Arboricultural Method Statement for Enabling and Construction Phases of Work

Land at Richmond upon Thames College

Presented to **Clarion Housing Group**

Issued: April 2021

Delta-Simons Project No. 18-0573.02

deltasimons

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Report Details

Client	Clarion Housing Group
Report Title	Arboricultural Method Statement for Enabling and Construction Phases of Work
Site Address	Richmond Upon Thames College, Egerton Road, Twickenham, TW2 7SJ
Project No.	18-0573.02
Delta-Simons Contact	Pete Morrell (pete.morrell@deltasimons.com)

Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
1	Final	30th April 2021				
				Peter Morrell Principal Arboriculturalist	**Charlotte Sanderson-Lewis Associate and Ecology Team Leader**	**Charlotte Sanderson-Lewis Associate and Ecology Team Leader**

About us

Delta-Simons is a trusted, multidisciplinary environmental consultancy, focused on delivering the best possible project outcomes for customers.

Specialising in Environment, Health & Safety and Sustainability, Delta-Simons provide support and advice within the property development, asset management, corporate and industrial markets. Operating from across the UK we employ over 120 environmental professionals, bringing experience from across the private consultancy and public sector markets.

Delta-Simons is proud to be a founder member of the Inogen Environmental Alliance, enabling us to efficiently deliver customer projects worldwide by calling upon over 5000 resources in our global network of consultants, each committed to providing superior EH&S and sustainability consulting expertise to our customers. Inogen Environmental Alliance offers its clients more consultants, with more services in more countries than the traditional multinational consultancy.

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1.0 Introduction

1.1 Purpose and Scope of the Method Statement

Delta-Simons Environmental Consultants Limited ("Delta-Simons") was instructed by Clarion Housing Group (the "Client") to produce an Arboricultural Method Statement (AMS) to British Standard BS5837:2012. This AMS has been prepared for trees within and immediately beyond the boundary of an area of land situated at Richmond upon Thames College, Twickenham, in Middlesex (hereafter referred to as 'the Site'). The Delta-Simons Tree Survey Report (issued March 2021, Report Reference 18-0573.02) has been used to inform this Statement. This AMS covers the Enabling (including Site clearance) and Construction Phases of Works for the Site which will comprise the demolition of existing college buildings, removal of hard-surfacing, site clearance and groundworks together with the redevelopment of the Site to provide 212 residential units across a collection of buildings up to five storeys in height; together with associated parking for 110 vehicles, cycle parking, open space and landscaping (See Drawing 1).

The purpose of this AMS is to assist with the preservation of trees shown to be retained at, and adjacent to, the Site. Trees can readily be retained and protected during the proposed development by ensuring that the tree protection methods, construction techniques and working practices are adhered to. This document provides this information; principles that are approved and enforced by the Local Planning Authority (LPA), London Borough of Richmond upon Thames Council (LBRuTC).

1.2 AMS Summary

The following points are explained and qualified in more detail within this Report, and this summary is intended for reference only. Any actions consequent to this summary should be discussed with the Arboriculturalist at Delta-Simons before being undertaken in order to prevent a potential breach of tree protection legislation, whether by planning condition, area planning designation or specific tree preservation order (which may apply to individual trees or groups).

This document will give Site-specific instructions on the methods required to protect the existing tree stock agreed to be retained. These methods are set out in a logical sequence of operations and include:

- Pre-construction meeting: To review the AMS and ensure all relevant parties are familiar with its content, show the trees concerned and where protection will be required;
- Tree protection fencing and exclusion signage: To BS 5837:2012 or other agreed approach if required;
- Ground protection: Techniques to avoid compaction, disturbance or contamination of the tree root environment;
- Site clearance works, groundworks, foundations and services: Methods to allow building operations including service routing and special measures where Root Protection Areas (RPA) are unavoidably breached. To include specialist construction methods such as no-dig solutions for footpaths and paved areas, where permissible, in proximity to trees without damage to the tree, from root damage, or to the buildings, either from roots or from ground desiccation and heave;
- Erection of scaffolding for construction;
- General tree care measures and awareness; and
- Site monitoring to be undertaken by the Arboriculturalist at agreed intervals through the Site preparation and construction process.

It should be noted that this is a Site-specific AMS produced solely for the physical protection of those trees identified within the Tree Survey and is not relevant to any other site or situation. This Report has been compiled from data achieved by a visual Tree Assessment by Delta-Simons on 10th February 2021.

2.0 Root Protection Areas

As the majority of tree roots are found in the upper metre of soil, development works, including for example even shallow excavation and soil compaction can adversely affect the health of trees in close proximity. Trees differ in their tolerance to root loss or disturbance, according to their age, speces and/or condition. All protection works within this document are in accordance with BS5837:2012 *'Trees in Relation to Design, Demolition and Construction – Recommendations'*

Based on the tree survey data, RPAs have been determined for every retained tree as shown in the Tree Survey (Appendix A). The RPAs are designed to protect at least a functional minimum of tree root mass in order to ensure that the trees survive the construction process. The RPA has been used to inform the Construction Exclusion Zone (CEZ), the area to be protected during development by the use of ground protection and specialised construction techniques, outlined below.

From the assessment undertaken, the following tree needs specific consideration in this AMS:

- **TG4** – This tree group is located immediately adjacent to the northern boundary with a RPA that extends into the working footprint of the planned area of hard standing associated with a new substation and footpath linked to Egerton Road;
- **TG6** – This tree group borders the main access route within the Site with a root protection area which will extend into the proposed new road; and
- **T7, T8, T9, T10, T11 and TG15** – These trees are located within the Site adjacent to the southern boundary with RPAs and canopies which extend into the working footprint of proposed gardens.

3.0 Methodology

The following sequences are governed by operational constraints and subject to change. The Site Arboriculturalist must be noted of any changes to this schedule.

3.1 Sequenced Methods of Construction and Tree Protection

3.1.1 Pre-Commencement

An on-Site meeting will be held if required, with all relevant parties; including the developer, Site Arboriculturalist, Architect and LPA representative. The purpose of this meeting is to record Site features including tree condition, to agree tree works (detailed below), location of permanent and temporary access, location of Site storage, the location of ground protection barriers and the timing of Site operations.

3.1.2 Completion of Agreed Tree Works

All tree work is to conform to BS3998:2010 'Tree Work' and to current arboricultural best practice. Tree works are to be undertaken by a professional and specialist arboricultural contractor, who carries the appropriate experience and insurance cover and following formal approval from the LPA.

The following works are specifically proposed and are shown on Figure 2:

- **TG4** - No-dig construction methods are to be employed within the RPA of TG4 for the construction of the area of hard standing and footpath;
- **T7, TG12, T13, T14, TG15 (three trees) TG18, T19, T20, T21 and TG22** – Tree removals to allow for redevelopment of the Site; and
- **T8, T9, T10, T11 and TG15** – Supervision of works during installation of fencing within RPA's;

3.1.3 Tree Protection Barriers

Tree protection barriers will be erected in order to exclude the CEZ from significant construction activity. It is the responsibility of everyone engaged in the construction process to respect the tree protection measures and observe the necessary precautions within and adjacent to them.

Inside the exclusion area of the development, the following shall apply:

- No mechanical excavation without approval from the LPA;
- No excavation by any other means without Arboricultural Site supervision;
- No hand digging without a written Method Statement having first been approved by the Site Arboriculturist;
- No ground level changes whatsoever;
- No storage of plant or materials;
- No storage or handling of any chemicals;
- If 360-degree excavators are to be used during construction, at no time is the excavating arm to encroach over the position of the protection barriers;
- No vehicular access;
- No fires should be lit within 10 metres of the nearest point of the canopy of any retained tree;
- No equipment, signage, fencing, tree protection barriers, materials, components, vehicles or structures shall be attached to or supported by a retained tree; and
- No mixing of cement or use of other materials or substances shall take place within tree RPA or tree CEZ, nor in proximity to tree RPA or tree CEZ, since leakage or displacement of those materials or substances could cause them to enter tree RPA or tree CEZ.

Following the authorised tree works, and before any works on-Site in the vicinity of the retained trees commence, including enabling works or the delivery of machinery, materials, plant or equipment to the Site or

any adjacent land, TPF will be erected in accordance with BS5837:2012 that comprises of vertical and horizontal scaffolds with vertical tubes spaced at no more than 3 m intervals and driven into the ground. Weld mesh (Heras or similar) panels will be securely fixed on to this framework with wire or scaffold clamps. Tubes will be firmed into holes in the ground made with post hole boring equipment. Post holes are to be no more than 30% larger than the scaffold tube. Supporting struts will be fixed to the inside of the barrier to ensure maximum rigidity (See Appendix C).

The location of the protection barriers is indicated on Figure 2. The position of the barriers is to be marked out with biodegradable marker paint on-Site and agreed with appropriate representatives from the LPA and the Site Contractor.

It may be necessary to remove part of the existing vegetation from under the canopy of the tree or remove over-hanging branches prior to erecting the fencing. Any works of this nature are to be carried out by hand.

Once the barriers have been properly erected in position, they are to be considered fixed, and are not to be removed or altered in any way without prior approval from the Site Arboriculturist and the LPA.

Weather-proof signs shall be fixed to the outside of the walls with words such as 'CONSTRUCTION EXCLUSION ZONE – NO ACCESS AND NO STORAGE OR WORKING WITHIN THIS AREA'. (See Appendix D).

All operatives and other relevant personnel are to be informed of the role of the exclusion barriers and their importance. A copy of the TPP will be displayed on-Site at all times during the construction process.

Construction of hardstanding and paths will be undertaken as part of the Construction Stage.

3.1.4 Removal of Existing Hard Surfaces

Reasonable notice will be given to the LPA as to the date of commencement of any removal of hard standing surfaces areas adjacent to the retained trees as part of the enabling works, noting that there is very limited above ground removal to be undertaken within the RPAs of retained trees (specifically TG6). This will provide the LPA with the opportunity to visit the Site and ensure that all tree protection methods are in place.

- Removal of existing hard surfaces and curbs by machinery will take place with machinery on the hard surface, working backwards;
- Spoil, including soil and rubble will be removed from the Site and not stored against any protection barriers or over any ground protection;
- When working within the RPA of TG6, removal of hard surfaces will be supervised by the Delta-Simons Arboriculturist and if no protected tree roots with a diameter greater than 25 mm are found, normal techniques can be used;
- If roots with a diameter between 25 – 50 mm diameter are found, then they are to be pruned to a side root, or suitable point, with secateurs; or
- If a major root (50 mm plus) is found, it is to be wrapped in hessian and hand dug around the roots and casing placed at the side of it;
- The soil will be back filled to original level; and
- Spoil, including soil and rubble will be removed from the Site and not stored against any protection barriers or over any ground protection.

The enabling programme is to be undertaken across the Site. The works are not considered to impact upon any RPA of trees not already highlighted.

3.1.5 Groundworks within RPA's

A no-dig method of construction for the footpath at the northern corner of Site will be employed within the RPA of TG1. Similarly, a no-dig method of construction for the creation of hard standing within the RPA of TG4 will be used using TERRAM Geocell 25/10 (Appendix E) or similar product.

- When working within the RPA's of TG4, no excavations will be undertaken; and

- Geocell ground protection as specified in Appendix E will be installed to preserve roots.

In the unlikely event that further areas of RPAs are required to be impacted by development work, the Contractor, Developers Arboriculturist, and the LPA will liaise over measures for vehicular or pedestrian access for construction operations to be located within a tree RPA. In such a case, a combination of barriers and ground protection should be adopted to form the CEZ. The objective is to minimise soil compaction.

3.1.6 Construction Stage, Foundations, Drainage and Services

All areas for construction of buildings, including foundations are confined to areas beyond CEZ and, therefore, no specialised foundation design is required in these areas. No drainage or other new services shall be placed within the identified RPA / CEZ.

In the event that work on utilities is required within the RPA the principles set in National Joint Utilities Group (NJUG) 4 (See Appendix F) will be adopted but any approach must be approved by the Site Arboriculturalist and brought to the attention of the LPA Tree Officer.

3.1.7 Dismantling Protection Barriers and Landscaping Works

It is anticipated that the barriers will remain in place until the landscaping stage of works;

- A minimum of seven days' notice will be given to the LPA prior to the dismantling of the protection barriers;
- Prior to any landscaping works taking place on-Site, the Site Arboriculturist will inspect the RPA for signs of ground compaction and brief the landscaping contractors to working practices to be employed within RPAs; and
- Once the barriers have been removed, all landscaping works undertaken will avoid soil re-grading and disturbance within the CEZ, and no soil levels will be altered after the protection barriers have been removed.

3.1.8 Soft Landscaping within the RPA

- All works will conform to BS 4428:1989 Code of practice for general landscape operations (excluding hard surfaces);
- Sensitive ground preparation must be carried out in the RPA's to ensure root damage is avoided;
- Heavy machinery i.e. a rotovator, is not permitted and only clearance of vegetation by hand, is acceptable;
- Soil levelling must be carried out by hand, should soil levels require raising this will be limited to 30 cm within an RPA;
- Should soil become compacted or have poor structure, which may hinder the development of newly planted flora, advice can be sought from the Arboriculturist in regard to de-compaction works using 'air-spade' technology and 'vertimulching' techniques; and
- Trench planting should be avoided in the RPA to avoid damage to roots. Plants must be bedded individually.

3.1.9 Hard Landscaping

Limited hard landscaping is proposed within the RPA of TG6. The area involved is already heavily disturbed and already supports hard standing and is towards the furthest extent of the RPA.

- When working within the RPA of TG6, works will be supervised by the Delta-Simons Arboriculturist and if no protected tree roots with a diameter greater than 25 mm are found, normal techniques can be used;
- If roots with a diameter between 25 – 50 mm diameter are found, then they are to be pruned to a side root, or suitable point, with secateurs; or
- If a major root (50 mm plus) is found, it is to be wrapped in hessian and hand dug around the roots and casing placed at the side of it.

Limited hard landscaping is proposed within the RPA's of T7, T8, T9, T10, T11 and the retained trees within TG15 and will consist of the erection of boundary fencing. When working within the RPAs during the installation of boundary fencing, fence post holes will be hand dug.

4.0 Communications/Monitoring

In order to ensure that the principles of tree protection set out in the statement are adhered to, the contact details of the key individuals involved with these works, and the tasks that require monitoring should be set out. These details should be retained by all relevant parties and available on-Site at all times. Relevant parties will be advised of any changes in personnel or contractor during the development process.

Before construction begins written confirmation that the Site contractor or its agents agree to comply in full with the principles set out within this Method Statement will be lodged with the LPA.

Specific Contacts are identified as follows:

- **Developers Arboriculturalist**: Pete Morrell, Delta-Simons

  Pete.Morrell@deltasimons.com 07824 445051

4.1 Monitoring

Monitoring of all trees on-Site and immediately adjacent to the Site will be undertaken by the developer's arboriculturalist. This will take the form of Arboricultural Protection Site Inspections:

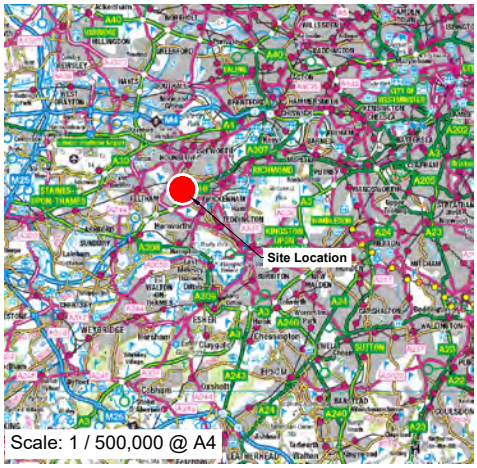
- Site inspections will be completed at regular intervals for the entire duration of on-Site external operations;
- Adherence to the approved Arboricultural Method Statement and any incidents will be monitored and recorded; and
- A Reporting Form (Appendix G) will be produced following each visit by the Developers Arboriculturalist and distributed to the LPA and Site contractor.

5.0 Limitations of the Arboricultural Method Statement

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

This Method Statement 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 Method Statement. Nothing contained in this Method Statement 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 Method Statement 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 Method Statement by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Method Statement, 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



Scale: 1 / 500,000 @ A4

LEGEND

Site Boundary

Scale: 1 / 5,000 @ A4

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Environment - Health & Safety - Sustainability

TITLE:
Site Location Map
Richmond Upon Thames College
Twickenham

DRAWN BY: NW	SCALE: To Scale@A4
CHECKED BY: PM	REVISION: 1
DATE: 27 April 2021	

PROJECT NO: 18-0573.02

FIGURE NO: 1

Figure 2 – Tree Protection Plan

Site Plan Provided by Client

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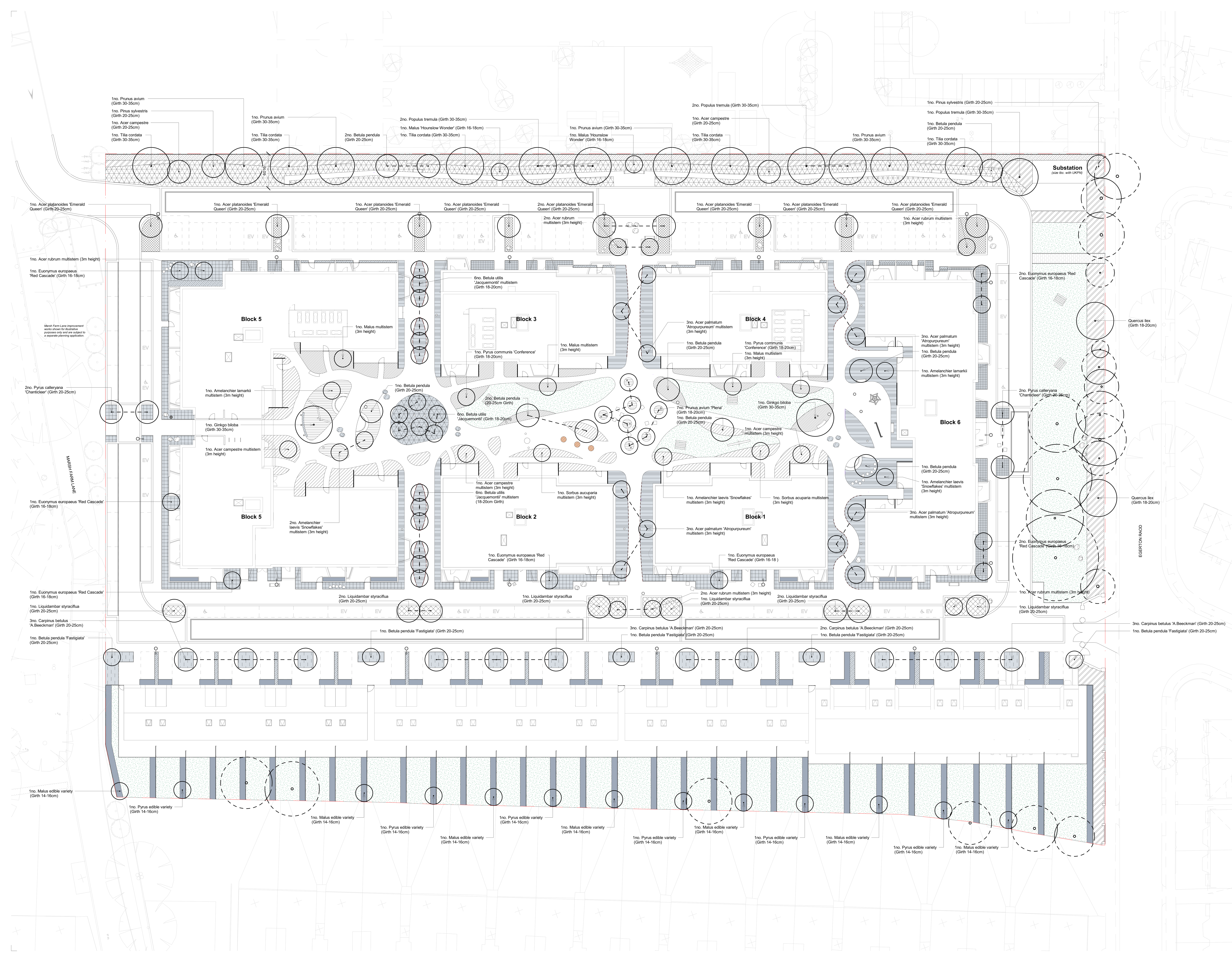
Environment - Health & Safety - Sustainability

TITLE:
Tree Protection Plan
Richmond Upon Thames College
Twickenham

DRAWN BY: NW	SCALE: Not to Scale	PROJECT NO: 18-0573.02
CHECKED BY: PM	REVISION: 1	FIGURE NO: 2
DATE: 29 April 2021		

Drawing 1 – Landscape Planting Plan



Notes

1. Do not scale this drawing.
2. All dimensions must be checked on site and any discrepancies verified with the architect.
3. Unless shown otherwise, all dimensions are to structural surfaces.
4. Drawing to be read with all other issued information. Any discrepancies to be brought to the attention of the architect.
5. This drawing is the copyright of Levitt Bernstein and may not be copied, altered or reproduced in any form, or passed to a third party without license or written consent.
6. This document is prepared for the sole use of Clarion and no liability to any other persons is accepted by Levitt Bernstein. Levitt Bernstein accepts no liability for use of this drawing by parties other than the party for whom it was prepared or for purposes other than those for which it was prepared.

This is not a construction drawing, it is unsuitable for the purpose of construction and must on no account be used as such.

Legend

Site boundary

Planting Schedule

Existing tree to be retained

Proposed large tree (30-35cm girth)

Proposed medium sized tree (20-25cm girth)

Proposed small or multi-stem tree (14-16,16-18,18-20cm girth or 3m height)

PL01 - Amenity lawn

PL02 - Resident's planting bed

PL03 - Streetscape evergreen hedge planting
100% Prunus laurocerasus 'Otto Luyken'

PL04 - Streetscape Planting Mix 1
20% Lonicera pileata
12.5% Nepeta gigantea 'Six Hills Giant'
15% Pennisetum alopecuroides 'Hameln'
10% Persicaria affinis 'Superba'
20% Pittosporum tobira
7.5% Verbena bonariensis
15% Vinca minor
Allium Globemaster
Tulipa Ballerina

PL05 - Streetscape Planting Mix 2
7.5% Actaea simplex
17.5% Ajuga reptans 'Catlins Giant'
12.5% Brunnera macrophylla 'Jack Frost'
20% Lonicera pileata
15% Luzula nivea
7.5% Matteuccia struthiopteris
25% Sarcococca confusa
Cyclamen hederifolium
Galanthus nivalis

PL06 - Streetscape Planting Mix 3
30% Ajuga reptans 'Catlins Giant'
5% Hydrangea 'Little Lime'
25% Liriope muscari
15% Lonicera pileata
25% Vinca minor
Tulipa 'White Triumphator'

PL07 - Streetscape Rain Garden Mix 1
20% Ajuga reptans 'Catlins Giant'
5% Dryopteris filix-mas
20% Liriope muscari
15% Sarcococca confusa
15% Viburnum davidii
5% Viburnum opulus 'Compactum'
20% Vinca minor 'Alba'

PL08 - Streetscape Rain Garden Mix 2
20% Ajuga reptans 'Catlins Giant'
5% Daphne x burkwoodii
20% Juncus effusus
10% Rudbeckia fulgida 'Goldsturm'
15% Tiarella cordifolia 'Pink Skyrocket'
15% Viburnum davidii
15% Vinca minor 'Alba'

PL09 - Ecological Corridor Hedge Mix
10% Corylus avellana
50% Crateagus monogyna
10% Euonymus europaeus
10% Rosa canina
10% Rosa rubiginosa
10% Viburnum opulus

PL10 - Ecological Corridor Planting Mix
20% Carex pendula
25% Galium odoratum
5% Lonicera periclymenum
10% Matteuccia struthiopteris
15% Primula vulgaris
5% Ribes nigrum
5% Ribes rubrum
10% Rubus fruticosus
5% Vaccinium corymbosum
Hyacinthoides non-scripta
Narcissus Thalia

PL11 - Ecological Corridor Meadow Mix
LW7 light shade mix and LW8 heavy shade mix, 3g/m²

PL12 - Courtyard Planting Mix 1
10% Aster novae angliae 'September Ruby'
5% Daphne x burkwoodii
5% Garrya elliptica 'James Roof'
10% Helleborus x orientalis 'White Lady'
7.5% Libertia grandiflora
10% Mentha x piperita
15% Pennisetum alopecuroides 'Hameln'
10% Persicaria bistorta 'Superba'
7.5% Rosa kent
10% Rosmarinus officinalis 'Miss Jessopps'
10% Thymus vulgaris 'Compactus'

PL13 - Courtyard Planting Mix 2
5% Asplenium scolopendrium
10% Geranium macrorrhizum 'White Ness'
15% Hakonechloa macra
7.5% Liriope muscari
7.5% Liriope muscari 'Monroe White'
15% Luzula nivea
5% Matteuccia struthiopteris
15% Pachysandra terminalis
5% Sarcococca confusa
10% Tiarella cordifolia 'Pink Skyrocket'
5% Viburnum opulus 'Compactum'

PL14 - Courtyard Planting Mix 3
15% Alchemilla mollis
12.5% Bergenia 'Bressingham White'
7.5% Dryopteris filix-mas
5% Fatsia japonica
10% Geranium macrorrhizum 'White Ness'
15% Liriope muscari Monroe White
10% Luzula nivea
5% Mahonia Soft Caress
10% Primula vulgaris
10% Tiarella Spring Symphony

PL15 - Courtyard Planting Mix 4
20%Bergenia 'Bressingham White'
10% Dryopteris filix-mas
5% Fatsia japonica
20% Liriope muscari 'Monroe White'
5% Mahonia 'Soft Caress'
25% Pachysandra terminalis
15% Tiarella 'Spring Symphony'

PL16 - Courtyard Grassland Mix
LW1M traditional meadow wildflower mix, 5g/m²

PL17 - Biodiverse roof planting

Notes

1. Tree canopies shown at approximate size after 25 years.

Rev	Date	Description	Drawn / Checked
P4	28/04/21	PLANNING ISSUE	CW
P3	21/04/21	Issue for review and comment	CW
P2	31/03/21	Issue for review and comment	CW
P1	26/03/21	Issue for review and comment	CW

Project name

RICHMOND COLLEGE
RESIDENTIAL DEVELOPMENT

Drawing number: 3775 - LB - ZZ - ZZ - DP - L - 210000 Rev: **P4**

Drawing

Landscape Planting Plan

Suitability Code: S3 - For Review and Comment

Scale: 1 : 200 @ A0 Date: 31/03/21

Client: Clarion

London
Thane Studios
2-4 Thane Villas
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+44 (0)20 7275 7676
Manchester
Bonded Warehouse
18 Lower Byrom Street
Manchester M3 4AP
+44 (0)161 669 8740
Levitt Bernstein
levittbernstein.co.uk

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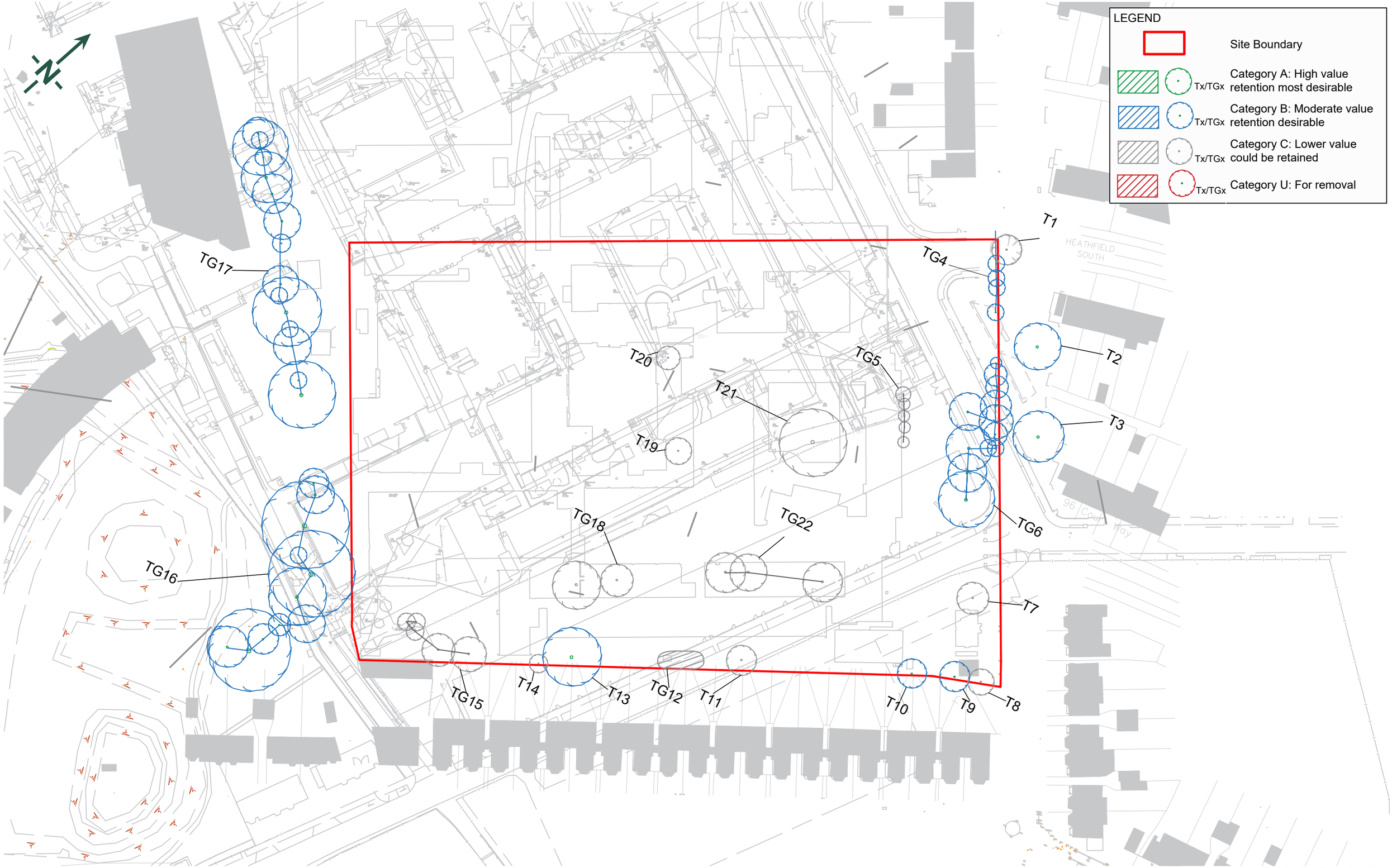
Appendix A – Tree Survey



Site Plan Provided by Client

deltasimons
Environment - Health & Safety - Sustainability

TITLE:
Tree Survey
Richmond Upon Thames College
Twickenham

DRAWN BY:	SCALE:	PROJECT NO:
NW	Not to Scale	18-0573.02
CHECKED BY:	REVISION:	FIGURE NO:
PM	1	A
DATE: 27 April 2021		

Appendix B – Tree Schedule

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	

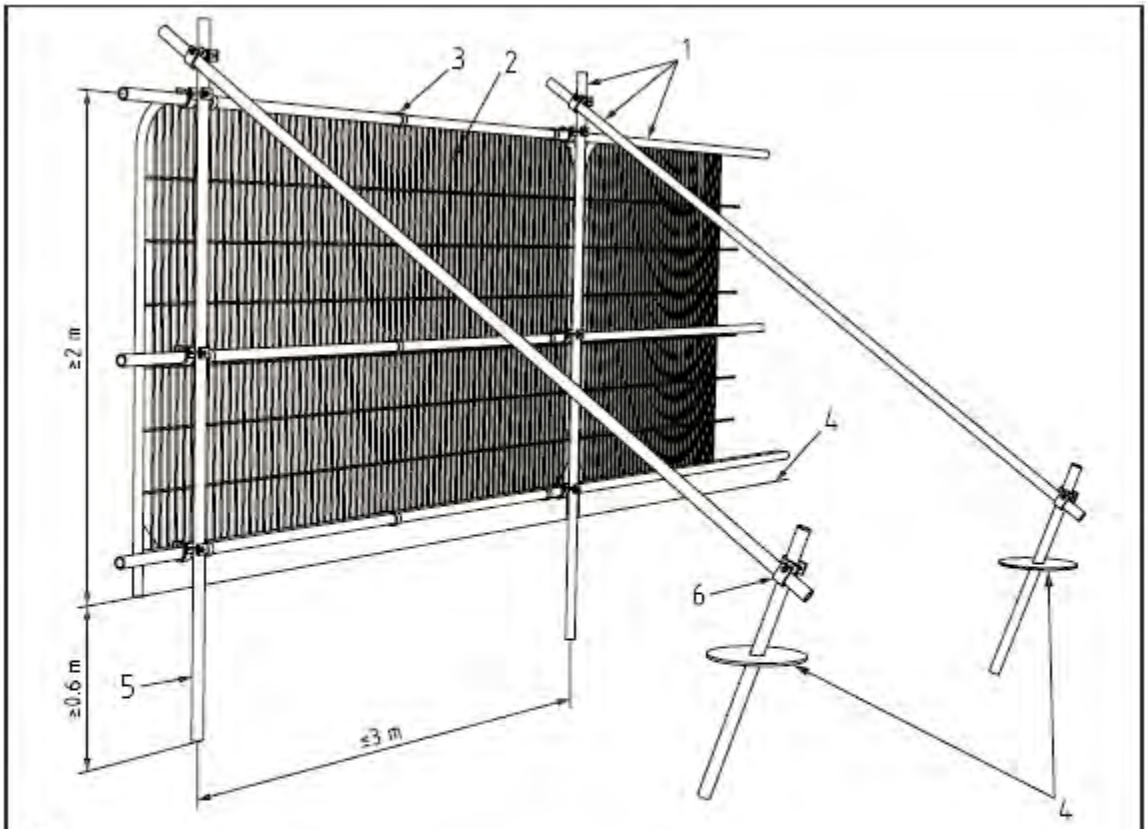
T13	Sycamore	*Acer pseudoplatanus*	M	14	1	825	5	9	8	6	9	No visual signs of damage	Single stem. Vertical	Unbalanced	Rot hole on stem. Low BRP	F	20 - 40	B2	9.9	
T14	Sycamore	*Acer pseudoplatanus*	SM	12	1	Est 300	4	4	4	4	4	No obvious damage	Single stem. Vertical	Open rounded canopy		F	20 - 40	C2	3.6	
TG15	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

Table 2 – Key to Tree Schedule

Measurements	Age – Class	Overall Condition	BS 5837 2005 : Cascade Chart for Quality Assessment/Retention Category	Symbols:
MS – Multi-stemmed	Y - Young	G – Good	A – High	< = less than
Ht - Height in metres	SM – Semi-Mature	F – Fair	B – Moderate	~ = approximately
Stem – Stem Diameter at 1.5m in mm	EM – Early-mature	P – Poor	C – Low	> = greater than
Crown – Crown spread in metres	M – Mature	D – Dead	R – Trees for Removal	
TD - Trunk division (height in metres)	V - Veteran Est Yrs – estimate of years remaining (>40 years; 20 –40 years; <20 years)		Sub-categories: 1 = mainly arboricultural values 2 = mainly landscape values 3 = mainly cultural values.	
RPA = Root Protection Area (equivalent to a circle with a radius 12 x the stem diameter for single stem trees and 10 x the basal diameter for trees with more than one stem arising below 1.5m above ground level).				

Appendix C – Tree Protection Barriers

Default Specification for Protective Barrier



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Appendix D – CEZ Warning Sign

– TREE PROTECTION AREA –
KEEP OUT!

(TOWN & COUNTRY PLANNING ACT 1990)
THE TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS, THE CONTRAVENTION OF WHICH MAY LEAD TO CRIMINAL PROSECUTION.
THE FOLLOWING MUST BE OBSERVED BY ALL PERSONNEL:

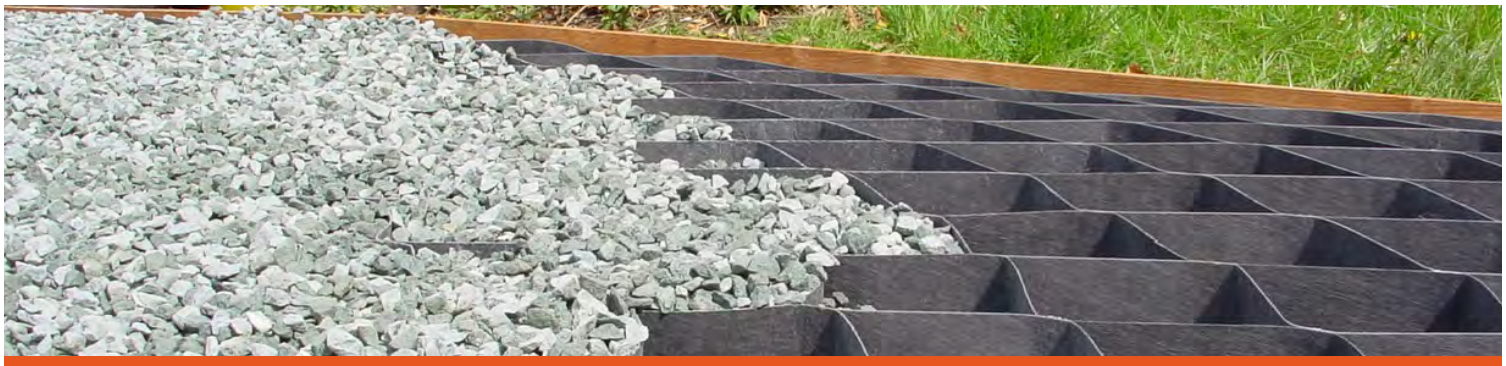
- Δ **THE PROTECTIVE FENCING MUST NOT BE MOVED**
- Δ **NO PERSON SHALL ENTER THE CONSTRUCTION EXCLUSION ZONE**
- Δ **NO MACHINE, PLANT OR VEHICLES SHALL ENTER THE EXCLUSION ZONE**
- Δ **NO MATERIALS SHALL BE STORED IN THE EXCLUSION ZONE**
- Δ **NO SPOIL SHALL BE DEPOSITED IN THE EXCLUSION ZONE**
- Δ **NO EXCAVATION SHALL OCCUR IN THE EXCLUSION ZONE**
- Δ **NO FIRES SHALL BE LIT IN THE EXCLUSION ZONE**

ANY INCURSION INTO THE EXCLUSION ZONE MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

Appendix E – Example of Geocell Root Protection

TERRAM™ Geocell 25/10

Case Study



No-dig driveway for tree-root protection

Client:	Essex Arb
Location:	St Albans
Product:	TERRAM™ Geocell 25/10

PROBLEM

The conversion of a grass lawn into a driveway suitable for parking a car was required in an area where a tree preservation order was in place. In order not to damage the roots, planning requirements stipulated that a no-dig solution should be used. A TERRAM geocell was specified as it would provide a stable, no-dig solution for a new parking area whilst protecting the tree roots from damage, and yet still allow drainage - unlike with concrete and asphalt.

SOLUTION

A TERRAM geocell confines the infill so that trafficking forces are spread laterally thus reducing the pressure on the underlying soil. Without the cellular system, the surface would be subject to deformation and this would inevitably result in damage to tree roots; possibly killing the trees.

The parking area was constructed on top of the existing ground within kerbs. A geotextile was first laid, followed by geocell which was fixed in place then filled with a free-draining, mediumsized, angular, granite stone. The geotextile will ensure that there is no intermixing of the stone and the underlying soil.

BENEFITS

Adopting this technique ensured minimum disruption to the tree roots. Disruption can, in itself, damage tree roots. Now the driving surface is stable and supportive. Traffic loads are controlled and directed away from the roots. The long-term result should be an environmentally friendly drive which is both attractive and functional.

e.mail: info@terram.com
www.terram.com

TERRAM
Geosynthetics you can trust

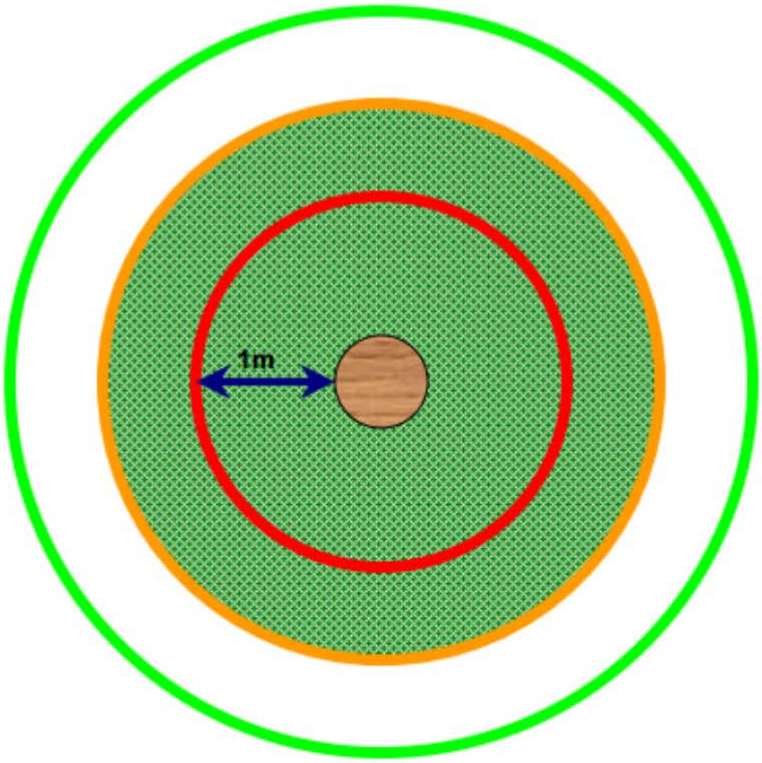
Appendix F – NJUG Volume 4

NJUG Volume 4

The National Joint Utilities Group

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

FIGURE 1 – Tree Protection Zone



Key

Trunk of tree

Canopy or branch spread

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

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

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

DAMAGE TO TREES

Tree roots keep a tree healthy and upright. Most roots are found in the top 600mm of soil and often grow out further than the tree's height. The majority of these roots are very fine; even close to a tree few will be thicker than a pencil. Most street tree roots grow under the footway but may also extend under the carriageway. If roots are damaged the tree may suffer irreversible harm and eventually die.

PROTECTING ROOTS - DO'S and DON'TS

There are three designated zones around a tree each of which has its own criteria for working practices.

THE PROHIBITED ZONE

Don't excavate within this zone.

Don't use any form of mechanical plant within this zone

Don't store materials, plant or equipment within this zone.

Don't move plant or vehicles within this zone.

Don't lean materials against, or chain plant to, the trunk.

Do contact the local authority tree officer or owner of the tree if excavation within this zone is unavoidable.

Do protect any exposed roots uncovered within this zone with dry sacking.

Do backfill with a suitable inert granular and top soil material mix as soon as possible on completion of works.

Do notify the local authority tree officer or the tree's owner of any damage.

THE PRECAUTIONARY ZONE

Don't excavate with machinery. Where excavation is unavoidable within this zone excavate only by hand or use trenchless techniques.

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Don't repeatedly move / use heavy mechanical plant except on hard standing.

Don't store spoil or building material, including chemicals and fuels, within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

Do backfill the trench with an inert granular material and top soil mix. Compact the backfill with care around the retained roots. On non highway sites backfill only with excavated soil.

Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.

THE PERMITTED ZONE

Don't cut roots over 25mm in diameter, unless advice has been sought from the local authority tree officer.

Do use caution if it is absolutely necessary to operate mechanical plant within this zone.

Do prune roots which have to be removed using a sharp tool (e.g. secateurs or handsaw). Make a clean cut and leave as small a wound as possible.

Do protect any exposed roots with dry sacking ensuring this is removed before backfilling.

Do notify the local authority tree officer or the tree's owner of any damage.

Appendix G – AMS Reporting Form

Technical Note

Project:	Richmond College, Twickenham	**Job No:**	18-0573.02
Subject:	Arboricultural Inspection Visit	**Report Date:**	
Author:	Pete Morrell	**Inspection:**	

Date of Inspection

1.0 Results

2.0 Actions to be taken

3.0 Photographs

Date of next visit –

Distribution

Tree Officer	
Site Engineer	
Site Manager	
Job File	**18-0573.02**