

# Rob Keyzor Tree Surgeons & Arboricultural Consultants Ltd

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Tree Report (BS 5837:2012): for: -

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Proposed development of 10-Bed Proposed extension to existing Care Home of Challoner House at: -

Challoner House, 175 Winchester Road, Eastleigh, S053 2DU

Date of report:

October 2022

January 2023 – Rev C – Reposition of bund.

Surveyed by: - Rob Keyzor:

Report prepared by: - Michael Garrett



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|------------------------------------------------------------------|----|----------|
|                                                                  |    | Date     |
| Inspector:                                                       | RK | 27/06/22 |
| Prepared by:                                                     | MG | 31/10/22 |
| Checked by:                                                      | NP | 31/10/22 |

## 1 SUMMARY:

### The Application

- 1.1. This document is in support of a planning application for a 10-Bed proposed extension to an existing Care Home, Challoner House, 175 Winchester Road, Eastleigh, S053 2DU.

### Overall

- 1.2. All trees have an intrinsic value and within the planning framework there is understandably, an obligation to consider carefully (and where appropriate retain and protect trees) any potential impacts.
- 1.3. In this case and from an arboricultural perspective, the trees are not considered to be a significant constraint on the proposed development. This is due to the low quality of the trees scheduled to be removed and the protective measures proposed to mitigate damage to the retained trees.
- 1.3.1. It will be necessary to remove five comparatively low value trees, this is due to three trees being in poor condition (T1910, T1914 & T1917) and two requiring removal to facilitate the development (T1906, T1908).
- 1.4. The Eastleigh Borough Council Interactive Map (cross referenced 25/07/22) shows there are multiple trees subject to tree preservation order – TPO No: 287E. We have matched surveyed trees T1901 – T1907 and T1917 to be covered by the order in addition to possibly two trees along the north west boundary from T1909-T1916 but this is unclear due to TPO location projected as a group. The trees on site are not within a conservation area.
- (<https://emaps.eastleigh.gov.uk/WebMaps/Map.aspx?MapName=WebmapsNoLocalPlan>)
- 1.4.1. Considering the above, we would advise caution and presume that all trees between T1909-T1916 are protected by virtue of their retention within the development; if there is cause for concern about the protected status of any of the site trees then an enquiry needs to be made to Eastleigh Borough Council at: [Tree enquiries - Eastleigh Borough Council](#).

## **Tree retention / removal**

T1910, T1914 and T1917 are scheduled to be removed due to poor condition and therefore considered to have no retention value. T1906 and T1908 are scheduled for removal due to their close proximity to the new western elevation with significant RPA encroachment and assumed ground level changes.

## **Tree pruning**

1.5. It is advised that access facilitation pruning of T1904 will be required to provide ground clearance for development access and crown clearance from south west elevation respectively.

1.5.1. It is expected that other minor works may be required as works progress, e.g. deadwood removal, but they are not pertinent to the proposals.

## **Landscaping (new planting)**

1.6. There is some space for new / compensatory planting and landscaping though caution is advised on selecting species with large potential stature.

## **Existing / retained tree protection provisions**

1.7. Lightweight barriers are recommended to provide protection from inadvertent encroachment of vehicles and the storage of materials within root protection areas of onsite trees if access is required along the southern elevation of the proposed. In many respects these trees are already protected due to lack of any development within their immediate proximity. However, the use of barriers will provide additional security to prevent soil compaction and disturbance to root protection areas of retained trees.

1.8. A method and installation of temporary ground cover has been prescribed where access is presumed to be required from the south-eastern car park of the property and through the garden to provide construction access to the proposed development area. The use of temporary ground cover is advocated to prevent disturbance, damage, compaction or contamination of the uncovered soil and turf where protective fencing could not be recommended to preserve work site access.

1.8.1. The specification and location of such a barrier is included in the appendices.

1.9. Additionally, percussive boring techniques will have to be utilized where the proposed new drainage system runs through the RPA of the retained tree. If for any reason the soil type or geology refuses the boring then the alignment of the proposed utilities will have to be repositioned.

## 2 INTRODUCTION & PURPOSE:

- 2.1.** Instructions to undertake this report were received from Aaron Cheung an Assistant Quantity Surveyor at McLeod + Aitkin.

### **Drawings/ documents supplied:**

- 2.2.** A topographical survey in AutoCAD format were supplied along with associated planning drawings in PDF and DWG format.

**2.2.1.** 4268YOLS-01-Topographical Survey

**2.2.2.** 3307-HIA-01-B0-DR-A-0201 - Proposed Ground Floor

**2.2.3.** CCL-8\_2762-C-CHA-GA-DRN-4400-P1 – Drainage Strategy General Arrangement

- 2.3.** The completed report will form part of submissions to Eastleigh Borough Council.

## 3 CONTENT & PROCESS:

- 3.1.** The report generally considers and follows the feasibility and planning stages at sections 4 & 5 of BS 5837: 2012. Namely: -

**3.1.1.** At Appendix 1 & 2: tree survey schedule and a tree constraints plan: This plan shows the proposed development in relation to the trees, any significant above or below ground constraints and root protection areas. The information enables evaluation of the direct and indirect effects of the proposed design upon the trees and is used to inform the tree constraints and tree impacts assessment at sections 4 & 5 of this report.

**3.1.2.** At Appendix 3 & 4: proposed tree removal and protection plans. These show the implications in the context of a proposed layout.

**3.1.3.** At Appendix 6: Administrative information

- 3.2.** Note: in some cases, information may be provided in a provisional or heads of terms format. This is to ensure sufficient information is provided to give a high level of confidence that adequate consideration is made for the retention of trees.

## The site and trees:

- 3.3.** The site (bordered red in image below) comprises the land we have been requested to survey of Challoner House, 175 Winchester Road, Eastleigh, S053 2DU.



Image above to illustrate survey & site extents (OS Grid Ref: SU 44241 21388)

- 3.4.** Twenty nine trees have been included in this document. All trees, hedges and groups have been categorised as per guidance in BS 5837: 2012 Trees in Relation to Design, Demolition and Construction and provided in tabular summary below (also refer to Appendix 1 for more detailed information).

| Individual Trees |                   |      |       |                 |      |
|------------------|-------------------|------|-------|-----------------|------|
| T1400            | Oak               | B1   | T1903 | Holm Oak        | B2   |
| T1401            | Cappadocian Maple | B1   | T1904 | Pedunculate Oak | A1,2 |
| T1402            | Eucalyptus        | B1   | T1905 | Pedunculate Oak | A1,2 |
| T1403            | Douglas Fir       | B2   | T1906 | European Larch  | C2   |
| T1404            | Sweet Chestnut    | B1   | T1907 | European Larch  | C2   |
| T1405            | Oak               | B1   | T1908 | Lawson Cypress  | C2   |
| T1406            | Birch             | B1   | T1909 | Not identified  | C2   |
| T1407            | Eucalyptus        | B1   | T1910 | Spruce          | U    |
| T1408            | Eucalyptus        | C    | T1911 | Not identified  | C1   |
| T1409            | Magnolia          | C1   | T1912 | Not identified  | C1   |
| T1410            | Beech             | C1   | T1914 | Spruce          | U    |
| T1411            | Birch             | C1   | T1915 | Lawson Cypress  | C2   |
| T1412            | Cappadocian Maple | B1   | T1916 | Douglas Fir     | C    |
| T1901            | Douglas Fir       | B1,2 | T1917 | Spruce          | U    |
| T1902            | Cork Oak          | B1,2 |       |                 |      |

## 4 CONSTRAINTS:

**4.1.** Where trees may impose a constraint on development it is important that resolutions are sought as part of the final design and layout process.

**4.1.1.** This will also reduce the potential pressure 'post development' (property occupation) for future tree felling or surgery.

**4.2.** Illustrative guidance of the constraints posed by trees on the subject site is annotated upon the tree constraints plan, attached as Appendix 2.

### **Above ground constraints & proximity of trees to structures**

**4.3.** Where the current and/or ultimate height of a Category A, B or C tree will cause an obstruction to the proposed development, this must be considered as a constraint. This is usually considered in terms of issues relating to shade and light, as well as factors such as:

- Shading (of buildings and open space)
- Direct damage to structures
- Future pressure for removal
- Seasonal nuisance (e.g. leaf fall blocking gutters, fruit fall creating slippery patches and honey dew dripping on vehicles and surfaces)
- Consideration is also given to species characteristics such as:
  - Deciduous or evergreen;
  - Density of foliage;

**4.4.** Where relevant, the above ground constraints are marked on the attached tree survey plan as a continuous line around each individual tree, in this case representing maximum branch spread. This line is colour coded to match the BS5837 tree quality and category assessment.

### **Below ground constraints**

**4.5.** The below ground constraints are essentially the likely spread and distribution of the root system of the tree. These are plotted on the attached tree survey plan as yellow polygons around each tree and referred to as root protection areas (RPA).

**4.5.1.** The RPA is defined as the minimum area (in 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.

**4.5.2.** The 'circular nature' of the RPA is a design tool based upon an open grown tree with good soil conditions all round. This may be refined (also see sections 4.6.2 & 4.6.3 of BS5837), taking into account factors such as:

- Past or existing site conditions;
- Soil type and structure;
- Topography and drainage.

**4.6.** The construction phases do not encroach significantly on the RPA as the proposed is located outside the RPA of retained trees, however there is a potential that level changes will encroach on the RPA and ground works should be supervised by an arboricultural clerk of works to ensure roots that might be exposed by the works are managed in accordance with BS5837: 2012 Section 7.2.

**4.6.1.** *Note: The total area of the RPA must not be changed without appropriate mitigation measures. 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 (also see section 5.3 (a) of BS5837).*

## 5 ARBORICULTURAL IMPACT ASSESSMENT:

### General Considerations:

**5.1.** Development proposals and associated construction operations have the potential to harm trees in several ways, including: - causing them to be removed (i.e. they may be directly in route of the development); direct damage to trunk and stems; disturbance and contamination of the tree's root protection areas (RPA's). These risks can potentially be mitigated to acceptable levels by making provision for the trees at the design stage of the development, and subsequently through the use of appropriate tree protection methods

### Summary of impacts:

**5.2.** A tabular summary is provided: -

| Impact                                                                        | BS 5837: 2012 Tree Quality Assessment Definitions |                                           |                                                       |                              |
|-------------------------------------------------------------------------------|---------------------------------------------------|-------------------------------------------|-------------------------------------------------------|------------------------------|
|                                                                               | A (High Quality)                                  | B (Moderate Quality)                      | C (Low Quality)                                       | U (Unsuitable for retention) |
| Tree Felling                                                                  | N/A                                               | N/A                                       | T1906, T1908,                                         | T1910, T1914, T1917          |
| Tree Pruning                                                                  | N/A                                               | T1904                                     | NA                                                    | N/A                          |
| Tree Protection (barriers etc)                                                | T1904, T1905                                      | T1901, T1902, T1903, T1412, T1400 – T1408 | T1907, T1909, T1911, T1912, T1915, T1916 T1410, T1411 | N/A                          |
| Specialised measures i.e. ground protection, access / structures within RPA's | T1904, T1905                                      | T1901, T1902, T1903                       | T1916                                                 | T861                         |
| Other                                                                         | NA                                                | NA                                        | NA                                                    | NA                           |

Note: T = Tree; H = Hedge; G=Group. Refer to tree data section for further information.

### Overall Conclusion:

- 5.3.** In the context of a planning proposal: - existing retained trees (in the absence of an obvious wildlife or environmental factors) should not be an insurmountable constraint to development.
- 5.4.** Trees intended for removal are of poor quality with limited sustainability and or scope to make any appreciable long-term amenity contribution.
- 5.5.** Trees shown as retained can be realistically protected from construction works by virtue of being an appropriate safe distance from the location of the works or their proximity to proposed works can be managed with bespoke working methods.

- 5.5.1.** There is sufficient space for site development facilities; storage and mixing areas etc without encroaching on the RPA of retained trees.
- 5.5.2.** There is some space for new / compensatory planting and landscaping though caution is advised on selecting species with large potential stature.
- 5.5.3.** Percussive boring techniques or hand digging within RPA's require supervision from an arboricultural clerk of works.

## 6 IMPLEMENTATION TIMETABLES

- 6.1.** Table over the page indicates Implementation timetables in a broad chronology illustrating timing constraints for tree felling and tree planting.
  - 6.1.1.** The chronology is based on the likely logistical issues relating to development access to the proposed extension as there is no other appropriate vehicular or construction access.

| Stage          | Operation                                                                                                                                                                                                  | Constraints                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Supervision/Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Stage 1</b> | <b>Before development</b>                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                | <p>In chronological order:</p> <ol style="list-style-type: none"> <li>1. Tree removals</li> <li>2. Tree pruning</li> <li>3. Erect Protective Barriers</li> <li>4. Percussive boring techniques.</li> </ol> | <p>All tree works will be subject to statutory constraints relating to habitat and wildlife protection and care should be taken to ensure that works are timed to be implemented outside of nesting and roosting season, particularly March to September.</p> <ol style="list-style-type: none"> <li>1. Remnant stumps from tree removals not suitable for retention can only be ground using mechanical stump grinder unless outside the RPA of retained trees.</li> <li>2. All tree pruning in accordance with BS3998: 2010 Recommendations for tree works, section 7 Pruning and related work.</li> <li>3. Barriers to be erected as specified in Appendices.</li> </ol> | <p>Project ecologist to be consulted on timing of tree felling operations.</p> <p>Project arboriculturalist to act as clerk of works and keep records of timing of tree removals, specialised methods within RPA's and tree protection barrier installation is in accordance with approved plans.</p>                                                                                                                                                                                                                                                                                                                                      |
| <b>Stage 2</b> | <b>Demolition and development</b>                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                | Demolition and groundworks to prepare site to formation level.                                                                                                                                             | Excavations close to trees, potential for tree roots in trenches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Methods to follow hierarchical system described in National Joint Utilities Group (NJUG) Publication: Volume 4: Issue 2: 16/11/2007, favouring low impact and no dig methods, see <a href="http://streetworks.org.uk/wp-content/uploads/V4-Trees-Issue-2-16-11-2007.pdf">http://streetworks.org.uk/wp-content/uploads/V4-Trees-Issue-2-16-11-2007.pdf</a> and BS5837: 2012 Trees in Relation to design demolition and construction section 7.2</p> <p>Project arboriculturalist to act as clerk of works and keep records of timing of tree removals and tree protection barrier installation is in accordance with approved plans.</p> |

## 7 PROVISIONAL TREE PROTECTION / METHODOLOGY

7.1. This section details the methodology to be adopted for tree protection measures: to ensure minimal risk of adverse impact upon retained trees. It should be read in conjunction with the attached provisional tree protection plan at Appendix 4.

7.2. For this project, the primary considerations are considered to be:

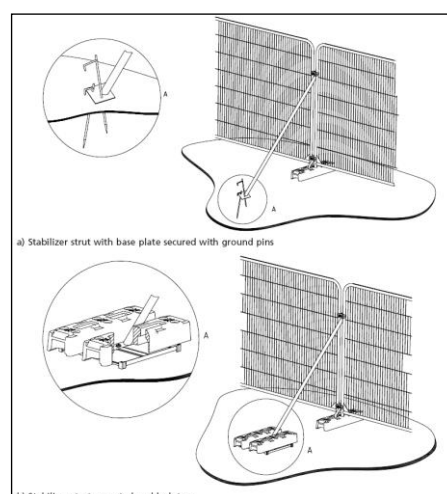
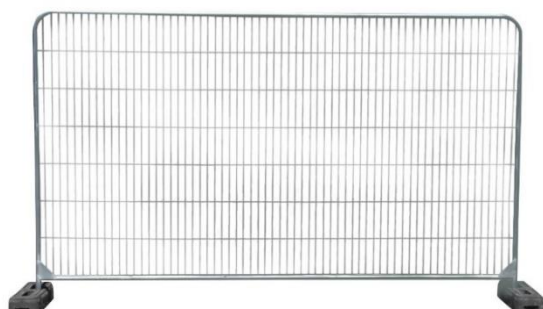
- The use and location of barriers to demarcate RPA's and CEZ's.
- The use and location of temporary ground cover to prevent distortion or compaction of soil within RPA's.
- Tree pruning works (comparatively minor scale).
- Use of percussive boring techniques where the notional RPA's (shown in protection plan) are encroached by underground drainage.

### Barriers, ground protection and construction exclusion zone (CEZ)

7.3. The RPA of trees that are being retained on site (where no specialized engineering or sanctioned access is to be allowed) will be protected by barriers before any construction work commences or materials or machinery are brought onto the site. The area enclosed by the fencing is the construction exclusion zone (CEZ).

- The position of protective barriers is shown on the tree protection plan (TPP) in the appendices.

7.4. Use of Heras type fencing to demarcate RPAs is shown in accordance with figure 3 on page 21 of BS 5837 (2012) – Trees in Relation to Design, Demolition and Construction, as illustrated below.



- Barriers must remain in place until the development is complete.
- The barrier should be erected following tree removal and prior to site formation level.
- The location of the barrier is as shown in purple line and at prescribed linear distances measured from nearest point of stem.
- The fence erection is a priority and should proceed all works on site including site preparation and delivery of plant and machinery. The barrier can be dismantled for landscaping phases and to implement construction of no dig footway access as indicated in green hatch areas.
- The purpose of the barrier is to prevent all construction related activity trespassing outside the area of unprotected ground and should be marked with signs that say:

**"CONSTRUCTION EXCLUSION ZONE - NO ACCESS"**

- Signs can also include contact information for principal contractor or project arboriculturalist for advice if fencing is damaged, accidental spillages, roots are exposed or there are minor layout amendments.
- Additional controls will entail staff inductions and pre start debriefing to ensure all contractors are aware of the Construction Exclusion Zone.

### **Temporary ground cover**

**7.5.** The position of protective barriers is shown on the tree protection plan at Appendix 4.

**7.6.** 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, recommendations below are taken from BS 5837:2012 Trees in relation to Design, Demolition and Construction Section 6.3.

- For pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100 mm depth of woodchip), laid onto a geotextile membrane;

- 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. 150 mm depth of woodchip), laid onto a geotextile membrane;
- For wheeled or tracked construction traffic exceeding 2t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

## 8 SITE SUPERVISION AND MONITORING

- 8.1.** The need for supervision, the scope and level, will be dependent and proportional to the arboricultural impacts identified.
- 8.2.** In this case, the majority of the project is comparatively low risk. Formal supervision (i.e. of specialised operations within RPAs) will only be necessary if hand digging takes place within RPA's to install drainage pipes.
- 8.3.** Tree pruning, felling / removal: shall be carried out prior to construction and demolition phase, in strict accordance with BS3998: 2010 Tree Works - Recommendations. Works must be undertaken by suitably qualified, competent and insured arboriculturists. Under no circumstances shall construction personnel undertake any tree felling or pruning operations.

### **Root damage (retained trees)**

- 8.4.** In the unlikely event that roots are encountered, these are to be immediately wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping is to be removed prior to backfilling, which is to take place as soon as possible.
- 8.5.** Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw), except where they occur in clumps.
- 8.6.** Roots occurring in clumps or of 25 mm diameter and over are to be severed only following consultation with an arboriculturist.
- 8.7.** Prior to backfilling, retained roots are to be surrounded with topsoil or uncompacted sharp sand (builders' sand is not be used), or another loose inert granular fill.

### **Underground services**

- 8.8.** Electricity, water etc we have no proposals for but must be routed outside of RPA's & CEZ's. New drainage proposals are covered within this AIA.

### **Domestic arrangements (access egress, site storage and welfare)**

- 8.9.** Access and egress are initially provided by existing infrastructure and can be directed along the proposed temporary ground cover pathway.
- 8.10.** Site welfare provisions and storage must be located outside of any RPA's and the lawn area of the site is recommended.
- 8.11.** Operations: such as concrete mixing should take place outside any RPA's, within a mixer or containing tray to prevent run off / contamination.

### **End of section**

## 9 GENERAL ARRANGEMENTS

- 9.1. Tree work must be carried out by a suitably qualified, experienced and insured contractor - to the minimum standard of BS 3998: 2010 Tree Work - Recommendations.
- 9.2. Tree works must be carried out strictly in accordance with any permission obtained from the Local Planning Department. A copy of the permission letter and report must be given to the tree work contractor.
- 9.3. The contractor is responsible for notifying Highways Authority in respect of any road signing, lighting or guarding necessary.
- 9.4. The contractor must be aware of the requirements for the identification and avoidance of danger from overhead and underground services.
- 9.5. Prior to any works commencing, the contractor should provide the client with a suitable risk assessment and method statement.
- 9.6. Whilst every effort was made, at the time of inspection, to identify sensitive, endangered and / or protected wildlife, flora and fauna it is the responsibility of the contractor, prior to any works commencing, to: - re appraise the site and the trees; if necessary, obtain professional assistance; comply with any legislative / planning procedure requirements.
- 9.7. A copy of this report must be passed to all site contractors and the tree protection measures clearly explained.
- 9.8. Note: Clients engaging contractors have a duty of care to ensure that appointed contractors have the necessary levels of competency to undertake works in accordance with industry best practice and with due regard for health and safety.
- 9.9. The Local Planning Department and / or Tree Officer may be able to supply lists of suitable tree work contractors. Alternatively, listings are provided in the local area Yellow Pages.

**END**

**Prepared 31<sup>st</sup> October 2022**



# APPENDIX 1

## Tree constraints plan & tree report schedule

## 10 DATE(S) OF SURVEY / SITE INSPECTION

10.1. The site survey was reviewed on 27<sup>th</sup> June & 30<sup>th</sup> August 2022.

10.2. All observations were ground based and no specialised equipment was utilised.

## 11 OBSERVATIONS AND INTERPRETATIONS (TREE SCHEDULE SECTION)

11.1. Information on the trees is provided in the Tree Schedule as follows:

11.2. Please note, the presentation has been slightly changed from the tree survey pro-forma detailed in BS 5837:2012. This is considered more appropriate, particularly where an indicative or detailed design has been supplied.

11.3. **\*Tree Tag / Hedge/ Group Number** – The trees are \*numbered within the report to cross reference with positions as marked upon the accompanying site plans (Appendix 1&2). \*The numbering is derived purely from 'convenience' and 'logical progression of my inspection'. No inference is intended, in terms of ranking, value, reference to other reports or TPO Registers. Where trees are subject to TPO's, if the number is known this will be shown in brackets after my numbering.

11.4. The trees and hedges are readily identifiable on site using the site plan provided and tags have not been attached to site trees only.

- **Species** - The most commonly used name is only given.
- **Age Class:** -
  - **RP:** Recently planted trees –up to approximately 5 years old.
  - **Y:** Young – established tree up to one third the expected ultimate height.
  - **EM:** Early Mature – between one third and two-thirds the expected ultimate height. Growth rate still increasing.
  - **YM:** Young Mature – Growth rate stabilises, although tree has not obtained full potential stature.
  - **M:** Mature –full stature achieved, more or less full height, but still increasing in girth.

- **LM:** Late Mature – Crown may begin to decline. Annual increment declines or slows down.
- **NOTE:** *The Young Mature and Mature period may account for approximately half the trees' life span.*
- *Intermediate classifications have been used where trees do not fall clearly within an age class.*
- **Diameter at Breast Height - (Dbh.** measured in centimetres at approx. 1.5m)
- **Height -** (Approximate height. Measured in meters)
- **Height of Crown –** The height of the crown (to lowest point above ground level) where appropriate.
- **Crown Spread -** (Approximate \*crown spread, measured in meters, to each cardinal point) \*rounded up to the nearest 0.5m
- **General Observations –** A general Classification of the trees condition is provided: Good; Fair; Poor; Dead; Dangerous and intermediate classifications, followed by more detailed information, if necessary, to expand upon the classification.
- **Overall appraisal of the tree to include: -** health / biological condition (together with any relevant comments e.g. pests and diseases), structural condition together with any relevant comments e.g. dead, damaged branches, low branches etc.

## 12 INTERPRETATION OF SURVEY DATA

**12.1.** Constraint's considerations; if a detailed design has been supplied, comments pertaining to tree protection considerations, mitigation, potential tree work to facilitate the proposal etc: -

- **Root Protection Area (RPA):** In broad based terms, the main concern of BS5837 is to make provision for the protection and preservation of both aerial and below ground parts of the tree. The root protection area is a theoretical design calculation to ensure that a minimum area is retained around a tree to contain sufficient roots and soil structure to maintain its viability.
- **RPA Calculations:** The RPA is calculated in accordance with the guidance provided in BS5837. In summary: -

- for single stemmed trees this is equivalent to an area equivalent to a circle with a radius 12 times the stem diameter;
- for trees with two to five stems the RPA is calculated from a combined stem diameter, derived from the sum of the measurements of each individual stem;
- for trees with more than five stems the RPA is calculated from a combined stem diameter, derived from a sum of the mean stem diameter of each stem;
- **Clarification on RPA shape and radius:** *The circular based RPA is a notional model based on an open grown tree with unrestricted rooting availability all round. The figures derived are not the automatic minimum distance of protection from the centre of the tree trunk. Various site and tree constraints may impact upon the final RPA size and position. These will be shown upon the tree protection plan as relevant to the given situation.*
- **Tree Protection considerations:** comments regarding the need for measures including Protective Fencing (i.e. to demarcate the RPA) and establishing CEZ's (construction exclusion Zones)
- **Tree Pruning / Removal Considerations:** comments regarding tree pruning to facilitate construction e.g. removal of low branches, or trees to be removed because of poor condition etc
- **\*Tree Quality Grading -**
  - U – Remove dead, dangerous, dying; less than 10 year useful contribution
  - A – High quality; minimum of 40 year useful contribution
  - B – Moderate quality; minimum of 20 year useful contribution
  - C – Low quality; minimum of 10-year useful contribution
- Sub categories for A, B, C above -**
  - 1 – Mainly arboricultural Values
  - 2 – Mainly landscape values
  - 3 – Mainly cultural /conservation Values

## 13 PRE-DEVELOPMENT CASCADE CHART; TREE QUALITY ASSESSMENT

| Trees unsuitable for retention (see Note)                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                       |                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Category and definition                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                    | Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                       | Identification on plan              |
| <b>Category U</b><br><br>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)<br><br>Trees that are dead or are showing signs of irreversible, overall decline.<br><br>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<br><br>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve |                                                                                                                                       | Coloured<br><br>Dark red on plan    |
| Trees to be considered for retention                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                       |                                     |
| Category and definition                                                                                                                                                        | 1. Mainly Arboricultural qualities                                                                                                                                                                                                                                                                                                                                                 | 2. Mainly landscape qualities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 3. Mainly cultural values incl. conservation                                                                                          | Identification on plan              |
| <b>Category A</b><br><br>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) | Coloured<br><br>Light green on plan |
| <b>Category B</b><br><br>Those of moderate quality and value: those in such a condition as to make a significant contribution for a minimum of 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                                                                              | Coloured<br><br>Mid blue on plan    |
| <b>Category C</b><br><br>Trees of low quality: with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.              | 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 only temporary / transient landscape benefits.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Trees with no material conservation or other cultural value                                                                           | Coloured<br><br>Grey on plan        |

## 14 GLOSSARY OF TERMS USED

**Formative Pruning -** Generally confined to RP or Y trees: entails the removal of crossing, duplicate and diseased branches, and, where possible, twin or duplicated leaders, in order to promote the development of healthy and well formed, mature trees.

**Epicormic Growth -** Small branches arising from latent and/or adventitious buds on the stem or main branches.

**Short stake planting method-** The tree stake will be no more than one third of the height of the clear stem of the tree being supported. The stake and tie must hold and support the lower section of stem and root ball firmly, whilst allowing the remainder of stem and crown to move, thus encouraging growth and development.

**Crown Raise -**The removal of branches from the main trunk and/or growth from main scaffold branches which extend below a height specified in the recommendations. Removal may be necessary to facilitate site access and or prevent damage to retained trees. Where trees overhang roads and footpaths the base of the crown may be 'stepped' to allow for different clearances over each surface.

**Minor Dead Wood -** Dead material over 10mm in diameter or over 100mm in length.

**Major Dead Wood -** Dead material over 40mm in diameter or 200mm in length.

***N.B.** Most trees will contain dead wood. The sub-division enables criteria to be set for possible removal based on health and safety considerations.*

**Stubs -** Woody remnants of previous poor pruning or broken / damaged branches.

**Crown Clean -** The removal of dead, dying, defective or diseased branch wood. Includes removal of broken/ torn/ hung up branches, stubs etc, together with any unwanted or extraneous material e.g. Litter debris, rope swings etc.

**Felling / Dismantling- Felling:** generally, implies that trees will be removed from ground level utilising a sequence of suitable saw cuts. **Dismantling:** implies that the operation involves aerial tree surgery works, to remove the tree in small sections, thereby avoiding damage to surrounding site features.

15 TREE SCHEDULE, TABULAR SECTION

| Ref   | Species                                           | Measurements                                                                                                                                                                     | Life Stage   | Condition | General Observations | Comments | Pre-construction    | During construction                                         | Post construction   | Rem. Contrib. (yrs) | Retention Category |
|-------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------|----------------------|----------|---------------------|-------------------------------------------------------------|---------------------|---------------------|--------------------|
| T1400 | Oak<br>( <i>Quercus sp.</i> )                     | Height (m): 18<br>Stem Diam (mm): 700<br>Spread (m): 10N, 10E, 14S, 9W<br>Crown Clearance (m): 4<br>Lowest Branch (m): 7(S)<br>Life Stage: Mature<br>Rem. Contrib.: 40+ Years    | Mature       | Good      | Lean towards road    |          | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 40+ Years           | B1                 |
| T1401 | Cappadocian Maple<br>( <i>Acer cappadocicum</i> ) | Height (m): 16<br>Stem Diam (mm): 400<br>Spread (m): 6N, 8E, 2S, 3W<br>Crown Clearance (m): 3<br>Lowest Branch (m): 6(E)<br>Life Stage: Early Mature<br>Rem. Contrib.: 20+ Years | Early Mature | Moderate  | Lean towards road    |          | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 20+ Years           | B1                 |
| T1402 | Eucalyptus<br>( <i>Eucalyptus sp.</i> )           | Height (m): 16<br>Stem Diam (mm): 900<br>Spread (m): 2N, 12E, 12S, 2W<br>Crown Clearance (m): 4<br>Lowest Branch (m): 7(E)<br>Life Stage: Mature<br>Rem. Contrib.: 20+ Years     | Mature       | Moderate  | Lean towards sw      |          | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 20+ Years           | B1                 |
| T1403 | Douglas Fir<br>( <i>Pseudotsuga menziesii</i> )   | Height (m): 20<br>Stem Diam (mm): 700<br>Spread (m): 2N, 2E, 2S, 2W<br>Crown Clearance (m): 3<br>Lowest Branch (m): 5(E)<br>Life Stage: Mature                                   | Mature       | Moderate  | Lean towards road    |          | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 20+ Years           | B2                 |

| Ref   | Species                                      | Measurements                                                                                                                                                                        | Life Stage   | Condition | General Observations             | Comments | Pre-construction    | During construction                                         | Post construction   | Rem. Contrib. (yrs) | Retention Category |
|-------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------|----------------------------------|----------|---------------------|-------------------------------------------------------------|---------------------|---------------------|--------------------|
|       |                                              | Rem. Contrib.: 20+ Years                                                                                                                                                            |              |           |                                  |          |                     |                                                             |                     |                     |                    |
| T1404 | Sweet Chestnut<br>( <i>Castanea sativa</i> ) | Height (m): 11<br>Stem Diam (mm): 400<br>Spread (m): 8N, 4E, 5S, 4W<br>Crown Clearance (m): 2<br>Lowest Branch (m): 3.5(NW)<br>Life Stage: Early Mature<br>Rem. Contrib.: 40+ Years | Early Mature | Good      |                                  |          | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 40+ Years           | B1,3               |
| T1405 | Oak<br>( <i>Quercus sp.</i> )                | Height (m): 16<br>Stem Diam (mm): 900<br>Spread (m): 13N, 10E, 5S, 5W<br>Crown Clearance (m): 5<br>Lowest Branch (m): 8(E)<br>Life Stage: Mature<br>Rem. Contrib.: 50+ Years        | Mature       | Moderate  | Lean and all weight towards road |          | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 50+ Years           | B1                 |
| T1406 | Birch<br>( <i>Betula sp.</i> )               | Height (m): 10<br>Stem Diam (mm): 200<br>Spread (m): 3N, 4E, 1S, 2W<br>Crown Clearance (m): 2<br>Lowest Branch (m): 2.5(W)<br>Life Stage: Early Mature<br>Rem. Contrib.: 10+ Years  | Early Mature | Moderate  | Lean towards road                |          | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 10+ Years           | B1                 |

| Ref   | Species                                 | Measurements                                                                                                                                                                                           | Life Stage   | Condition | General Observations                                                 | Comments | Pre-construction    | During construction                                         | Post construction   | Rem. Contrib. (yrs) | Retention Category |
|-------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------|----------------------------------------------------------------------|----------|---------------------|-------------------------------------------------------------|---------------------|---------------------|--------------------|
| T1407 | Eucalyptus<br>( <i>Eucalyptus sp.</i> ) | Height (m): 17<br>Stem Diam (mm): 600<br>Spread (m): 3N, 3E, 1S, 3W<br>Crown Clearance (m): 6<br>Lowest Branch (m): 5(W)<br>Life Stage: Mature<br>Rem. Contrib.: 20+ Years                             | Mature       | Moderate  |                                                                      |          | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 20+ Years           | B1                 |
| T1408 | Eucalyptus<br>( <i>Eucalyptus sp.</i> ) | Height (m): 11<br>6 stems, diam(mm): 200,150,200,170,200,200<br>Spread (m): 11N, 8E, 5S, 11W<br>Crown Clearance (m): 8<br>Lowest Branch (m): 8<br>Life Stage: Early Mature<br>Rem. Contrib.: <10 years | Early Mature | Moderate  |                                                                      |          | No action required. | No action required – in-situ site conditions protect RPA.   | No action required. | <10 years           | C                  |
| T1409 | Magnolia<br>( <i>Magnolia sp.</i> )     | Height (m): 8<br>2 stems, avg.(mm): 60<br>Spread (m): 3N, 3E, 3S, 3W<br>Crown Clearance (m): 2<br>Lowest Branch (m): 2(S)<br>Life Stage: Mature<br>Rem. Contrib.: <10 years                            | Mature       | Poor      | Topped at 5.5m. Damage to surface roots in grass                     |          | No action required. | No action required.                                         | No action required. | <10 years           | C1                 |
| T1410 | Beech<br>( <i>Fagus sp.</i> )           | Height (m): 10<br>Stem Diam (mm): 200<br>Spread (m): 3N, 3E, 2S, 0.5W<br>Crown Clearance (m): 1.5<br>Lowest Branch (m): 1.5(S)                                                                         |              | Good      | Tree in adjacent garden recently removed leaving tree very one sided |          | No action required. | No action required.                                         | No action required. | 50+ Years           | C1                 |

| Ref   | Species                                           | Measurements                                                                                                                                                                     | Life Stage   | Condition | General Observations                              | Comments                       | Pre-construction    | During construction                                                                                                                  | Post construction   | Rem. Contrib. (yrs) | Retention Category |
|-------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------|---------------------------------------------------|--------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------|--------------------|
|       |                                                   | Rem. Contrib.: 50+ Years                                                                                                                                                         |              |           |                                                   |                                |                     |                                                                                                                                      |                     |                     |                    |
| T1411 | Birch<br>( <i>Betula sp.</i> )                    | Height (m): 11<br>2 stems, avg.(mm): 200<br>Spread (m): 3N, 2E, 3S, 2W<br>Crown Clearance (m): 3<br>Lowest Branch (m): 4(W)<br>Rem. Contrib.: 20+ Years                          |              | Moderate  |                                                   |                                | No action required. | No action required.                                                                                                                  | No action required. | 20+ Years           | C1                 |
| T1412 | Cappadocian Maple<br>( <i>Acer cappadocicum</i> ) | Height (m): 14<br>Stem Diam (mm): 400<br>Spread (m): 2N, 2E, 3S, 8W<br>Crown Clearance (m): 3<br>Lowest Branch (m): 6(W)<br>Life Stage: Early Mature<br>Rem. Contrib.: 20+ Years | Early Mature | Good      | Lean towards road                                 |                                | No action required. | Protect trees with protective barriers - as shown on plans.                                                                          | No action required. | 20+ Years           | B1                 |
| T1901 | Douglas Fir<br>( <i>Pseudotsuga menziesii</i> )   | Height (m): 19<br>Stem Diam (mm): 700<br>Spread (m): 6#N, 6E, 6S, 8W<br>Crown Clearance (m): 12<br>Lowest Branch (m): 6(S)<br>Life Stage: Mature<br>Rem. Contrib.: 20+ Years     | Mature       | Good      | Crown very small but wide. Branches over building | 4m from retaining wall to west | No action required. | Protect trees with protective barriers - as shown on plans.<br><br>Protect RPA with Temporary ground protection - as shown on plans. | No action required. | 20+ Years           | B1,2               |

| Ref   | Species                                     | Measurements                                                                                                                                                                             | Life Stage   | Condition         | General Observations                      | Comments           | Pre-construction                                                              | During construction                                                                                                                  | Post construction   | Rem. Contrib. (yrs) | Retention Category |
|-------|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|-------------------------------------------|--------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------|--------------------|
| T1902 | Cork Oak<br>( <i>Quercus suber</i> )        | Height (m): 16<br>Stem Diam (mm): 800<br>Spread (m): 2N, 6E, 8S, 8W<br>Crown Clearance (m): 6<br>Lowest Branch (m): 4(E)<br>Life Stage: Mature<br>Rem. Contrib.: 20+ Years               | Mature       | Good              |                                           |                    | No action required.                                                           | Protect trees with protective barriers - as shown on plans.<br><br>Protect RPA with Temporary ground protection - as shown on plans. | No action required. | 20+ Years           | B1,2               |
| T1903 | Holm Oak<br>( <i>Quercus ilex</i> )         | Height (m): 10<br>2 stems, avg.(mm): 500<br>Spread (m): 7N, 2E, 3S, 3W<br>Crown Clearance (m): 1.5<br>Lowest Branch (m): 1.5(NW)<br>Life Stage: Early Mature<br>Rem. Contrib.: 20+ Years | Early Mature | Good              | Crown suppressed and lean to north        |                    | No action required.                                                           | Protect trees with protective barriers - as shown on plans.<br><br>Protect RPA with Temporary ground protection - as shown on plans. | No action required. | 20+ Years           | B2                 |
| T1904 | Pedunculate Oak<br>( <i>Quercus robur</i> ) | Height (m): 20<br>Stem Diam (mm): 1100<br>Spread (m): 8N, 10E, 10S, 10W<br>Crown Clearance (m): 1<br>Lowest Branch (m): 6<br>Life Stage: Mature<br>Rem. Contrib.: 20+ Years              | Mature       | Ownership unclear | In boundary hedge                         |                    | Crown lift to 5m as required to allow for site traffic to access development. | Protect trees with protective barriers - as shown on plans.<br><br>Protect RPA with Temporary ground protection - as shown on plans. | No action required. | 20+ Years           | A1,2               |
| T1905 | Pedunculate Oak<br>( <i>Quercus robur</i> ) | Height (m): 17<br>Stem Diam (mm): 1100<br>Spread (m): 10N, 5E,                                                                                                                           | Mature       | Good              | Crown less than 1m from and over building | Stem leans to east | Access facilitating pruning for crown clearance along                         | Protect trees with protective barriers - as shown on plans.                                                                          | No action required. | 20+ Years           | A1,2               |

| Ref   | Species                                               | Measurements                                                                                                                                                                     | Life Stage      | Condition | General Observations | Comments                                                    | Pre-construction                           | During construction                                         | Post construction   | Rem. Contrib. (yrs) | Retention Category |
|-------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|----------------------|-------------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------|---------------------|---------------------|--------------------|
|       |                                                       | 6S, 10W<br>Crown Clearance (m): 8<br>Lowest Branch (m): 5(N)<br>Life Stage: Mature<br>Rem. Contrib.: 20+ Years                                                                   |                 |           |                      | Unable to fully inspect due to access.<br>Ownership unclear | southwest elevation.                       |                                                             |                     |                     |                    |
| T1906 | European Larch<br>( <i>Larix decidua</i> )            | Height (m): 15<br>Stem Diam (mm): 500<br>Spread (m): 4N, 3E, 4S, 5W<br>Crown Clearance (m): 2<br>Lowest Branch (m): 6(S)<br>Life Stage: Early Mature<br>Rem. Contrib.: 10+ Years | Early<br>Mature | Moderate  |                      |                                                             | Remove tree to facilitate the development. | No action required.                                         | No action required. | 10+ Years           | C2                 |
| T1907 | European Larch<br>( <i>Larix decidua</i> )            | Height (m): 14<br>Stem Diam (mm): 600<br>Spread (m): 6N, 6E, 6S, 6W<br>Crown Clearance (m): 2<br>Lowest Branch (m): 4(E)<br>Life Stage: Early Mature<br>Rem. Contrib.: 10+ Years | Early<br>Mature | Moderate  |                      |                                                             | No action required.                        | Protect trees with protective barriers - as shown on plans. | No action required. | 10+ Years           | C2                 |
| T1908 | Lawson Cypress<br>( <i>Chamaecyparis lawsoniana</i> ) | Height (m): 8<br>Stem Diam (mm): 300<br>Spread (m): 4N, 4E, 4S, 4W<br>Crown Clearance (m): 0<br>Lowest Branch (m): 0.5<br>Life Stage: Early Mature<br>Rem. Contrib.: 10+ Years   | Early<br>Mature | Good      |                      |                                                             | Remove tree to facilitate the development. | No action required.                                         | No action required. | 10+ Years           | C2                 |

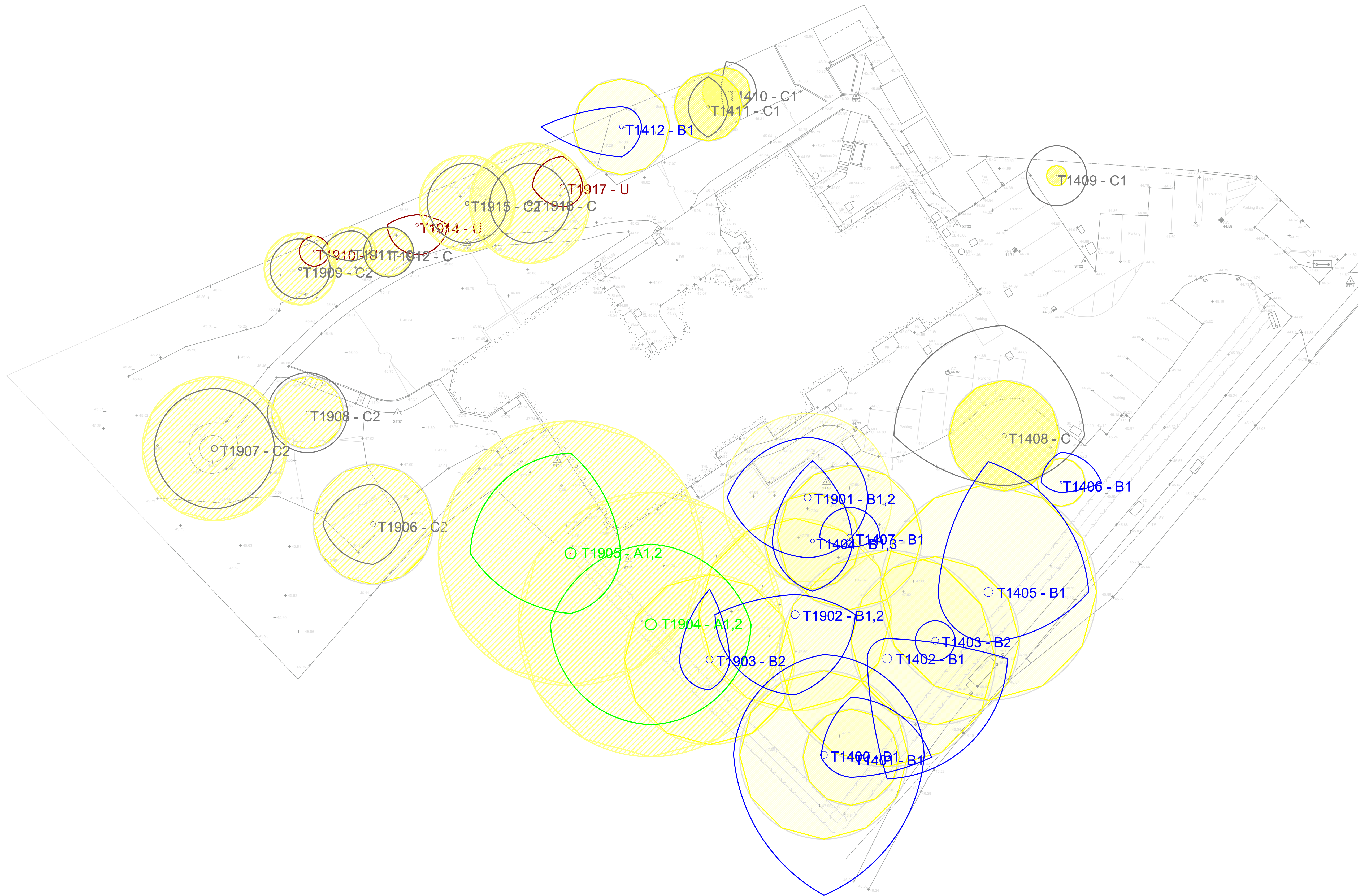
| Ref   | Species                                     | Measurements                                                                                                                                                                         | Life Stage      | Condition | General Observations   | Comments                               | Pre-construction    | During construction                                         | Post construction   | Rem. Contrib. (yrs) | Retention Category |
|-------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|------------------------|----------------------------------------|---------------------|-------------------------------------------------------------|---------------------|---------------------|--------------------|
| T1909 | Not identified<br>( <i>Not identified</i> ) | Height (m): 9<br>Stem Diam (mm): 300<br>Spread (m): 3N, 3E, 3S, 3W<br>Crown Clearance (m): 1.5<br>Lowest Branch (m): 2<br>Life Stage: Early Mature<br>Rem. Contrib.: 10+ Years       | Early<br>Mature | Moderate  |                        |                                        | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 10+ Years           | C2                 |
| T1910 | Spruce<br>( <i>Picea sp.</i> )              | Height (m): 8<br>Stem Diam (mm): 200<br>Spread (m): 1.5N, 1.5E, 1.5S, 1.5W<br>Crown Clearance (m): 6<br>Lowest Branch (m): 6<br>Life Stage: Early Mature<br>Rem. Contrib.: <10 years | Early<br>Mature | Poor      | Dieback - poor foliage |                                        | Remove tree         | No action required                                          | No action required  | <10 years           | U                  |
| T1911 | Not identified<br>( <i>Not identified</i> ) | Height (m): 7<br>Stem Diam (mm): 200<br>Spread (m): 2N, 2E, 1S, 3W<br>Crown Clearance (m): 2<br>Lowest Branch (m): 2<br>Life Stage: Early Mature<br>Rem. Contrib.: 10+ Years         | Early<br>Mature | Moderate  |                        | One sided due to adjacent tree removal | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 10+ Years           | C                  |
| T1912 | Not identified<br>( <i>Not identified</i> ) | Height (m): 9<br>Stem Diam (mm): 200<br>Spread (m): 2.5N, 2.5E, 2.5S, 2.5W<br>Crown Clearance (m): 2<br>Lowest Branch (m): 2<br>Life Stage: Early Mature                             | Early<br>Mature | Moderate  |                        |                                        | No action required. | Protect trees with protective barriers - as shown on plans. | No action required. | 10+ Years           | C                  |

| Ref   | Species                                               | Measurements                                                                                                                                                                     | Life Stage      | Condition | General Observations                           | Comments | Pre-construction    | During construction                                                                                                                  | Post construction   | Rem. Contrib. (yrs) | Retention Category |
|-------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|------------------------------------------------|----------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------|--------------------|
|       |                                                       | Rem. Contrib.: 10+ Years                                                                                                                                                         |                 |           |                                                |          |                     |                                                                                                                                      |                     |                     |                    |
| T1914 | Spruce<br>( <i>Picea sp.</i> )                        | Height (m): 14<br>Stem Diam (mm): 300<br>Spread (m): 1N, 3E, 3S, 3W<br>Crown Clearance (m): 5<br>Lowest Branch (m): 4(E)<br>Life Stage: Early Mature<br>Rem. Contrib.: <10 years | Early<br>Mature | Poor      |                                                |          | Remove tree         | No action required                                                                                                                   | No action required  | <10 years           | U                  |
| T1915 | Lawson Cypress<br>( <i>Chamaecyparis lawsoniana</i> ) | Height (m): 12<br>Stem Diam (mm): 400<br>Spread (m): 4N, 4E, 4S, 4W<br>Crown Clearance (m): 1.5<br>Lowest Branch (m): 2<br>Life Stage: Early Mature<br>Rem. Contrib.: 10+ Years  | Early<br>Mature | Moderate  |                                                |          | No action required. | Protect trees with protective barriers - as shown on plans.                                                                          | No action required. | 10+ Years           | C2                 |
| T1916 | Douglas Fir<br>( <i>Pseudotsuga menziesii</i> )       | Height (m): 17<br>Stem Diam (mm): 500<br>Spread (m): 4N, 4E, 4S, 4W<br>Crown Clearance (m): 2<br>Lowest Branch (m): 2<br>Life Stage: Early Mature                                | Early<br>Mature | Moderate  | Dieback - poor foliage. Damage to base of stem |          | No action required  | Protect trees with protective barriers - as shown on plans.<br><br>Protect RPA with Temporary ground protection - as shown on plans. | No action required  | 10+ Years           | C                  |

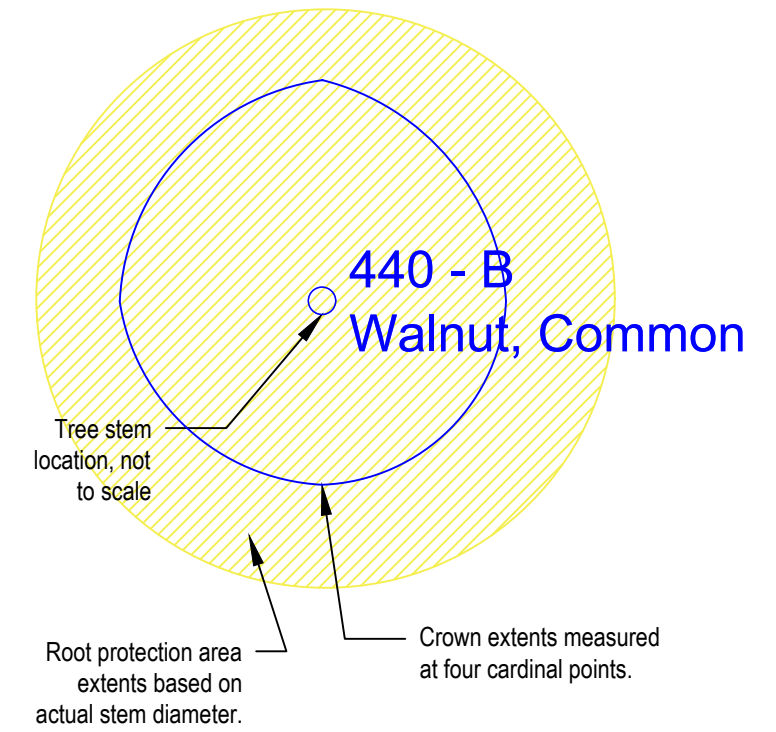
| Ref   | Species                        | Measurements                                                                                                                                                                  | Life Stage      | Condition | General Observations   | Comments | Pre-construction | During construction | Post construction  | Rem. Contrib. (yrs) | Retention Category |
|-------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|------------------------|----------|------------------|---------------------|--------------------|---------------------|--------------------|
|       |                                | Rem. Contrib.: 10+ Years                                                                                                                                                      |                 |           |                        |          |                  |                     |                    |                     |                    |
| T1917 | Spruce<br>( <i>Picea sp.</i> ) | Height (m): 14<br>Stem Diam (mm): 500<br>Spread (m): 3N, 2E, 2S, 3W<br>Crown Clearance (m): 8<br>Lowest Branch (m): 8<br>Life Stage: Early Mature<br>Rem. Contrib.: <10 years | Early<br>Mature | Poor      | Dieback - poor foliage |          | Remove tree      | No action required  | No action required | <10 years           | U                  |

## APPENDIX 2

### Tree constraints plan



LEGEND  
For tree constraints only, see topographical survey or layouts for other feature identification.



Tree survey data super imposed on site plans produced by other parties. All tree locations have been plotted using hand held GPS and their positions should be checked on site where they might impose a constraint, especially where levels are likely to change. Only trees with locations provided within the topographical survey (Orig No: 4268YOLS.01) have been matched with the co-ordinates contained within the aforementioned survey.

Third party tree measurements are estimated due to a lack of access to third party land and stated in tree data within the report.

Tree survey data collected and presented in accordance with BS5837: 2012 Trees in relation to design, demolition & construction - Recommendations - section 4, feasibility: Surveys and preliminary constraints.

This drawing is to be read in conjunction with all other relevant drawings/documentation

If in doubt ask.

Critical dimensions and heights must be checked on site prior to construction.

REVISIONS

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CLIENT  
McLeod+Aitken

SITE  
175 WINCHESTER ROAD

EASTLEIGH, HAMPSHIRE, SO53 2DU

TITLE  
TREE CONSTRAINTS PLAN

SCALE  
1:200 @ A1

DATE  
08/07/2022

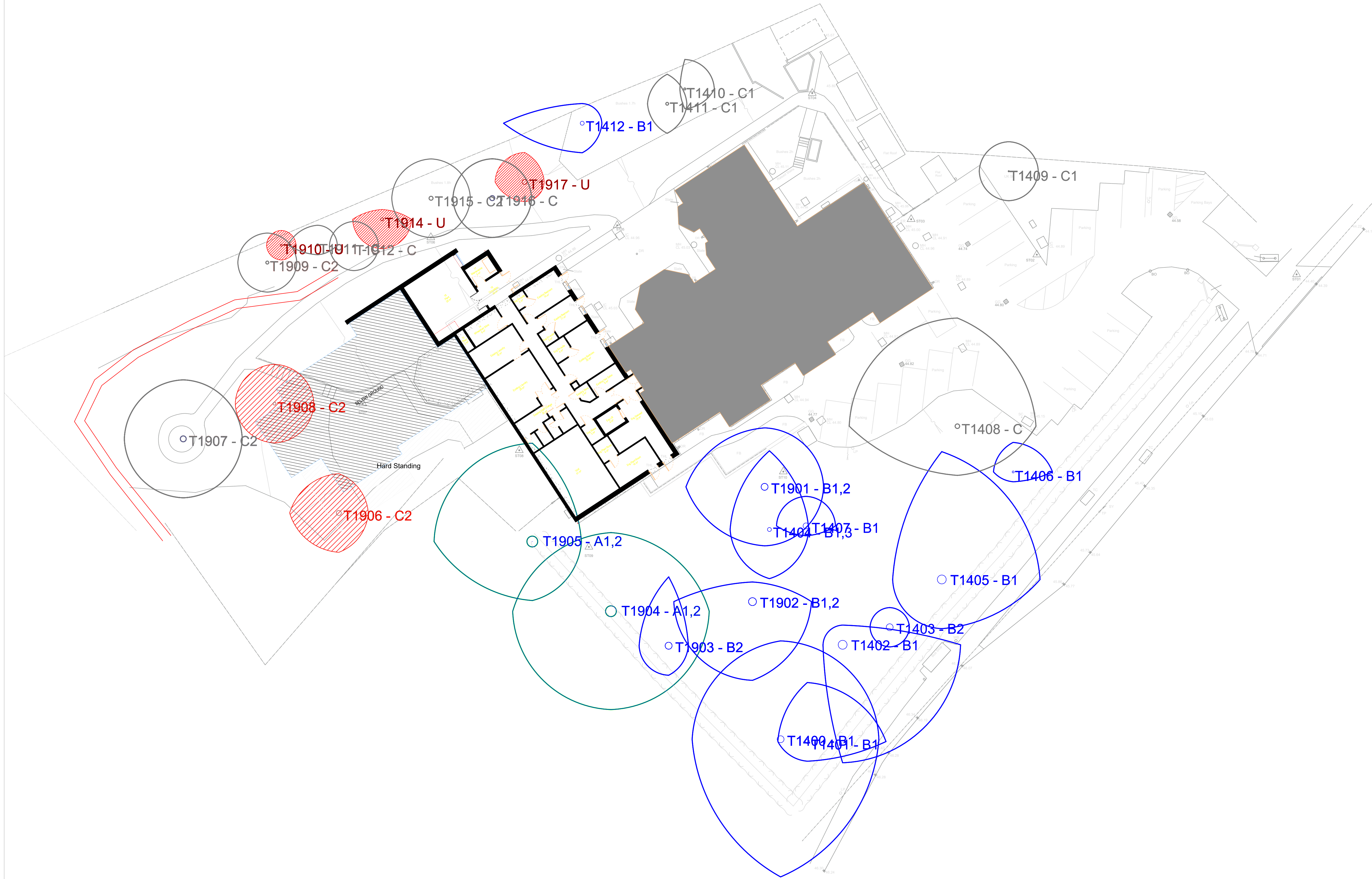
DRAWN BY  
MG

REVISION  
A

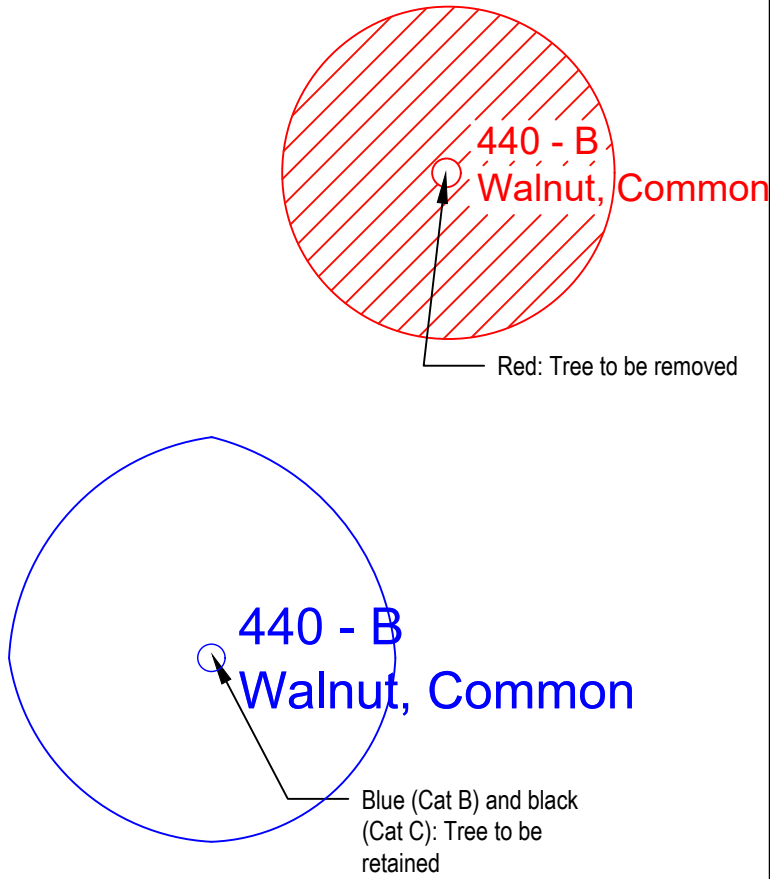
DRAWING NUMBER  
J4421 TCP

# APPENDIX 3

## Proposed Layout Tree Removal Plan



LEGEND  
For tree constraints only, see topographical survey or layouts for other feature identification.



Tree survey data super imposed on site plans produced by other parties. All tree locations have been plotted using hand held GPS and their positions should be checked on site where they might impose a constraint, especially where levels are likely to change. Only trees with locations provided within the topographical survey (Orig No: 4268YOLS-01) have been matched with the co-ordinates contained within the aforementioned survey.

Third party tree measurements are estimated due to a lack of access to third party land and stated in tree data within the report.

Tree survey data collected and presented in accordance with BS5837: 2012 Trees in relation to design, demolition & construction - Recommendations - section 4, feasibility: Surveys and preliminary constraints.

This drawing is to be read in conjunction with all other relevant drawings/documentation

If in doubt ask.  
Critical dimensions and heights must be checked on site prior to construction.

REVISIONS

- Rev. B to show proposed drains, soak & bund & updated tree impacts
- Rev C to show review of bund reposition

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TITLE  
TREE REMOVAL PLAN

SCALE  
1:200 @ A1

DATE  
31/10/2022

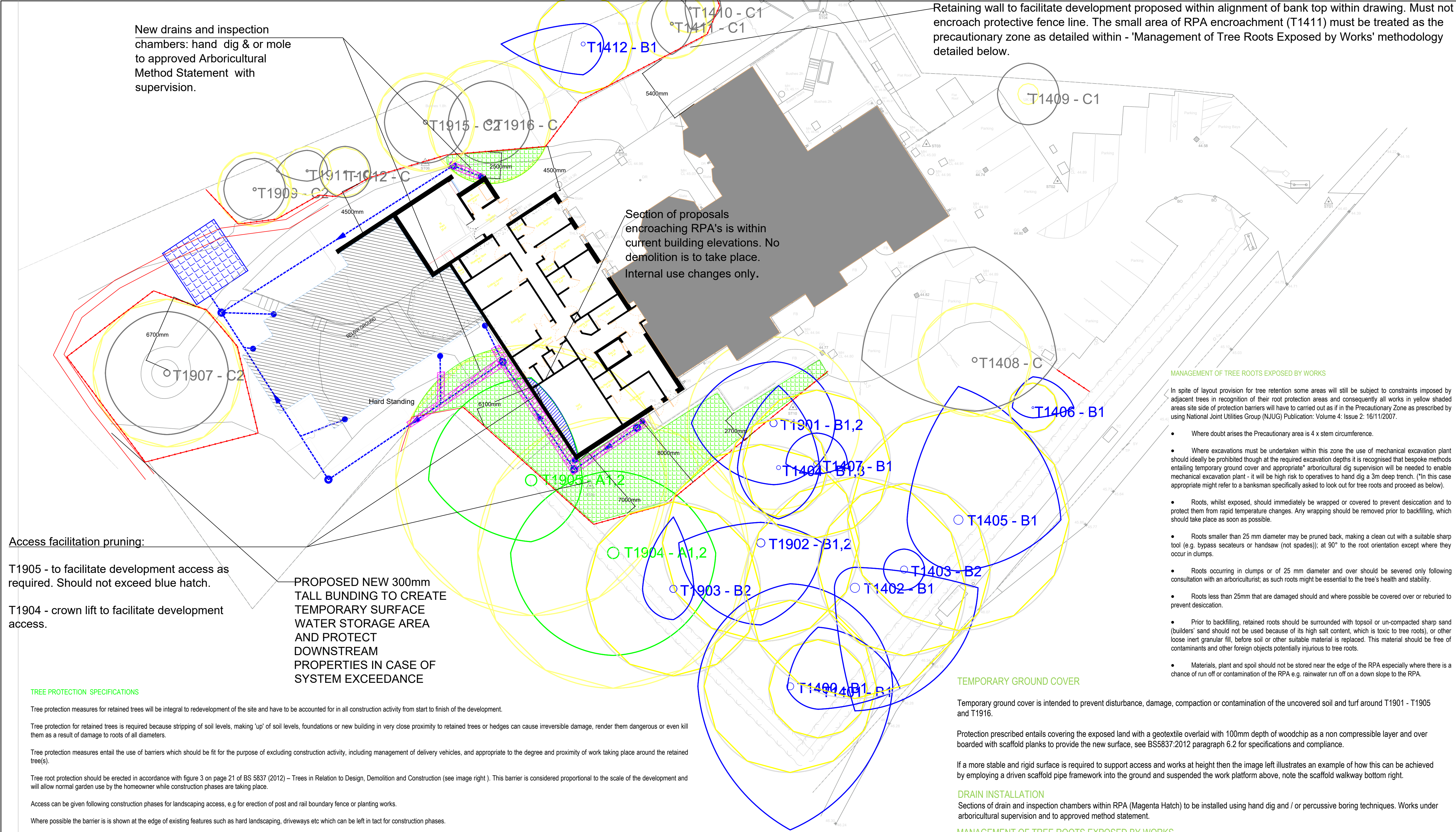
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MG&WJL

REVISION  
C

DRAWING NUMBER  
J4421 TRP

# APPENDIX 4

## Proposed Layout Tree Protection Plan



LEGEND

For tree constraints only, see topographical survey or layouts for other feature identification.

Tree stem location, not to scale

Crown extents measured at four cardinal points

Protective fencing outline

Blue hatch indicates access facilitating pruning

Root protection area extents based on actual stem diameter

Green hatch highlighting area requiring temporary ground cover

Hand Dig and / or mole to construct proposed drains and inspection chambers

Proposed drains & soak (blue); extension (red)

Tree survey data super imposed on site plans produced by other parties. All tree locations have been plotted using hand held GPS and their positions should be checked on site where they might impose a constraint, especially where levels are likely to change. Only trees with locations provided within the topographical survey (DrG No: 4268YOLS-01) have been matched with the co-ordinates contained within the aforementioned survey.

Third party tree measurements are estimated due to a lack of access to third party land and stated in tree data within the report.

Tree survey data collected and presented in accordance with BS5837: 2012 Trees in relation to design, demolition & construction - Recommendations - section 4, feasibility: Surveys and preliminary constraints.

This drawing is to be read in conjunction with all other relevant drawings/documentation

If in doubt ask.

Critical dimensions and heights must be checked on site prior to construction.

REVISIONS

|                                                                   |
|-------------------------------------------------------------------|
| Rev. B to show proposed drains, soak, bund & updated tree impacts |
| Rev. C to impacts of repositioned bund                            |

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TITLE  
**TREE PROTECTION PLAN**

SCALE  
1:200 @ A1

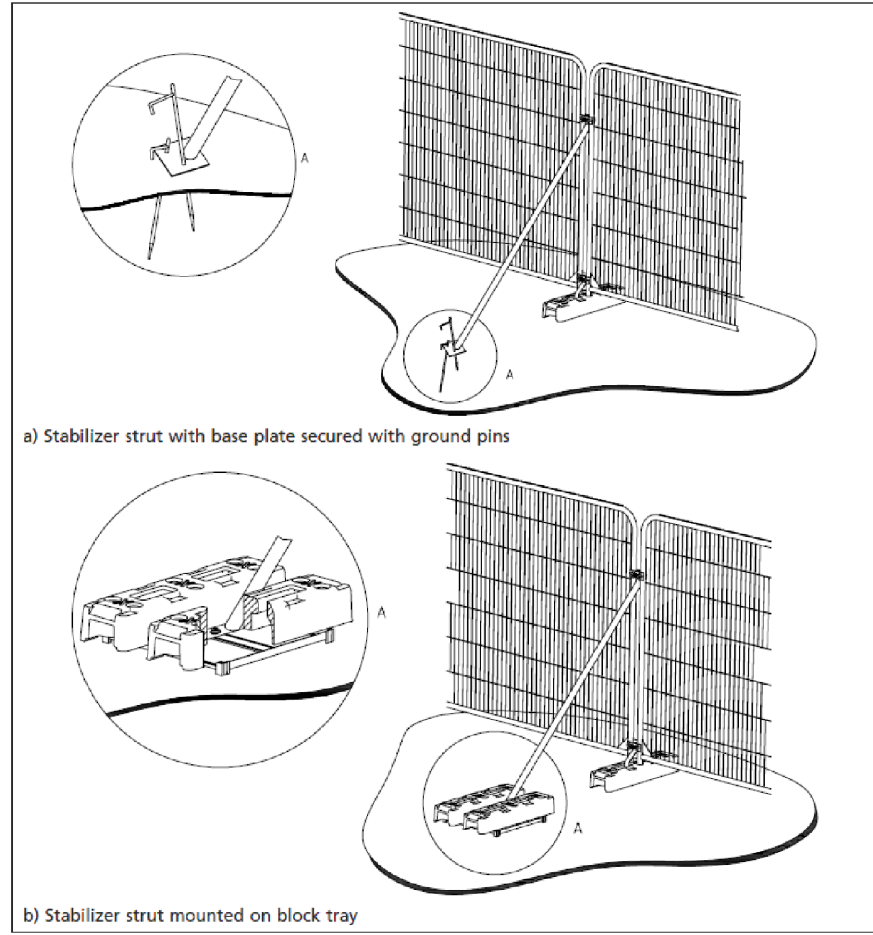
DATE  
31/10/2022

DRAWN BY  
MG&WJL

REVISION  
C

DRAWING NUMBER  
J4421 TPP

Fig 3. Specification for tree protection barrier located on purple line.



Retaining wall to facilitate development proposed within alignment of bank top within drawing. Must not encroach protective fence line. The small area of RPA encroachment (T1411) must be treated as the precautionary zone as detailed within - 'Management of Tree Roots Exposed by Works' methodology detailed below.

Section of proposals encroaching RPA's is within current building elevations. No demolition is to take place. Internal use changes only.

MANAGEMENT OF TREE ROOTS EXPOSED BY WORKS

In spite of layout provision for tree retention some areas will still be subject to constraints imposed by adjacent trees in recognition of their root protection areas and consequently all works in yellow shaded areas site side of protection barriers will have to be carried out as if in the Precautionary Zone as prescribed by using National Joint Utilities Group (NJUG) Publication: Volume 4: Issue 2: 16/11/2007.

- Where doubt arises the Precautionary area is 4 x stem circumference.
- Where excavations must be undertaken within this zone the use of mechanical excavation plant should ideally be prohibited though at the required excavation depths it is recognised that bespoke methods entailing temporary ground cover and appropriate\* arboricultural dig supervision will be needed to enable mechanical excavation plant - it will be high risk to operatives to hand dig a 3m deep trench. (\*In this case appropriate might refer to a banksman specifically asked to look out for tree roots and proceed as below).
- Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.
- Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw (not spades)); at 90° to the root orientation except where they occur in clumps.
- Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist; as such roots might be essential to the tree's health and stability.
- Roots less than 25mm that are damaged should and where possible be covered over or reburied to prevent desiccation.
- Prior to backfilling, retained roots should be surrounded with topsoil or un-compacted sharp sand (builders' sand should not be used because of its high salt content, which is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.
- Materials, plant and spoil should not be stored near the edge of the RPA especially where there is a chance of run off or contamination of the RPA e.g. rainwater run off on a down slope to the RPA.

TEMPORARY GROUND COVER

Temporary ground cover is intended to prevent disturbance, damage, compaction or contamination of the uncovered soil and turf around T1901 - T1905 and T1916.

Protection prescribed entails covering the exposed land with a geotextile overlaid with 100mm depth of woodchip as a non compressible layer and over boarded with scaffold planks to provide the new surface, see BS5837:2012 paragraph 6.2 for specifications and compliance.

If a more stable and rigid surface is required to support access and works at height then the image left illustrates an example of how this can be achieved by employing a driven scaffold pipe framework into the ground and suspended the work platform above, note the scaffold walkway bottom right.

DRAIN INSTALLATION

Sections of drain and inspection chambers within RPA (Magenta Hatch) to be installed using hand dig and / or percussive boring techniques. Works under arboricultural supervision and to approved method statement.

MANAGEMENT OF TREE ROOTS EXPOSED BY WORKS

All works close to the site side of protection barriers will have to be carried out as if in the Precautionary Zone as prescribed by using National Joint Utilities Group (NJUG) Publication: Volume 4: Issue 2: 16/11/2007 in case roots are disturbed and could result in damage tracing back into the RPA through root death or damage. This is especially significant along the south western boundary where the proposed building sits in alignment with the existing car park edge.

Where doubt arises consult with project arboriculturist and/or Local Authority Tree Officer BEFORE works commence.

- Where excavations must be undertaken within this zone the use of mechanical excavation plant should ideally be prohibited though at the required excavation depths it is recognized that bespoke methods entailing temporary ground cover and appropriate\* arboricultural dig supervision will be needed to enable mechanical excavation plant - it will be high risk to operatives to hand dig a 3m deep trench. (\*In this case appropriate might refer to a banksman specifically asked to look out for tree roots and proceed as below).
- Roots, whilst exposed, should immediately be wrapped or covered to prevent desiccation and to protect them from rapid temperature changes. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.
- Roots smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (e.g. bypass secateurs or handsaw (not spades)); at 90° to the root orientation except where they occur in clumps.
- Roots occurring in clumps or of 25 mm diameter and over should be severed only following consultation with an arboriculturist; as such roots might be essential to the tree's health and stability.
- Roots less than 25mm that are damaged should and where possible be covered over or reburied to prevent desiccation.
- Prior to backfilling, retained roots should be surrounded with topsoil or un-compacted sharp sand (builders' sand should not be used because of its high salt content, which is toxic to tree roots), or other loose inert granular fill, before soil or other suitable material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.
- Materials, plant and spoil should not be stored near the edge of the RPA especially where there is a chance of run off or contamination of the RPA e.g. rainwater run off on a down slope to the RPA.

## APPENDIX 5

NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees Volume 4, pages 7 & 13 detailing tree damage concepts methods. For full version see <http://streetworks.org.uk/wp-content/uploads/V4-Trees-Issue-2-16-11-2007.pdf>

## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

### **1. HOW TREES ARE DAMAGED**

Trees are complex living organisms, which are susceptible to damage from a wide range of physical agents or activities. Trees do not heal, damage caused to a tree will remain for the rest of its life. Even minor damage may set up circumstances leading to serious long term decay.

Contrary to popular belief, the root system of a tree is not a mirror image of the branches, nor is there usually a 'tap root'. The majority of the root system of any tree is in the surface 600mm of soil, extending radially in any direction for distances frequently in excess of the tree's height. Excavation or other works within this area are liable to damage the roots.

#### **1.1 The Root System**

The base of a trunk typically flares out in buttresses extending into the main lateral structural roots. These rapidly subdivide into the mass of smaller roots which serve to anchor the tree into the soil and transport water and nutrients. Even at a short distance (3m) from a large mature tree, most roots will be less than 10mm in diameter, but these may extend to well beyond the branch spread of the tree. A mass of fine roots, less than 1 mm in diameter, develop off all parts of this root system. These fine roots also absorb the water and nutrients, which are essential for the growth of the tree.



## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

The main structural roots (close to the trunk) develop as the tree grows in response to the need for physical stability. Beyond these major roots growth is influenced by the availability of water, air and nutrients in the soil. Disturbance of soil provides ideal conditions for root growth. Apparatus is often cooler than the surrounding soil encouraging moisture within the soil to condense on its surface stimulating root growth close to the apparatus. For all these reasons root growth is often most prolific within the backfilled trench and in the soil around the apparatus.

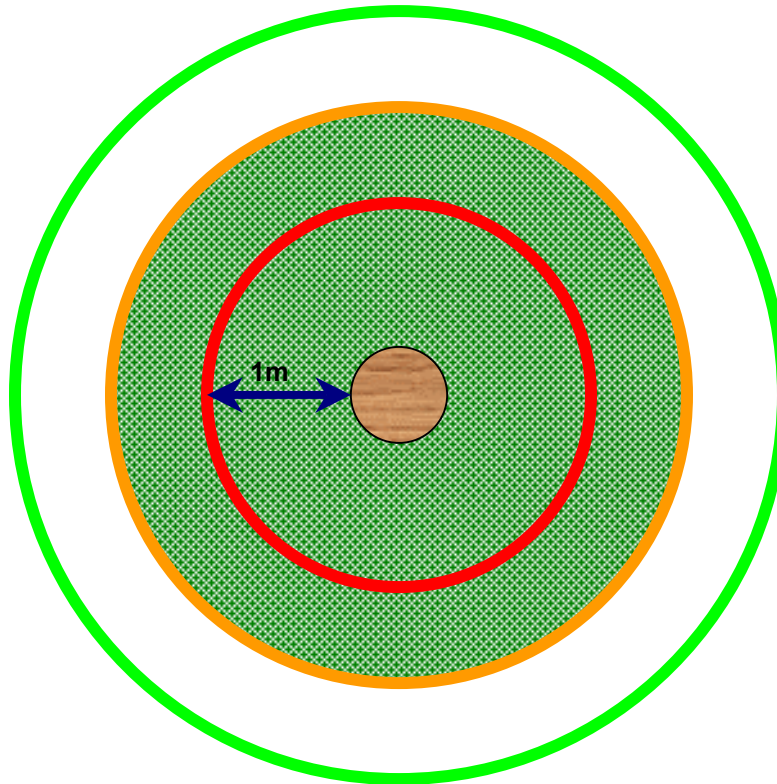
There are certain areas around trees, illustrated in Figure 1 – ‘Tree Protection Zone’, where excavation either must not be undertaken or only undertaken under strict conditions in order to avoid or minimise any damage to a tree’s root system.

For the purposes of this guideline document they are called zones;

- the Prohibited Zone (1m from the trunk)
- the Precautionary Zone (4 x the tree circumference)
- the Permitted Zone (outside of the Precautionary Zone)

## NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

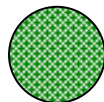
**FIGURE 1 – Tree Protection Zone**



### Key



Trunk of tree



Canopy or branch spread



**PROHIBITED ZONE – 1m from trunk.** Excavations of any kind must not be undertaken within this zone unless full consultation with the local authority Tree Officer is undertaken. Materials, plant and spoil must not be stored within this zone.



**PRECAUTIONARY ZONE – 4 x tree circumference.** Where excavations must be undertaken within this zone the use of mechanical excavation plant should be prohibited. Precautions should be undertaken to protect any exposed roots. Materials, plant and spoil should not be stored within this zone. Consult with the local authority Tree Officer if in any doubt.



**PERMITTED ZONE – outside of the precautionary zone.** Excavation works may be undertaken within this zone, however caution must be applied and the use of mechanical plant limited. Any exposed roots should be protected.

## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

### **1.2 Below Ground**

#### **1.2.1 Root systems can be damaged by;**

- the severance of a root, for example by trenching will destroy all parts of the root beyond that point. Even roots less than 10mm in diameter may be serving the fine roots over a wide area. The larger the root severed, the greater the impact on the tree.



**Typical root damage caused by excavation works**

- damage to the bark on the root. The bark protects the root from decay and is also essential for further root growth. It is loosely attached and easily damaged. If damage to the bark extends around the whole circumference the root beyond that point will be killed.
- damage to surface roots. Care must be taken when using mechanical plant. Materials and vehicles must never be stored within the Prohibited Zone and ideally should not be stored within the Precautionary Zone.

## **NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees**

- compaction of the soil. Incidental compaction may occur from storage of materials and / or the passing of heavy equipment over the roots. This 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.



### **Poor site management within the Precautionary Zone**

- alterations in soil level. Lowering the level will strip out the mass of roots near the surface. Raising levels will have the same effect as soil compaction.
- the application of herbicide - frequently used to clear weed growth on operational land (e.g. substations). The wide-ranging root system of a tree may extend into the operational land and absorb herbicides, which have been applied to the ground. Herbicide absorbed in one part of the root system can kill the whole tree.

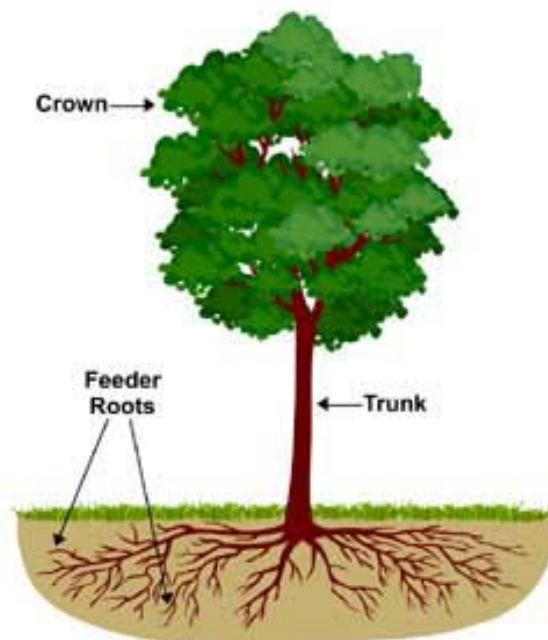
## NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

*NOTE: The selection and application of herbicides must be undertaken by a competent person in accordance with Control of Substances Hazardous to Health (COSHH) regulations.*

- spillage of oils or other materials (e.g. diesel oil, cement, resins). Spillage can permeate into the soil and damage root systems (see sub-section 4.3 – ‘Chemical Damage to Trees’).

### 1.2.2 If roots are damaged;

- close to the trunk. The anchorage and stability of the tree may be adversely affected rendering the tree immediately hazardous.
- anywhere along their length. The distal portion including the fine roots they serve, will be destroyed. Damage to fine roots by severance of a main root, or by compaction or alteration of ground levels, will prevent fine roots from absorbing the water and nutrients which are essential for the well-being, growth and anchorage of the tree.
- by successive excavations. Multi-utility excavations close to a tree can cumulatively damage a root system.



**Figure 2 - Typical Tree Structure**

# APPENDIX 6

## Administrative information

## 18 LIMITATIONS

- 18.1.** The purpose of this report is to provide a level of comment, sufficient to accompany a planning application for discharge of conditions. It sets out to measure and comment upon current, arboricultural best practice, guidelines and recommendations (e.g. BS 5837:2012). Compliance with these documents and guidance is not an absolute guarantee of successful long-term retention of trees. However, it will ensure that the risks of tree damage are reduced to acceptable levels, based upon current best practice, knowledge and understanding.
- 18.2.** The size and position of development features have been provided by the architect, and we cannot accept liability for deviation from this specification.
- 18.3.** Soil samples and testing do not form part of this report.
- 18.4.** This report does not comment upon, or take account of, potential for damage caused by shrinkage or heave of soils.
- 18.5.** Assessments of tree condition are made following a ground-based inspection. Test boring, ultra sound and climbing investigations do not form part of this report. Cavities that can be assessed from the ground level are investigated using a graduated probe to determine the size and shape of the cavity, the extent of compartmentalisation, and the amount of material lost expressed as a percentage of the remaining sound material at that point.
- 18.6.** If further investigations are considered necessary these will be stated in the Tree Schedule table.
- 18.7.** It is not possible to guarantee the safety of any tree; even trees with no apparent defects can collapse or partially collapse in extreme weather conditions. Trees are dynamic, biological systems which are subject to change with age; as a result of changes to the environment and the effects of pathogens. These factors reinforce the need to have trees inspected regularly.
- 18.8.** Wildlife, ecology and archaeological considerations: trees can provide wildlife, and ecological habitats in potentially archeologically sensitive locations. These considerations are outside of my area of expertise and do not form part of this report

## 19 LEGAL / BEST PRACTICE CONSTRAINTS

- 19.1.** This report is not a mandate to undertake any recommended works. If any of the trees are subject to tree preservation orders, within conservation areas or the subject of planning constraints; permission must be obtained from the relevant enforcing authority before any recommended works can be carried out.

**19.2.** Exemptions exist for works to dead trees (or the removal of dead parts of living trees); however even in these situations the tree owner should give at least 5 working days written notice of any proposed work. If there is an urgent risk to safety, tree owners should still endeavour to contact/notify the relevant enforcing authority at the earliest opportunity. It is prudent to maintain some records (e.g. photographs) as evidence to support any decisions made.

**19.3.** Tree owners are liable for any damage caused by their trees to the property of others, provided that the potential for damage is reasonably foreseeable. They have a common law Duty of Care to inspect their trees on a regular basis, and to seek and act on advice from a suitable arboriculture professional if signs are noticed which give cause for concern. It is generally recommended that trees are inspected by a suitably qualified/experienced arboriculturist at five yearly intervals, unless earlier re-inspections are specifically recommended. Tree owners should continue to monitor their trees in the interim period, and seek professional advice if they have any concerns.

## 20 TECHNICAL REFERENCES

19.4. In preparing this report, consideration and reference has been given to relevant technical references including:

- 
- The Body Language of Trees  
*Mattheck C. & Breloer H.*
- A New Tree Biology  
*Shigo A.L.*
- Modern Arboriculture  
*Shigo A.L.*
- Hazards From Trees - A General Guide: Forestry Commission Practice Guide  
*Lonsdale D.*
- Diagnosis of Ill Health in Trees  
*Strouts R.G. & Winter T.G.*
- Principles of Tree Hazard Assessment and Management  
*Lonsdale D.*
- Tree Mechanics  
*Mattheck C.*
- BS 5837: 2012 Trees in relation to design, demolition and construction- Recommendations  
*British Standards Institute*
- BS 3998:2010; Recommendations for Tree Work  
*British Standards Institute*
- SIM 01/2007/05: Management of the Risk from Falling Trees  
*Health & Safety Executive*
- Veteran Trees - A Guide to Risk & Responsibility  
*English Nature*
- G55/2 Engineering Recommendations: Safe Tree Working in Relation to Overhead Lines –  
September 2009.  
*Energy Network Association*
- Towards Reasonable Tree Risk Decision- Making?  
*The Arboricultural Journal (2). 143 – 161*
- Alan Mitchell's Trees Of Britain  
*Mitchell A.*
- (NJUG) (2007) Volume 4, Issue 1: Guidelines for the planning, installation and maintenance of utility  
apparatus in proximity to trees  
*National Joint Utilities Group*

- Common sense risk management of trees: Guidance on trees and public safety in the UK for owners, managers and advisers

*The National Tree Safety Group*

End