Arborclimb Consultants

Arboricultural Impact Assessment

BS 5837:2012 Trees in relation to design, demolition and construction- Recommendations

Arboricultural ASSOCIATION Professional Member

Project: Land to the rear of 14-16 Vicarage Park
Report: P82jrDec23FV04_AIA
Date: December 2023

Project: Land to the rear of 14-16 Vicarage Park

Report Title:

BS5837 Tree Survey and Arboricultural Impact Assessment

Client:

Evolution Estate Development Ltd

Report Structure	Arboricultural Impact Assessment
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1.0 EXECUTIVE SUMMARY

1.1 Arborclimb Consultants were commissioned by Evolution Estate Development Ltd to undertake a Tree Survey and prepare an Arboricultural Impact Assessment at a site known as Land to the rear of 14-16 Vicarage Park in the Royal Borough of Greenwich, to the *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*[1] methodology.

1.2 This document presents the findings of the tree survey and has been produced to support a planning submission for the creation of three three-bed family homes on the site with associated landscaping, refuse storage, and cycle parking.

1.3 The purpose of this survey is to provide an assessment of the arboricultural value of the trees based on their current quality and to provide recommendations on the proposed layout and construction.

1.4 A visit was made to the site on 26 July 2023 to survey trees, hedges and vegetation following guidance in BS5837. The crowns and stems were inspected from the ground using the 'Visual Tree Assessment' (VTA) method; no invasive techniques were used at this stage.

1.5 During the survey, seven trees were identified within or adjacent to the development area. See Table 1.1 below.

Table 1.1 BS5837 Category mix

Category	Individual Trees	Tree Group/Hedge	Total
A	0	0	0
B	1	0	1
C	4	0	4
U	2	0	2
Total	**7**	**0**	**7**

1.6 An assessment of the potential below and above ground impacts of the proposed development and recommendations to help avoid, minimise or compensate for these impacts is outlined within this report.

1.7 Through this assessment it has been confirmed that two of the surveyed trees will be removed, although it is noted that both are proposed to be removed regardless of any site development proposals.

1.8 Of these removals, T2 Cherry is shown to be in a heavily declining condition, and T1 Lime showing increasing damage to the western perimeter site wall. The removal of T1 then subject to an approved conservation area planning application and associated conditions, (Section 211 of the Town and Country Planning Act 1990).

1.9 Any constraints from the existing tree crowns against the proposed development facade have been shown to be managed through a combination of setting back the building line from the northern site perimeter and via the pruning back of the tree crowns and overlapping minor roots from offsite trees.

2.0 INTRODUCTION

OVERVIEW

2.1 Arborclimb Consultants were commissioned by Evolution Estate Development Ltd to undertake a BS5837 tree survey and prepare an Arboricultural Impact Assessment (AIA) report for a site located at Land to the rear of 14-16 Vicarage Park in the Royal Borough of Greenwich.

2.2 This document has been produced to support a planning submission for the residential redevelopment of the site for the creation of three three-bed family homes on the site with associated landscaping, refuse storage, and cycle parking.

2.3 A site visit was made on 26 July 2023 to survey all trees within and adjacent to the site following the approach set out in BS5837.

2.4 As required by the British Standard, an Arboricultural Impact Assessment has been undertaken to evaluate the constraints to the development from the existing trees both on and adjacent to the site using information gained from the BS5837 Tree Survey.

2.5 The methodology followed to complete the survey and prepare this report is provided in Appendix 1. Full details of the surveyed trees can be found in the Tree Schedule (Appendix 2). The Tree Constraints Plan (Appendix 3) presents the locations, crown spreads, root protection areas (RPAs) and BS5837 Categories of the surveyed trees against proposed layout.

SITE DESCRIPTION

2.6 The site is a square parcel of land that spans across parts of the rear gardens of the three properties at 14-16 Vicarage Park in Plumstead. 14 Vicarage Road is made up of 4 flats, 15 Vicarage Road is also 4 flats, and 16 Vicarage Park is one 6-bed house.

2.7 Some properties along Vicarage Park have double garages and so the gardens along Vicarage Park back directly onto Vicarage Road with no pavement. The site therefore has both direct pedestrian and vehicular access. The site is set at a considerably higher level than the properties on Vicarage Park and their rear gardens all have a large set of stairs up from the properties to their respective gardens.

2.8 There are a number of existing trees on and around the site, however none are subject to Tree Preservation Orders. The land is designated on the adopted proposal map as being within the Plumstead Common Conservation Area and The Old Vicarage at the northern end of Vicarage Road is Grade II listed building.

3.0 TREE SURVEY METHODOLOGY

DESK REVIEW

Tree Legal Protection

3.1 Trees within the Royal Borough of Greenwich may be protected under the Town & Country Planning Act[2] by a Tree Preservation Order (TPO) or by virtue of being within a Conservation Area.

3.2 A TPO makes it an offence to wilfully damage or destroy a protected tree and written permission from the Council must be obtained prior to undertaking any works to the tree. Similarly, if any stem on any tree in a Conservation Area is larger than 75mm diameter when measured at 1.5 metres above ground level it is automatically protected and required by law to notify the Council of any proposed works.

3.3 To determine whether any of the trees are protected by TPOs a search of the readily available data on the Council's website was undertaken.

3.4 Additionally, the online mapping was reviewed to identify any local Conservation Areas that would add additional protection to the trees.

Geological Conditions

3.5 A review of the readily available Geology of Britain interactive map by the British Geological Society[3] was undertaken to identify the bedrock geology and superficial deposits at the site.

SITE VISIT

3.6 A site survey was undertaken on 26 July 2023 to survey trees, hedges and vegetation following guidance in the British Standard.

3.7 The crowns and stems were inspected from the ground using the 'Visual Tree Assessment (VTA)' method; no invasive techniques were used at this stage. The survey followed the methodology outlined in *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*.

3.8 The site visit was undertaken in wet and winter weather conditions with trees in the winter bud stage. Full details on the methodology can be found at Appendix 1.

LIMITATIONS

3.9 This report includes information on only the trees that were inspected and the condition they were observed in at the time of survey. The condition of trees can change, and as such any findings from this report should be held valid to inform for purposes of development for no longer than 12 months from the survey date. No guarantee can be

given for the structural integrity of any trees on site as a full hazard assessment has not been made.

3.10 There were no significant constraints to the assessment; all areas of the site were fully accessible to survey.

4.0 RESULTS OF SURVEY

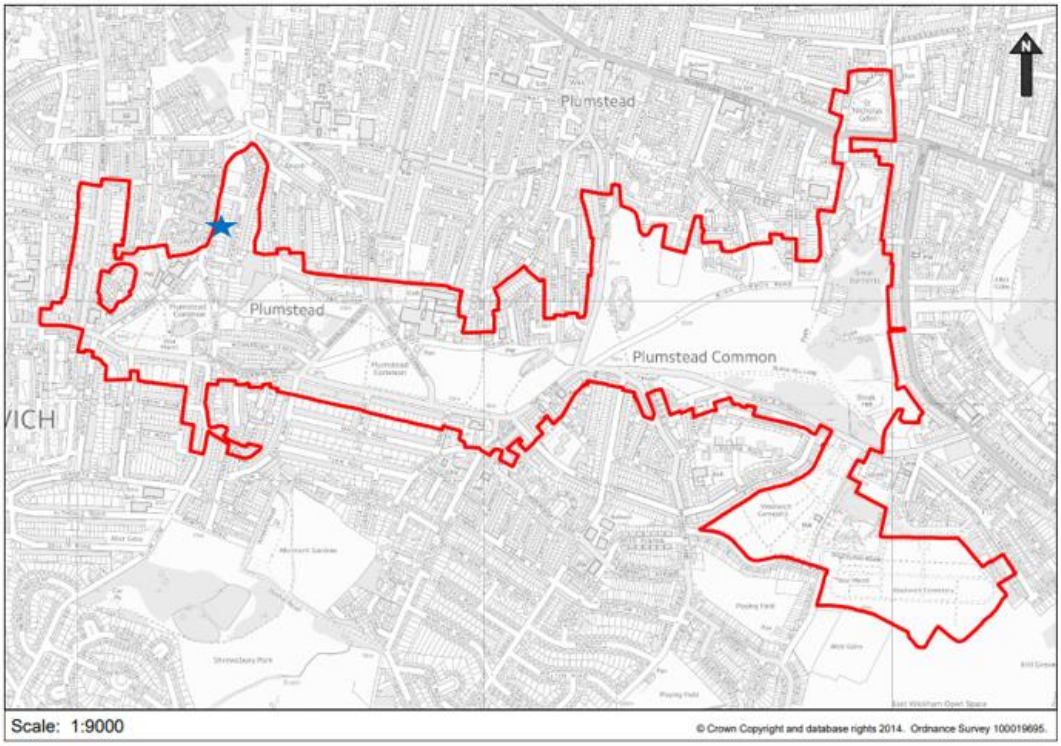
DESK REVIEW

Tree Legal Protection

4.1 Review of the Council's Tree Preservation Order (TPO) and Conservation Area data (available from www.royalgreenwich.gov.uk) has confirmed that whilst none of the site trees are designated with TPO's, the development site falls within the Plumstead Common Conservation Area, (as shown at Figure 4.1). This then essentially providing the same protection to the site trees as a TPO designation.

4.2 Prior to planning permission being obtained, any proposed works to trees within the Conservation Area would be subject to formal permission from the Royal Borough of Greenwich.

Figure 4.1. Plumstead Common Conservation Area (blue star indicates site location)



Geological Conditions

4.3 The BGS interactive map[3] indicates the underlying geology to show Harwich Formation - sand and gravel.

4.4 It is recommended that a geotechnical specialist / structural engineer undertake a detailed soil investigation to determine the actual underlying geology and Plasticity Index which may then inform foundation design. The design of any new planting and landscape

proposals should be based upon a soil analysis which considers the pH and nutrient composition of localised conditions.

SITE VISIT

4.1 During the site survey, seven individual trees were noted either within or directly adjacent to the site boundary, with the Tree Schedule (Appendix 2) providing all relevant details.

4.2 Trees within the site boundary include T2 a Category U cherry in terminal decline and T1 a semi mature small leaved lime growing directly against the western boundary wall. As this tree is currently causing the boundary wall to collapse (and the tree has significant future growth potential), a Section 211 application has been made for its removal. This then irrespective of any proposals for the redevelopment of the site.

4.3 Trees to the outside of the site boundary then include T3 to T6 self-seeded Sycamore to the north showing significant overhang and encroachment of the crowns and RPA respectively; and T7 Norway maple to the south, that shows minor crown overhang of the site boundary.

4.4 Further consideration of T3 to T6, suggests that the perimeter boundary wall is likely to have had at least a minor influence on on-site root spread. RPA overlap within the site area is therefore likely to be less than shown on the Tree Constraints and Tree Protection Plans at Appendix 3 and 4.

4.5 In terms of visual and arboricultural amenity, many of the surveyed trees are of limited value apart from T7 Norway maple, which presents as a well-structured landscape feature tree.

4.6 The Tree Constraints Plan found at Appendix 3 shows the layout of the existing tree stock with reference to BS5837 Category and survey data.

LOCAL PLANNING POLICY

4.7 With full details of the relevant Planning Policy given in Appendix 5, the overriding considerations for the application are considered to be Policy DH1 (subsection iii-a) and Policy OS(f) Ecological Factors (subsections iii and iv), as set out within the Royal Greenwich Local Plan: Core Strategy with Detailed Policies (2014); detailed below.

Policy DH1 Design

All developments are required to be of a high quality of design and to demonstrate that they positively contribute to the improvement of both the built and natural environments. To achieve a high quality of design, all developments are expected to:

iii. provide a positive relationship between the proposed and existing urban context by taking account of:

a. the need to retain trees in line with Policy OS(f);

Policy OS(f) Ecological Factors

Development proposals will be expected to take account of ecological factors, in particular paying attention to the need for:

iii. An appropriate level of survey to enable decisions to be made about the existing trees on the site. Development decisions will be based on the requirement:

- To protect trees and their root systems from damage as a result of the development both during and after building operations;
- To achieve an appropriate replacement of trees taking account of size, coverage and species where it is agreed that existing trees can be felled;

iv. The retention of trees and the protection and enhancement of natural and ecological features, tree ridge lines, green corridors, wildlife habitats, boundary walls, surface materials, hedges and other features where these will contribute to the biodiversity.

5.0 ARBORICULTURAL IMPACT ASSESSMENT

INTRODUCTION

5.1 The purpose of this Arboricultural Impact Assessment (AIA) is to assess the potential below and above ground impacts to existing trees from the proposed development, and to highlight the need for the pruning, removal or retention and protection of specific trees during construction.

5.2 Works associated with development of this type can damage trees, threatening the survival of those that are to be retained. The following actions can have negative impacts upon tree health:

- Soil compaction;
- Root damage (e.g. severance);
- Soil coverage with impermeable material; and
- Alterations in ground level.

5.3 As such, where possible, the RPAs and canopies that are defined in Appendix 4 should be protected and considered throughout works to prevent risks to the health of the trees. With full details of any such protection then detailed within a subsequent Arboricultural Method Statement, where required.

SITE LAYOUT

5.4 Proposals and existing drawings provided for the assessment of the potential constraints that exist include:

- Existing layout/ topographical survey (drawing ref. 869-10-100); and
- Proposed layout (drawing ref. 869-00-010).

5.5 In designing the site layout as shown in Appendix 4, the northern facade has been specifically set back from the northern boundary line. This then allows for greater building separation space given the close proximity of the off-site trees in this location.

TREE REMOVALS

5.6 Through this assessment it has been confirmed that two of the surveyed trees will be removed, although it is noted that both are proposed to be removed regardless of any site development proposals.

5.7 Of these removals, T2 Cherry is shown to be in a heavily declining condition, and T1 Lime showing increasing damage to the western perimeter site wall. The removal of T1 then subject to an approved conservation area planning application (23/2480/TC) and associated conditions, (Section 211 of the Town and Country Planning Act 1990).

TREE PLANTING

5.8 Albeit part of the separate conservation area application for the removal of two onsite trees (23/2480/TC), the proposed development will include the necessary mitigation tree planting as stated as a condition.

5.9 Whilst subject to further consideration during the landscaping phase, the current development proposes the planting of three Sweet Gum trees (*Liquidambar styraciflua* Slender Silhouette), to the front, and three Himalayan Birch (*Betula utilis Jacquemontii*) to the rear. These species were then chosen with respect to their mature crown size and height (as well as ornament garden features), given the limited space for new trees and crown spread within the site gardens.

5.10 This then as indicated in the Tree Protection Plan at Appendix 4.

FACILITATION PRUNING

5.11 In terms of site constraints, the current southern crown extent of T3 to T5 shows direct conflict with the building footprint and facade location of the proposed development. It is therefore proposed to prune these crown areas back to the site boundary to provide both development and construction space, (such as for scaffolding etc).

5.12 Whilst the proposed crown pruning extent is moderate, as T3 and T5 are semi mature and of good physiological condition they will not be significantly impacted in the long term, with future crown development naturally growing parallel and away from the new development façade. Conversely, T4 is a category U tree and should ideally be removed, although as the tree is off site this will be brought to the attention of the owner/occupant of No. 12 Vicarage Road

5.13 Finally, whilst the conflict shown from the tree crown of T2 is shown as far less substantial, a reduction of approximately 2.5m is proposed. The extent of this pruning will though be discussed with the owners of the tree at No.20 Vicarage Road given the tree is located off site.

5.14 Overall, once pruned back, occasional repruning of the regrowth of the impacted trees may be required to maintain site clearance space, although significant regrowth is not anticipated as trees in this situation tend to phototropically grow away from buildings.

5.15 It is essential that arboricultural best practice as set out in *BS:3998 Tree work – Recommendations*[5], is adhered to for any required tree work.

OVERSHADING FROM TREE CROWNS

5.16 Retention of trees with future growth potential (as is the case with this development) can often raise concerns with respect of possible over shading of habitable rooms. Any such constraints have though been designed out by omitting any windows along either the northern or southern facades.

WORKS WITH THE RPA'S OF RETAINED TREES

5.17 The provisional root protection areas for all site trees have been calculated via the methodology set out in BS5837 and are shown in the Tree Protection Plan (Appendix 4).

5.18 In terms of providing constraints information for any future development, providing accurate root zone information is of great significance, as this defines the area that cannot be generally constructed over or disturbed without bespoke foundation and site design considerations.

5.19 With consideration to this, it is anticipated that the perimeter boundary wall that runs to the north of the site will have had at least a minor influence on on-site root spread from T3 to T5. That being the case, the RPA overlap shown within the proposed site building footprint is likely to be less than shown on the Tree Constraints and Tree Protection Plans at Appendix 3 and 4.

5.20 In line with this assumption, minor root pruning as described below, can then be undertaken to manage any root constraints in this location.

Root Pruning

5.21 Whilst it has been shown that conflict with significant roots is unlikely, any smaller roots from retained trees identified during the construction phase, will need to be managed in line with the relevant best practice.

5.22 In line with BS5937, roots of <25 mm (other than where they occur in clumps) will be pruned back via a clean cut with a suitable sharp tool.

5.23 During these works (if not immediately re-covered), exposed roots that are not proposed to be pruned should immediately be wrapped or covered with a wet hessian sack (or similar), to prevent desiccation. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.

NEW SITE UTILITIES

5.24 Given the destructive impacts that utilities excavation can have on tree roots and the subsequent physiological and structural life of trees, all subterranean utility runs that will service the site will use the existing utility runs within the highway and pavement area of Vicarage Road.

5.25 Should the need for any new utility works within the RPA's of retained trees be subsequently identified, then details of all relevant best practice are provided within the NJUG guildnce[6] for utilities works adjacent to trees.

ARBORICULTURAL METHOD STATEMENT (AMS)

5.26 Subsequent to an AIA, an Arboricultural Method Statement (AMS) is often secured through planning condition. This then detailing further how constraints on retained trees identified will be addressed throughout the construction phase and how works will be carried out near trees to avoid accidental damage.

5.27 It is however the conclusion of this report that given the development will have only minor impacts on retained trees and that relevant best practice methodology has been set out, an additional AMS is not required. Furthermore, it is suggested that this AIA be conditioned to ensure all stated tree pruning and tree protection is implemented in full.

5.28 In line with this recommendation, general construction site good practice and guidance for how site works should be carried out near trees to avoid accidental damage is set out in Appendix 6.

Tree Protection (Construction)

5.29 Prior to any demolition or construction works taking place, all relevant tree protection measures will be in place around all retained trees within the construction vicinity of the site.

5.30 These protective measures ensure suitable protection of trees and associated soils, with the key method of tree protection being through the use of tree fencing and ground protection.

5.31 For the demolition and construction phases, BS5837 tree protection fencing should be installed around the existing soft landscaped RPA's of T1 to T4 and G6 (as shown on the Tree Protection Plan, Appendix 4). In line with the best practice approach as set out below, this fencing should only be removed at the end of the construction phase.

Tree Protection Fencing

5.32 Tree protection fencing will comprise 1.8m Heras fencing around retained trees. Once erected, this will not be moved or relocated.

5.33 The tree protection area behind the Heras fencing (the Construction Exclusion Zone) will be sacrosanct throughout development and no access will be allowed to this area including (for example) the storage of or moving of materials or machinery.

5.34 In the Construction Exclusion Zone, there will be no excavations or increases in soil level.

5.35 The Heras fencing will be secured using footings to prevent movement of the protective fencing and ensure its rigid installation. Details of this are given on the Tree Protection Plan.

5.36 There will be clear and visible signs (as shown in Appendix 6) attached to the protective fencing with the wording, "Tree Protection Area – Keep Out". This area will be checked by the construction manager throughout the course of development.

5.37 The tree protection fencing denotes the Construction Exclusion Zone. Therefore, careful consideration must be given when planning site operations to ensure that wide or tall loads or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Any transit or traverse of plant in close proximity to trees should be conducted under the supervision of a banks person to ensure that adequate clearance from trees is maintained at all times.

5.38 Material that will contaminate the soil such as concrete mixing, diesel oil and vehicle washing should not be discharged within 10m of the tree stems. Furthermore, no fire shall be lit or liquids disposed of within 10m of an area designated as being fenced off or otherwise protected in the scheme.

5.39 The specification and location of this protective fencing is illustrated on the Tree Protection Plan (Appendix 4).

5.40 In line with the best practice approach as set out below, this fencing should only be removed at the end of the construction phase.

Temporary Ground Protection

5.41 As possible construction space to the south of the site (within the adjacent soft RPA ground of T7), will be primarily for walking and access scaffolding, this area (as indicated on the Tree Protection Plan), should be covered with a protective layer such as Ground Guards (examples as shown at Appendix 7) to ensure there will be no significant impact on the RPA of this retained tree.

5.42 This will be required to protect the tree against the increase in activity during the construction phase and will be removed post construction.

6.0 SUMMARY AND CONCLUSIONS

6.1 Arborclimb Consultants were commissioned by Evolution Estate Development Ltd to undertake a BS5837 tree survey and prepare a report relating to the arboricultural impact of the proposed residential development at Land to the rear of 14-16 Vicarage Park in the Royal Borough of Greenwich.

6.2 The survey was undertaken on 26 July 2023 to survey the trees on and adjacent to the site.

6.3 During the site survey, seven individual trees were noted either within or directly adjacent to the site boundary, with the Tree Schedule (Appendix 2) providing all relevant details.

6.4 Leading on from the tree survey, the Arboricultural Impact Assessment for the proposed development was drawn up based on the detailed design for the site. The AIA then focusing in on any constraints associated with and RPA and/or crown overlaps of the site boundary.

6.5 Through this assessment it has been confirmed that two of the surveyed trees will be removed, although it is noted that both are proposed to be removed regardless of any site development proposals.

6.6 In mitigation, and in line with the conditions of the conservation area planning permission 23/2480/TC, landscaping tree planting is proposed.

6.7 In designing the site layout as shown in Appendix 4, the northern facade has been specifically set back from the northern boundary line. This then allows for greater building separation space given the close proximity of the off-site trees in this location.

6.8 All residual constraints from retained trees have then been shown as managed via a combination of building design and routine crown and root pruning.

6.9 If the recommendations within this report are adhered to, all existing trees will be protected and retained within the redeveloped site. This then in line with relevant local planning policy as detailed within this report.

6.10 Overall, it is the conclusion of this report that given the details and best practice methodology set out, an additional AMS is not required and has therefore not been considered further beyond the best practice methodology detailed.

APPENDIX 1: TREE SURVEY METHODOLOGY

Trees, tree groups and woodlands have been considered following evaluation into one of four categories (U, A, B, C) based on tree quality as outlined in British Standard 5837 (2012) which has been followed. Categorisation of trees, following the British Standard, gives an indication as to the trees' importance in relation to the site and the local landscape and also, the overall value and quality of the existing tree stock on site. This allows for informed decisions to be made concerning which trees should be removed or retained, should development occur.

For a tree to qualify under any given category it should fall within the scope of that category's definition. In the categories A, B, C which collectively deal with trees that should be a material consideration in the development process, there are three sub-categories which are intended to reflect arboricultural, landscape and cultural values respectively. Category U trees are those which would be lost in the short-term for reasons connected with their poor physiological or structural condition. They are, for this reason, not usually considered in the planning process.

In assigning trees to the A, B or C categories the presence of any serious disease or tree related hazards are taken into account. If the disease is considered fatal and / or irremediable, or likely to require sanitation for the protection of other trees it may be categorised as U, even if they are otherwise of considerable value.

Category (A) – trees whose retention is most desirable and is of high quality and value. These trees are considered to be in such a condition as to be able to make a lasting contribution (a minimum of 40 years) and may comprise:

- Trees which are particularly good examples of their species especially rare or unusual, or essential components of groups or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue);
- Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups); and
- Trees or groups or woodlands of significant conservation, historical, commemorative or other value (e.g. Veteran or wood-pasture trees).

Category (B) – are trees whose retention is considered desirable and are of moderate quality and value. These trees are considered to be in such a condition as to make a significant contribution (a minimum of 20 years) and may comprise:

- Trees that might be included in the high category but because of their numbers or slightly impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage), are downgraded in favour of the best individuals;

- Trees present in numbers such that they form distinct landscape features and attract a higher collective rating than they would as individuals. Individually these trees are not essential components of formal or semi-formal arboricultural features, or trees situated mainly internally to the site and have little visual impact beyond the site; and
- Trees with clearly identifiable conservation or other cultural benefits.

Category (C) – are trees that could be retained and are considered to be of low quality and value. These trees are in an adequate condition to remain until new planting could be established (a minimum of ten years) or are young trees with a stem diameter below 150mm and may comprise:

- Trees not qualifying in higher categories;
- Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value and or trees offering low or only temporary screening benefit; and
- Trees with very limited conservation or other cultural benefits.

Category (U) – trees for removal are those trees in such a condition that any existing value would be lost within 10 years and which should in the current context be removed for reasons of sound arboricultural management. Trees within this category are:

- 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;
- Trees that are dead or are showing signs of significant, immediate or irreversible overall decline; and
- Trees infected with pathogens of significance to the health and or/safety of other trees nearby trees or very low quality trees suppressing adjacent trees of better quality.

Species has been recorded by common name and recorded as such in the Tree Schedule. Height has been estimated in metre and stem diameters have been measured at 1.5 metres above ground level and recorded in millimetres (unless otherwise stated). Crown spreads have been measured in half metres and taken to the point of greatest spread unless the crown has presented a pronounced asymmetrical form and therefore measurements have been taken for the four cardinal points. The measurements have always been considered in the following sequence, North, East, South, and West, and therefore appear as such within the Tree Schedule.

In the assessment particular consideration has been given to the following when deciding the most appropriate British Standard Category and Sub-Category allocation:

a. the health, vigour and condition of each tree;

b. the presence of any structural defects in each tree and its life expectancy;

c. the size and form of each tree and its suitability within the context of the proposed scheme; and

d. the location of each tree relative to existing site features, e.g. its value as a screen or as a skyline feature.

Age class is assessed according to the age class categories referred to in BS 5837.

- Y: Young trees up to five years of age;
- SM: Semi-mature, trees less than 1/3 life expectancy;
- EM: Early mature, trees 1/3 – 2/3 life expectancy;
- M: Mature trees over 2/3 life expectancy;
- OM: Over mature – declining or moribund trees of low vigour; and
- V: Veteran - characteristics have been noted where a tree exhibits certain characteristic features of veteran trees.

The overall condition of the tree, or group of trees, has been referred to as one of the following. A more detailed description of condition has been noted in the Tree Schedule and discussed in the main text of the report.

- Good: A sound tree, trees, needing little, if any, attention;
- Fair: A tree, trees, with minor but rectifiable defects or in the early stages of stress, from which it may recover;
- Poor: A tree, trees, with major structural and physiological defects or stressed such that it would be expensive and inappropriate to retain; and
- Dead: A tree, trees, no longer alive. However, this could also apply to those trees that are dying and will be unlikely to recover, or are / have become dangerous.

Major defects or diseases and relevant observations have also been recorded under Structural Condition. The assessment for structural condition has included inspection of the following defects:

- The presence of fungal fruiting bodies around the base of the tree or on the stem, as they could possibly indicate the presence of possible internal decay;
- Soil cracks and any heaving of the soil around the base indicating possible root plate movement;
- Any abrupt bends in branches and limbs resulting from past pruning, as it may be an indication of internal weakness and decay;
- Tight or weak 'V' shaped unions and co-dominant stems;

- Hazard beam formations and other such biomechanical related defects (as described by Claus Mattheck, Body Language of Trees HMSO Research for Amenity Trees No. 4 1994);
- Cavities as a result of limb losses or previous pruning;
- Broken branches;
- Storm damage;
- Canker formations;
- Loose bark;
- Damage to roots;
- Basal, stem or branch / limb cavities;
- Crown die-back;
- Abnormal foliage size and colour;
- Any changes to the timing of normal leaf flush and leaf fall patterns; and
- Other pathological diseases affecting any part of the tree.
- Major defects or diseases and relevant observations have also been recorded. Dead wood has been defined as the following:
    - Twigs and small branch material up to 5cm in diameter;
    - Minor dead wood 5cm to 10cm in diameter; and
    - Major dead wood 10cm in diameter and above.

The survey was completed from ground level only, aerial inspection of trees was not undertaken. Investigations as to the internal condition of a tree have not been undertaken. Further investigations of this type can be made and have been recommended where it has been considered necessary, within the report although these investigations are beyond the scope of this report.

Evaluation of the trees condition given within this assessment applies to the date of survey and cannot be assumed to remain unchanged. It may be necessary to review these within 12 months, in accordance with sound arboricultural practice.

The individual positions of trees and groups of trees recorded in the Tree Schedule have been shown on the Tree Constraints Plan. The positions of trees are based on a topographical / land survey supplied by the client in dwg. format for the purpose of plotting the trees.

The Root Protection Areas (RPA) to be required by the individual and groups of trees are indicated by the Tree Constraints element of the above plans. The Root Protection Areas are formulated as described below.

Below ground constraints to future development is represented by the area surrounding the tree that contains sufficient rooting volume to ensure survival of the tree, which need protecting in order for the tree to be incorporated into any future scheme, without adverse harm to the tree or structural integrity of buildings. This is referred to as the RPA and is shown as a circle of a given radius.

The circle may be modified in shape to maintain a similar total area depending on the presence of surrounding obstacles. Where groups of trees have been assessed, the RPA has been shown based on the maximum sized tree in any one group and so would automatically exceed the RPA's required for many of the individual specimens within the group. The RPA is equivalent to a circle with a radius 12x the stem diameter for single stem trees and 10x the basal diameter for trees with more than one stem arising less than 1.5 meters above ground level.

APPENDIX 2: TREE SCHEDULE

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Tree No	Species	Height (m)	Stem Diameter (mm)	Crown Spread				Crown Height	Hight of First Brach	Direction of First Branch	Age Class	Condition		Tree description	Estimated years remaining	Grade Category
				N	E	S	W					P	S			
T1	Lime	8	450	5	4	4.5	4.5	GL	2	MS	EM	G	G	Well-structured twin stem form that shows as a notable feature tree in the street scene. Expanding stem growth is now pushing through boundary wall with heavy damage to wall having now been sustained.	>20	C1
T2	Cherry	5	270	1	2.5	4	4	1	2	MS	OM	P	P	Tree in heavy terminal decline with only small section of live foliage remining.	<2	U
T3	Sycamore	8	320	3.5	3	3	3	1.5	2	MS	SM	G	G	Off site tree of good form that shows significant site crown overhang. Root spread onto site likely to have been limited by perimeter retaining wall.	>20	C2
T4	Sycamore	6	240	2.5	2.5	2	2.5	1	2	MS	SM	P	P	Offsite tree of poor form that shows minor site crown overhang. Root spread onto site likely to have been limited by perimeter retaining wall.	<5	U
T5	Sycamore	8	400	3	4	2.5	3.5	1	2	W	SM	F	F	Offsite tree of asymmetrical form that shows significant site crown overhang. Root spread onto site likely to have been limited by perimeter retaining wall.	>20	C2
T6	Sycamore	9	500	4	4	5	4.5	2	2	W	EM	G	F	Large multistem offsite tree than dominates this northern tree line. Shows significant site crown overhang with low hanging sections. Root spread onto site likely to have been limited by perimeter retaining wall.	>20	C2
T7	Norway maple	10	450	4	4	5	4	4	2	N	EM	G	G	Well-structured off-site tree that presents as a key landscape feature tree. Shows minor site overhang to the south.	>40	B1

G: Good
F: Fair
P: Poor
Y: Young
S: Semi mature
E: Early mature
M: Mature
MD: Multi directional

APPENDIX 3: TREE CONSTRAINTS PLAN

Tree Constraints Plan showing existing layout against BS5837:2012 tree categories & Root Protection Areas

BS5837 Categories

Canopy and stem colour denotes BS5837 category. Pink denotes Root Protection Area.

-Category A (Green)
-Category B (Blue)
-Category C (Grey)
-Category U (Dark Red)

Category A

Trees of high quality with an estimated remaining life expectancy of at least 40 years.

Category B

Trees of moderate quality with an estimated remaining expectancy of at least 20 years.

Category C

Trees of low quality with an estimated remaining life expectancy of at least 10 years, or a stem diameter below 150mm.

Category U

Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

No.	Revision/Issue
1	P82JrAug23_TCPex_FV1.dwg

Arborclimb Consultants
6 Charlesfield Road, Horley
RH6 8BL
Tel: 07533793587

Project Name and Address
Land R/O 14-16 Vicarage Park
Plumstead
London
SE18 7S

Project
Land R/O 14-16 Vicarage Park

Sheet

Date
03/08/2023

Scale
1:100

APPENDIX 4: TREE PROTECTION PLAN

Tree Protection Plan showing proposed layout against BS5837:2012 tree categories & Root Protection Areas

Crown Pruning
Facilitation crown pruning of T3 and T7 is as detailed within section 5.11 to 5.15 of the main report.

On site Root Growth
Perimeter boundary wall anticipated to have had at least a minor influence on on-site root spread from T3 to T5. RPA overlap with proposed site building is therefore likely to be less than shown on this plan. Minor root pruning (Section 5 of main report), can then be undertaken to manage any root constraints in this location.

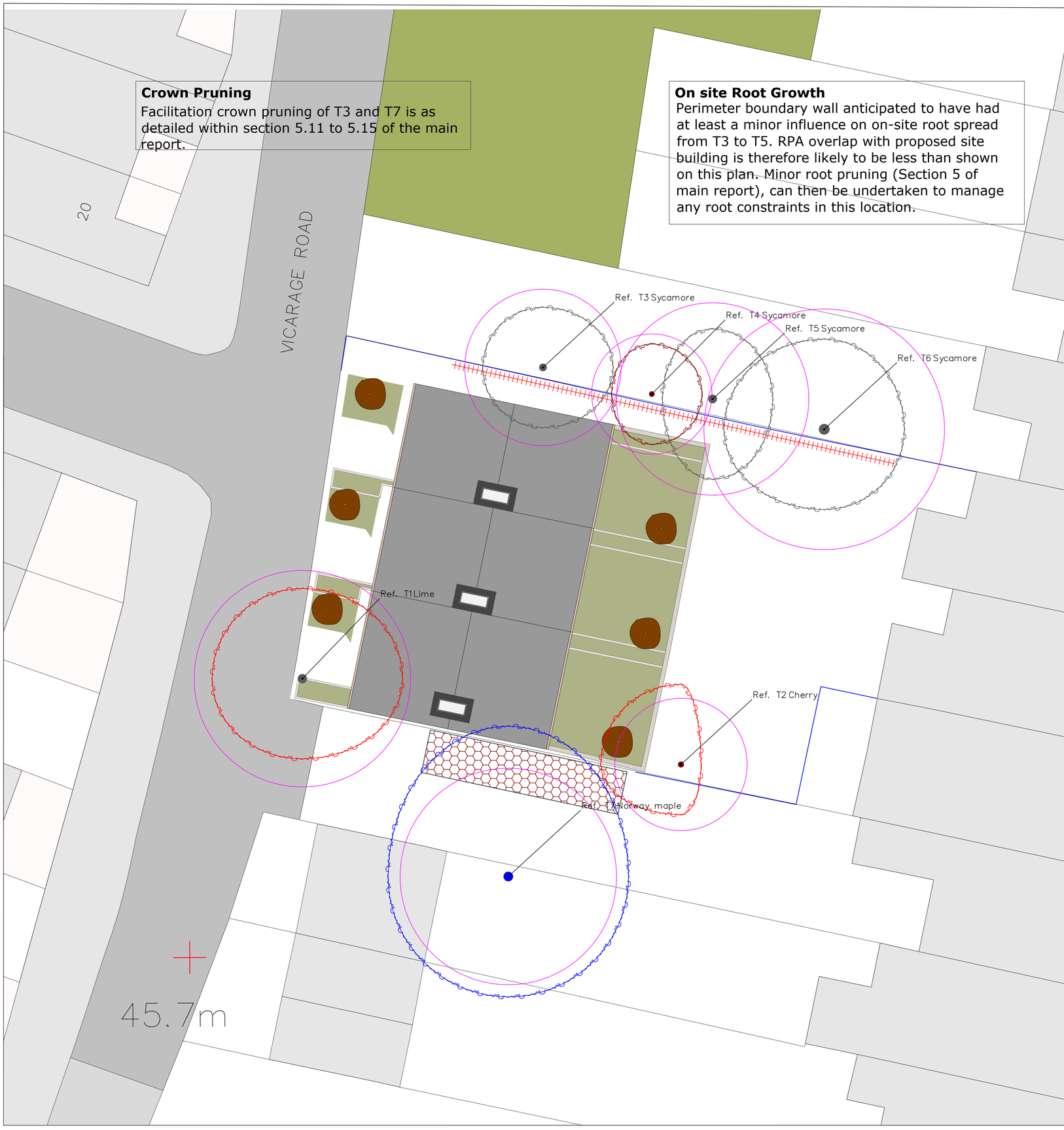

Figure 1. Tree Protection Fencing

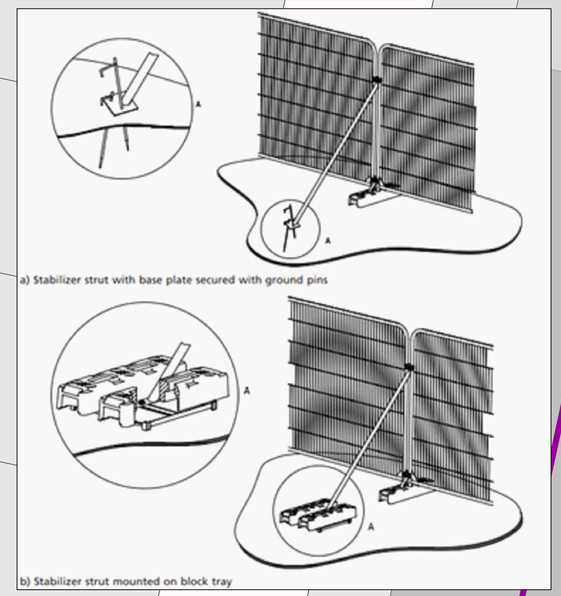

Figure 2. Tree Protection Singage

Figure 3. Light Duty Ground Protection (Ground Guard)

BS5837 Categories
Canopy and stem colour denotes BS5837 category. Pink denotes Root Protection Area.

-Category A (Green)
-Category B (Blue)
-Category C (Grey)
-Category U (Dark Red)

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

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

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

Category U
Trees in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

Trees to be removed
See Section x of main report

Tree protection fencing (figs 1 and 2)
See Section 5 of main report.

Ground protection (construction, fig 3)
See Section 5 of main report

Proposed tree planting

No.	Revision/Issue
1	P82jrDec23_TCPpr_FV4.dwg

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Project Name and Address
Land R/O 14-16 Vicarage Park
Plumstead
London
SE18 7S

Project	Sheet
Land R/O 14-16 Vicarage Park	
Date: 11/12/2023	
Scale: 1:100	

APPENDIX 5: LEGISLATION AND POLICY CONTEXT

LEGISLATION

The Town and Country Planning (Tree Preservation) (England) Regulations (2012)[4]

A Tree Preservation Order is an order made by a local planning authority in England to protect specific trees, groups of trees or woodlands in the interests of amenity. An Order prohibits, without the local planning authority's written consent, the following works to trees:

- Cutting down
- Topping
- Lopping
- Uprooting
- Wilful damage
- Wilful destruction

Similarly, trees in a Conservation Area that are not protected by an Order are protected by the provisions in section 211 of the Town and Country Planning Act 1990. These provisions require issue of a section 211 notice six weeks before carrying certain work on such trees. This notice period gives the authority an opportunity to consider whether to make an Order on the tree.

PLANNING POLICY

National

National Planning Policy Framework (2021)

The National Planning Policy Framework (NPPF) 2021 sets out the Government's planning policies for England, including how plans and decisions are expected to apply a presumption in favour of sustainable development.

Chapter 15 of the NPPF focuses on conservation and enhancement of the natural environment, stating plans should recognise 'the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland'.

It goes on to state: 'if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused'. Alongside this, it acknowledges that planning should be refused where irreplaceable habitats such as ancient woodland or veteran trees are lost.

Regional

London Plan 2021

Policy G7 Trees and Woodland

a. London's urban forest and woodlands should be protected and maintained, and new trees and woodlands should be planted in appropriate locations in order to increase the extent of London's urban forest – the area of London under the canopy of trees

b. In their Development Plans, boroughs should:

1) protect 'veteran' trees and ancient woodland where these are not already part of a protected site

2) identify opportunities for tree planting in strategic locations. B

c. Development proposals should ensure that, wherever possible, existing trees of value are retained. If planning permission is granted that necessitates the removal of trees there should be adequate replacement based on the existing value of the benefits of the trees removed, determined by, for example, i-tree or CAVAT or another appropriate valuation system. The planting of additional trees should generally be included in new developments – particularly large-canopied species which provide a wider range of benefits because of the larger surface area of their canopy.

Local (Royal Borough of Greenwich)

Local Plan (2014)

Policy DH1 Design

All developments are required to be of a high quality of design and to demonstrate that they positively contribute to the improvement of both the built and natural environments. To achieve a high quality of design, all developments are expected to:

i. provide a positive relationship between the proposed and existing urban context by taking account of:

- topography, landscape setting, ridges and natural features;
- existing townscapes, local landmarks, views and skylines;
- the architecture of surrounding buildings;
- the need to retain trees in line with Policy OS(f) and Policy OS(g);
- the quality and nature of materials, both traditional and modern;
- established layout and spatial character;
- the scale, height, bulk and massing of the adjacent townscape;
- architectural, historical and archaeological features and their settings;
- the effective use of land;
- the potential for a mix of uses;

- patterns of activity, movement and circulation particularly for pedestrians and cyclists;
- the cultural diversity of the area; and
- acceptable noise insulation and attenuation;

ii. promote local distinctiveness by providing a site-specific design solution;

iii. demonstrate that the development contributes to a safe and secure environment for users and the public (See Policy CH1);

iv. achieve accessible and inclusive environments for all, including disabled people;

v. create attractive, manageable well-functioning spaces within the site;

vi. maximise energy conservation, through effective layout, orientation, use of appropriate materials, detailing and landscape design (also see Policy E1);

vii. benefit Royal Greenwich by helping mitigate and adapt to climate change;

viii. enhance biodiversity consistent with the Greenwich Biodiversity Action Plan;

ix. incorporate living roofs and/or walls in line with Policy E(f);

x. demonstrate on-site waste management including evidence of waste reduction, use of recycled materials and dedicated recyclable waste storage space;

xi. Demonstrate water efficiency and demand management measures;

xii. wherever possible, ensure building materials are responsibly sourced and minimise environmental impact;

xiii. demonstrate measures that reduce surface water flood risk and landscape the environment in a way that provides for permeable surfaces;

xiv. meet the requirements of Policy H5 for residential schemes;

xv. integrate with existing path and circulation networks and patterns of activity particularly for pedestrians and cyclists; and

xvi. for non-residential buildings in major developments, achieve a BREEAM rating of 'Excellent.'

Policy OS(f) Ecological Factors

Development proposals will be expected to take account of ecological factors, in particular paying attention to the need for:

i. Consideration of the biodiversity and geological features of the site and the surrounding area, including protected species (Refer to Policy OS4). These features should be respected and the area's natural character enhanced;

ii. A survey of flora and fauna on Sites of Importance for Nature Conservation and on sites over one hectare to enable decisions to be made regarding their conservation;

iii. An appropriate level of survey to enable decisions to be made about the existing trees on the site. Development decisions will be based on the requirement:

- To protect trees and their root systems from damage as a result of the development both during and after building operations;
- To achieve an appropriate replacement of trees taking account of size, coverage and species where it is agreed that existing trees can be felled;
- That landscaping schemes should include environmentally appropriate planting using locally native species and demonstrate appropriate irrigation plans for landscaping; and
- To ensure that planting design does not impact negatively on personal safety and accessibility;

iv. The retention of trees and the protection and enhancement of natural and ecological features, tree ridge lines, green corridors, wildlife habitats, boundary walls, surface materials, hedges and other features where these will contribute to the biodiversity; and

v. The protection, enhancement and restoration of natural river features and corridors by appropriate landscaping and design.

APPENDIX 6: TREE PROTECTION MEASURES (GENERAL)

TREE PROTECTION (INTRODUCTION)

Prior to any construction works (including vehicular movements) taking place, all relevant tree protective measures will be in place around all retained trees within the construction vicinity of the site. It shall be set out as per the detail on a Tree Protection Plan.

These protective measures ensure suitable protection of trees and associated soils, with the key method of tree protection being through the use of fencing and ground protection.

Tree protection fencing should be set out as per the detail on the Tree Protection Plan and identified as such using appropriate signage.

TREE PROTECTION FENCING (BS5837)

The tree protection fencing should comprise 1.8m Heras fencing around retained trees. Once erected, this should not be moved or relocated without approval from the Council Tree Officer.

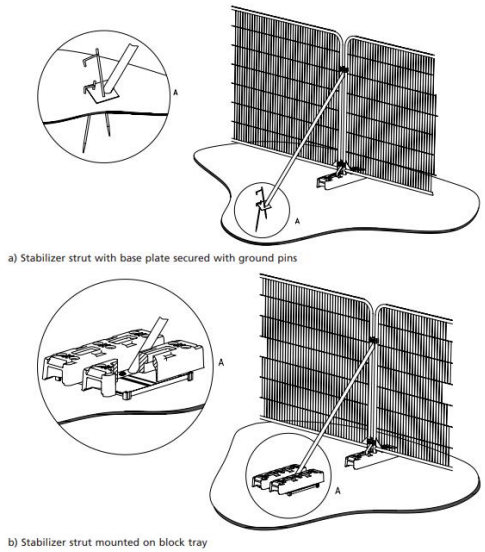
The tree protection area behind the Heras fencing (the Construction Exclusion Zone) will be sacrosanct throughout development and no access will be allowed to this area including (for example) the storage of or moving of materials or machinery.

In the Construction Exclusion Zone, there will be no excavations or increases in soil level without prior approval from the Council Tree Officer.

The Heras fencing will be secured using footings to prevent movement of the protective fencing and ensure its rigid installation (Figure A3.1).

There will be clear and visible signs (below) attached to the protective fencing with the wording, "Tree Protection Area – Keep Out". This area will be checked prior to the commencement of work by the Site Manger and throughout the course of development.

Figure A3.1 BS5837 Tree Protection Fencing



The tree protection fencing denotes the Construction Exclusion Zone. Therefore, careful consideration must be given when planning site operations to ensure that wide or tall loads or plant with booms, jibs and counterweights can operate without coming into contact with retained trees. Any transit or traverse of plant in close proximity to trees should be conducted under the supervision of a banks person to ensure that adequate clearance from trees is maintained at all times.

Material that will contaminate the soil such as concrete mixing, diesel oil and vehicle washing should not be discharged within 10 m of the tree stems. Furthermore, no fire shall be lit or liquids disposed of within 10 m of an area designated as being fenced off or otherwise protected in the scheme.

At the end of the project the Heras fencing should be removed only after confirmation by the Council Tree Officer.

A copy of the Tree Protection Plan(s) should be located within the site cabins throughout the course of development works. This will include details of the fencing specification and location for which the fence will be erected. This plan will be printed at no less than A1 in size to ensure easy reading of all the detail contained within.

For the duration of the works phase the Tree Protection Fencing should be fixed around at least the calculated RPAs for on site trees to be retained.

TREE PROTECTION SIGNAGE (EXAMPLES)

To accompany the tree protection fencing, clear and visible signage should be attached to advise of the need for the fencing to remain sacrosanct and intact throughout the course of the development, subject to advice from the ACoW or council tree officer.

ROOT PROTECTION AREA GROUND PROTECTION

For new hard surfaces (such as roads and paving) required as part of the development or for wheeled or tracked construction traffic within the RPA's of trees to be retained, suitable ground protection should be designed by the project engineer and arboriculturalist to accommodate the likely loading.

This would likely require the use of proprietary systems such as the "no-dig" three-dimensional cellular confinement, specifically designed for tree root protection. This follows the guidance in BS5837 Section 6.2.3.3.

All areas requiring such protection should be shown on the Tree Protection Plan.

The stated ground protection within all retained trees will not require any excavation or alteration in ground levels other than through the installation of the specified ground protection and road surface, which should remain porous and non-compacting by design.

WORKS WITHIN ROOT PROTECTION AREAS

Site redesign level changes

It is generally bad arboricultural practice to modify the soil levels within an RPA of trees to be retained. Lowering levels can remove the fibrous root network, expose roots, as well as damage the delicate structure of the top soil, which may include mycorrhizal fungi. Increasing levels can result in problems of soil compaction and as well as a significant reduction in the ability of the tree to obtain and absorb nutrients, water and perform gaseous exchange.

Depending on the ground conditions and species, there is sometimes scope for minor level changes provided (in the case of level increases) the fill level is sufficiently porous in terms of air and water.

Both hard and soft landscaping for the RPA's of retained trees should so designed to retain the existing site levels; therefore, preventing any associated root damage or soil compaction.

Installation of subterranean utilities

Given the destructive impacts that trench excavation can have on tree roots and the subsequent physiological and structural health of trees, all subterranean utility lines across the site should be designed to avoid the RPA's of retained trees. If required, best practice here includes utilising trenchless insertion techniques, or the use of air spading and soft hand digging to expose the rooting area prior to the laying of utilities.

Exposed Roots and Root Pruning

During any of the stated excavation works (such as for the removal of existing hard surfacing or the installation of new utilities), any exposed roots of retained trees (if not immediately re-covered), should be wrapped or covered with a wet hessen sack (or similar), to prevent desiccation. Any wrapping should be removed prior to backfilling, which should take place as soon as possible.

Prior to backfilling, retained roots should be surrounded with topsoil or uncompacted sharp sand (builders' sand should not be used because of its toxic high salt content), or other loose inert granular fill, before soil is replaced.

Should root pruning be required then anything smaller than 25 mm diameter may be pruned back, making a clean cut with a suitable sharp tool (secateurs or pruning saw), except where they occur in clumps. All such works will however be overseen by the project ACoW.

Landscaping within RPAs

Any RPAs presently in uncovered areas (such as grass and open ground) which are to be modified as part of the development of the site, will need to be designed to remain porous and to minimise compaction. This allows for continued gaseous, water and nutrient exchange to take place between the air, soil and roots, vital to the continuous health of the trees. Surfaces here include block paving, asphalt, loose gravel, grass and gravel retention systems (e.g. Golpla) resin bound gravel, etc.

For proposed soft landscaping works within tree RPAs, heavy mechanical cultivation such as rotavating should be avoided. Any such cultivation operations should be undertaken carefully by hand in order to minimize damage to tree roots.

Any proposed reconstruction to existing hard surface areas adjacent to retained trees will need to be undertaken sympathetically with respect to any unearthed tree roots, the following best practice procedure must be followed.

- *Any existing hard surfacing will need to be carefully lifted using hand tools and/or hand operated power tools only; taking care not to damage any surface tree roots that maybe present. (small diggers may be suitable in some circumstances, under the watch of the project arboricultialist).*

AVOIDING CROWN AND STEM DAMAGE

While facilitation pruning and tree protection will minimise any potential risk, care and vigilance must be taken to avoid crown and stem damage when working with machinery near the retained trees. Plant machinery with booms, jibs and counterweighs/ tall or wide loads should be controlled by banksman to maintain adequate clearance. Machinery will remain outside of the Development Exclusion Zone as denoted by HERAS fencing and signage.

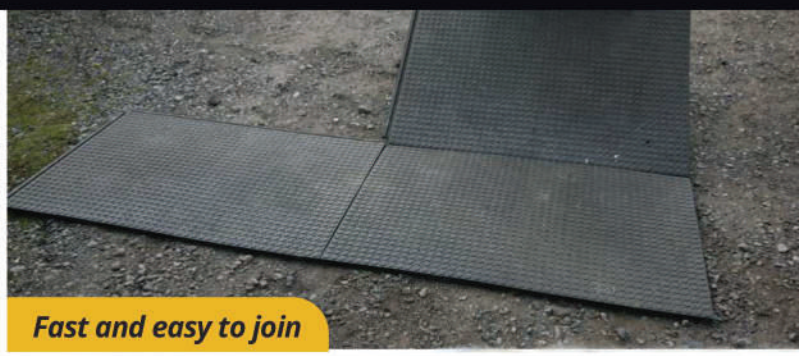
SITE OFFICE, DELIVERIES & TEMPORARY SITE STORAGE

All site office, storage and any welfare facilities required should be located outside of the RPAs of retained trees. Any changes to this would need to be first agreed with the ACoW or Council Tree Officer.

APPENDIX 7: TEMPORARY GROUND PROTECTION

FastCover

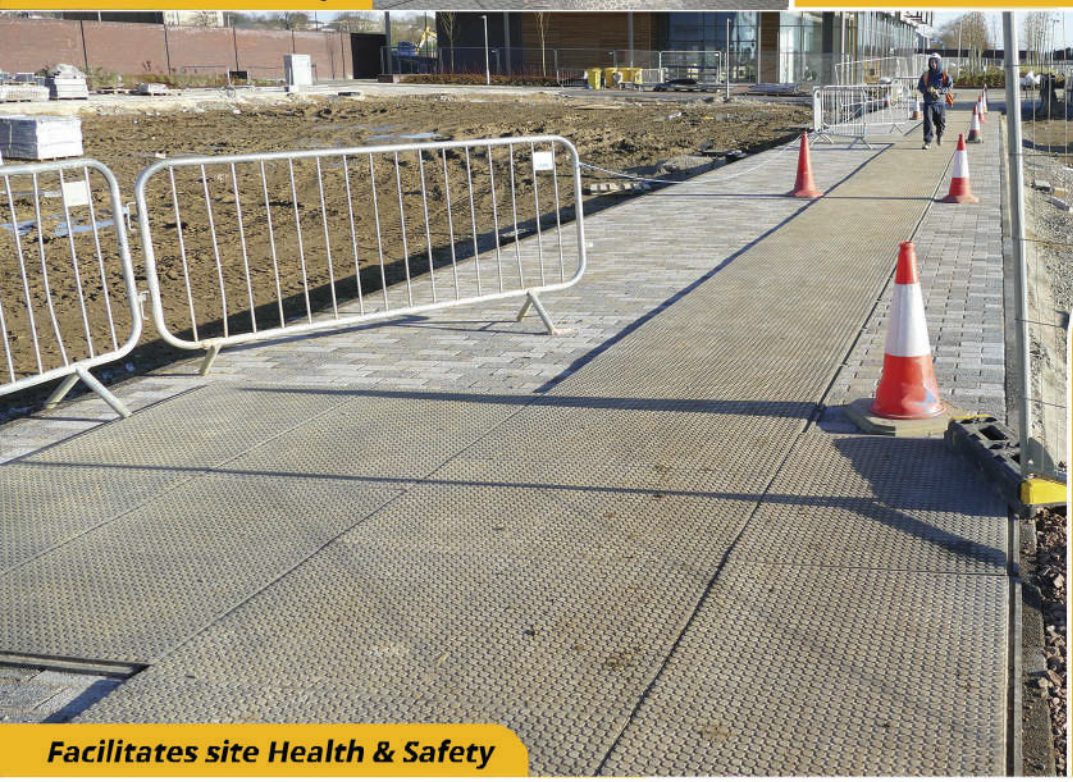
Site walkway



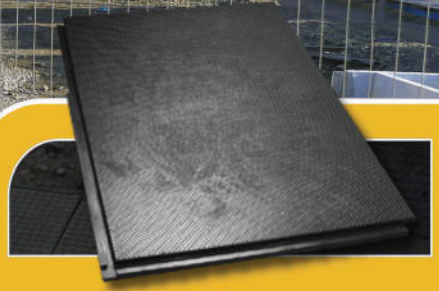
Fast and easy to join

Warehouse flooring

Ideal as a temporary construction site car park



Facilitates site Health & Safety



DIMENSIONS & WEIGHT

Length:..... 1200mm
Width:..... 800mm

Core Thickness:..... 22mm (Option 1)
..... 43mm (Option 2)

Weight:..... 20kg (Option 1)
..... 32kg (Option 2)

GroundGuards®

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info@ground-guards.co.uk
www.ground-guards.co.uk

REFERENCES

[1] British Standards Institution. (2012). 5837: *Trees in relation to design, demolition and construction - Recommendations*. London: BSI.

[2] Legislation.gov.uk. (2012). *Town and Country Planning Act 1990*. [online] Available at: https://www.legislation.gov.uk/uksi/2012/605/contents/made.

[3] British Geological Society (2019). Geology of Britain [interactive web map]. Available at: http://mapapps.bgs.ac.uk/geologyofbritain/home.html [Accessed 21 Jan 2019].

[4] British Standards Institution. (2010). 3998: *Tree Works - Recommendations*. London: BSI.

[5] NJUG. (Issue 2: 16th November 2007). Guidelines for The Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees. (http://streetworks.org.uk/wp-content/uploads/2016/09/V4-Trees-Issue-2-16-11-2007.pdf)