3 The Square, Stockley Park

Arboricultural Impact Assessment and Method Statement

A Report for F & C Commercial Property Holdings Ltd

February 2024

Greenspace Ecological Solutions

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Arboricultural Impact Assessment and Method Statement

February 2024

Client:	F & C Commercial Property Holdings Ltd	
Project Ref:	3 The Square, Stockley Park	
Report Ref:	J21357_Arb	
Author:	**Proofed by:**	**Approved:**
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Revision Ref:	**Status/ Comment:**	**Date of Issue:**
-	Issued to Client	08/02/2024

Disclosure:

It should be noted that whilst every effort has been made to meet the client’s requirements, no site survey can ensure complete assessment or prediction of the changeable onsite environment. Furthermore, should more than 12 months elapse between the date of this survey and any subsequent development, it may be necessary to consider the need for an update survey to be undertaken.

CONTENTS

1 PROJECT OVERVIEW

Client:	F & C Commercial Property Holdings Ltd
Site Address:	3 The Square, Stockley Park, Uxbridge, Middlesex, UB11 1ET
Attending Surveyor:	Neil Taylor
Survey Dates:	20th December 2023
Site Proposals:	The change of use of existing office building (Use Class E, formerly Use Class B1) to a post-operative care facility (Use Class C2), and the provision of landscaping and associated works.
Associated Planning Reference Number:	Not yet Submitted

Source of Relevant Documents:

Document:	**Source:**
Site Plans:	Stephen Langer Architects: 07109-PLAN-01 Rev B

2 INTRODUCTION

2.1 Context

2.1.1 To inform a planning application, Greenspace Ecological Solutions (GES) has been commissioned by F & C Commercial Property Holdings Ltd to undertake a tree survey of 3 The Square, Stockley Park (hereafter referred to as "the Site"). The survey was conducted in accordance with British Standard (BS) 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations".

2.1.2 The aim of this report is to present the results of the survey, including a Tree Survey Schedule (TSS), an Arboricultural Impact Assessment (AIA) and an Arboricultural Method Statement (AMS). A Tree Protection Plan (TPP) has also been produced and accompanies this report.

2.1.3 The proposal involves the change of use of existing office building (Use Class E, formerly Use Class B1) to a post-operative care facility (Use Class C2), and the provision of landscaping and associated works.

2.1.4 This report in no way constitutes a health and safety survey report. Where concerns for tree health and safety exist, the necessary and appropriate tree inspections should be carried out.

2.2 Site Location

2.2.1 The Site is located in the London borough of Uxbridge, Hillingdon, Middlesex, at National Grid Reference: TQ 08577 80178. The location of The Site is depicted in Image 1.

Image 1 – Geographical Location of the Site

2.3 Site Description

2.3.1 The Site occupies approximately 1.3ha and comprises a single building surrounded by car parking with small amounts of landscaping. The Site is bounded by the Stockley Park golf club to the north and east, and the Stockley Park business park to the south and west.

2.3.2 The wider landscape comprises urban residential, commercial and industrial development, and areas of green space.

3 SURVEY METHODOLOGY

3.1.1 All trees within the Site were inspected from ground-level by consultant arboriculturist Neil Taylor on 20th December 2023.

3.1.2 Measurements were taken in accordance with the recommendations set out in the BS 5837:2012. Canopy spreads were measured and plotted to the four compass points. Where direct access was not possible, measurements have been estimated. The surveyed trees are colour-coded on the accompanying tree survey drawing according to their relevant BS category.

3.1.3 The trees were categorised in accordance with the following criteria:

Trees for removal

U Those 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. (Identified by red colouration on the TCP.)

3.1.4 These trees should not be a consideration in the planning process.

Trees to be considered for retention

A Those of high quality and value: in such a condition as to be able to make a significant contribution (a minimum of 40 years is suggested). (Identified by green colouration on the TCP.)

B Those of moderate quality and value: those in such a condition as to make a substantial contribution (a minimum of 20 years is suggested). (Identified by blue colouration on the TCP.)

C Those of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150mm. (Identified by grey colouration on the TCP.)

3.1.5 Category C trees will usually not be retained where they would impose a significant constraint on development. Category A and B trees will normally be retained.

3.1.6 The following subcategories are applied. Trees may be allocated more than one subcategory, but this will not increase their overall value.

1: Mainly arboricultural values

A1 Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue).

B1 Trees that might be included in the high category but are downgraded because of impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage).

C1 Trees not qualifying in higher categories.

2: Mainly landscape values

A2 Trees, groups of trees 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).

B2 Trees present in numbers, usually as groups or woodlands, such that they form distinct landscape features, thereby attracting a higher collective rating than they might as individuals but which are not, individually, essential components of formal or semi-formal arboricultural features (e.g. trees of moderate quality within an avenue that includes better, A category specimens), or trees situated mainly internally to the Site, therefore individually having little visual impact on the wider locality.

C2 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.

3: Mainly cultural values, including conservation.

A3 Trees, groups of trees or woodlands of significant conservation, historical, commemorative, or other value (e.g. veteran trees or wood-pasture).

B3 Trees with clearly identifiable conservation or other cultural benefits.

C3 Trees with very limited conservation or other cultural benefits.

3.1.7 The tree data collected is used to enable the current canopy spread of the surveyed trees and the Root Protection Area (RPA) to be plotted on the accompanying TPP. The RPA is defined by the formula in paragraph 4.6 of the BS 5837:2012 and may be refined by considering current on-Site constraints to root activity such as buildings, earthworks and hard paving. This forms part of the design process for the proposed development.

3.1.8 The design process should consider the below and above-ground constraints posed by the better-quality trees on, and adjacent to, the Site.

4 ASSESSMENT

4.1 Tree Character Groups

4.1.1 The detailed results of the tree survey are provided in the TSS, in Appendix A.

4.1.2 In summary, the trees on, and adjacent to, the Site vary considerably in terms of condition and the amenity value that they provide to the wider landscape.

4.1.3 The trees can be divided into three distinct character groups as follows:

1. The first character group includes the large, mature trees growing adjacent to the northeast corner of the Site. The trees in this character group are in a reasonable condition and provide a mature back drop to the Site.
2. The second character group includes the medium-sized, middle-aged trees growing across the Site. In the main, the trees are in a good condition and provide a degree of arboricultural amenity to the local area.
3. The third character group includes the pollarded trees that line The Square. The trees in this character group are in a good condition and contribute to the formal character of the landscape of Stockley Park.

5 ARBORICULTURAL IMPACT ASSESSMENT (AIA)

5.1 Methodology

5.1.1 The AIA uses the information obtained in the tree survey to identify areas where the proposed renovations may be at odds with accepted standards, in terms of a tree's requirements for space in which to maintain existing roots and shoots, and space for future growth.

5.1.2 The quality and relative importance of each tree is illustrated as a coloured polygon. The colour used relates to the BS categories as follows: A - green, B - blue, C - grey and U - red (see accompanying drawing reference J21357 _Arb_TPP). In general, the design process will try to retain A and B category trees. Proposed construction will therefore normally be excluded from the RPA of A and B category trees. Red trees are discounted as they are recommended for removal.

5.1.3 The juxtaposition of the proposed development in relation to existing tree locations is shown on the accompanying TPP (reference J21357 _Arb_TPP).

5.1.4 The AIA considers existing Site conditions and the effect that they may have on the development of the surveyed trees' root systems. Hard structures such as building and paved roads and paths can influence the root activity of trees by reducing the availability of both moisture and nutrients.

5.2 Assessment

5.2.1 The accompanying TPP (reference J21357 _Arb_TPP) should be referred to for the relationship between the proposed development and the trees on and adjacent to the Site.

5.2.2 The following trees will be removed for arboricultural reasons:

T15, T16, T22, T43 and T50

5.2.3 The following trees and hedges will be removed to enable the proposed development:

- T46 – to enable landscape improvements.
- T60 – to enable landscape improvements.
- T62 – to enable landscape improvements.
- T68 – to enable landscape improvements.
- T69 – to enable landscape improvements.
- T70 – to enable landscape improvements.
- G5 – to enable landscape improvements.

- G6 – to enable landscape improvements.
- Part of H23 – to enable landscape improvements.
- H24 – to enable landscape improvements.
- Part of H26 – to enable landscape improvements.
- Part of H29 – to enable landscape improvements.
- H30 – to enable landscape improvements.
- Part of H31 – to enable landscape improvements.
- H33 – to enable landscape improvements.
- H34 – to landscape improvements.
- Part of H3 – to enable landscape improvements.
- H33 – to enable landscape improvements.
- Part of H36 – to enable landscape improvements.
- Part of H38 – to enable landscape improvements.

5.2.4 The following trees will be affected by the removal of the existing hard surface from with the RPA:

T45, T47, T48, T49, T51-T59, T61, T63, T64-T67, T71-T77, T79-T81 – The hard surface will remain in situ for as long as possible, to act as ground protection. Once all other works are complete, the hard surface will be removed in accordance with the methodology outlined in Section 6.3 below.

5.2.5 The following trees will be affected by the construction of new hard surfaces on the edge of the RPA:

T53, T54 and T59 – the relatively small incursion means that a no dig surface is not feasible so excavations will be required to lower the level to enable the new hard surface to tie in with the existing. The percentage incursion into the RPAs is less than 3 % so is considered acceptable. The excavations to lower the level will be carried out in accordance with the methodology outlined in Section 6.3 below.

5.2.6 The following trees will be affected by the construction of new hard surfaces within the RPA:

T47 and T48 – The new hard surfaces will be constructed in accordance with ‘no dig’ principles and utilise a cellular confinement system such as Cell Web as a sub-base. Refer to Section 6.3 below for details.

6 ARBORICULTURAL METHOD STATEMENT (AMS)

6.1 Methodology

6.1.1 The AMS provides the means by which retained trees and hedges can be protected throughout the development.

6.1.2 The movement of demolition and construction machinery in close proximity to trees may cause compaction of the soil which affects the tree's ability to absorb moisture and nutrients.

6.1.3 The RPAs of retained trees will be protected by a tree protection barrier as described in paragraph 6.5 below.

6.2 Demolition within the RPA of Retained Trees

6.2.1 The existing hard surface to be removed from with the RPA will be broken up and removed using hand operated tools only. Once removed, the area will be reinstated with topsoil immediately.

6.3 Construction within the RPA of Retained Trees

6.3.1 Excavations within the RPA: Where excavations are required to lower the level on the edge of the RPA of T53, T54 and T59, a trench will be excavated by hand along the edge of the area closest to the tree under the supervision of a suitably qualified arboriculturist to the required depth. Any roots that are uncovered will be pruned back to the edge of the trench using sharp secateurs. Once the roots are pruned, excavations can continue by machine.

6.3.2 Construction of New Hard Surfaces: Construction of the new hard surfaces that are within the RPA of T47 and T48 will incorporate the principles set out in Arboricultural Advisory and Information Service guidance note APN12 and utilise a cellular confinement system, such as cell web, as a sub base. Guidance on the form of construction necessary to avoid root damage and loss is provided in the form of an extract of the Cell Web Product brochure for their cellular confinement system at Appendix B.

6.3.3 The installation of the new hard surface should proceed in the following order:

- Kill ground vegetation and gather dead organic matter. Care must be taken to select a herbicide that will not affect tree roots.
- Remove major projections such as stumps and rocks. Stumps must be removed with a stump grinder so as to minimise ground disturbance.
- Fill major hollows with sharp sand.

- Lay geotextile membrane over the soil and pin into place.
- Lay cellular confinement system (such as Cell Web) as specified by engineer and pin into place.
- Fill the cellular confinement system with a 'no fines' aggregate to engineer's specification. Work must be carried out progressively so that any machinery used only moves on the laid surface.
- Lay geotextile membrane over filled cellular confinement system.
- Install timber sleeper or timber edging as specified by landscape architect or engineer.
- Lay porous wearing course.

6.3.4 Where the proposed new hard surface is to be installed on the existing soft landscape, allowances will be made for the increase in level which can be graded out across the remainder of the existing hard surface.

6.3.5 No materials or spoil is to be stored within the RPA of a retained tree unless on an existing hard surface.

6.3.6 In order to avoid damage to the retained trees, the tree surgery and felling work identified in the accompanying tree survey schedule will be carried out prior to the occupation of the Site by the building contractor. The work will be carried out in accordance with BS 3998:2010.

6.4 Services

6.4.1 It is understood that there will be no new services within the RPA of retained trees. However, where this is unavoidable, the section of service run which passes within the RPA of a retained tree will be hand dug in accordance with 'broken trenches' described in NJUG 4 Section 4, an extract of which can be found in Appendix C. This will ensure that tree roots are not damaged during the installation of the service. All root pruning will be agreed beforehand with the named Arboriculturist in consultation with the Local Planning Authority (LPA) Tree Officer. All root pruning will be in accordance with current best working practice. All routes for overhead services will aim to avoid the trees. Where this is unavoidable any tree work will be agreed prior to commencement with the LPA Tree Officer.

6.4.2 If the conditions are suitable on-site and there is sufficient space, underground services may cross the RPA if a low impact method is used. Such low impact methods include: moleing, directional drilling and thrust boring. It is important that all entry and exit pits remain outside of the RPA and the services are installed at a sufficient depth (at least 600mm) to avoid the tree rooting system.

6.5 Tree Protection

6.5.1 All trees that are to be retained on the Site will be protected by the use of a tree protection barrier erected in the location shown on the accompanying TPP, drawing number: J21357 _Arb_TPP. The barrier will be constructed in accordance with BS 5837:2012 and will consist of "Heras" type panels or similar on a vertical and horizontal scaffold framework, braced at a maximum interval of every three metres by vertical tubes driven securely into the ground. The tree protection barrier will be erected prior to the occupation of the Site by the contractor and will only be removed once the construction phase is complete.

6.6 Site Monitoring and Supervision

6.6.1 The process of reporting to the client and LPA Tree Officer will be by emailing the checklist form in Appendix D. The detailed schedule of works is yet to be produced. As such, a draft monitoring schedule has been produced at this stage to demonstrate how the project will be supervised throughout its lifespan. Once the schedule of works has been produced, the draft monitoring schedule can be finalised with more detail and timings. It can then be submitted as a condition of planning approval.

7 CONCLUSIONS

7.1 GES was commissioned by F & C Commercial Property Holdings Ltd to carry out a tree survey of the Site.

7.2 The results of the survey indicate that the trees within the survey area vary considerably in terms of quality and contribution to the amenity value within the local area.

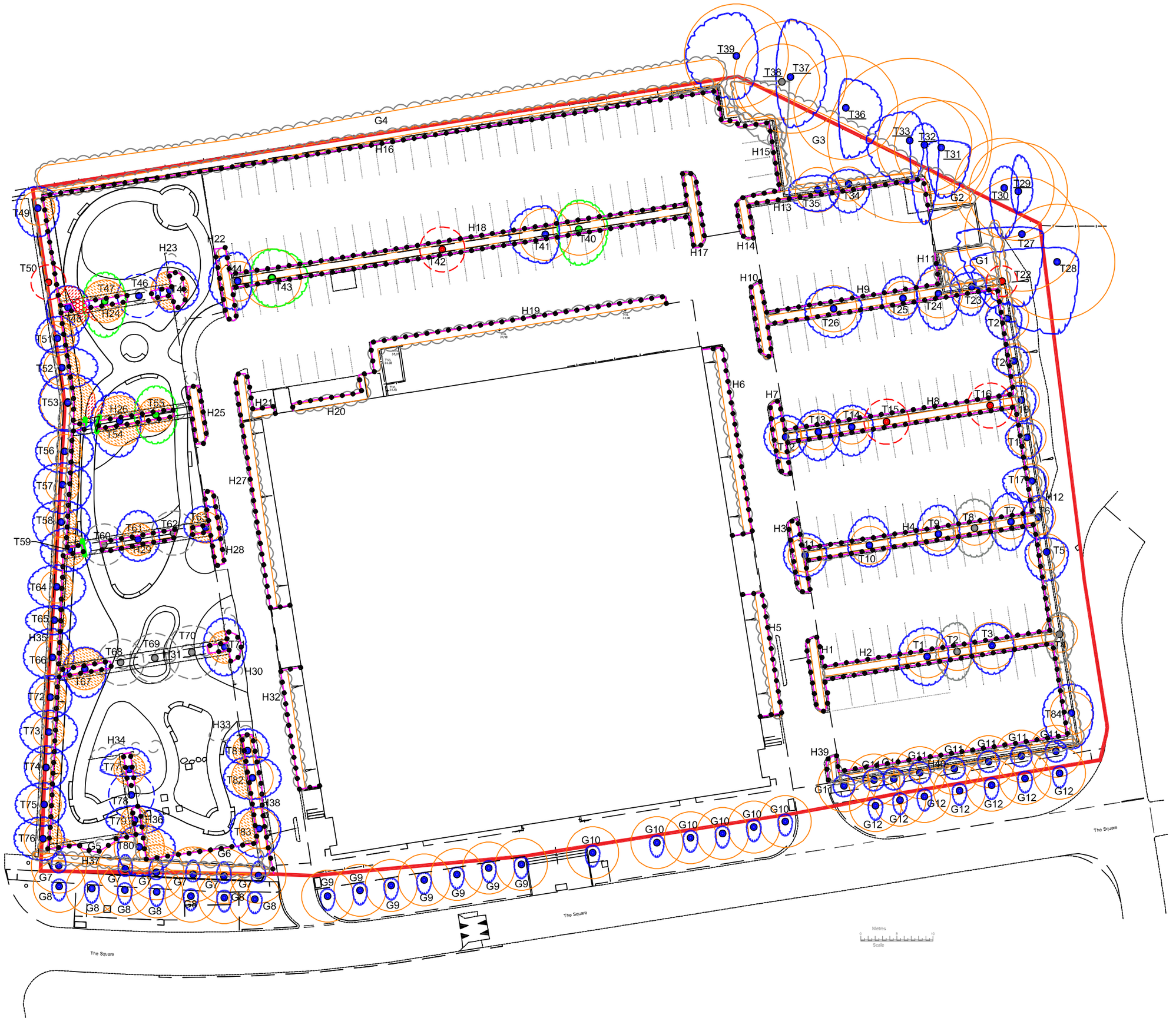
7.3 A total of six individual trees, two groups of trees, five entire hedges and a section of seven further hedges will be removed to enable the proposed development.

7.4 Seventeen new trees will be planted as part of a landscape scheme for the Site. The new trees will increase the species diversity and age range of trees in the local area.

7.5 Through the specified tree protection measures and construction methodologies, it will be possible to minimise the impact of the proposed development on the retained trees.

7.6 Overall, there are no known overriding arboricultural constraints which would prevent the proposed development from going ahead, subject to the protection measures and construction methodologies specified within this report being correctly implemented.

DRAWINGS



Root Protection Area
Diameter of trunk
Tree number as recorded on Survey Schedule
Tree canopy
Coloured symbol indicating BS category as shown below

T99

Underlined tree tags denote tree located by eye

Tree categories

- Category A tree — BS5837 2012
- Category B tree — BS5837 2012
- Category C tree — BS5837 2012
- Category U tree — BS5837 2012

Arboricultural Strategy

- Tree to be retained — Colour reference in accordance with the categories defined by BS:5837
- Tree to be removed — Colour reference in accordance with the categories defined by BS:5837
- G1/H1 — Tree group/hedge to be retained — Colour reference in accordance with the categories defined above
- Tree group or part of tree group to be removed — Colour reference in accordance with the categories defined above
- Line along which Tree Protection Barrier should be installed. Refer to accompanying report for specification
- Area of existing hard surface to be removed in accordance with the the methodology outlined in the accompanying report
- Area of existing hard surface to remain in situ and used as a sub base for the proposed re-surfacing
- Area of hard surface to be installed following a 'no dig' method of construction

Drawing Reference : J21357_Arb_TCP

Project Title
3 The Square, Stockley Park

Drawing Title
Tree Protection Plan

Date : 07-02-24 Checked : GN

Drawn : NT Approved : N/A

Status : Final Scale : 1:500@A2

GES Greenspace Ecological Solutions

APPENDICES

APPENDIX A – TREE SURVEY SCHEDULE

Project:	3 The Square, Stockley Park	BS 5837 2012 Trees in relation to design, demolition and construction-recommendations	Surveyed by	NT	Greenspace Ecological Solutions
Ref:	J21357_Arb		Weather	Overcast	
Date:	20.12.23		Tagged	No	
Client:	Columbia Threadneedle Investments				

				Canopy Spread											
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T1	Quercus palustris (Pin Oak)	8	250	4	3	4	4	1	2	MA	Good	Good	None	40+	B2
T2	Quercus palustris (Pin Oak)	8	220	4	2	4	3	1	2	MA	Fair - upper crown die back	Good	None	10-20	C1
T3	Quercus palustris (Pin Oak)	8	270	3	3	4	3	1	2	MA	Fair - upper crown die back	Good	None	10-20	B2
T4	Quercus palustris (Pin Oak)	8	210	3	2	4	2	1	2	MA	Fair - upper crown die back	Good	None	10-20	C1
T5	Quercus palustris (Pin Oak)	8	210	2	3	4	3	1	2	MA	Good	Good	None	40+	B2
T6	Quercus palustris (Pin Oak)	8	200	3	2	3	2	1	2	MA	Good	Good	None	40+	B2
T7	Quercus palustris (Pin Oak)	8	200	4	2	4	3	1	2	MA	Good	Good	None	40+	B2
T8	Quercus palustris (Pin Oak)	8	200	4	3	4	3	1	2	MA	Fair - upper crown die back	Good	None	10-20	C1
T9	Quercus palustris (Pin Oak)	8	200	4	3	3	3	1	2	MA	Good	Good	None	40+	B2
T10	Quercus palustris (Pin Oak)	9	220	4	3	3	3	1	2	MA	Good	Good	None	40+	B2
T11	Quercus palustris (Pin Oak)	8	200	3	3	3	3	1	2	MA	Good	Good	None	40+	B2
T12	Quercus palustris (Pin Oak)	8	190	3	3	3	3	1	2	MA	Good	Good	None	40+	B2

Project:	3 The Square, Stockley Park	BS 5837 2012 Trees in relation to design, demolition and construction-recommendations	Surveyed by	NT	Greenspace Ecological Solutions
Ref:	J21357_Arb		Weather	Overcast	
Date:	20.12.23		Tagged	No	
Client:	Columbia Threadneedle Investments				

				Canopy Spread											
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T13	Quercus palustris (Pin Oak)	8	210	3	3	4	3	1	2	MA	Good	Good	None	40+	B2
T14	Quercus palustris (Pin Oak)	8	200	3	3	4	3	1	2	MA	Good	Good	None	40+	B2
T15	Quercus palustris (Pin Oak)	7	200	3	3	3	2	1	2	MA	Poor - moribund	Fair	Remove tree.	<10	U
T16	Quercus palustris (Pin Oak)	7	200	3	1	2	2	1	2	MA	Dead	Fair	Remove tree.	0	U
T17	Quercus palustris (Pin Oak)	8	200	2	2	3	4	1	3	MA	Good	Good	None	40+	B2
T18	Quercus palustris (Pin Oak)	9	220	2	2	3	3	1	3	MA	Good	Good	None	40+	B2
T19	Quercus palustris (Pin Oak)	8	210	2	2	3	3	1	3	MA	Good	Good	None	40+	B2
T20	Quercus palustris (Pin Oak)	8	200	2	2	2	3	1	3	MA	Good	Good	None	40+	B2
T21	Quercus palustris (Pin Oak)	9	250	2	2	3	3	1	3	MA	Good	Good	None	40+	B2
T22	Quercus palustris (Pin Oak)	8	160	2	2	1	1	1	3	MA	Poor - suppressed.	Fair	None	<10	U
T23	Quercus palustris (Pin Oak)	9	250	2	2	4	3	1	2	MA	Good	Good	None	40+	B2
T24	Quercus palustris (Pin Oak)	10	280	4	3	5	3	1	3	MA	Good	Good	None	40+	B2

Project:	3 The Square, Stockley Park							**BS 5837 2012 Trees in relation to design, demolition and construction-recommendations**			**Surveyed by**	NT	GES Greenspace Ecological Solutions		
Ref:	J21357_Arb										**Weather**	Overcast			
Date:	20.12.23										**Tagged**	No			
Client:	Columbia Threadneedle Investments														
				Canopy Spread											
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T25	Quercus palustris (Pin Oak)	8	200	3	2	3	3	1	3	MA	Good	Good	None	40+	B2
T26	Quercus palustris (Pin Oak)	10	270	3	4	4	4	1	2	MA	Good	Good	None	40+	B2
T27	Populus alba (White Poplar)	16	660	1	3	10	9	1	6	M	Good	Fair - Poor shape & form.	None	20-40	B2
T28	Populus alba (White Poplar)	18	670	2	3	10	12	1	4	M	Good	Fair - Poor shape & form.	None	20-40	B2
T29	Populus canescens (Grey Poplar)	18	570	5	2	3	1	1	6	M	Fair - Die back. Off site.	Fair - large deadwood	None	20-40	B3
T30	Populus canescens (Grey Poplar)	18	577	3	2	7	2	2	4	M	Fair - Poor shape & form. Off site.	Fair	None	20-40	B3
T31	Populus canescens (Grey Poplar)	18	540	1	4	7	2	1	4	M	Fair - Poor shape & form. Die back. Off site.	Fair	None	20-40	B3
T32	Populus canescens (Grey Poplar)	18	549	3	2	11	2	2	4	M	Fair - Poor shape & form. Off site.	Fair	None	20-40	B3
T33	Populus canescens (Grey Poplar)	18	950	4	2	6	6	3	4	M	Fair - Poor shape & form. Off site.	Fair	None	20-40	B3
T34	Quercus palustris (Pin Oak)	8	200	2	3	4	3	1	3	MA	Good	Good	None	40+	B2
T35	Quercus palustris (Pin Oak)	8	260	2	3	3	4	1	2	MA	Good	Good	None	40+	B2
T36	Populus canescens (Grey Poplar)	18	600	4	5	7	1	1	4	M	Fair - Poor shape & form. Off site.	Fair	None	20-40	B3

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				Canopy Spread											
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T37	Populus canescens (Grey Poplar)	18	650	8	5	7	2	1	4	M	Fair - Poor shape & form. Off site.	Fair	None	20-40	B3
T38	Populus canescens (Grey Poplar)	18	440	0	1	9	7	1	4	M	Fair - Poor shape & form. Off site.	Fair	None	10-20	C1
T39	Populus canescens (Grey Poplar)	18	600	6	3	6	7	1	6	M	Fair - Poor shape & form. Off site.	Fair	None	20-40	B3
T40	Quercus palustris (Pin Oak)	12	300	4	4	5	3	1	2	MA	Good	Good	None	40+	A2
T41	Quercus palustris (Pin Oak)	11	300	4	2	4	5	1	2	MA	Good	Good	None	40+	B2
T42	Quercus palustris (Pin Oak)	7	200	3	2	3	3	1	2	MA	Poor - moribund	Fair	Remove tree.	0	U
T43	Quercus palustris (Pin Oak)	11	340	4	5	4	3	1	2	MA	Good	Good	None	40+	A2
T44	Quercus palustris (Pin Oak)	9	230	4	2	4	4	1	2	MA	Good	Good	None	40+	B2
T45	Quercus palustris (Pin Oak)	8	220	4	4	3	2	1	3	MA	Good	Good	None	40+	B2
T46	Quercus palustris (Pin Oak)	8	250	4	3	5	3	1	2	MA	Good	Good	None	40+	B2
T47	Quercus palustris (Pin Oak)	10	250	4	3	5	3	1	2	MA	Good	Good	None	40+	A2

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Client:	Columbia Threadneedle Investments				

				Canopy Spread											
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T48	Quercus palustris (Pin Oak)	10	250	3	3	4	3	1	3	MA	Good	Good	None	40+	B2
H24	Taxus baccata (Yew)	1	40	0.6	1	1	1	1	0	MA	Good	Good	None	40+	C1
T49	Quercus palustris (Pin Oak)	6	200	3	3	4	3	1	3	MA	Good	Good	None	40+	B2
T50	Quercus palustris (Pin Oak)	6	170	2	3	2	2	1	3	MA	Poor - Die back.	Fair	None	<10	U
T51	Quercus palustris (Pin Oak)	7	200	3	3	2	3	1	3	MA	Good	Good	None	40+	B2
T52	Quercus palustris (Pin Oak)	6	210	3	5	3	3	1	3	MA	Good	Good	None	40+	B2
T53	Quercus palustris (Pin Oak)	11	320	4	5	4	4	1	3	MA	Good	Good	None	40+	B2
T54	Quercus palustris (Pin Oak)	11	290	4	3	5	4	1	2	MA	Good	Good	None	40+	B2
T55	Quercus palustris (Pin Oak)	10	200	4	3	4	3	1	3	MA	Good	Good	None	40+	A2
T56	Quercus palustris (Pin Oak)	10	200	3	4	3	4	1	3	MA	Good	Good	None	40+	B2
T57	Quercus palustris (Pin Oak)	10	200	3	4	4	4	1	3	MA	Good	Good	None	40+	B2

Project:	3 The Square, Stockley Park	BS 5837 2012 Trees in relation to design, demolition and construction-recommendations	Surveyed by	NT	GES Greenspace Ecological Solutions
Ref:	J21357_Arb		Weather	Overcast	
Date:	20.12.23		Tagged	No	
Client:	Columbia Threadneedle Investments				

				Canopy Spread											
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T58	Quercus palustris (Pin Oak)	10	180	3	4	4	4	1	3	MA	Good	Good	None	40+	B2
T59	Quercus palustris (Pin Oak)	10	190	3	3	3	4	1	3	MA	Good	Good	None	40+	B2
T60	Quercus palustris (Pin Oak)	6	170	3	3	3	3	1	3	MA	Fair - Declining.	Good	None	10-20	C1
T61	Quercus palustris (Pin Oak)	10	190	4	3	3	3	1	3	MA	Good	Good	None	40+	B2
T62	Quercus palustris (Pin Oak)	6	170	4	3	4	3	1	3	MA	Fair - Declining.	Good	None	10-20	C1
T63	Quercus palustris (Pin Oak)	7	180	3	3	2	3	1	3	MA	Good	Good	None	40+	B2
T64	Quercus palustris (Pin Oak)	9	190	3	4	3	4	1	2	MA	Good	Good	None	40+	B2
T65	Quercus palustris (Pin Oak)	9	140	2	3	2	4	1	2	MA	Good	Good	None	40+	B2
T66	Quercus palustris (Pin Oak)	9	200	4	3	3	4	1	3	MA	Good	Good	None	40+	B2
T67	Quercus palustris (Pin Oak)	11	240	3	3	4	3	1	2	MA	Good	Good	None	40+	B2
T68	Quercus palustris (Pin Oak)	6	190	3	3	3	3	1	3	MA	Fair - Declining.	Good	None	10-20	C1

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Date:	20.12.23		Tagged	No	
Client:	Columbia Threadneedle Investments				

				Canopy Spread											
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T69	Quercus palustris (Pin Oak)	7	160	4	3	4	3	1	3	MA	Fair - Declining.	Good	None	10-20	C1
T70	Quercus palustris (Pin Oak)	5	150	4	3	3	3	1	2	MA	Fair - Declining.	Good	None	10-20	C1
T71	Quercus palustris (Pin Oak)	7	190	4	3	4	3	1	2	MA	Good	Good	None	40+	B2
T72	Quercus palustris (Pin Oak)	9	180	3	3	3	3	1	3	MA	Good	Good	None	40+	B2
T73	Quercus palustris (Pin Oak)	10	180	3	4	3	4	1	3	MA	Good	Good	None	40+	B2
T74	Quercus palustris (Pin Oak)	9	170	3	3	3	3	1	3	MA	Good	Good	None	40+	B2
T75	Quercus palustris (Pin Oak)	10	200	3	3	3	4	1	3	MA	Good	Good	None	40+	B2
T76	Quercus palustris (Pin Oak)	11	220	3	3	3	4	1	3	MA	Good	Good	None	40+	B2
T77	Quercus palustris (Pin Oak)	9	180	3	3	1	4	1	3	MA	Good	Good	None	40+	B2
T78	Quercus palustris (Pin Oak)	9	180	2	4	2	4	1	3	MA	Good	Good	None	40+	B2
T79	Quercus palustris (Pin Oak)	9	160	2	4	2	4	1	3	MA	Good	Good	None	40+	B2
T80	Quercus palustris (Pin Oak)	11	290	3	5	4	3	1	2	MA	Good	Good	None	40+	B2
T81	Quercus palustris (Pin Oak)	9	170	3	3	2	3	1	3	MA	Good	Good	None	40+	B2

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Client:	Columbia Threadneedle Investments				

				Canopy Spread											
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
T82	Quercus palustris (Pin Oak)	11	240	3	4	3	4	1	2	MA	Good	Good	None	40+	B2
T83	Quercus palustris (Pin Oak)	9	230	3	3	4	4	1	2	MA	Good	Good	None	40+	B2
T84	Quercus palustris (Pin Oak)	10	250	4	3	5	4	1	2	MA	Good	Good	None	40+	B2
G1	Taxus baccata (Yew),Prunus laurocerasus (Cherry Laurel)	3	Varied							Y	Good - soft landscape planting	Good	None	40+	C1
G2	Taxus baccata (Yew),Prunus laurocerasus (Cherry Laurel)	3	Varied							Y	Good - soft landscape planting	Good	None	40+	C1
G3	Taxus baccata (Yew),Prunus laurocerasus (Cherry Laurel)	3	Varied							Y	Good - soft landscape planting	Good	None	40+	C1
G4	Corylus avellana (Hazel),Crataegus monogyna (Hawthorn)	6	Varied							Y	Good - boundary group. Off site.	Good	None	40+	C1
G5	Prunus laurocerasus (Cherry Laurel)	1.5	Varied							Y	Good - soft landscape planting	Good	None	40+	C1
G6	Prunus laurocerasus (Cherry Laurel)	1.5	Varied							Y	Good - soft landscape planting	Good	None	40+	C1

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Date:	20.12.23		Tagged	No	
Client:	Columbia Threadneedle Investments				

				Canopy Spread											
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
G7	Tilia X europaea (Common Lime)	6	Varied							MA	Good - linear group of pollards.	Good	None	40+	B2
G8	Tilia X europaea (Common Lime)	6	Varied							MA	Good - linear group of pollards.	Good	None	40+	B2
G9	Tilia X europaea (Common Lime)	6	Varied							MA	Good - linear group of pollards.	Good	None	40+	B2
G10	Tilia X europaea (Common Lime)	6	Varied							MA	Good - linear group of pollards.	Good	None	40+	B2
G11	Tilia X europaea (Common Lime)	6	Varied							MA	Good - linear group of pollards.	Good	None	40+	B2
G12	Tilia X europaea (Common Lime)	6	Varied							MA	Good - linear group of pollards.	Good	None	40+	B2
H1	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H2	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H3	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H4	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H5	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1

Project:	3 The Square, Stockley Park	BS 5837 2012 Trees in relation to design, demolition and construction- recommendations	Surveyed by	NT	GES Greenspace Ecological Solutions
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Client:	Columbia Threadneedle Investments				

				Canopy Spread											
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
H6	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H7	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H8	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H9	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H10	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H11	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H12	Carpinus betulus (Hornbeam)	3	Varied							Y	Good - boundary hedge	Good	None	40+	C1
H13	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H14	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H15	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H16	Carpinus betulus (Hornbeam)	3	Varied							Y	Good - boundary hedge	Good	None	40+	C1

Project:	3 The Square, Stockley Park							**BS 5837 2012 Trees in relation to design, demolition and construction-recommendations**			**Surveyed by**	NT	Greenspace Ecological Solutions			
Ref:	J21357_Arb										**Weather**	Overcast				
Date:	20.12.23										**Tagged**	No				
Client:	Columbia Threadneedle Investments															
				Canopy Spread												
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category	
H17	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	
H18	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	
H19	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	
H20	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	
H21	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	
H22	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	
H23	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	
H25	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	
H26	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	
H27	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	
H28	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1	

Project:	3 The Square, Stockley Park	BS 5837 2012 Trees in relation to design, demolition and construction- recommendations	Surveyed by	NT	Greenspace Ecological Solutions
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Date:	20.12.23		Tagged	No	
Client:	Columbia Threadneedle Investments				

Tree No.	Species	Height (m)	Stem Dia. (mm)	Canopy Spread N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
H29	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H30	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H31	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H32	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H33	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H34	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H35	Carpinus betulus (Hornbeam)	3	Varied							Y	Good - boundary hedge	Good	None	40+	C1
H36	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H37	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H38	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1
H39	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1

Project:	3 The Square, Stockley Park							**BS 5837 2012 Trees in relation to design, demolition and construction-recommendations**		**Surveyed by**	NT	Greenspace Ecological Solutions		
Ref:	J21357_Arb									**Weather**	Overcast			
Date:	20.12.23									**Tagged**	No			
Client:	Columbia Threadneedle Investments													
				Canopy Spread										
Tree No.	Species	Height (m)	Stem Dia. (mm)	N	E	S	W	Stems	Height of crown clearance	Age class	Physiological condition problems/comments	Structural condition	Preliminary management recommendations	Estimated remaining contribution years	BS category
H40	Taxus baccata (Yew)	1	Varied							Y	Good - internal hedge	Good	None	40+	C1

Appendix B: Extract from the Cell Web product brochure

CellWeb

Tree Root Protection System

CellWeb Tree Root Protection System provides a flexible and permeable solution for protecting tree roots while creating a strong stable surface for traffic.

With increased urbanisation and more redevelopments of existing properties, the need to be mindful of the impact on the surrounding environment is more important than ever.

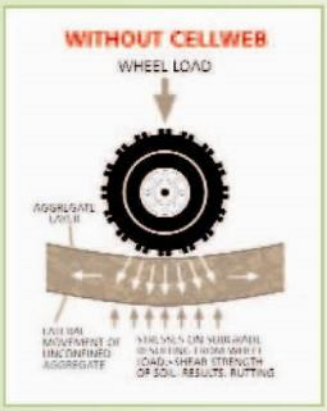
The demand for building site access, driveways and parking around existing trees can have a potentially fatal impact on the tree if carried out incorrectly. Tree preservation orders (TPO's) ensure that trees are not wilfully damaged. However the need for vehicle access over and around tree roots can still cause the following problems:

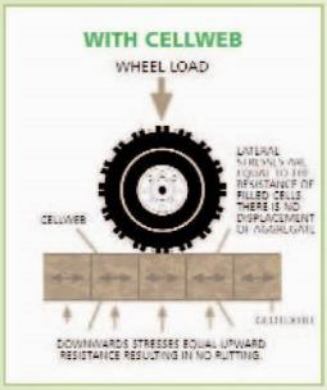
Problems:

- Compaction of subsoils (especially by construction traffic) causing oxygen and nutrient depletion
- Creating an impermeable surface that prevents water reaching the roots
- Changes in ground level and water table
- Damage caused during excavation
- Contamination of the subsoil

By using CellWeb Tree Root Protection System you can avoid these problems and ensure the tree's long-term future. BS 5837:1991 (revised 2005) and APN 1 provide information for the protection of trees during the construction process, and CellWeb is a well-established solution that conforms to these guidelines.

Product features

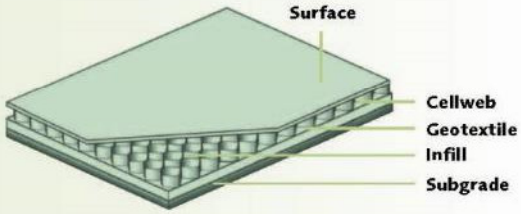




Cellweb's patented design with its unique cellular structure and perforated cell walls reduces the vertical load pressure on tree roots and prevents damage. With clean granular materials as infill, air and moisture can reach the roots to encourage healthy growth.

With no-dig solutions being the preferred option of most Arboricultural Consultants and Tree Officers, CellWeb is ideal as only the surface vegetation need be removed. As well as avoiding disruption to the roots this reduces installation time and saves money.

What's more CellWeb also cuts down the depth required for the sub base – in most cases by 50% for further cost savings. CellWeb also significantly reduces surface rutting, increasing the long-term performance of the finished surface.



Using CellWeb for tree root protection gives you these benefits:

- Reduced depth of excavation required
- Preventing the compaction of subsoils
- Preventing oxygen and nutrient depletion
- Environmentally sound
- Quick, easy and cost-effective installation
- Free technical support available

CellWeb gives you the cost-effectiveness you need at the same time as helping to preserve trees.

Geosynthetics Ltd is a leading dis

Please call
01455 617 139
or email sales@geosyn.co.uk
for further information.

Wide product range

Large stock holding

Next day delivery

Access road for the National Lake District Parks Authority.

Site before construction pictured above.

CellWeb during installation.

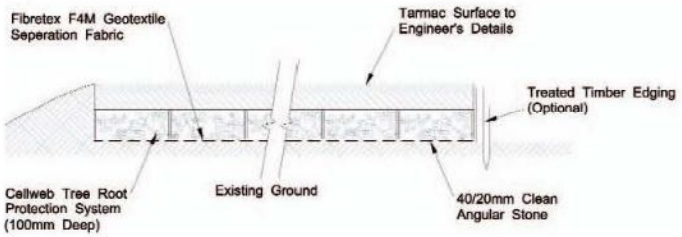
Final surfacing.

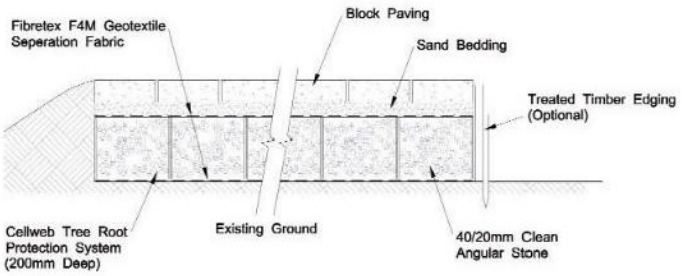
Final surfacing

The CellWeb Tree Root Protection is totally confined within the clean stone sub base, therefore you can choose whichever surface materials are most appropriate for your installation. Some materials are more suitable than others and serious consideration should be given to the porosity of the surface for continued healthy growth of the tree. An ideal surfacing are DuoBlocks: a grass reinforcement and gravel retention system. Geosynthetics can supply these systems for a visually attractive surface that also has the advantage of being fully porous.

Loose or bonded gravels can be used as an alternative hard landscaping and CellWeb can also be used with block paviors whose porous joints will permit moisture and air transfer to the roots. Where planning allows, porous asphalt is yet another possible surfacing treatment.

Call our sales office on 01455 617 139 for more information.





APPENDIX C – SECTION 4, EXTRACTED FROM NJUG 4

4. HOW TO AVOID DAMAGE TO TREES

This section gives general guidance on methods of work to minimise damage to trees. The local authority (or for privately owned trees, the owner or their agent), should be consulted at an early stage prior to the commencement of any works. This will reduce the potential for future conflict between trees and apparatus.

4.1 Below Ground

Wherever trees are present, precautions should be taken to minimise damage to their root systems. As the shape of the root system is unpredictable, there should be control and supervision of any works, particularly if this involves excavating through the surface 600mm, where the majority of roots develop.

4.1.1 **Fine Roots**
Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

4.1.2 **Precautions**
The precautions referred to in this section are applicable to any excavations or other works occurring within the Prohibited or Precautionary Zones as illustrated in Figure 1 – 'Tree Protection Zone'.

4.1.3 **Realignment**
Whenever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone.

The appropriate method of working within the Precautionary Zone should be determined in consultation with the local authority (or for privately owned trees the owner or their agent) and may depend on the following circumstances;

- the scope of the works (e.g. one-off repair or part of an extensive operation)
- degree of urgency (e.g. for restoration of supplies)
- knowledge of location of other apparatus
- soil conditions
- age, condition, quality and life expectancy of the tree

Where works are required for the laying or maintenance of any apparatus within the Prohibited or Precautionary Zones there are various techniques available to minimise damage.

Acceptable techniques in order of preference are;

a) Trenchless
Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited or Precautionary Zones.
In order to avoid damage to roots by percussive boring techniques it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone following consultation and by agreement.

b) Broken Trench - Hand-dug
This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching as in (c) below. Open sections of the trench should only be long enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible and outside of the Prohibited Zone.

c) Continuous Trench - Hand-dug
The use of this method must be considered only as a last resort if works are to be undertaken by agreement within the Prohibited Zone. The objective being to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary zones must be undertaken with great care requiring closer supervision than normal operations.

After careful removal of the hard surface material digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.

All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer / arboriculturist. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound.

4.1.5 **Backfilling**

- Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: **Volume 6 – 'Legislation and Bibliography'**). In England this relates to the requirements of the code of practice – 'Specification for the Reinstatement of Openings in Highways' approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them.

- The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builder's sand) around the roots. This should allow the soil to be compacted for resurfacing without damage to the roots securing a local aerated zone enabling the root to survive in the longer term.

- Backfilling outside the constructed highway limits should be carried out using the excavated soil. This should not be compacted but lightly "tamped" and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

4.1.6 **Additional Precautions near Trees**

- Movement of heavy mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.

- Where it is absolutely necessary to use mechanical plant within the Precautionary Zone care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way advice should be sought from the local authority tree officer / arboriculturist.

See TABLE 1 –'Prevention of Damage to Trees Below Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 1 - Prevention of Damage to Trees Below Ground

Causes of Damage	Type of Damage	Implications to Tree	Precautions
Trenching, mechanical digging etc.	Root severance	• The tree may fall over • Death of the root beyond the point of damage • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm in diameter use a sharp tool and make a clean cut leaving as small a wound as possible.
Trenching, mechanical digging, top soil surface removal etc.	Root bark damage	• The tree may fall over • If the damage circles the root it will cause the death of the root beyond that point • Potential risk of infection of the tree The larger the root the greater the impact on the tree.	Do not use mechanical machinery to strip the top soil within the Precautionary Zone. Hand excavate only within the Precautionary Zone. Work carefully around roots. Do not cut roots over 25mm in diameter without referring to the local authority tree officer. For roots less than 25mm use a sharp tool and make a clean cut leaving as small a wound as possible.
Vehicle movement and plant use. Material storage within the precautionary area.	Soil compaction & water saturation	Restricts or prevents passage of gaseous diffusion through soil, the roots are asphyxiated and killed affecting the whole tree.	Prevent all vehicle movement, plant use or material storage within the Precautionary Zone.
Top-soil scouring, excavation or banking up.	Alterations in soil level causing compaction or exposure of roots.	Lowering levels strips out the mass of roots over a wide area. Raising soil levels asphyxiates roots and has the same effect as soil compaction.	Avoid altering or disturbing soil levels within the Precautionary Zone.
Use of herbicides.	Poisoning of the tree via root absorption	• Death of the whole tree • Death of individual branches Damage to leaves and shoots.	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.
Spillage of oils or other materials.	Contamination of soil	Toxic and asphyxiation effects of chemicals, oils, building materials (cement, plaster, additives etc.) on the root system can kill the tree.	Never store oils, chemicals or building materials within the Precautionary Zone or within the branch spread of a tree, which ever is the greater.
Placement or replacement of underground apparatus.	Various	Death of all or part of the tree.	Effective planning and liaison with local authority tree officer, taking into consideration the position of trees, and their future growth potential and management

4.2 Above Ground

4.2.1 Damage by Pruning

Trees (including shrubs and hedges) can be damaged by inappropriate or excessive pruning. Reference should be made to the Energy Networks Association (ENA) document "Engineering Technical Report 136 Vegetation Management near Electricity Equipment – Principles of Good Practice" (see section 8 – 'Other Useful Publications') or appropriate company specific documentation for guidance on pruning.

See TABLE 2 – 'Prevention of Damage to Trees Above Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

TABLE 2 - Prevention of Damage to Trees Above Ground

Causes of Damage	Type of Damage	Implications for the Tree	Precautions
Impact by vehicle or plant Physical attachment of signs or hoardings to the trunk Storage of materials at base of tree Rubbing by winch or pulling cables	Bark bruising, bark removal, damage to the wood, damage to buttress roots, abrasion to trunk	Wounding with the potential for infection ultimately resulting in death of all or part of the tree. Structural failure of the tree	Surround the trunk with protective free-standing barrier. Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes.
Impact by vehicle or plant Rubbing by overhead cables	Bark damage to branches, breakage and splitting of branches, abrasion to branches	Structural failure of the branch. Wounding or loss of a branch with the potential for infection ultimately resulting in death of all or part of the branch or tree.	Exclude vehicles, plant or material storage from the Precautionary Zone. Ensure sufficient clearance of cables or ropes. All pruning should be carried out in accordance with BS3998 *(prune affected branches to give appropriate clearance from cables)*
Inappropriate siting of overhead apparatus, such as CCTV, lighting fixtures and communications masts and dishes.	Inappropriate pruning, unnecessary tree removal	Severely pruning tree to acquire line of sight signal for communications dish etc.	Effective planning and liaison with local authority tree officer / arboriculturist, taking into consideration the position of trees, and their future growth potential and management.
Lack of forethought in design and location of apparatus and services entries on new developments	Complete tree removal	The tree is removed unnecessarily	Agree the location and installation of services at the design stage. Consideration should be given to the creation of dedicated service routes wherever possible.
Use of herbicides	Poisoning of the tree via absorption through bark, leaves and shoots	Death of the whole tree, death of individual branches, damage to leaves and shoots	The selection and application of herbicides must be undertaken by a competent person in accordance with COSHH regulations.

APPENDIX D – PROGRAMME OF SITE MONITORING

3 The Square, Stockley Park

Site Monitoring Form

To be completed by the named arboriculturist and emailed to the client and tree officer at the completion of each operation.

Arboriculturist……

Client……

Project Manager……

Tree Officer……

(The above to be filled in with names and contact numbers)

OPERATION	TIMING	DATE	COMMENTS
Pre-commencement meeting or contact with project/Site manager.	Before any works or pre-works on Site		
Spot check of tree protection measures	Before works begins		
Supervision of excavations for new hard surfaces	During landscape works		
Spot check of no dig hard surfaces within RPAs	During la*ndscape* works		
Completion of development	Once all construction activity has been completed		