

**BS5837:2012 Tree Survey**  
including  
**Arboricultural Impact Assessment**  
and  
**Arboricultural Method Statement**  
for  
**13 Maze Road, Richmond, TW9 3DA**



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## ***PURPOSE OF THIS DOCUMENT***

This report has been commissioned to provide an assessment of the trees at 13 Maze Road, Richmond, TW9 3DA in accordance with the guidelines provided by BS5837:2012 *Trees in relation to design, demolition and construction – Recommendations*.

It consists of:

- A **tree survey** that records all relevant information about the trees on or adjacent to the site that may be impacted by the proposals. This includes a **tree schedule**, and a **tree constraints plan (TCP)** that shows the location and constraints of the tree on the site irrespective of any development considerations.
- An **arboricultural impact assessment** to consider the impact that the development proposal may have on the trees. It provides details of how any adverse impact will be mitigated and includes a **tree protection plan (TPP)**.
- An **arboricultural method statement** to provide details on how the retained trees will be protected and managed during the ongoing development process. The AMS is based on the provided plans and should be read in conjunction with the TPP ref: PB/TPP-24/01.04.

The purpose of this report is to provide the local authority (London Borough of Richmond Upon Thames) with the necessary information to assess the tree issues associated with the planning application, and use it as a basis for issuing planning consent or engaging in further discussions towards that end.

As part of the planning process this document should be available for inspection by interested parties including members of the public. The aim is to present the information in a manner that can easily be understood by people without specific knowledge of tree related matters.

***EXECUTIVE SUMMARY OF THE IMPACT  
OF THE DEVELOPMENT ON THE TREES***

The development proposal considered for this report is for a planning application in London Borough of Richmond upon Thames at 13 Maze Road, Richmond TW9 3DA; proposals for *'Ground Floor Side Extension, Internal remodelling, loft conversion and garage works'*.

There is an RPA incursion as a result of excavation of foundations for the extension, but mitigation is to be followed during the excavation and construction of the foundations as detailed in section 2.8.1; including the use of 'pile and slab' foundations.

There will be no direct tree loss as a result of the development proposals, and minor necessary facilitation pruning to the retained trees (T) T1 and T3.

The Tree Protection Plan, drawing no. PB/TPP-24/01.04 in Appendix 3 shows ground protection measures and tree protection during demolition and the development works.

The arboricultural method statement provides details on how the retained trees will be protected and managed during the ongoing development process, including the 3no highway cherry trees growing in the footway outside the property.

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*Appendix 2 - Tree Constraints Plan*

*Appendix 3 - Tree Protection Plan*

*Appendix 4 - Site Supervision & Monitoring Form*

## SECTION 2: SITE & TREE SURVEY

### 2.1 INSTRUCTION

We are instructed by John Rich Architects, 6a Royal Parade, Kew, Richmond, Surrey, TW9 3QD on behalf of Mr & Mrs Kennerley at 13 Maze Road, Richmond, TW9 3DA to conduct a BS5837 compliant tree survey and prepare an Arboricultural Impact Assessment report.

### 2.2 DRAWINGS

A copy of the drawings listed below have been provided by John Rich Architects for the purpose of this tree report:

- *Existing Site Plan – Project: 23.6006; Drawing No. A050*
- *Proposed Site Plan – Project: 23.6006; Drawing No. A051*
- *Existing & Proposed Ground Floor Plan – Project: 23.6006; Drawing No. A051*
- *Existing & Proposed Side Elevation – Project: 23.6006; Drawing No. A058*

### 2.3 SITE VISIT

The site visit at 13 Maze Road, Richmond, TW9 3DA was undertaken on the 4 January 2024 by Paul Billin BSc MICFor. The trees were inspected from ground level and without any form of detailed investigations. The measurements we undertook on site were made with the aid of a rounded down diameter tape and TruPulse™ laser hypsometer. The trees were not tagged as they are easily identified on site and with reference to the attached tree constraints plan. The weather at the time of the inspections was sunny and clear.

### 2.4 TREE DATA

The assessment of the trees has been carried out in accordance with the guidance provided in Annexe C of British Standard (BS) 5837:2012 'Trees In Relation To Design, Demolition and Construction - Recommendations' (BS5837:2012). In summary this requires that any tree on the site with a stem diameter of over 75mm at 1.5m above ground level is recorded.

A copy of the tree survey schedule can be found in Appendix 1.

The location of the trees has been plotted on the attached Tree Constraints Plan (TCP) drawing no. PB/5837-24/01.04 in Appendix 2.

Stem diameter measurements were recorded to the nearest full unit or in accordance with the requirements of BS5837:2012.

Height measurements are recorded to the nearest quarter metre.

Crown spread dimensions have been paced where possible and are recorded to the nearest full metre.

The trees were categorised in accordance with the cascade chart for tree quality (Table 1: Section 4) of British Standard (BS) 5837:2012.

The average stem diameter of T4 is below 75mm diameter at 1.5 m above ground level and therefore there is no BS5837 categorisation, although its location is included on the TCP.

The trees were assessed in accordance with the cascade chart for tree quality (Table 1: Section 4) of British Standard (BS) 5837:2012.

They are categorised as follows.

- Four trees are in Category 'C' - "Trees of low quality".
- Two trees are in Category 'U' - "Trees unsuitable for retention".

While every effort has been made to ensure that comments relating to the tree surveyed are accurate, it must be noted that no trees have been climbed; no internal inspections carried out and no excavation of root areas has taken place. As such this report should not be taken to mean or imply that any of the trees have been inspected for tree safety to the standard of a visual tree assessment.

A summary of the assessment of the quality of the tree is shown in Table 1 below:

**Table 1 - An overview of tree quality within the surveyed area**

Category A	Category B	Category C	Category U
-	-	4	2

## 2.5 STATUTORY DESIGNATION

An online search for Tree Preservation Order status is not an available tool of the London Borough of Richmond Upon Thames website, as checked on 7 January 2024.

This search revealed that the property is located within the Kew Green Conservation Area No2.

Trees T3 and T5 are sited in the pavement at the side of the property in Haverfield Gardens, T7 is sited in the pavement at the front of the property in Maze Road, and are therefore noted as the Highway Authority's assets.

## **SECTION 2: ARBORICULTURAL IMPLICATIONS ASSESSMENT**

### **2.1 DEVELOPMENT PROPOSAL**

The proposed layout of the scheme has been over-drawn on the Tree Protection Plan (TPP) drawing no. PB/TPP-24/01.04 shown in Appendix 3.

The Tree Protection Plan indicates the relationship between the trees and the development proposal, and has helped inform the assessment of the potential impacts to the current tree resource.

### **2.2 AIA OBJECTIVES**

To assess the areas within this site where proposed works are to be carried out in close proximity to established trees.

To determine whether the proposed works can be carried out successfully without adversely affecting the trees both in the short and long term.

To determine whether the trees will have adverse effects on the proposed development both in the short and long term.

To suggest ways to mitigate any conflicts that may arise between the tree and the proposed development and to offer recommendations relating to the protection of the tree during redevelopment works.

### **2.3 ITEMS FOR CONSIDERATION**

Trees and development located within close proximity to each other can influence each other in a number of ways. The following items are normally considered during arboricultural impact studies:

- Root disturbance caused by demolition, excavation & construction from buildings and roads.
- Location of service runs, welfare/office buildings & materials storage.
- Changes in levels & surface types.
- Sunlight shading of exterior amenity areas including gardens, terraces, patios, etc.
- Physical encroachment by roots, tree stem & branches.
- Allowance for future tree growth.
- Health, safety and nuisance items e.g. leaves, fruit and residues.

### **2.4 GUIDANCE WHILST ASSESSING TREES IN RELATION TO DEVELOPMENT INCLUDES:**

The assessment is based on the guidance given in:

- British Standards Institute; BS 5837:2012 *Trees in Relation to Design, Demolition and Construction - Recommendations*.

With further reference as necessary to the following documents:

- British Standards Institute; BS 3998:2010: *Tree work – Recommendations*.
- *Tree Preservation Orders: A Guide to the Law and Good Practice*. Published by the Department of the Environment, Transport and the Regions;



- National Joint Utilities Group (NJUG) (2007) Volume 4, Issue 2: - *Guidelines for the planning, installation and maintenance of Utility Services in relation to trees.*

## 2.5 KEY ISSUES

The key issues associated with the proposed items identified above in relation to trees are:

- Will there be direct impacts from tree losses on the landscape, both in terms of impacts on visual receptors and impacts on the landscape character of the area?
- Will the proposed development work require grade and ground level alterations that may have significant implications for root systems of retained trees?
- The tree constraints and tree protection measures.
- Services in close proximity to the retained trees
- Leaf/fruit or sap fall and shade constraints leading to pressure to prune or fell.
- Damage to mature trees with low canopy heights growing in close proximity to machinery and contractors' plant operating areas.

These key issues and associated impacts are considered below along with possible tree protection measures and mitigation as necessary.

## 2.6 CONSTRAINTS POSED BY EXISTING TREES

Development proposals can impact on trees by causing them to be removed either immediately or in the future. It does this by adversely affecting their potential for retention either through disturbance to the root protection area (RPA) or through the need for pruning.

The existing layout of the property is shown on drawing *Existing Ground Floor Plan – Project: 23.6006; Drawing No, A052* which has been over-drawn on to the Tree Constraints Plan (TCP), drawing no. PB/5837-24/01.04, attached as Appendix 2, showing illustrative guidance of the constraints posed by the trees to the site.

There are three trees within the property's garden and three trees on the highway verge which may be impacted by the development proposal.

Mitigation measures will be recommended to minimise the impact on the trees by the proposed development.

### 2.6.1 Above ground constraints

The branch spread of the trees has been shown on the TCP by an unbroken line in the Category code colour.

### 2.6.2 Below ground constraints

The below ground constraints, the root protection area (RPA), are defined as the likely spread and disposition of the root system of the trees.

The root protection area (RPA) is defined as the minimum area in square metres (m<sup>2</sup>) around the tree that is 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.

Section 4.6.2 & 4.6.3 of BS5837 allows for the shape of the RPA to be changed for the likely spread of the roots, considering factors such as; past or existing site conditions; soil type and structure; existing walls, foundations and hard surfaced areas; topography and drainage.

The total area of the RPA cannot be changed during any adjustment to the likely root spread.

Section 5.3 (a) of BS5837 requires that any encroachment of the RPA by the proposed development must be justified and it must be demonstrated that the tree can remain viable. The area lost to encroachment must be compensated for elsewhere, contiguous with its RPA.

## 2.7 DETAILED IMPACT APPRAISAL ON EXISTING TREES

### 2.7.1 Trees to be removed or pruned

There will be no direct tree loss as a result of the development proposals.

Tree loss is anticipated as a result of the *British Standard classification for trees of poor health and condition*, in this case the urgent removal of one category ‘U’ tree; tree T2.

It is anticipated there will be the necessary facilitation pruning to two retained trees as detailed in **section 3.5.2** below.

### 2.7.2 Tree protection measures

To protect the retained trees from construction activities, they must be protected by suitable protection barriers and ground protection.

The accompanying Tree Protection Plan drawing ref PB/TPP-24/01.04 shows the specific tree protection measures required prior to and during the construction of the *Ground Floor Side Extension* and construction of the extended permeable paving.

To ensure the RPA of the retained trees remains undamaged and to prevent contamination and compaction during access and construction the temporary protective barrier (TPB) must be installed prior to any site activity as shown on drawing PB/TPP-24/01.04 and detailed in **section 3.5.3** below and remain in situ for the duration of the scheme.

The excavation for the *Ground Floor Side Extension* is anticipated to have an incursion within the RPA of tree T3 as detailed in Table 2 below:

**Table 2. Impact upon RPAs of retained trees by Ground Floor Side Extension**

Tree No.	Incursion (m2)	Tree RPA (m2)	% of Tree RPA
T3	5.1	23.9	21.3

Abbreviations: m<sup>2</sup>. = square metre

Specific tree protection mitigation will be required, see section 3.5.5 below.

Spoil movements, storage of materials, skips, parking and welfare facilities must be sited beyond the RPAs of retained trees. In this instance materials must be brought on to site from the side road.

The main contractor's method statement must make provision for protecting the cherry trees, T3, T5 and T7, on the highway verge when loading and unloading materials, see **section 3.5.3** below.

### **2.7.3 Grade changes**

No grade changes are proposed to facilitate the approved development and therefore there will be no impact on the retained tree RPA providing the tree protection measures are implemented.

### **2.7.4 Services in close proximity to retained trees**

Existing soakaways will be used and there are no requirements for any new soakaway.

The supply of electric, water and internal drainage will be taken from the existing house, and there is not anticipated to be any RPA incursion of the retained trees.

### **2.7.5 Visual impact on the landscape and tree character**

It is not anticipated that the proposed layout of the site development works will require the necessary removal of any tree to allow full implementation of the design.

### **2.7.6 Direct or indirect impacts of trees**

The crown of the retained tree T3 will be adjacent to the extension. Provided normal maintenance of the tree is carried out, the trees, existing building and new extension will be able to coexist successfully. The periodical arboricultural maintenance of the tree will continue; including the removal of deadwood, and crown-lifting and pruning back of the lower branches where they impact on the building.

### **2.7.7 Leaf, fruit or sap fall and shade**

Leaf fall is anticipated from the retained tree, and can cause problems, particularly in the autumn, by blocking gullies and gutters; but the provision of leaf guards or grilles on gutters and gullies will minimise the problem and leaf clearance will continue as part of normal property maintenance. There will therefore be no adverse impact as a result of the proposal.

There are no trees near the proposed replacement which are prone to the production of excessive honeydew exudate, or fruit fall.

## **2.8 PROPOSALS TO MITIGATE ANY IMPACT**

### **2.8.1 Protection of retained trees**

**2.8.1.1** A **Tree Protection Plan** has been prepared detailing how tree protection of the retained trees can be implemented during the development of this site. The retained trees must be protected by suitable temporary protection barriers and ground protection measures.

The proposed layout of the ground floor side extension as shown on 'Proposed Site Plan – Project: 23.6006; Drawing No, A051' has been over-drawn on to the Tree Protection Plan (TPP) no. PB/TPP-24/01.04 shown in Appendix 3.

**2.8.1.2** **Demolition of the existing garage** is adjacent to the RPA of retained tree T1 and wall removal from the existing house is adjacent to the RPA of retained tree T3. The potential RPA incursion on retained trees during demolition and

removal of material will have little impact on the tree providing the mitigation set out in section 3.5.4 below is followed.

**2.8.1.3 The excavation and construction of the foundations for the ground floor side extension.** Disturbance to tree roots can be significantly reduced by appropriate mitigation work; in this case supporting the above ground part of the structure on piles and an on-site cast, reinforced concrete floor slab set above ground level, to the engineer's design. The excavation and construction of the foundations over the RPA incursion of the retained tree is shown on the tree protection plan PB/TPP-24/01.04 as 'Ground protection - "No-dig" construction', showing the minimum area.

Specific mitigation is detailed in section 3.5.5 below.

**2.8.1.4 The excavation and construction of the foundations for the new sliding gate.** Disturbance to tree roots of T1 can be significantly reduced by appropriate mitigation work; in this case by supporting the above ground part of the sliding gate on piles constructed to an engineer's design.

Specific mitigation is detailed in section 3.5.6 below.

**2.8.1.5 The excavation and construction of the permeable paving.** The design of the new permeable paving within the RPA of T1 and T3 must be undertaken using a "no dig" cellular confinement system.

Specific mitigation is detailed in section 3.5.7 below.

## **2.9 SUMMARY OF THE IMPACT ON LOCAL AMENITY AND CHARACTER**

There will be no direct trees loss as a result of the development proposals and therefore there is no long term impact on local landscape amenity and character.

## **2.10 RECOMMENDATIONS**

The excavation and construction of foundations for the ground floor side extension should follow the mitigation recommendations in section 2.8.

## SECTION 3: ARBORICULTURAL METHOD STATEMENT

### 3.1 OVERVIEW

- 3.1.1 We are to review the British Standard (BS) 5837:2012 tree survey reference data in order to integrate the approved development options and safeguard the long-term preservation of the retained trees. This AMS provides guidance on the typical range of processes that are involved during development and seeks to ensure that appropriate methods of implementation are carried out. It further aims to provide a holistic view of the development process and seeks to address any potential issues and conflicts that may arise and provide solutions to these, resolving them in line with current arboricultural and industry best practice guidance.
- 3.1.2 The AMS sets out the mitigation required to demonstrate how the retained tree RPAs will be protected during the approved site development works including access to the proposed development area and construction works; and they must be implemented to secure successful tree retention.
- 3.1.3 In the absence of industry specific guidance on the installation of underground services, all new services required for this project must conform to the minimum standards required and will be those as set out in the National Joint Utilities Group (NJUG) 2007 Volume 4, Issue 2: *Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees*.
- 3.1.4 We have used our extensive experience to interpret these references in the context of evolving good practice and site-specific issues relating to approved construction works for the erection of a single-storey side extension at 13 Maze Road, Richmond, TW9 3DA .
- 3.1.5 The following prohibitions apply when working within any tree RPA:
- No linear mechanical excavation whatsoever without prior written agreement from the Local Planning authority (LPA) and Arboricultural Consultant (AC).
  - No excavation by any other means without arboricultural site monitoring.
  - No hand digging without a written method statement from the main contractor having first been approved in writing by the AC.
  - No lowering of levels unless agreed in writing with the LPA and AC, except for the removal of grass sward using hand tools in accordance with BS 5837:2012 (section 7.4.2.1).
  - No construction of a sealed hard surface.
  - No storage of plant or materials.
  - No storage or handling of any chemical including cement washings, unless site specific mitigation is approved by the AC and LPA.
  - No vehicular access without prior written agreement from the LPA.
  - No fire lighting.

3.1.6 In addition to the measures above further precautions are necessary adjacent to trees:

- A minimum 10 metre separation distance, or the RPA radius if it is greater, shall normally be observed between any tree RPA during the cement mixing phases including storage and other substances injurious to tree health, this should include such things as fuels, oil, bitumen, cement (including cement washings), builders' sand, concrete mixing and other chemicals.

3.1.7 Avoiding damage to stems and branches:

Care shall be taken when planning site operations in proximity to trees to ensure that contact with the retained trees and overhanging branches is avoided. Such contact can result in serious injury to the tree and might make the safe retention impossible. Consequently, any tree protection in proximity to the trees shall be constructed under the supervision of the AC, to ensure that adequate clearance from the trees is at all times maintained.

3.1.8 The following explanations relate specifically to this site and they should be read in conjunction with the Tree Protection Plan, drawing no. PB/TPP-24/01.04.

3.1.9 A copy of this Arboricultural Method Statement must be kept on site and be permanently available for the duration of the development. It can be referenced on site for practical guidance on how to continue to protect trees.

## **3.2 ARBORICULTURAL SUPERVISION**

3.2.1 An arboricultural consultant (AC) should be appointed to advise on the tree management for the site, and to participate via a 'Teams' Meeting in a Pre-commencement meeting that must be held between the Arboricultural Consultant (AC), the site works manager and representatives from the client and local authority to consider tree protection measures, their implementation and sequencing. A written record is to be prepared, following the template in Appendix 4, of site findings and conditions with a photographic record; identification of individual responsibilities and key personnel; induction and personnel awareness of arboricultural matters, and procedures for dealing with variations and incidents.

3.2.2 All subsequent monitoring could be achieved by a photographic record sent from the site works manager to the AC, recording: site findings and observations with a photographic record; objective opinions concerning the tree protection, and whether it is being provided in accordance with the approved scheme; details of any observed damage to the trees or their roots, root protection or other breaches of tree protection measures, and to recommend mitigation or amelioration measures required.

### 3.3 SEQUENCING, TIMING AND REPORTING

- 3.3.1 The AC's role is to liaise with the developer and LPA to ensure the tree protection measures are fit for purpose and monitor compliance with arboricultural planning conditions and advising on any tree problems that arise or modifications that become necessary.
- 3.3.2 It is the developer's responsibility to ensure that details of this AMS and any agreed amendments are known and understood by all site personnel.
- 3.3.3 The supervision arrangement will be sufficiently flexible to allow the supervision of all sensitive works as they occur.

**Table 2 - Sequencing and Supervision**

Stage	Action	Arboricultural Input Required	Report Section
1	Erect TPB and temporary ground protection	Supervisory input	3.5.2
2	Facilitative pruning	Advisory input	3.6.2
3	Construction Phase – Site specific precautions and mitigation	Advisory input	3.6
4	Remove TPB	Advisory input	3.5.2

- 3.3.4 A written Site Supervision and Monitoring Record shall be sent to Development Management, London Borough of Richmond upon Thames within five working days of a site visit. Appendix 5 gives a sample copy of a site inspection record.

### 3.4 TREE PROTECTION GENERAL

#### 3.4.1 Tree Protection Barrier

The proposed scheme involves construction activities in close proximity to retained trees.

A temporary protection barrier shall be erected around the trees to be retained prior to the commencement of the site works in accordance with *Section 6.2.2 and Figures 2 & 3 of BS5837:2012* with the framework being suitably braced to resist impacts.

It is considered that the minimum default type fencing, the tree protection barrier, must be that shown at Appendix 2.

The location for this type of fencing is shown as lines on the Tree Protection Plan drawing ref PB/TPP-24/01.04.

If construction work is adjacent to or within an RPA the default tree protection fencing may be inappropriate or unsuitable and therefore any alternative specification to the default described above must only be used following a written contingency plan submitted to and approved by the AC and LPA. It should identify the reasons why the default cannot be used, the location and

duration required for the substitute fence and it must be erected under the supervision of the AC. The AC must be given reasonable time to provide advice.

Specific tree protection measures have been considered at conflict points and mitigating measures are set out within this document that are proportionate to the risks associated with this project

The temporary protection barrier shall have signs attached stating that “NO WORKS are permitted within the fence”. No notice boards, cables or other services will be attached to any tree.

The temporary protection barriers should be maintained at all times and may only be removed following completion of all construction works.

### 3.4.2 Ground protection measures

Ground protection is required to protect at least a functional minimum mass of undisturbed ground during the construction process and is required to limit compaction or contamination of the RPA. An example of ground protection is set out at Appendix 4 and is considered generic to elements of this scheme.

The specific ground protection measures must be installed and maintained during all the construction phases, unless work is directly supervised by the AC and agreed by the LPA.

The proposed works on this site have been assessed and on the basis of the plans supplied the following site specific precautions and mitigation is required; see section 1.6

## 3.5 SITE SPECIFIC PRECAUTIONS AND MITIGATION

3.5.1 There will be no **direct loss** of any trees as a result of the approved development and therefore no landscape mitigation is required.

### 3.5.2 Access Pruning.

It is anticipated there will be a requirement for the necessary facilitation pruning to two retained trees. The following mitigation must be followed.

Mitigation:

- Tree T1; to allow clearance between the tree and the boundary wall for the construction of the new telescopic sliding gate at the widened vehicular entrance.
- Tree T3, a Highway’s tree; prune within the curtilage of the property to reduce crown width on northeast quadrant to allow clearance for site access and development, and pruning lower branches to allow construction of the TPB box.
- Pruning must be undertaken by suitably qualified and insured arboricultural contractors following guidance from the AC and must be undertaken in accordance with *BS 3998:2010 Tree Work - Recommendations* and current arboricultural practices.
- At no time must the trees be pruned by the construction contractors.



### 3.5.3 Protection of retained trees T1, T3, T5, T6 and T7.

To ensure the RPAs of retained trees remains undamaged and to prevent contamination and compaction during access and construction the tree protection barrier (TPB) must be installed prior to any site activity as shown on Tree Protection Plan drawing ref PB/TPP-24/01.04 and remain in situ for the duration of the scheme. The following mitigation must be followed.

#### Mitigation:

- The existing boundary wall, hedge or fencing and is to act as the TPB to protect the RPA of the retained trees T3 and T5, T6 and T7.
- The main contractor's Method Statement must make provision for protecting the cherry trees, T3, T5 and T7 on the highway verge when loading and unloading materials. Specifically this should include:
  - Temporary *Chapter 8 Safety Barriers* and *Warning Signs* must be used to create an exclusion zone around the trees before loading and unloading operations are to be carried out.
  - An on-site operative must be appointed to act as a Banksman to ensure that loading and unloading operations are kept clear of the trees, and that road users and pedestrian movements are controlled safely.
  - Local authority licensing procedures should be followed as appropriate, including compliance with deadlines, fee requirements and notice of dates of work.
  - Thorough risk assessment and action plan to address additional risk factors.
  - Insurance and indemnity cover, including additional cover which relates to the likely use of the road at the time of the works
- The TPB around T1 and T6 will be effected by constructing a wooden box consisting of exterior grade plywood on a wooden framework to a minimum width of 0.5 metres and minimum height of 1.5 metres above ground level which must remain in place for the duration of the works.
- The RPAs of retained trees T1, T3, T5, T6 and T7 must be protected by temporary ground protection laid over the exposed surface, which must be installed before work continues and remain in situ for the duration of the demolition and construction works.
- Examples of temporary ground protection to be used include:
  - DuraDeck® ground protection mats (moulded HDPE composite mats, 2.4m x 1.2m x 1.3cm), or MegaDeck®HD mats, or similar, laid on a 150 millimetre (mm) deep layer of woodchip or sharp sand, over a permeable, non-woven geotextile membrane (300 grams per square metre (g/m<sup>2</sup>) minimum), on top of the existing surface to minimise compaction from any additional, extraordinary vehicular access, including excavators or powered wheelbarrows.
  - Where protection of the RPA is only required from constant pedestrian access or wheelbarrow use; side-butting scaffold boards placed on a compression-resistant layer such as 100-millimetre depth of woodchip, laid on top of the geotextile membrane.

- Within the RPAs of retained trees there must be no disturbance of the existing base soil layer or additional compaction during the construction works.
- Any surface vegetation requiring removal within the RPAs must be agreed with the AC; furthermore it must be removed by hand tools in accordance with BS 5837:2012, 7.4.2.1.
- Under no circumstances must mini diggers or similar machinery be used to remove the surface vegetation in RPAs.

3.5.4 **Demolition of the existing garage** is adjacent to the RPA of retained tree T1 and wall removal from the existing house is adjacent to the RPA of retained tree T3.

The potential RPA impact on the retained trees during demolition and removal of material will have little impact on the trees providing the mitigation set out below is followed.

**Mitigation:**

- In order to ensure the RPA of the retained tree remains undamaged, and to prevent contamination and compaction during the demolition works, the RPA must be protected.
- The tree protection fence and temporary ground protection must be installed as shown on tree protection plan ref PB/TPP-24/01.04 and detailed in section 3.5.3 above and remain in situ until all works activity is completed.
- Where the barrier has to be temporarily moved to allow works access additional ground protection must be applied.
- Demolition using a mechanical excavator should be carried out with the excavator positioned outside the RPA of any retained tree, using a toothless bucket, working in a direction away from the edge of the RPA.
- Immediately upon excavation and removal of the existing hard surfaces, any voids shall immediately be loosely filled with new topsoil, firming the soil.
- Any additional soil required to restore ground levels will be with new topsoil imported on to site for the same purpose; supplied to BS 3882:2007 *Specification for topsoil and requirements for use*.
- To avoid root desiccation, any roots over 25mm and clumps of fibrous roots below 25mm encountered during this removal process must be immediately covered with topsoil taken from outside the RPAs of retained tree or new topsoil imported on to site.
- It is essential not to dig into the sub-base when removing existing concrete and hard surfaces over the RPAs of retained trees.

3.5.5 **The excavation for the Ground Floor Side Extension** is anticipated to have an incursion within the RPA of tree T3.

Disturbance to tree roots can be significantly reduced by appropriate mitigation work; in this case supporting the above ground part of the structure on piles and an on-site cast, reinforced concrete floor slab set above ground level, to the engineer's design. The excavation and construction of the foundations over the RPA incursion of the retained tree is

shown on the tree protection plan PB/TPP-24/01.04 as 'Ground protection – "No-dig" construction', showing the minimum area. The mitigation must include the following measures:

Mitigation:

- To ensure the RPA of the retained trees remains undamaged, and to prevent contamination and compaction during access, excavation and construction of the piles and slab, the RPA must be protected with appropriate temporary ground protection, as outlined in 3.5.3 above, as the works progress.
- The initial excavation for the piles within tree RPAs shall be by hand for the first 750 millimetre depth to ensure that any major tree roots are not disturbed.
- Any roots found with a diameter of less than 25mm shall be cleanly severed with either a hand saw or secateurs leaving a clean cut.
- Any roots of 25mm and above must be excavated around without damaging them; the arboricultural consultant shall decide if it's feasible or necessary to retain the root, if not it shall be severed.
- Should this excavation reveal the presence of significant tree roots the proposed pile can be repositioned to avoid any potential damage; the foundation design will incorporate sufficient flexibility such that the pile can be repositioned to an alternative unobstructed position.
- If the pile cannot be repositioned and roots are encountered during works they must be cut cleanly with a sharp hand saw under the supervision of the AC.
- The piles shall be bored piles formed with a 200mm diameter continuous flight auger; or other diameter as required by the engineer's specification. Once bored to the designed depth the augers are extracted, a plastic coated cardboard sleeve inserted to debond the pile shaft from volumetric ground movement, and to avoid root damage caused by leaching of cementitious materials into the ground.
- The pile is then reinforced with the specified prefabricated reinforcement cage and the bore filled with self-compacting high slump, high strength concrete.
- Once the piles have been installed the temporary ground protection will be removed.
- The proposed superstructure will be supported on the piles via an engineer designed reinforced concrete slab, with edge upstands to support perimeter walls, constructed on top of a 60 millimetre thick biodegradable, honeycomb void-former sub-base such as "Clayboard", or similar approved, with an impermeable membrane fitted on top of this to prevent the leaching of cementitious materials into the ground.
- The honeycomb void-former will act as shuttering for the slab and temporarily support the weight of the liquid concrete until it sets.
- The void-former can then be wetted and washed away, or left to degrade naturally, to leave a clear, breathable void to allow movement of air and moisture beneath the slab.

**3.5.6 The excavation and construction of the foundations for the new sliding gate.**

Disturbance to tree roots of T1 can be significantly reduced by appropriate mitigation work; in this case by supporting the above ground part of the sliding gate on piles constructed to an engineer's design. The mitigation must include the following measures:

Mitigation:

- To ensure the RPA of the retained trees remains undamaged, and to prevent contamination and compaction during access, excavation and construction of the piles and slab, the RPA must be protected with appropriate temporary ground protection, as outlined in 2.8.1.2 above, as the works progress.
- The initial excavation for the piles within tree RPAs shall be by hand for the first 750 millimetre depth to ensure that any major tree roots are not disturbed.
- Any roots found with a diameter of less than 25mm shall be cleanly severed with either a hand saw or secateurs leaving a clean cut.
- Any roots of 25mm and above must be excavated around without damaging them; the arboricultural consultant shall decide if it's feasible or necessary to retain the root, if not it shall be severed.
- The piles shall be bored piles formed with a 200mm diameter continuous flight auger; or other diameter as required by the engineer's specification. Once bored to the designed depth the augers are extracted, a plastic coated cardboard sleeve inserted to debond the pile shaft from volumetric ground movement, and to avoid root damage caused by leaching of cementitious materials into the ground.
- The pile is then reinforced with the specified prefabricated reinforcement cage and the bore filled with self-compacting high slump, high strength concrete.
- Once the piles have been installed the temporary ground protection will be removed.
- The support posts for the cantilevered sliding gate are to be fixed to the piles to the engineer's specification.

**3.5.7 The excavation and construction of the permeable paving.** The design of the new permeable paving within the RPA of T1 and T3 must include the following mitigation measures:

Mitigation:

- The design should not require excavation into the soil, including through lowering of levels and/or scraping, other than the removal, using hand tools, of any turf layer or other surface vegetation.
- Where a permeable surface is to be used by vehicular traffic, a geotextile should be used at the base of construction to help prevent pollution contamination of the rooting area below.
- Permeable hard surfacing can result in soil volume moisture content remaining at or near field capacity for long periods. Where there is a risk of waterlogging, the design should incorporate appropriate land drainage.
- Appropriate sub-base options for new hard surfacing include three-dimensional cellular confinement systems.

- The construction must therefore be undertaken using a “no dig” cellular confinement system; designed to support the anticipated traffic, such as Geoweb® or Cellweb®, or similar product, over a permeable, non-woven geotextile membrane, infilled with granular, no fines, PH neutral 20-40 millimetre washed, angular stone infill. This is detailed on PB/TPP-24/01.04 as *Ground protection – “No-dig” construction* showing the minimum area.
- The minimum depth of the cellular confinement system over the RPA of retained trees will need to consider the vehicular access requirements. The Cellweb® manufacturers recommend 100 millimetre depth TRP confinement system for domestic traffic such as cars and transit vans up to a 6 tonne gross vehicle weight.
- The finished surface must be a permeable surface or wearing course.
- The RPA will need be protected with temporary ground protection during construction which must be suitable for the maximum weight of vehicles, demolition and construction machinery required for the site.

3.5.8 Landscaping, including patio, walls and footways. We have not received any detailed landscaping construction plans at this stage however the following mitigation must apply within, and adjacent to, the RPA of retained tree T1.

Mitigation:

- The tree protection barriers must be installed prior to any site activity as shown on Tree Protection Plan drawing ref PB/TPP-24/01.04 and remain in situ for the duration of the scheme; this will also include any landscape operations unless this is otherwise agreed with the AC.
- There shall be no lowering or change of existing surface levels unless agreed in writing with the LPA and AC, except for the removal of grass sward using hand tools in accordance with BS 5837:2012 (section 7.4.2.1) or the replacement of existing hard surfaces.
- Under no circumstances must mini excavators or similar machinery be used to remove the surface vegetation or hard surfaces in RPAs, this includes landscaping operations; all works within tree RPAs must be undertaken by hand working and tools.
- All excavations within RPA must be undertaken by hand and lined with impermeable 1000-gauge polythene sheeting before filling with concrete to avoid root damage caused by leachate.
- If roots less than 25 millimetres in diameter are encountered during works they must be cut cleanly with a sharp hand saw and covered with damp hessian to prevent them from drying out. Roots greater than 25 millimetres in diameter must remain in place and the AC contacted.
- Construction of any new or replacement patios, footways and sealed areas in the RPAs must be undertaken using a “no dig” cellular confinement system designed to support the anticipated footfall or traffic such as Geoweb®, Cellweb®, or similar product, over a non-woven geotextile membrane, infilled with granular, no fines, PH neutral infill.
- The stone should be spread and lightly pushed into the cellular matting to minimise future rutting but avoid soil compaction.

- The minimum depth of the cellular confinement system will need to consider the access requirements. The manufacturers recommend 75mm Cellweb® TRP confinement system for foot and cycle traffic.
- The finished surface should be a permeable surface or wearing course.

### **3.6 GENERAL CONSTRUCTION**

#### **3.6.1 Spoil movements, site storage of materials, skips, parking and welfare facilities.**

**Mitigation:**

- Spoil and building materials must not be stored in the RPA of any retained tree.
- Skips, parking and welfare facilities must be sited beyond the RPAs of retained trees. In this instance materials must be brought on to site from the side road..

#### **3.6.2 Cement Mixing and Washing Points**

**Mitigation:**

- No mixing or storage of materials will take place up a slope where they may leak into an RPA.
- Where contours of the site create a risk of polluted water running into RPAs, precautionary measures of using heavy duty plastic sheeting and sandbags with the ability to contain accidental spillage will be put in place to prevent contamination.

#### **3.6.3 Contingency planning**

A general contingency plan for this project should be prepared by the main contractor for controlling such things as chemical/fuel spillage, run off from cement washings, sewage or water leaks, site collisions and emergency access into or adjacent to tree RPAs.

Water will be kept 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 contact the retained arboricultural consultant for advice.

### **3.7 POST DEVELOPMENT**

#### **3.7.1 Removal of temporary protection barriers**

When the development is complete, service runs are in place and the main site machinery has been removed, the TPB will be dismantled.

### 3.8 RESPONSIBILITIES

This AMS document is not a contract.

A qualified arboriculturist will need to be retained as Arboricultural Consultant for supervision and monitoring of tree protection during construction activity.

It is the responsibility of the main contractor to ensure that the planning conditions attached to the planning consent are adhered to at all times and that a monitoring regime, with regard to tree protection, is adopted on site.

The main contractor will be responsible for contacting the Local Planning Authority at any time issues are raised related to the trees on site.

If at any time additional pruning works are required, permission must be sought from the Local Planning Authority first and then carried out in accordance with BS3998:2010 *Tree Works – Recommendations* and industry best practice.

The main contractor will ensure the build sequence is appropriate to ensure that no damage occurs to the trees during the construction processes. Temporary protection barriers will remain in position until the completion of ALL construction works on the site.

The barrier and signs must be maintained in position at all times and checked on a regular basis by an on-site person designated with that responsibility.

### 3.9 COMPLETION MEETING

Upon completion of all works specified above and all procedures detailed, the Arboricultural Consultant will invite the LPA tree officer to meet via a Teams Meeting to discuss the process and agree any final remedial works which may be required.

### 3.10 QUERIES

Any queries regarding this BS 5837 Tree Report, the AIA and AMS should be addressed in the first instance, to:

**billin Tree Solutions**

14 Cotton End  
Lace Hill  
Buckingham  
MK18 7RJ

Email: [paul@billintreesolutions.co.uk](mailto:paul@billintreesolutions.co.uk)



Paul Billin BSc (Hons) For, MICFor  
*Chartered Arboriculturist*

**Revisions to this report:**

1. 18.04.2024: Revision to include arboricultural method statement

**This report was bound as a PDF document on:** 18 April 2024

## APPENDIX 1



# BS5837:2012 Tree Survey

## billin Tree Solutions

Client: Mr & Mrs Kennerley  
 Project: 13 Maze Road  
 Survey Date: 04/01/2024  
 Surveyor: Paul Billin



14 Cotton End  
 Lace Hill  
 Buckingham  
 MK18 7RJ  
 paul@billintreesolutions.co.uk

Tree and Tag No Species	Hght (m)	Stems		Crown		Age	RP A (m <sup>2</sup> ) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations Survey Comment	Cat ERC
		No	Ø (mm)	Spread (m)	Clear (m)						
1 Common Yew <i>Taxus baccata</i>	5	1	150	N E S W	1.5 2 1.5 1.5	1.5 1.2 2 2	Y A: 10.2 R: 1.8	Fair	C: Fair S: Fair B: Fair	No action :: Unspecified  Single stem. Height will need to be pruned to keep clear of overhead phone wires 0.95 back from wall	C.2  >40 yrs
2 Apple <i>Malus Spp.</i>	8	1	270	N E S W	3 2.5 1.5 2	3 3 3 2.5	M A: 33 R: 3.24	Poor	C: Fair S: Poor B: Fair	Fell :: Fell and remove stump(s)  Severe decay and cavity in lower stem. Leaning to northeast	U  <10 yrs
3 Prunus <i>Prunus Spp.</i>	9.5	1	230	N E S W	3 4 2.5 2.5	3 3 4 3	SM A: 23.9 R: 2.75	Fair	C: Fair S: Fair B: Fair	No action :: Unspecified  Highway verge. Single stem. Wound S 2.2m AGL, small cavity, decay. Minor facilitation pruning	C.2  20 to 40 yrs
4 Wisteria <i>Wisteria sinensis</i>	3	10	142 (Eq)				SM A: 9.2 R: 1.71		C: Fair S: Fair B: Fair	Multi-stemmed; stems less than 75mm diameter	

<b>Age Classifications:</b>	N Newly planted	EM Early Mature		<b>Condition:</b>	C Crown	<b>Stems:</b>	Ø Diameter
	Y Young	M Mature			S Stem		(Eq) Equivalent stem diameter using BS5837:2012 definition
	SM Semi-mature	OM Over Mature			B Basal area	<b>ERC:</b>	Estimated Remaining Contributio

Tree and Tag No Species	Hght (m)	Stems		Crown		Age	RP A (m <sup>2</sup> ) R (m)	Phys Condition	Structural Condition	Preliminary Recommendations		Cat ERC
		No	Ø (mm)	Spread (m)	Clear (m)					Survey Comment		
5 Prunus <i>Prunus Spp.</i>	4.2	1	250	N E S W	1.5 1 1.5 2	3 3 3 3	M A: 28.3 R: 3	Decline	C: Poor S: Poor B: Fair	No action :: Unspecified ----- Poor crown with dieback	C <10 yrs	
6 Unknown --	6.5	1	190	N E S W	1.5 2.5 1 0.5	2.5 2.5 2.5 2	SM A: 16.3 R: 2.27	Fair	C: Poor S: Fair B: Fair	No action :: Unspecified ----- Orange pyracantha ( <i>Pyracantha coccinea</i> ). Single stem. Poor form, severe sweep to SE in stem at 2.4m AGL. Historical pruning wounds, congested unions in top of canopy. Leaning over highway. Wound NE 1.3m AGL with cavity	U.2 <10 yrs	
7 Prunus <i>Prunus Spp.</i>	9.5	1	190	N E S W	3 2.5 2 2.5	3 3 4 3	SM A: 16.3 R: 2.27	Fair	C: Fair S: Fair B: Fair	No action :: Unspecified ----- Highway verge. Single stem.	C.2 20 to 40 yrs	
<b>Age Classifications:</b>	N	Newly planted	EM	Early Mature	<b>Condition:</b>	C	Crown	<b>Stems:</b>	Ø	Diameter		
	Y	Young	M	Mature		S	Stem		(Eq)	Equivalent stem diameter using BS5837:2012 definition		
	SM	Semi-mature	OM	Over Mature		B	Basal area	<b>ERC:</b>		Estimated Remaining Contributio		

### Report selection criteria.

Projects.

13 Maze Road

Date Range.

Any Date

Work types.

----> Fell :: Fell and remove stump(s)  
 ----> No action :: Unspecified  
 ----> -No Selection made-

Latest Survey.

All surveys for the selected trees.  
 ---> Last survey for each selected tree.

Work Completed.

---> Work Completed  
 ---> Work Not Completed

**Number of trees in selected Project(s) 7**  
**Number of trees in Report selection 7**

<b>Age Classifications:</b>	N Newly planted	EM Early Mature	<b>Condition:</b>	C Crown	<b>Stems:</b>	∅ Diameter
	Y Young	M Mature		S Stem		(Eq) Equivalent stem diameter using BS5837:2012 definition
	SM Semi-mature	OM Over Mature		B Basal area	<b>ERC:</b>	Estimated Remaining Contributio

## APPENDIX 2

**billin Tree Solutions**

14 Cotton End, Lace Hill, Buckingham, MK18 7RJ  
E: paul@billintreesolutions.co.uk

**13 MAZE ROAD, RICHMOND, TW9 3DA**

SCALE: 1:200 @ A3 DATE: 09/01/2024

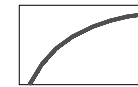


**Drg. No. PB/TCP-24/01.04**

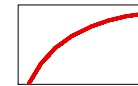
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**TREE CONSTRAINTS PLAN**

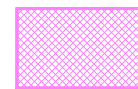
**Key:**



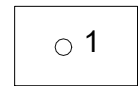
Tree Category C  
- tree of low quality



Tree Category U  
- tree of low quality



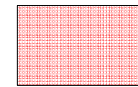
Root protection area (RPA)



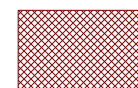
Tree number  
- refer to report for information



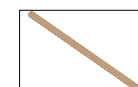
Area of shade



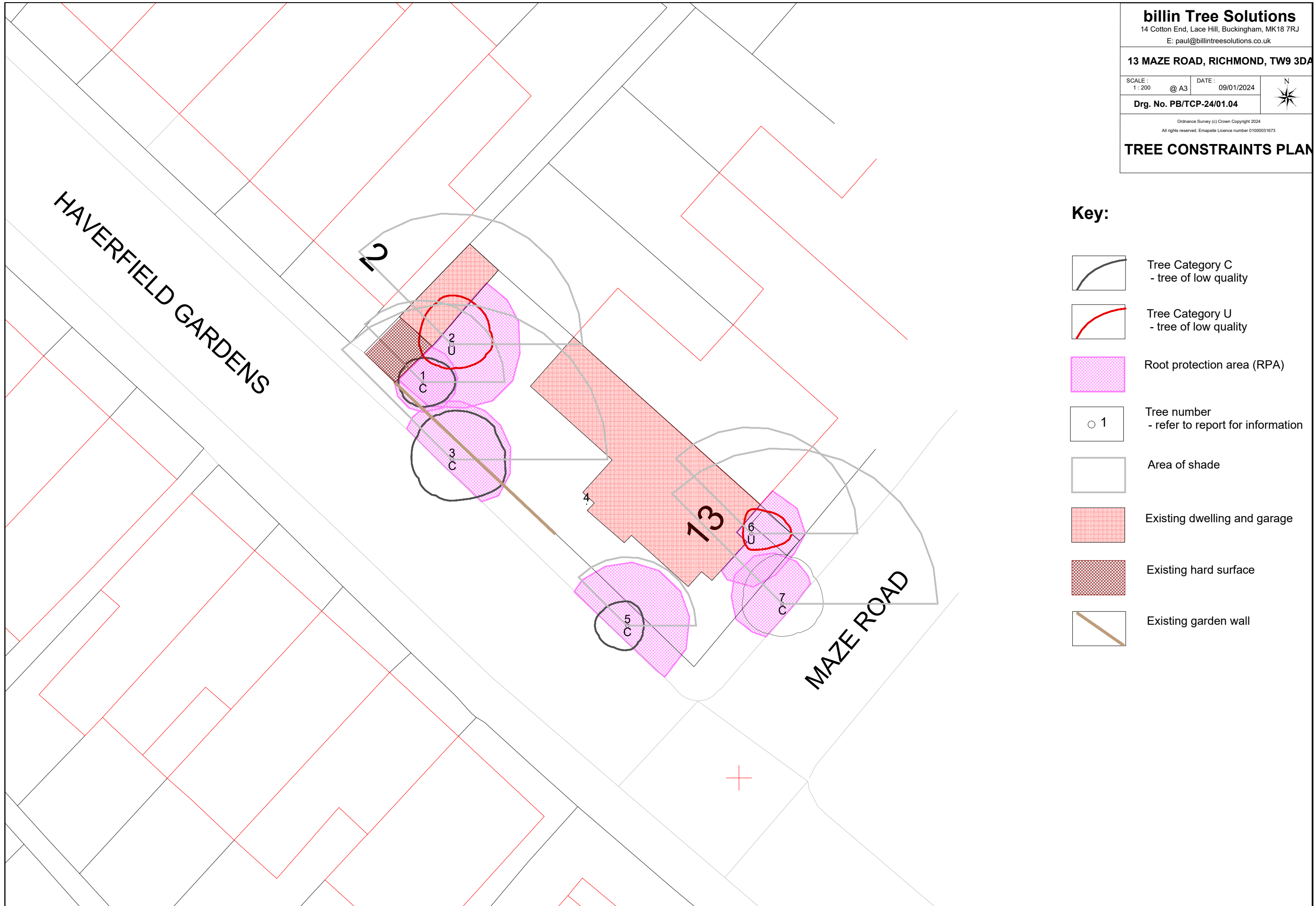
Existing dwelling and garage



Existing hard surface



Existing garden wall



## APPENDIX 3

**billin Tree Solutions**

14 Cotton End, Lace Hill, Buckingham, MK18 7RJ  
E: paul@billintreesolutions.co.uk

**13 MAZE ROAD, RICHMOND, TW9 3DA**

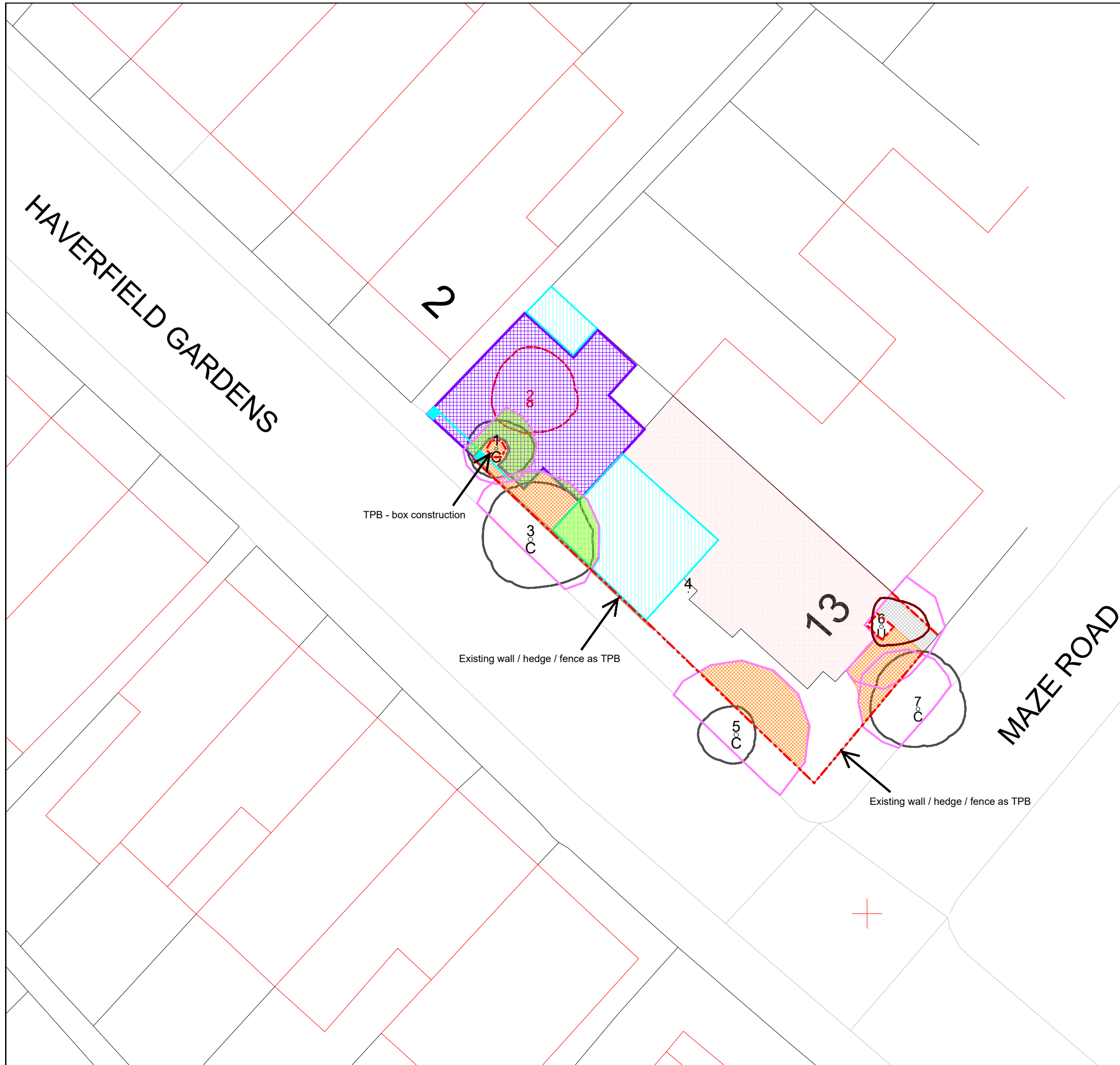
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**Drg. No. PB/TPP-24/01.04**

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**TREE PROTECTION PLAN**



**Key:**

- Trees retained - refer to report for information
- Existing dwelling and garage
- Existing garden wall
- Root protection area (RPA)
- Existing hard surfaced front path
- Proposed extension and Store
- Proposed sliding gate
- Permeable paving
- Ground protection - 'No-dig' construction (minimum area) refer to report for information
- Ground protection - temporary (minimum area) refer to report for information
- Tree protection barrier
- Tree for removal

## APPENDIX 4





Findings:
Action Taken:
Identification of individual responsibilities and key personnel:
Induction and personnel awareness of arboricultural matters given to:  Name:  Name:
Tree protection mitigation in place: <ul style="list-style-type: none"> <li>• Temporary protection barrier:</li> <li>• Temporary ground protection:</li> </ul>
Further mitigation or remediation action required or further recommendations:
Additional comments:
Photographic record:
Is an Additional site visit required?  YES / NO  Scheduled Date of next site visit:

Date sent to LPA case office: .....