BS 5837:2012 Arboricultural Survey

Land at Richmond upon Thames College

Presented to **Clarion Housing Group**

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Report Details

Client	Clarion Housing Group
Report Title	BS 5837:2012 Arboricultural Survey
Site Address	Richmond Upon Thames College, Egerton Road, Twickenham, TW2 7SJ
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Quality Assurance

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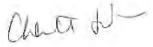
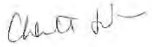
1	Final	24th March 2021				
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Executive Summary

Purpose	Delta-Simons Environmental Consultants Ltd was instructed by Clarion Housing Group ('the Client'), to undertake a Tree Survey to BS 5837:2012 standard of an area of land situated at Richmond upon Thames College, Twickenham, in Middlesex ('the Site'). The survey was undertaken on 10th February 2021. The survey was undertaken to inform a planning application for the Site.
Current Site Status	The Site is a disused college comprising college buildings and hard and soft landscaping. Car parking and the main entrance to the Site are accessed from the south-west.
Proposed Development	It is understood that the Site is proposed for development to comprise 180 residential units with access via the college site and Longhorn Drive to the north for both residential and construction traffic.
Results	A total of 13 trees and nine tree groups were identified and assessed as part of the Tree Survey. The results of the desk search following an email request to London Borough of Richmond upon Thames Council on 09/02/2021 indicates that no trees on or immediately adjacent to the Site are covered by a Tree Preservation Order (TPO) or fall within a Conservation Area (CA). Two trees within Tree Group (TG)5 in the north-eastern extent, Tree(T)13, one tree from TG15, trees within TG17, together with two trees within TG22 located inside an internal courtyard, were assessed as offering low Bat Roost Potential (BRP), with extensive ivy coverage and rot holes.
Recommendations	<u>Recommendation 1 – (Adequate Tree Protection)</u> Those trees identified within the proposed development plan for retention will need to be adequately protected during any construction works. Measures to protect trees should follow the best practice principles set out in BS 5837: Trees in Relation to Design, Development and Construction (2012). Prior to any construction or development work proceeding, the Root Protection Area (RPA) of individual trees to be retained should be marked out. Marking out should be completed by a competent person with arboricultural expertise. All trees that could be impacted should be protected by barriers or ground protection around the calculated RPA, and as indicated on the Tree Constraints Plan (TCP) produced in association with this Assessment. <u>Recommendation 2 – Low BRP Trees</u> ▲ Any proposed felling or management works to two trees within TG5, T13 a plum tree within TG15, trees within TG17 or two trees within TG22, assessed as having low BRP, should be completed under a method statement which could include a single dawn survey completed during the active bat season (April-October, inclusive) on the morning prior to the works being undertaken; or ▲ Alternatively, a licenced bat ecologist trained to use specialist tree climbing equipment could undertake a thorough inspection of the potential roost features immediately prior to works commencing.
This Tree Survey Executive Summary is intended as a summary of the assessment of the Site based on information received by Delta-Simons at the time of production. This Executive Summary should be read in conjunction with the full Report.	

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1.0 Introduction

1.1 Purpose and Scope of the Survey

Delta-Simons Environmental Consultants Ltd was instructed by Clarion Housing Group (the 'Client') to undertake an Arboricultural Survey to BS 5837:2012 standard. The survey was undertaken of an area of land situated at Richmond upon Thames College, Twickenham, in Middlesex (hereafter referred to as 'the Site'). The survey was undertaken on 10th February 2021. The Site location and the area surveyed are shown in Figure 1. The survey was undertaken in order to inform a planning application for redevelopment at the Site.

The aims of the Tree Survey were to:

- Identify the individual tree species present at the Site by means of visual inspection;
- To define the approximate age, condition and canopy spread of all individual mature trees identified and the value of these within the development;
- To identify any trees that present a risk to existing or proposed foundations or other structures that may be constructed on the Site and recommend actions to remove this risk; and
- Recommend tree management or mitigation measures where appropriate.

1.2 Site Description

The Site is centred at Ordnance Survey (OS) grid reference TQ 15519 73713, to the north of Twickenham in south-west London. The Site covers an area of 1.94 hectares (ha) and comprises a college with associated buildings and hard and soft landscaping. Car parking and the main entrance to the Site are accessed from the south-east.

The north of the Site is bordered by a new college facility and residential properties fronting Egerton Road. The eastern boundary is defined by a linear group of deciduous and coniferous trees adjacent to Egerton Road. The southern boundary is bordered by residential housing fronting Craneford Way, and the western boundary is adjacent to residential and commercial properties with associated amenity land. The Site layout and area surveyed is shown in Figure 2.

1.3 Proposed Development

It is understood from the Outline Master Plan provided by the Client (Drawing 1) that the Site is proposed for development to comprise 180 residential units that would be delivered in two phases as detailed in the outline consents (REF: 18/4157/RES dated 02.08.19) with a single point of vehicular entry via the college site and Longhorn Drive for both residential and construction traffic.

2.0 Legislation

2.1 Trees

Local planning authorities look upon trees as being highly beneficial to the locality. To ensure that any important specimens, or significant groups of trees are retained, they may place Tree Preservation Orders (TPOs) on them. In other situations, villages or whole districts may be classified as conservation areas. In these instances certain trees in the designated area will be protected. When trees are protected, legal procedures must be followed before any work is carried out.

When trees are protected by Preservation Orders, no work should be carried out on them without prior written consent from the Local Planning Authority (LPA). Once an application is made, the Authority personnel must inspect the trees, and make a decision within a statutory eight-week period as to whether work can go ahead. If no decision is made within the eight weeks period, the appellant can appeal to the Office of the Deputy Prime Minister for non-determination. If the Local Authority (LA) refuses the application the appellant still has the right to appeal.

If a tree protected by a Preservation Order is either killed or wilfully destroyed, the owners of the tree, and the contractor who did the work, can both be prosecuted. The fines for killing or wilfully destroying a tree can be high, i.e. the current maximum is £20,000 per tree, and there is an automatic requirement to re-plant. The current maximum for minor unlawful infringements, such as pruning, is £2,500.

Trees which are dead, dying, or dangerous are exempt from the legislation, although if such trees are removed, the onus on proving they fell into one of these categories lies with the tree owner. Whenever possible it is strongly recommended that the LA be given at least five days' notice before any work on such trees is carried out.

Trees in a conservation area that are already protected by a TPO are subject to the normal procedures and controls for any tree covered by such an Order.

Trees in a conservation area that are not protected by a TPO are protected by the provision in Section 211 of The Town and Country Planning Act (1990). These provisions require people to notify the LPA, using a 'section 211 notice', six weeks before carrying out certain works on such trees, unless an exception applies. The works may go ahead before the end of the six-week period if the LPA gives consent. This notice period gives the Authority an opportunity to consider whether to make an Order on the tree.

According to Annex 2 Glossary of the National Planning Practice Guidance, a veteran tree is a tree of exceptional wildlife, landscape or cultural value by virtue of its great age, size or condition. Local authorities, when determining planning applications affecting veteran trees are expected to consult the standing advice published jointly by Natural England and the Forestry Commission.

3.0 Methodology

The methodology set out below is a detailed summary of the suggested approach to tree assessment as described in British Standard 5837:2012. This Report has applied the methodology to all significant individual trees or groups of trees present at or near to the Site. Trees below 15 cm trunk diameter were generally excluded from the survey. All floral names follow the nomenclature of Stace (2010).

3.1 Trees

Trees have been broadly assessed based on guidance set out within the British Standard BS 5837:2012 Trees in Relation to Design, Development and Construction. This standard provides recommendations and guidance on the principles to be applied to achieve successful integration of development with trees, shrubs and hedgerows. Where development is to occur, the standard provides guidance on the approach needed to decide which trees are appropriate for retention, and the means for protecting these trees during the development (including demolition and construction works) and the means of incorporating trees into the developed landscape.

Trees on or adjacent to the Site have been divided into one of four categories (based on the cascade chart for tree quality assessment). These are classed as A, B, C or U (Section 4 of BS 5837) within Table 1. This gives an indication as to the tree's importance in relation to the Site, the local landscape and, also, the value and quality of the existing trees on-Site. This assists informal decisions 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 (see below).

Categories A, B and C cover trees that should be a material consideration in the development process, each with three further sub-categories (i, ii, iii) which are intended to reflect arboricultural, landscape and cultural (nature conservation) values. Category U trees may have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. In assigning trees to the A, B or C categories, the presence of any serious disease or tree–related hazard is 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 with a recommendation for work or even removal, even if they are otherwise of considerable value.

Category (A): Trees whose retention is most desirable and are 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, or groups of trees, 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 of significant conservation, historical, commemorative or other value (e.g. Veteran or wood-pasture trees).

Category (B): 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): Trees that could be retained but 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 150 mm 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 that are considered to have no significant landscape value but it is not presumed that there is any overriding need to remove these unless stated otherwise in the description and recommendations. They are for this reason not considered as being significant within the planning process. These trees will be in such a condition that any existing value would be lost within 10 years and which should in the current context be ignored or 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, or very low quality trees suppressing adjacent trees of better quality.

Species have been recorded by common and scientific name. Height has been estimated in metres and stem diameter measured in centimetres unless impractical, taken at a height of 1.5 m from the base of the tree.

In the assessment particular consideration has been given to:

- The health, vigour and condition of each tree;
- The presence of any structural defects in each tree and its life expectancy;
- The size and form of each tree and its suitability within the context of the proposed scheme; and
- 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 age less than 1/3 life expectancy;
- SM: Middle age trees 1/3 – 2/3 life expectancy;
- M: Mature trees over 2/3 life expectancy; and
- OM: Over mature – declining or moribund trees of low vigour.

The overall condition of any individual tree, or group of trees, has been referred to using one of the definitions listed below. A more detailed description of condition has been noted in the Tree Schedule:

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

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 5 cm in diameter.
Minor dead wood	-	5 cm to 10 cm in diameter.
Major dead wood	-	10 cm in diameter and above.

The survey was completed from ground level only. Aerial inspections were not undertaken. Evaluations of tree conditions given within this assessment apply to the date of survey and cannot be assumed to remain unchanged, and it may be necessary to review these within 24 months, in accordance with good arboricultural practice.

3.2 Potential for Protected Species

Potential bat roost locations are described within this Report using the methodology as that recommended by the Bat Conservation Trust (BCT), see Collins J. (ed) (2016) in references (Appendix A). Each tree of significant size assessed within this survey has also been assessed for the potential to provide roosts for bats and the table in Appendix B includes reference to this.

3.3 Tree Plans and Tree Schedules

The extent and positions of significant individual trees or groups of trees close to the Site are shown on the Arboricultural Survey Plan (Figures 2). The Root Protection Areas (RPA) of the key trees of value identified for, or recommended for retention have been marked within the Constraints Plan (Figures 3) using the RPAs provided in the Tree Schedule within Table 1.

A summary that includes the trees identified on or near to the Site is included in the Tree Assessment Report detailing information on each group of trees. This is also provided in Table 1. Within the summary table maximum RPAs (m²) for estimated tree diameters have been included where appropriate, as well as a calculated corresponding radius of the circle for that RPA. The RPAs are formulated as described below and assist when designing layouts in relation to trees.

3.4 Root Protection Area

Below ground constraints to development are represented by the root plate around a tree, which needs protecting in order for the tree to be incorporated into a proposed scheme without adverse harm to the tree or structural integrity of any proposed foundation structures.

This area is illustrated by the RPA and is calculated according to the formula set out in BS 5837:(2012). This area is equivalent to a circle with a radius 12 x the stem diameter for single stem trees or the basal diameter for trees with more than one stem arising less than 1.5 m above ground level.

RPA (m²) = (stem diameter (mm) x 12 / 1000) ² x 3.142

This figure should be capped to 707 m², that is, equivalent to a circle with a radius of 15 m, or a square with approximately 26 m sides

Taken from Table 2: Calculating the RPA, BS 5837 (2005).

3.5 Limitations of the Survey

There were no limitations to the survey in terms of timing and weather conditions. Where access to trees within off-Site land was not possible, approximations of the dimensions of the trees were made, including of the stem diameter at breast height. As most trees were clearly visible from the Site this is not anticipated to be detrimental to the survey.

4.0 Results

4.1 Data Search

The results of the desk search following an email request to London Borough of Richmond upon Thames Council on 09/02/2021 indicates that no trees on or immediately adjacent to the Site are covered by a Tree Preservation Order (TPO) or within a Conservation Area (CA).

4.2 Survey Details

The tree inspection took the form of a walkover inspection completed by Peter Morrell TechArbA on 10th February 2021. Each individual tree of significance that could be impacted upon by any proposed development was identified and visually inspected and classified. The trees identified during the survey at the Site have been individually noted and identified within this Report and are shown in the Tree Survey Plan within Figures 2, and within the Photograph Section of this Report (Appendix C).

4.3 Mature, Semi-Mature Trees

A total of 13 individual Trees (T) and nine Tree Groups (TG) have been identified and assessed as part of the tree survey. The majority of trees surveyed lay within landscaped areas of the Site or around the boundaries. Three individual (T1 – T3) trees and two groups (TG16 and TG17) of trees stood outside the boundary, and of these, a tree and tree group supported canopies that extend into the Site.

4.3.1 Species and their Arrangement in the Landscape

There are a limited range of tree species on, and immediately adjacent to, the Site, with no dominant species. Cherry *Prunus* sp., holly *Ilex aquifolium*, alder *Alnus glutinosa*, purple leaved plum Prunus pissardii 'Nigra', Portugal laurel *Prunus lusitanica*, Lawson cypress *Chamaecyparis lawsoniana*, sycamore *Acer pseudoplatanus*, silver birch *Betula pendula*, elder *Sambucus nigra*, willow *Salix* sp., pedunculate oak *Quercus robur*, white poplar *Populus alba, ,* and Leyland cypress *x Cupressocyparis leylandii*, are present in multiple numbers. Apple *Malus* sp., tree of heaven *Ailanthus altissima*, goat willow *Salix caprea*, ash *Fraxinus excelsior,* and hornbeam *Carpinus betulus,* are represented as single specimens.

Trees and tree groups are found along the north-eastern boundary, adjacent to the south-eastern, eastern and southern boundaries, and randomly dispersed within the central area. Two tree groups, TG16 and TG17, immediately adjacent to the south-western boundary, are off-Site, with the canopy of TG16 extending into the Site. Trees T1-3 are off-Site beyond the north-eastern boundary.

4.3.2 Height and Significance in the Landscape

The trees comprising TG6, at an average height of 13 m, together with TG4 standing up to 11 m, are by their positions along, and adjacent to the Site's north-eastern boundary, highly visible when viewed from Egerton Road and offer good screening into and out of the Site. They also contribute significantly to the street scene. For this reason, these trees are placed within Category B (see Table 1).

Trees T8 to TG15, on the southern boundary standing up to 14 m, dominate the area within which they stand. However, their contribution to the wider area is restricted by the surrounding college buildings and residential housing. For this reason, these trees are placed within Category B or C depending on their condition.

The remaining on-Site trees are either immediately adjacent to buildings or within internal courtyards with limited visibility of them outside of the college grounds. For this reason, these trees are placed within Category C.

4.3.3 Age and Condition

The trees present within the Site are semi-mature or mature. A number of the trees within the Site boundary show signs of past management in the form of crown lifting and crown reduction within areas of hardstanding and footpaths.

Adjacent to the Site's north-eastern boundary, TG6, a mixed deciduous group, with stature ranging from semi-mature to mature, is in varying degrees of health. The cherries in the group appear to have occasional mower damage to the root system and girdled roots.

Within an internal area of the Site, a willow in TG22 supported damage to roots and decay was present on the main stem from root flare to 0.5 m.

Adjacent to the Site's southern boundary, T13, a mature sycamore with an unbalanced crown, which has been regularly pruned to the southern aspect, appeared to be in good health at the time of the survey, though supported a rot hole on the main stem.

The remainder of on-Site trees appear to be in fair condition.

4.3.4 Environmental Condition

Given the Site's former use as an educational facility and the semi-mature and mature age of the majority of the trees, it is surmised that no damage to the root system of boundary and on-Site trees has been sustained through any recent on-Site working practices. The trees on-Site and immediately adjacent to the Site are not in an exposed position, having been protected from prevailing winds by the surrounding buildings.

Groundwater conditions are not assessed to be a significant factor in present or future growth or health of trees since the generally flat Site appears to be well drained and this situation will probably improve further following completion of any development.

4.3.5 Bat Roost Potential

Two trees within TG5 in the north-eastern extent, T13, one tree from TG15, trees within TG17, together with two trees within TG22 located inside an internal courtyard, were assessed as offering low Bat Roost Potential (BRP) as a result of the presence of extensive ivy coverage and rot holes

4.4 Tree Schedule

Table 1 – BS 5837:2012 Tree Schedule

	Tree Species		Measurements				Crown (m)					Tree Condition								Management
Tree Number	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Average Height	N	E	S	W	Roots	Stem	Crown	Comments	Structural	Life Expectancy (yrs)	Category	RPA (m)	Works
T1	Cherry	*Prunus* sp.	SM	5	1	210	4	3	3	2	3	Girdled to the west of the root flare	Single stem. Vertical	Balanced, previously reduced	Damage to basal area to the east	F	<20	C2	2.4	
T2	Cherry	*Prunus* sp.	M	13	1	570	4	5	5	5	5	No visual signs of damage	Single stem. Vertical	Balanced, previously reduced	Damage to main stem on west at 2 m	F	>20	B2	6.9	
T3	Cherry	*Prunus* sp.	M	8	1	410	4	4	4	4	4	No visual signs of damage	Single stem. Vertical	Balanced, previously reduced		F	>20	B2	4.8	
TG4	Lawson cypress	*Chamaecyparis lawsoniana*	M	11 Av	1	700 Av	0	4	4	4	4	No visual signs of damage	Single stems. Vertical	Mutually shared canopy	Bifurcated stems at 1 m	F	20 - 40	B2	8.4	
TG5	Lawson cypress	*Chamaecyparis lawsoniana*	SM	11 Av	1	340 Av	2	2	2	2	2	No visual signs of damage	Single stems. Slight lean to east	Balanced	Located adjacent to front elevation. Two trees ivy clad, Low BRP	F	<20	C2	4.2	
TG6	Alder Cherry	*Alnus glutinosa Prunus* sp.	M/ SM	13 Av	1	575 Av	2	5	5	5	5	Girdled roots with mower damage	Single stems. Vertical	Mutually shared canopy		F	<20	B2	6.9	
T7	Sycamore	*Acer pseudoplatanus*	SM	10	1	6 x 200	4	4	4	5	4	No obvious damage	Multiple stems at 1 m. Vertical	Balanced		F	>20	C2	6.0	
T8	Holly	*Ilex aquifolium*	SM	8	1	Est 250	4	4	4	4	4	No obvious damage	Single stem, vertical.	Conical canopy		F	20 -40	C2	3.6	
T9	Portugal laurel	*Prunus lusitanica*	SM	8	1	6 x 200	2	4	4	4	4	No obvious damage	Multiple stems from base at various angles	Rounded dense canopy.		F	20 - 40	B2	6.0	
T10	Sycamore	*Acer pseudoplatanus*	SM	8	3	350 Est	2	2	2	2	2	No visual signs of damage	Multi-stemmed. Vertical	Balanced		F	20 - 40	B2	4.20	
T11	Purple leaved plum	*Prunus pissardii 'Nigra'*	SM	8	1	600	5	5	5	5	5	No obvious damage	Single stem, vertical	Unbalanced canopy	Impacted by surrounding vegetation	F	10 -20	C2	7.2	

TG12	Leyland cypress Portugal laurel	*X Cupressocyparis leylandii* *Prunus lusitanica*	SM	12	M S	Av 350	0	5	5	5	5	No obvious damage	Single and multiple stems, vertical	Canopies read as one.		F	20 - 40	C2	4.2	
T13	Sycamore	*Acer pseudoplatanus*	M	14	1	825	5	9	8	6	9	No visual signs of damage	Single stem. Vertical	Unbalanced	Rot hole on stem. Low BRP	F	20 - 40	B2	9.9	
T14	Sycamore	*Acer pseudoplatanus*	SM	12	1	Est 300	4	4	4	4	4	No obvious damage	Single stem. Vertical	Open rounded canopy		F	20 - 40	C2	3.6	
TG15	Apple Purple leaved plum Silver birch Elder	*Malus sp.* *Prunus pissardii* 'Nigra' *Betula pendula* *Sambucus nigra*	SM	8 Av	1	330 Av	2	7	5	4	5	No visual signs of damage	Single stems. Vertical	Suppressed crowns by neighbouring trees	Ivy cladding on plum. Low BRP	F	<20	C	3.9	
TG16	Willow Sycamore Pedunculate oak Tree of heaven	*Salix* sp. *Acer pseudoplatanus* *Quercus robur* *Ailanthus altissima*	SM	8 Av	1	300 Est	3	3	4	3	4	Unable to assess due to access	Single stems. Vertical	Mutually shared canopy	Private trees	G	20 - 40	B2	3.6	
TG17	White poplar Cherry Leyland cypress	*Populus alba* *Prunus* sp *X Cupressocyparis leylandii*	M	18 Av	1	600 Av	5	9	6	8	5	No visual signs of damage	Single stems. Vertical	Unbalanced	Bifurcated at ground level. Ivy covered. Low BRP	F	20 - 40	B2	7.2	
TG18	Ash Hornbeam	*Fraxinus excelsior* *Carpinus betulus*	SM	11 Av	1	410 Av	2	5	5	4	5	No visual signs of damage	Single stems. Vertical	Balanced	Fused stems to hornbeam	F	<20	C2	4.8	
T19	Cherry	*Prunus* sp.	SM	6	1	375	2	4	4	4	4	No obvious damage	Single stem. Vertical	Open rounded canopy.		F	20 - 40	C2	4.5	
T20	Alder	*Alnus glutinosa*	SM	15	1	200	2	4	4	4	4	No obvious damage	Single stem, vertical	Conical canopy.		F	>40	C2	2.4	
T21	Cherry	*Prunus* sp.	M	16	1	450 525	2	8	8	8	8	No obvious damage	Bifurcated at base, vertical.	Rounded canopy, lifted to 2 m.		F	<20	C2	8.4	
TG22	Sycamore Cherry Goat willow	*Acer pseudoplatanus* *Prunus* sp. *Salix caprea*	SM	12 Av	1	Av 200	2	7	5	7	6	No visual signs of damage	Single stems. Vertical. Ivy clad	Unbalanced	Damage to roots and decay present on stem from root flare to 0.5 m on willow Two trees ivy clad, Low BRP.	F	<20	C2	2.40	Sever and remove ivy

5.0 Tree Management

5.1 Arboricultural Assessment

Adjacent to the north-eastern, southern and south-western boundaries and through the central section of the Site are a number of tree groups and individual trees that could be impacted by any proposed re-development. It may be possible to retain and incorporate certain trees and tree groups currently present within the Site into the landscaping scheme of the proposals.

It appears limited management has taken place to the trees present on-Site, confined to crown lifting and reduction of trees within areas of hardstanding and footpaths.

To ensure that the root areas and canopy extremities of the individual trees and the tree groups that may be retained are not damaged, a Constraints Plan has been prepared to show the locations where protective fencing should be erected for any trees selected for retention (see Figure 3). Any tree surgery required is best carried out towards the conclusion of the development so that, if necessary, any known root damage can be corrected by the appropriate crown thinning to restore root /shoot balance.

Two trees within (TG5 in the north-eastern extent, T13, one tree from TG15, trees within TG17, together with two trees within TG22 located in an internal courtyard, were assessed as offering low Bat Roost Potential (BRP) due to extensive ivy coverage and rot holes. It is considered that the Site would benefit from native deciduous tree planting along the southern boundary to provide more effective screening to the Site and complement retained trees and the surrounding landscape.

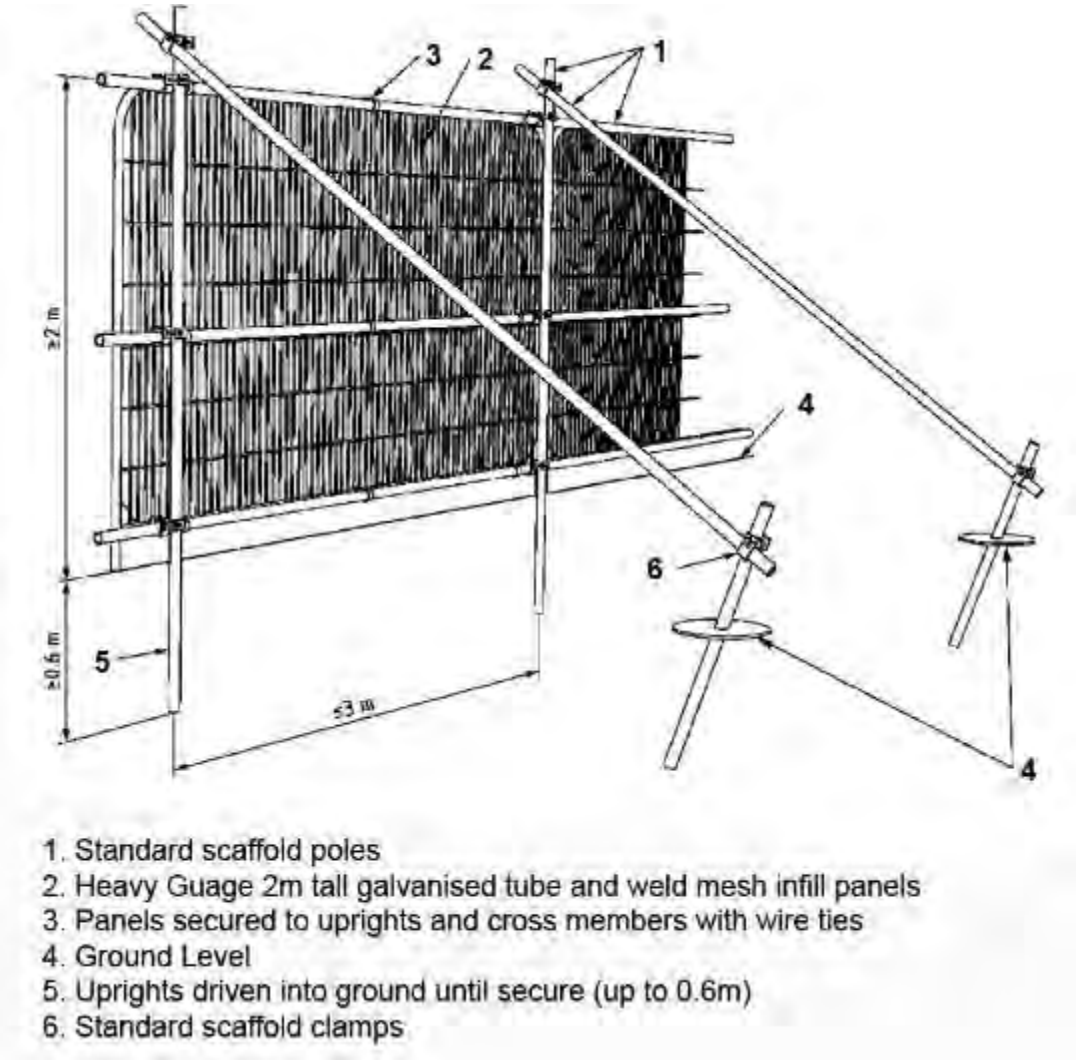
5.2 Recommendations

Recommendation 1 (Adequate Tree Protection)

Those trees identified within any development plan for retention will need to be adequately protected during any approved development works. As a general rule at this Site, measures to protect trees should follow the best practice principles set out in BS5837: Trees in Relation to Design, Development and Construction (2012). Prior to any construction or development work proceeding, the RPAs of individual trees to be retained should be marked out using the distances provided in the Table 1. Marking out should be completed by a person with arboricultural or horticultural expertise as individual trees will have root zones that may be affected by local conditions and allowances would need to be made to accommodate this.

The best practice principles have been broadly summarised below:

- All trees retained adjacent to the Site should be protected by barriers or ground protection around the calculated RPA and as indicated on any Tree Constraints Plan (TCP) that may be produced in association with the assessment;
- Any fencing required should be erected prior to commencement of construction and before demolition including erection of any temporary structures. Once set up fences should not be removed or altered without prior consultation with the arboricultural advisor;
- Arrangements should be made for an arboriculturist to supervise works and tree protection where trees are particularly vulnerable or sited close to access points;
- Pre-development works may be undertaken prior to the installation of fencing with the agreement of the local planning authority;



1. Standard scaffold poles
2. Heavy Guage 2m tall galvanised tube and weld mesh infill panels
3. Panels secured to uprights and cross members with wire ties
4. Ground Level
5. Uprights driven into ground until secure (up to 0.6m)
6. Standard scaffold clamps

- All tree works should follow best practice procedures as set out in BS 3998 (2010). All trees should be maintained in good condition on-Site and be inspected annually (where overall condition requires) or every two years and after any major storm events, with safety a priority;
- Fencing should be clearly visible and suitable for the location, type and proximity of construction activity;
- It may be appropriate on some sites to use temporary site offices as components of the protection barriers;
- Where it has been agreed and shown on a Tree Protection Plan, construction access may take place within the RPA if suitable ground protection measures are in place (e.g. existing surfaced car park areas). In other areas this may comprise single scaffold boards over a compressible layer laid onto geo-textile materials for pedestrian movements. Vehicular movements over the RPA will require the calculation of expected loading and may require the use of proprietary protection systems;
- Once areas around trees have been protected by fencing, any works on the remaining Site area may be commenced providing activities do not impinge on protected areas. Notices should be placed on fencing to indicate that operations are not permitted within the fenced area;
- Wide or tall loads etc should not come into contact with retained trees. Banksman should supervise transit of vehicles, jibs, booms etc where this is in close proximity to retained trees;
- Oil, bitumen, cement or other material that is potentially injurious to trees should not be stacked or discharged within 10 m of a tree bole. No concrete mixing should be done within 10 m of a tree. Allowance should be made for the slope of ground to prevent materials running towards the tree;

- No fires should be lit where flames are anticipated to extend to within 5 m of tree foliage, branches or trunk, taking into consideration wind direction and size of fire;
- Notice boards, telephone cables or other services should not be attached to any part of a retained tree;
- Where it is deemed necessary to operate a wide or tall load, plant bearing booms, jibs and counterweights or other such equipment, as part of construction works, and such equipment would have potential to cause injurious contact with crown material i.e. low branches and limbs, of retained trees within the RPA fencing, it is best advised that appropriate, but limited, tree surgery be carried out beforehand to remove any obvious problem branches. This is classed as 'Facilitation Pruning' within BS 5837 (2012). Any such pruning should be undertaken in accordance with a specification prepared by an arboriculturist;
- It is advised that a Pre-Commencement Site Meeting is held with contractors who are responsible for operating machinery, as described above, to firstly highlight the potential for damage occurring to tree crowns and to ensure that extra care is applied when manoeuvring machinery during such operations within close proximity to retained trees to avoid any contact;
- In the event of having caused any such branch or limb damage to retained trees it is strongly recommended that suitable tree surgery be carried out, in accordance with BS 3998 (2010) Recommendations for Tree Work, to correct the damage, upon completion of development; and
- All of the above precautionary measures should be applied to minimise the effect of any damage to long-term tree health and safety.

<u>Recommendation 2 – Low BRP Trees</u>

Low BRP Tree

- Any proposed felling or management works to two trees within TG5, T13 a plum tree within TG15, trees within TG17 or two trees within TG22, assessed as having low BRP, should be completed under a method statement which could include a single dawn survey completed during the active bat season (April-October, inclusive) on the morning prior to the works being undertaken; or

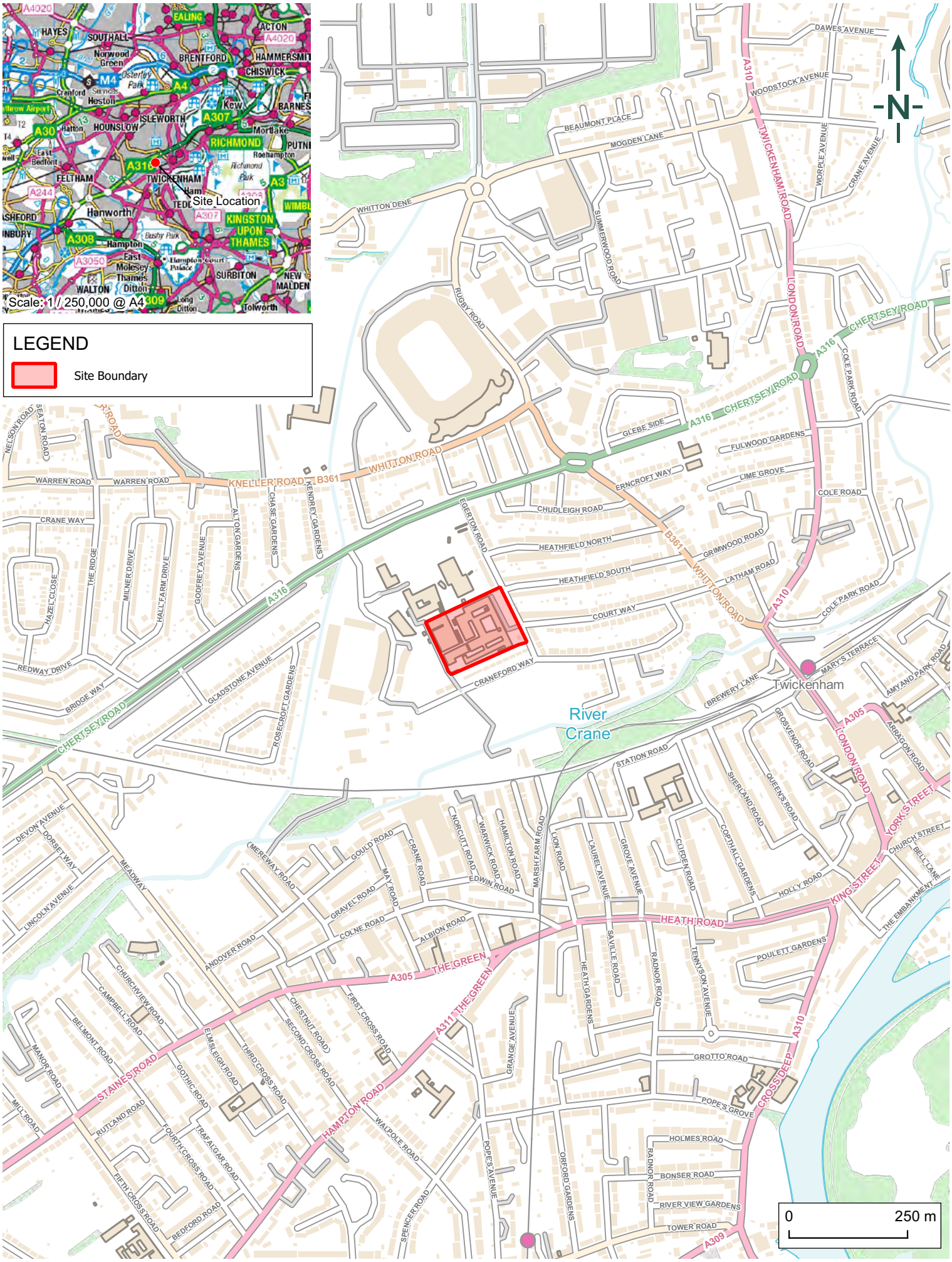
Alternatively, a licenced bat ecologist trained to use specialist tree climbing equipment could undertake a thorough inspection of the potential roost features immediately prior to works commencing.

6.0 Limitations of the Tree Survey

The recommendations contained in this Report represent Delta-Simons' professional opinions, based upon the information referred to in Section 1.0 of this Report, exercising the duty of care required of an experienced Environmental Consultant.

This Report was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed as defined in Section 1.1 of this Report. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

Figure 1 – Site Location Map



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Service Layer Credits: Contains OS data @ Crown Copyright and Database Right 2019

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Site Location Map
Richmond Upon Thames College
Twickenham

DRAWN BY:	SCALE (@A4):	PROJECT NO:
KJ	1:10,000	18-0573.02
CHECKED BY:	REVISION:	FIGURE NO:
JB	0	1
DATE: 05 March 2021		

Figure 2 – Tree Survey

Site Plan Provided by Client

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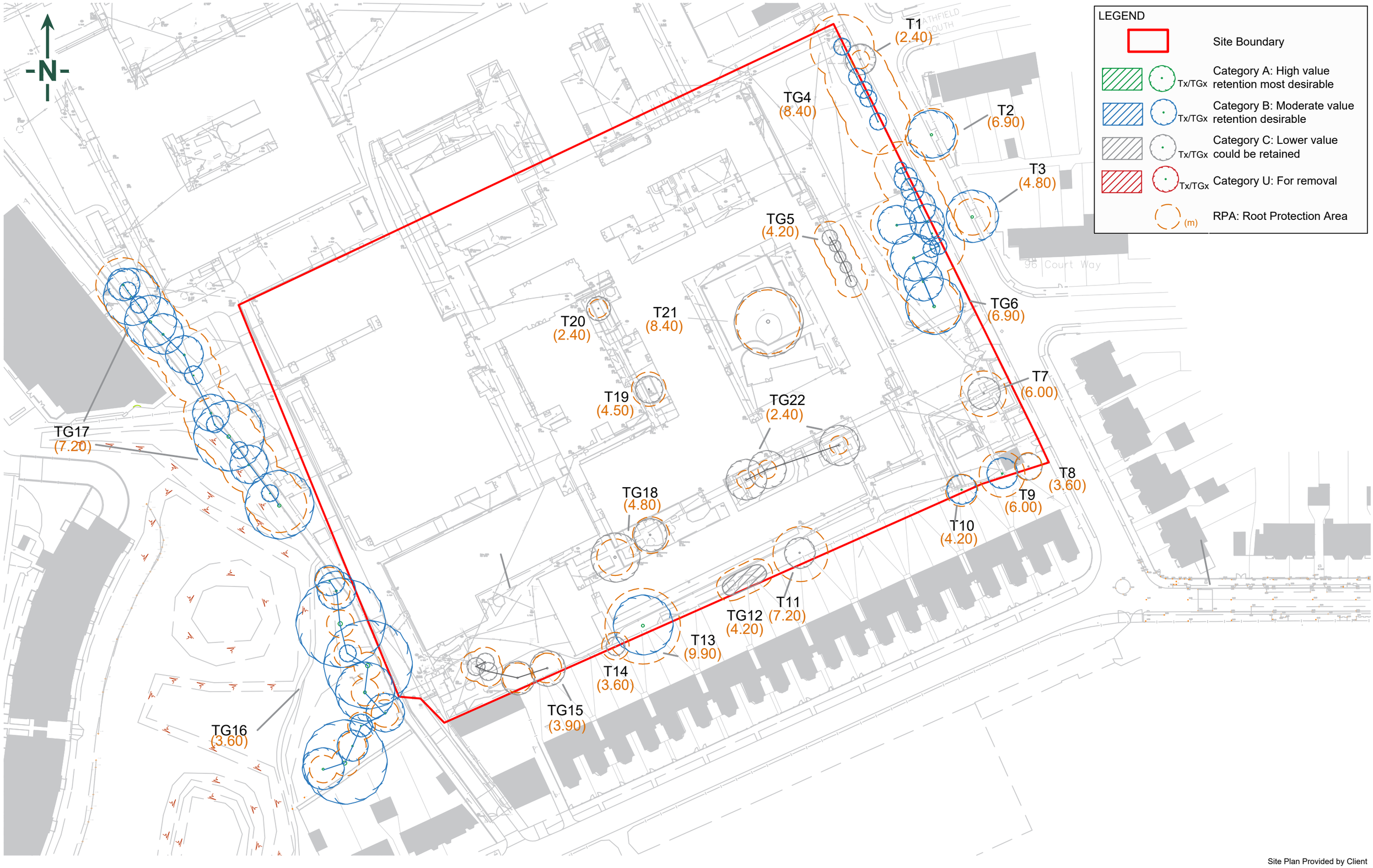
TITLE:
Tree Survey
Richmond Upon Thames College
Twickenham

DRAWN BY: KE	SCALE: Not to Scale	PROJECT NO: 18-0573.02	
CHECKED BY: PM	REVISION: 1	FIGURE NO: 2	
DATE: 12 March 2021			

Figure 3 – Tree Constraints Plan



Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Tree Constraints Plan
Richmond Upon Thames College
Twickenham

DRAWN BY: KE	SCALE: Not to Scale	PROJECT NO: 18-0573.02	
CHECKED BY: PM	REVISION: 1	FIGURE NO: 3	
DATE: 12 March 2021			

Drawing 1 – Outline Master Plan Clarion Housing Group 05/11/2020


HUB
College
STEM
Sports
School
SEN
Residential
Residential
Residential
Residential
Residential

Appendix A – References

References

BSI Publication BS 5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations.

BSI Publication BS 5837:2005 Trees in Relation to Construction - Recommendations.

Collins, J. (ed.) (2016) Bat surveys for Professional Ecologists: Good practice guidelines (3rd edition). The Bat Conservation Trust, London.

Stace, C. (2010). *New Flora of the British Isles 3rd edition*. University Press, Cambridge.

Appendix B – Guidance on Assessing the Potential Suitability of Development Sites to Support Bats

Guidance on Assessing the Potential Suitability of Development Sites to Support Bats

(adapted from Collins, J. (ed)).

Suitability	Description	
	Roosting	**Commuting and Foraging**
Negligible	An inspected structure or tree which is considered to have no features of importance for roosting bats. No further constraints apply to the method or timing of proposed works.	Negligible habitat features on-Site to support commuting or foraging bats
Low	A structure with at least one or more features suitable to support opportunistic individual bats. However, inadequate space, shelter, protection and conditions, and the low suitability of surrounding habitats means that it is unlikely to be used as a maternity or hibernation roost site. A tree of adequate age and stature to support potential roosting features, however, either no features, or only features of limited potential recorded from the ground.	Habitat with potential to support low numbers of commuting bats due to its quality and connectivity. For example, a gappy hedgerow or unvegetated stream that is isolated from the surrounding landscape. Alternatively, suitable but isolated habitats suitable to support low numbers of foraging bats such as a lone tree or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that are of adequate size, shelter and protection, with suitable conditions and surrounding habitat to support a bat roost not of high conservation status (with respect to roost type not individual species conservation status).	Linear habitat continuity connecting to the wider landscape offering potential to support commuting bats, such as rows of trees and scrub or linked back gardens. Habitat such as trees, scrub, grassland or a waterbody with connectivity to the wider landscape offering foraging opportunities for bats.
High	A structure or tree with one or more potential roost sites that are suitable for use by large numbers of bats on a regular basis and for long periods of time due to their size, shelter, protection, conditions and the surrounding habitat.	Continuous high-quality habitat with strong connectivity to the wider landscape that is likely to be used by commuting bats on a regular basis, such as flowing waterbodies, hedgerows, rows of trees and woodland edges. High quality habitat with strong connectivity to the wider landscape that is likely to be regularly used by foraging bats, such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to, and connected to, known roost sites

Appendix C – Site Photographs

Site Photographs

Photograph 1 – Tree (T)1

Photograph 2 – T2

Photograph 3 – T3

Photograph 4 – Tree Group (TG)4

Photograph 5 – TG5

Photograph 6 – TG6

Photograph 7 – T7

Photograph 8 – T8

Photograph 9 – T9

Photograph 10 – T10

Photograph 11 – T11

Photograph 12 – TG12

Photograph 13 – T13

Photograph 14 – T14

Photograph 15 - TG15

Photograph 16 – TG16

Photograph 17 – TG17

Photograph 18 – TG18

Photograph 19 – T19

Photograph 20 – T20

Photograph 21 – T21

Photograph 22 – TG22