.

1.5 This advice is subject to caveat at Appendix I, outlines relevant terms and definitions at Appendix II and constitutes the findings of the preliminary site assessment and associated arboricultural recommendations.

1.6 The survey data and site observations use the supplied plan to illustrate the surveyed trees in plan format as a 'Tree Constraints Plan' (hereafter; TCP); the TCP and the tree survey data table are at Appendix III. Tree locations are estimated

2. SITE INFORMATION & TREE ASSESSMENT

- 2.1 The site is occupied by a large end terrace residence with access to the side and to the rear garden. The site is situated in an area of similar style properties.
- 2.2 **Proposal:** It is understood that the site is being considered for a rear extension and internal improvements. This has been confirmed and plan represented by 0125-Drawing Set-P1 is to be submitted
- 2.3 The site requires consideration from an arboricultural perspective due to the presence of trees on and around the site; these trees are deemed to be within impacting distance of the existing property and potential construction area.
- 2.4.1 The tree survey and assessment resulted a range of the BS5837 quality/retention categories of 'B - moderate' and 'C – Low and 'U'- Uncatergorised being attributed to trees on site; it is also worth noting that the BS5837 circular RPAs are considered to halt at the extents of existing property such as walls etc.
- 2.4.2 The BS5837 tree survey is a means of objective assessment and reflects the trees' condition, quality contribution, remaining life expectancy and spatial considerations (stem, crown and roots). On this basis and in order to consider the trees' accurate constraints, the survey data has the crown extents for north, south, east west, the stem diameter measurement, and the calculated root protection areas (hereafter; RPAs). Hereafter, the trees are therefore reviewed and considered on their own merits and in line with the guidance of BS5837.

3. FINDINGS & RECOMMENDATIONS

- 3.1 The following information, as with the prior contents of this report, should be read with the appended tree data table and tree constraints plan (241909/TCP /01).
- 3.2 General Considerations for Tree Retention / Removal
- 3.2.1 'B' Class trees are also considered of value both individually and in the landscape and should be retained by design. Proposed encroachment or removal would need to be justifiable and mitigated although Council resistance would be anticipated.
- 3.2.2 The smaller scale, declining or limited contribution trees are categorised as low quality 'C' category trees. These may be suitable for retention for the most part but should not present a significant constraint to the scheme as mitigation planting can replicate and enhance their contribution.
- 3.2.3 Tree T2 has been categorised as 'U' but is within neighbouring property so is assumed to be retained.

4. PRE APPLICATION SCHEME / IMPLICATIONS ASSESSMENT

4.1 For this assessment, the proposed scheme has been considered (see; s.2.2 herein). This includes consideration for arboricultural management / tree works for H&S tree risk management, tree removal and pruning options, design solutions, tree protection and sensitive measures to account for trees. As per s.1.6 and s.2.2 herein, the TCP scheme overlay illustrates the proposed scheme.

4.2 T3 is to be removed to facilitate the scheme but will be replaced .

4.3 The specific considerations and implications for these are as follows. The drawings referred to can be found in Appendix III. This information has been prepared for the pre submission to demonstrate that construction can be achieved inline with the recommendation set out in the AIA. Development that is in line with AIA recommendations is possible through further detailed design.

4.3.1 *Consideration for T1 and T2*

4.3.1 All Trees and Groups

4.3.2 Trees T1 and T2 will be separate from the intended development and are therefore protected by avoidance and distance from the proposal.

4.3.3 *Consideration for T4*

T4 will be protected by temporary fencing and appropriate ground protection and/or BS5837 approved scaffolding.

5. ARBORICULTURAL METHOD STATEMENT (AMS) 'CONSIDERATIONS'

5.1 Arboricultural Construction Restrictions

5.1.1 The following restrictions are considered relevant for tree protection purposes which are illustrated on the appended Tree Protection Plan (TPP):

- a) **Tree Works** - are to be completed prior to any and all site works: no tree works not specified within this AIA (or leaning against or attaching of objects to a tree) are permitted unless agreed in writing by the council (subject to standard exemptions).
- b) **Tree Protection** - a site compound will be set up within the application boundary, excluding the surveyed trees as per the TPP, or Protective Barrier Fencing (PBF) is to be installed as per the TPP with works clearance, i.e. 1.5-2.0m around the hard landscape extents, existing boundary walls retained and supplemented to prevent RPA, stem or crown impact; to be installed after tree works and prior to site works.
- c) **Construction Exclusion** - the fenced off areas are Construction Exclusion Zones (CEZ).
- d) **Site Restrictions** - no chemicals/materials are to be transported/stored/used/mixed within the CEZ, and no fires are to be lit and no machinery, plant or vehicles are to be washed down within 10m of the tree's canopy or in a CEZ.
- e) **Ground Works** - during site works RPAs/CEZ may not be breached, i.e. no surface works, without the consultant's prior advice and council consent, and no mechanical digging or scraping is permitted within RPAs/CEZ;
- e) **Sensitive Landscape** - the PBF may be temporarily moved to allow pedestrian access to start sensitive soft landscape works within RPA, i.e. turf removal, retained soil levels, new planting, mulch borders.
- a) **Completion** - only following construction and hard landscape completion can PBF be removed and remaining soft landscape works undertaken within RPAs / CEZ (ground levels to be retained and works undertaken manually with non driven machinery).

5.2 Arboricultural Site Monitoring / Supervision

- 5.2.1 The council will typically request 'a scheme of supervision for the arboricultural protection measures' to confirm tree protection and adherence to working methods around trees and so we set this out below.
- 5.2.2 The appointed site contractor and project manager will be provided with an approved AMS and TPP and will need to be briefed as to prohibited works and tree protection.
- 5.2.3 A record of each site visit will be kept and a summary letter drafted for the client, the site manager and the local authority (to be sent to the client for distribution), thus -
- (1) *Post-commencement* to confirm approved, site hoarding / tree protection fence line, ground protection and construction restrictions for ground works.
 - (2) *After-main construction* to confirm excavations of existing hard surfaces and discuss tree protection requirements with the landscape team.
 - (3) *Development completion* after all hard landscape works and tree and shrub planting are complete to sign off the site as having adhere to the AMS.

5.3 Tree Works

5.3.1 All approved tree works must be undertaken with the council's written permission (subject to statutory exemption) and undertaken to BS3998 by a tree service contractor who is suitably qualified, experienced and insured to for arboricultural contracting.

5.3.2 In accordance with the approved scheme the following tree works are recommended in conjunction with the scheme (additional tree works must only be undertaken with the full and written permission of the council):

NUMBER	TREE REMOVALS / PRUNING WORKS	
T3	Remove	Remove to facilitate the scheme.

5.6 Underground utilities

5.5.1 It is assumed that services are to be taken to the main road (St Paul's Crescent) and therefore no constraints are envisaged. In case services are required near to trees the following applies.

5.6.1 Any new underground utilities are to utilise the construction area for new installations and avoid the need for works in proximity to trees. Certainly, utility installations are to be:

- Located outside of RPAs and construction exclusion zones; and
- Installed only following the installation of the protective barrier fencing to ensure the retained trees and their RPAs are protected.

5.6.2 The following restrictions are recommended for underground utilities within RPAs:

- Any necessary excavations to be undertaken sensitively using either a no-dig method (e.g. Air-Spade) and/or under arboricultural supervision;
- Any exposed roots shall be packed with a clean damp sand (not builders sand) and wrapped in hessian sacking to protect them.
- Small roots which are identified (those less than 25mm diameter) may be carefully pruned back with a clean sharp tree saw; and
- Larger roots which are identified (those greater than 25mm in diameter) are to be retained and protected as they may be necessary for a tree's health and stability.

Example of service installation retaining tree roots using Airspade below



5.7 Protective Barrier Fencing (PBF) Specification

- 5.7.1 Protective barrier fencing (hereafter; PBF) is to be installed to illustrate the no access areas for contractors, limit access to the existing driveway and paths and exclude all ground works, material storage and construction processes outside of the approved scheme and from the soft surfaced RPAs during construction.
- 5.7.2 PBF is to be used in conjunction with retained boundary walls and retained hard surfaces within RPAs for pedestrian access until construction completion (surface works within RPAs will be undertaken sensitively - detail to follow).
- 5.7.3 PBF is to be installed as per the TPP prior to any site works being undertaken and is to remain in place until construction completion.
- 5.7.4 The PBF is to be a fixed line aside the existing pathways to illustrate the Construction Exclusion Zone (CEZ) as the fenced off area. It is to prevent the pedestrian access into the soft surfaces borders and lawn and only allow access via the existing driveway and pathways and will be Heras panels and feet with support posts.
- 5.7.5 Tree protection signage denoting the words "TREE PROTECTION ZONE – KEEP OUT" is to be fixed onto each panel of the PBF (see TPP illustration).

5.8 Ground Protection

- 5.8.1 Supplementary ground protection and BS5837 Scaffolding are to be used in conjunction with the installation of the PBF; surface works within retained trees' RPAs are to be delayed until construction completion.
- 5.8.2 At the point of PBF being installed, the enclosed RPA sections become Construction Exclusion Zones (hereafter; CEZ) to protect the trees' rooting areas during construction.
- 5.8.3 Due to the PBF installation and use of ground protection within RPAs (for the duration of works), is anticipated that construction related RPA incursion will occur. However, where this situation arises, it will be necessary to protect tree roots and their growing environment. The advice of the consultant will be sought, and the written permission of the council will be required.
- 5.8.4 It is anticipated that, temporary ground protection will be needed, i.e. for exposed RPAs of trees around the perimeter of the proposal. It is therefore recommended that a 2m wide strip have ground protection installed as per locations marked on the TPP. It is also proposed that a 1m wide strip have ground protection installed next to the proposed new access.
- 5.8.5 Specifically, the ground is to be protected from impact where it may be subject to direct pedestrian/vehicular movements. The ground protection is to be appropriate for the intensity of the pedestrian or vehicular movements thus -
- a) For pedestrian movements within an exposed RPA, the ground protection is to consist of "a single thickness of scaffold boards on top of a compressible layer laid onto a geotextile, or supported by scaffold"; and
 - b) For wheeled or tracked movements within an exposed RPA, the ground protection is to "be designed by an engineer to accommodate the likely loading".

5.9 Report Handling

- 5.9.1 This report is released to the client and architect to be distributed at their discretion and the consultant is available for queries relating to this report and/or trees.
- 5.9.2 The proposed scheme is reviewed in respect of the arboricultural constraints and is considered to be achievable in line with the BS5837 guidance. The tree protection methods herein may be approved by the council for which a planning approval will be subject to a final and detailed Arboricultural Method Statement based on the approved information and other detail perhaps not available at the pre-planning approval stage, i.e. final landscape plan. Draft construction management plan (CMP)
- 5.9.3 This AMS and the TPP may be approved by the council in support of the application, subject to a conditioned final AMS and TPP as a means of authorised tree protection measures; all site personnel will have access to a copy and the tree work and protection details are to be inspected as per s.5.2 for '*Arboricultural Monitoring / Supervision*'.

This concludes our advice.

Appendix I

Caveat

Any and all information supplied to Indigo Surveys Ltd by/on behalf of the client is assumed to be accurate unless otherwise informed. | This advice is limited to the observations made on the date of inspection as detailed herein and any deletion, editing or alteration will result in the advice being null and void in its entirety. | This advice in its entirety may be deemed null and void if remedial works are undertaken on any area of the site, on or after the date of the survey. | No liability is assumed by the author or by Indigo Surveys Ltd for any misuse, misinterpretation or misrepresentation of this advice. | This advice is not valid in adverse or unpredictable weather conditions or for any failure due to 'force majeure' or unpredictable events. | No responsibility is assumed either by the author of this advice or by Indigo Surveys Ltd for any legal matters that may arise as a consequence. | Neither the author nor Indigo Surveys Ltd will be required to attend court or give testimony as part of this agreement. | The responsibility for any works undertaken on the basis of the recommendations of this advice does not form part of this agreement.

Appendix II

Terms and Definitions

“Arboriculturist” - person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction.

“Competent Person” - person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached.

“Topographical survey” - an accurately measured land survey undertaken to show all relevant existing site features. A method of carrying out topographical surveys is given in RICS specification Surveys of land buildings and utility services at scales of 1:500 and larger.

“BS5837 Tree survey” - should be undertaken by an arboriculturist to record information about the trees on or adjacent to a site. The results of the tree survey, including material constraints arising from existing trees that merit retention, should be used (along with any other relevant baseline data) to inform feasibility studies and design options. For this reason, the tree survey should be completed and made available to designers prior to and/or independently of any specific proposals for development.

“Tree categorisation method” - trees should be categorised in accordance with the BS5837 cascade chart by an arboriculturist. This is to identify the quality and value (in a non-fiscal sense) of the existing tree stock, allowing informed decisions to be made concerning which trees should be removed or retained in the event of development occurring.

“Root protection area (RPA)” - layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority, shown as an arboricultural constraint in m². The radius is calculated using the BS5837 calculation method. An arboriculturist may change the shape of an RPA but not reduce its area.

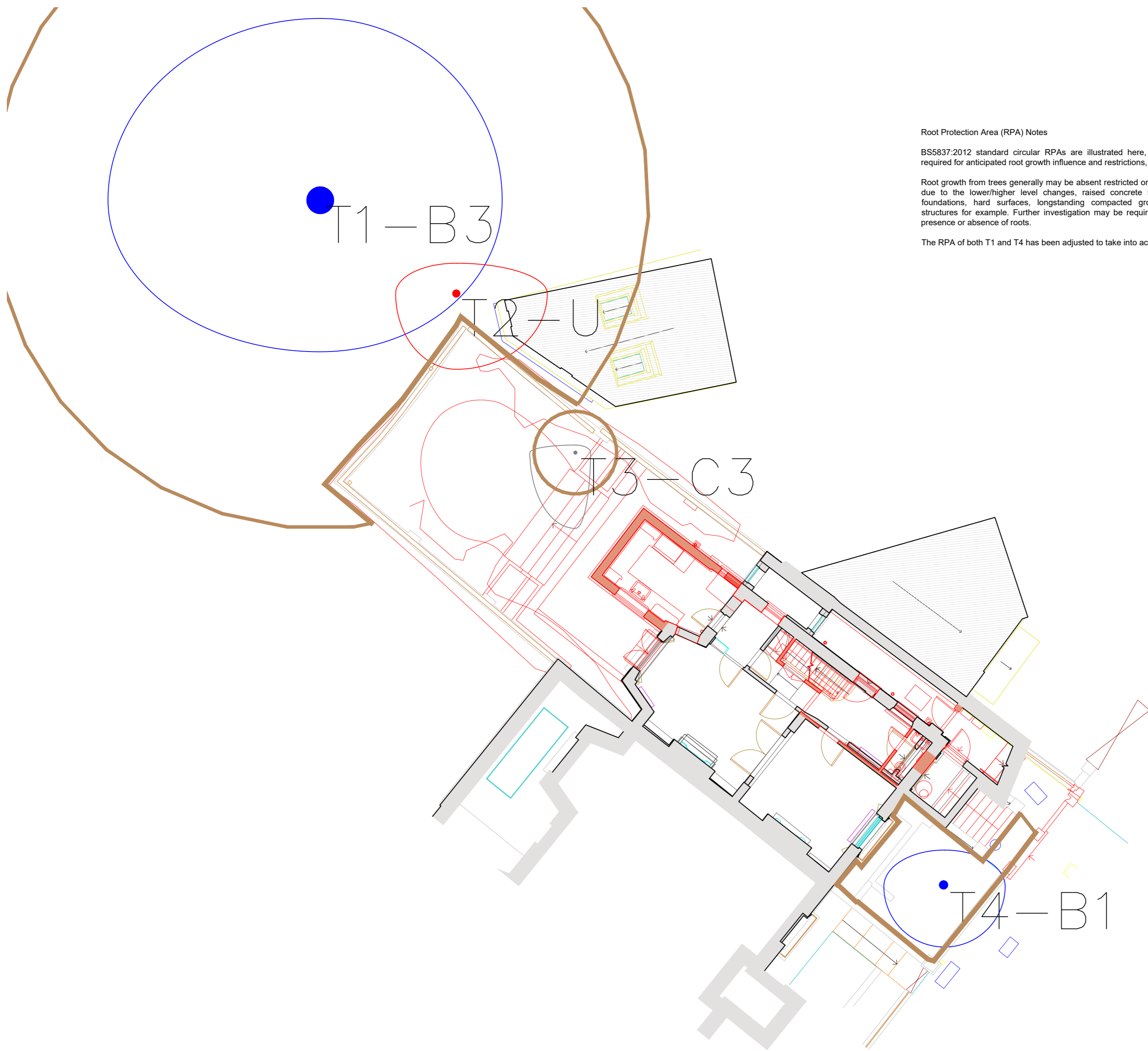
“Arboricultural implications assessment” - a study, undertaken by an arboriculturist, to identify, evaluate and possibly mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implementation of any site layout proposal.

“Arboricultural method statement” - methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in loss of or damage to a tree to be retained.

“Tree protection plan” - a scale drawing, informed by descriptive text where necessary, based upon the finalised proposals, showing trees for retention and illustrating the tree and landscape protection measures.

Appendix III

Data Table:	As appended (BS5837 Tree Survey Key & Table)
Tree Constraints Plan:	As appended (241909/TCP/01)
Tree Protection Plan: (Application Stage)	As appended (241909/TPP/01)



Root Protection Area (RPA) Notes

BS5837:2012 standard circular RPAs are illustrated here, with consideration required for anticipated root growth influence and restrictions, such as -

Root growth from trees generally may be absent restricted or deflected from site due to the lower/higher level changes, raised concrete structures, existing foundations, hard surfaces, longstanding compacted ground and existing structures for example. Further investigation may be required to establish the presence or absence of roots.

The RPA of both T1 and T4 has been adjusted to take into account the above

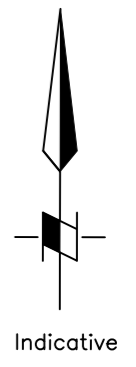
KEY

- ○ ○ ○ Tree Crown Spread
- Root Protection Area (RPA)
- ● ● ● Tree Stem
- T1 Tree No.
- Removed Tree

Tree Condition Category

- A
- B
- C
- U

The surveyed trees are illustrated on this Constraints Plan which is prepared in accordance with British Standard BS5837: 2012 'Trees in Relation to Design, Demolition and Construction - Recommendations'



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REV.	DESCRIPTION	DWN	CHK'D	DATE
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CLIENT
House of Design Architects

PROJECT
241909/A1
2 St Paul's Crescent, NW1 9XS

TITLE
Tree Constraints Plan

DWN	DATE	CHK'D	DATE	APP'D	DATE	SCALE
RPHB	1/11/2024	AT	1/11/2024			1-100

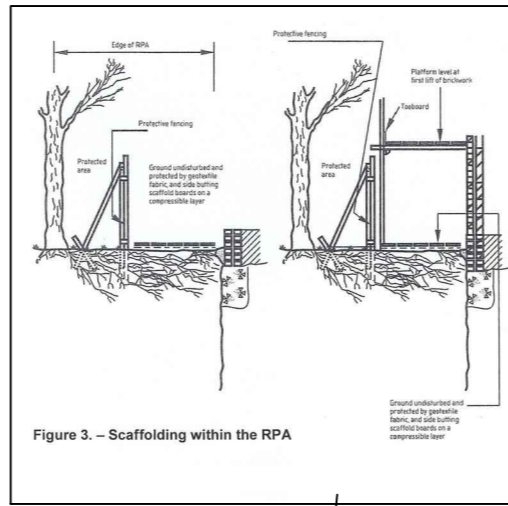
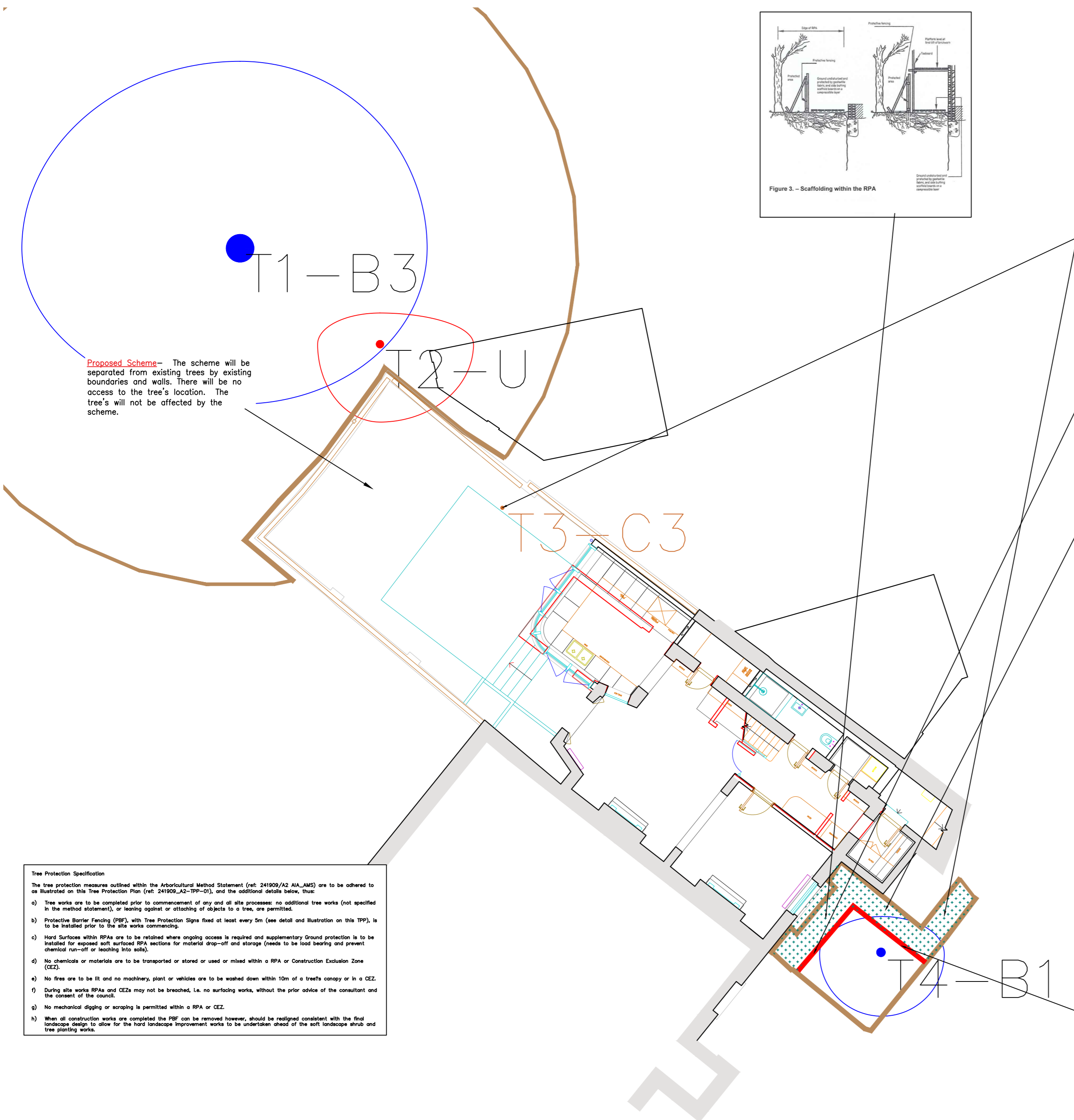


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Drawing Number A2

221476/A1/TCP/01 REV.

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Proposed Scheme – The scheme will be separated from existing trees by existing boundaries and walls. There will be no access to the tree's location. The tree's will not be affected by the scheme.

Tree Removals:
T1 is to be removed for arboricultural reasons.

Protective Barrier Fencing (PBF):
To comprise of 2m tall welded mesh panels on rubber or concrete feet. Panels are to be joined together using a minimum of two anti-tamper couplers, installed so that they can only be removed from inside the fence. The panels should be supported on the inner side by stabilizer struts, which should be attached to a base plate and secured with ground pins. All weather notices should be erected at regular intervals on the weld mesh panels with words such as "Tree Protection Area – Keep out". See example on TPP.

2 Locations marked, "Location 1" is during the construction phase then the fencing is moved to "Location 2" during landscape phase for deck installation.

Ground Protection:
Temporary ground protection to be used as indicated around T2 & T3. This can be existing hard surfaces or temporary ground protection where soft ground is situated. This will have tree protection signs, to be fixed in place for the duration of site works for tree protection and to remain until construction completion, then to be realigned for hard landscape. 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.

Note The ground protection will 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, as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100mm depth of woodchip), laid onto a geotextile membrane; (see example)
- b) for pedestrian-operated plant up to a gross weight of 2t, proprietary inter-linked ground protection boards placed on top of a compression-resistant layer (e.g. 150mm 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 system 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.

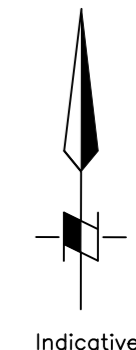
KEY

- Tree Crown Spread
- Root Protection Area (RPA)
- Tree Stem
- T1 Tree No.
- Removed Tree

Tree Condition Category

- A
- B
- C
- U

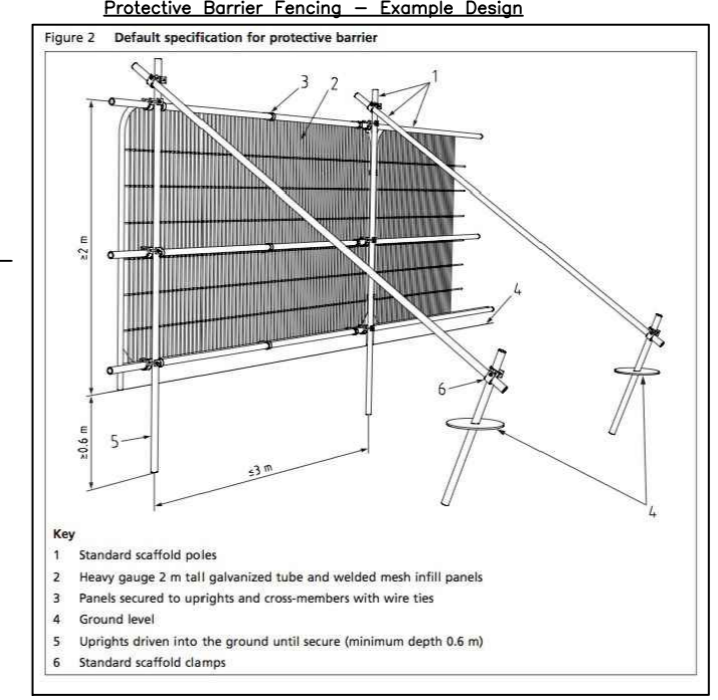
The surveyed trees are illustrated on this Constraints Plan which is prepared in accordance with British Standard BS5837: 2012 'Trees in Relation to Design, Demolition and Construction – Recommendations'



Tree Protection Specification

The tree protection measures outlined within the Arboricultural Method Statement (ref: 241909/A2 AIA_AMS) are to be adhered to as illustrated on this Tree Protection Plan (ref: 241909/A2-TPP-01), and the additional details below, thus:

- a) Tree works are to be completed prior to commencement of any and all site processes: no additional tree works (not specified in the method statement), or leaning against or attaching of objects to a tree, are permitted.
- b) Protective Barrier Fencing (PBF), with Tree Protection Signs fixed at least every 5m (see detail and illustration on this TPP), is to be installed prior to the site works commencing.
- c) Hard Surfaces within RPAs are to be retained where ongoing access is required and supplementary Ground protection is to be installed for exposed soft surfaced RPA sections for material drop-off and storage (needs to be load bearing and prevent chemical run-off or leaching into soils).
- d) No chemicals or materials are to be transported or stored or used or mixed within a RPA or Construction Exclusion Zone (CEZ).
- e) No fires are to be lit and no machinery, plant or vehicles are to be washed down within 10m of a tree's canopy or in a CEZ.
- f) During site works RPAs and CEZs may not be breached, i.e. no surfacing works, without the prior advice of the consultant and the consent of the council.
- g) No mechanical digging or scraping is permitted within a RPA or CEZ.
- h) When all construction works are completed the PBF can be removed however, should be realigned consistent with the final landscape design to allow for the hard landscape improvement works to be undertaken ahead of the soft landscape shrub and tree planting works.



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	Based on TCP 241909 & 0125-A-P-1001	RB	TB	6/11/24
REV.	DESCRIPTION	DWN	CHK'D	DATE

CLIENT
House of Design Architects

PROJECT
241909/TPP/A2
2 St Paul's Crescent, NW1 9XS

TITLE
Tree Protection Plan

DWN	DATE	CHK'D	DATE	APP'D	DATE	SCALE
RPHB	7/11/2024	AT	7/11/2024			1-100

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