

BS5837 Arboricultural Impact Assessment



NCP Car Park, Terminals 2-3 Heathrow, West Drayton, UB7
0DU

Client: **Aprirose Real Estate Investment**

Job Reference: **03528R**

Consultant: **Keiron Hart (BSc Hons, C.Env, F.Arbor.A, MICFor,
MEWI)**

March 2021

Contents

1. Executive Summary	3
2. Statutory Protection	4
3. Terms of Reference.....	6
4. The Trees	6
5.0 Arboricultural Impact Assessment	8
5.1 Site Specific Soils.....	8
5.2 Root Protection Area (RPA) Incursions	16
5.3 Tree Pruning & Removal.....	18
5.4 Demolition & Foundations.....	20
5.5 Surfaces near Trees	23
5.6 Site Service Provision	23
5.7 Ground Level Changes & Landscaping	24
5.8 Tree Shading of Proposal	27
5.9 Arboricultural Project Supervision	27

Appendix 1 – BS5837 Survey Key	29
Appendix 2 – BS5837 Tree Classification	30
Appendix 3 – BS5837 Survey Data.....	32
Appendix 4 – Tree Works Schedule	34
Appendix 5 - Tree Constraints Plan	35
Appendix 6 - Tree Protection Plan.....	37
Appendix 7 – Site Photographs	39
Appendix 8 – Limitations	41

1. Executive Summary

- 1.1 Tamla Trees Ltd has been appointed by Aprirose Real Estate Investment to provide advice on the arboricultural issues relating to proposed development which can be described as: *“Provision of a new vehicular access to existing NCP Car Park via A4 Bath Road.”*
- 1.2 We surveyed the site on March 2021. The survey accorded with BS5837:2012 “Trees in relation to design, demolition and construction – Recommendations”. There was no direct access to the trees within TG1.
- 1.3 Highway verge trees T3 (Norway Maple) and T4 (London Plane) require removal to facilitate the access point and visibility splay. A section of TG1 (Mixed Species) will be removed to facilitate the link access road to the care park site.
- 1.4 The tree removal works places the remaining trees within TG1 outside of the development area and protective fencing will be used to link between the remaining sections of brick-built boundary wall at the north and south of TG1 protecting the retained tree Root Protection Areas (RPA). Tree removal within TG1 will be undertaken to suitable symmetric/ robust trees within the group to remove the risk of windthrow from new exposure as a result of these works.
- 1.5 As an additional precaution the remaining highway verge trees (T1 & T2) will be basally shuttered to protect the stems from direct physical damage.
- 1.6 The tree issues can be summarised as: **Tree Removal Works> Effective Tree Protection> Access Road & Visibility splay works> Soft landscaping to make good.**
- 1.7 Hillingdon Borough Council website indicates the site and surveyed trees are not the subject of a Tree Preservation Order (TPO) and are not located within a designated Conservation Area.
- 1.8 Subject to the working practices detailed within this report there should be no discernible impact on the retained trees.
- 1.9 This report is based on the client plans ref: MBSK210222 01 - 07

2. Statutory Protection

2.1 At the time of writing we are advised as follows:

Conservation Area Status	
Is the site located within a Conservation Area?	No
Notes: (i) All trees larger than 7.5cm diameter at 1.5m above ground level are subject to regulations within a Conservation Area. Exemptions apply for trees which are dead and dangerous but clarification before any tree works is advised. A notification is required in many circumstances.	
Tree Preservation Order Status	
Are inspected trees subject to a TPO?	No
Type of TPO	~~Area~~ ~~Individual~~ ~~Group~~ ~~Woodland~~
TPO Reference	NA
Date TPO Made	NA
Notes: (i) The type and details of any TPO determine which trees are 'protected'. Exemptions apply for trees which are dead and dangerous but clarification before any tree works is advised. An application may be required before undertaking works. (ii) At the time of writing Hillingdon Council website indicates there is no statutory protection to the trees the subject of this report.	

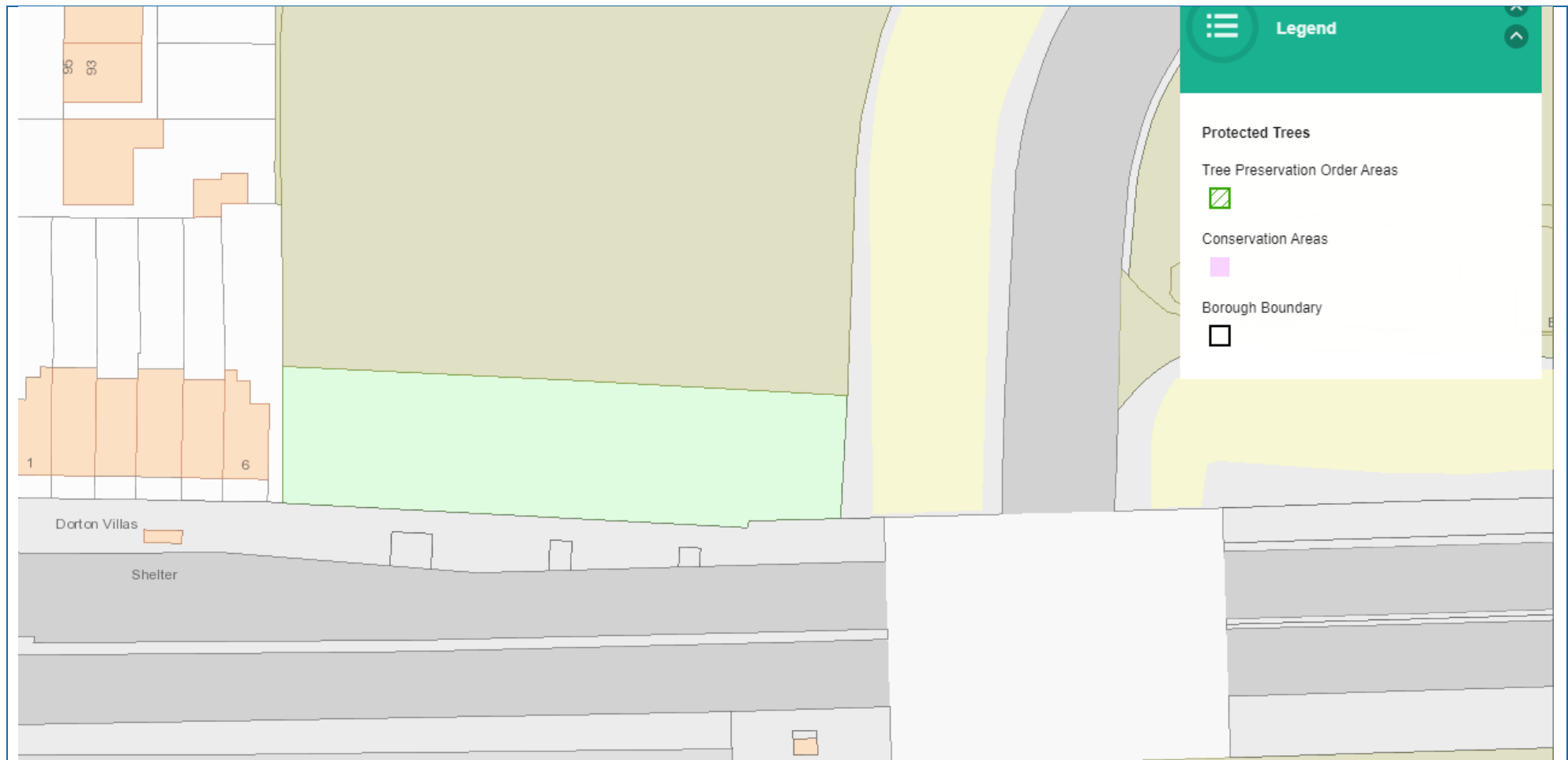


Fig 1 – Area of survey/ proposal extract plan from Hillingdon Council constraint map. The trees are not the subject of a TPO or located within a Conservation Area.

3. Terms of Reference

- 3.1 [BS5837:2012](#) 'Trees in relation to design, demolition and construction – recommendations'
- 3.2 [BS3998:2010](#) 'Tree work – recommendations'
- 3.3 [NJUG 4 – National Joint Utilities Group](#) "Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees. Volume 4, issue 2. London: NJUG 2007" To include [Operatives Hand-out Guidance](#)
- 3.4 BGS Open-Source Soil Data <http://www.bgs.ac.uk/nercsoilportal/maps.html>
- 3.5 HSE (2014) Avoiding danger from underground services: <https://www.hse.gov.uk/pubns/books/hsg47.htm>
- 3.6 Eissenstat & Yanai (1997) The ecology of root lifespan. *Advances in Ecological Research*, 27, 1-60.
- 3.7 Hendricks & Pregitzer (1992) The demography of fine roots in a northern hardwood forest. *Ecology*, 73, 1094-1104.
- 3.8 BRE Digest 412: Desiccation in clay soils.
- 3.9 Matheny & Clark (1998) Trees and Development: A Technical Guide to Preservation of Trees During Land Development.
- 3.10 <https://www.trees.org.uk/Help-Advice/Help-for-Tree-Owners/Guide-to-Tree-Pruning>
- 3.11 <https://www.trees.org.uk/ARB-Approved-Contractor-Directory>
- 3.12 Prof. Claus Mattheck (2007) Updated Field Guide for Visual Tree Assessment Paperback ISBN-10 : 3923704593

4. The Trees

4.1 The trees can be summarised as follows:

BS 5837 Cat	A	B	C	U
Specific Trees	-	T1, T2, T3 & TG1	T4	-
Total Number	None	3 individuals, 1 group	1 individual	None

4.2 These tree locations and a summary of their visual contributions can be summarized as follows:

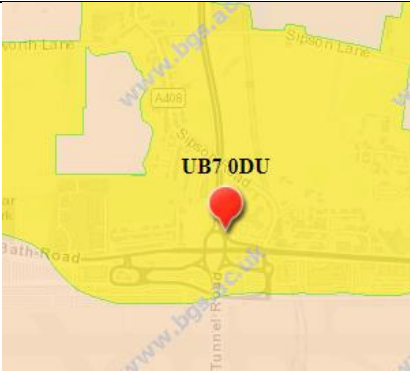
BS 5837 Cat	A	B	C
Bath Road (A4) Providing amenity between road and car park and to both pedestrian and vehicular users of A4.	-	T1, T2, T3 & TG1	T4

4.3 There were no hedgerows that qualify for consideration under the 1997 Hedgerow Regulations.

5.0 Arboricultural Impact Assessment

5.1 Site Specific Soils

- 5.1.1 Soil is an important factor in tree growth and the type of underlying soil can impact on successful integration of new developments.
- 5.1.2 A free draining sandy soil containing sand/gravel is likely to lead to water being accessible in the upper horizons during the growing season and available at greater depths and trees will generally be forced to explore a larger volume/ depth on such soils. The structure of such soil also makes compression more difficult (by heavy construction plant) and root penetration is easier for the trees. By comparison, a clay soil is more easily compressed, particularly when wet and compression can have a greater impact on tree health.
- 5.1.3 As shown below the site is located within what is defined as clay.

	Soil Description
	Bedrock formation: London Clay Formation - Clay, Silt And Sand. Sedimentary Bedrock formed approximately 48 to 56 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas. Superficial Formation: Langley Silt Member - Clay And Silt. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by wind-blown deposits (U).

Underlying Soil Material contains Clay	Yes
Soil Type increased rooting depth profile?	No
Increased risk of soil compaction due to soil type	Yes

- 5.1.4 All comments regarding soils should be verified with onsite geotechnical investigations and laboratory testing with foundation depth and design undertaken by a structural engineer in accordance with the requirements of NHBC Chapter 4.2.
- 5.1.5 BS5837 indicates: 4.6.2 *“The RPA for each tree should initially be plotted as a circle centred on the base of the stem. Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution.”* It advises at Section 4.6.3 That any deviation in the RPA from the original circular plot should take account of a number of site-specific factors.
- 5.1.6 BS5837 recognises that the root morphology of trees may be affected by a number of factors and in certain situations the plotting of RPA’s will deviate from the circle to reflect site specific considerations. It is our experience that to consider structures such as driveways, houses and garages as areas trees cannot utilise for rooting (and to then modify RPA plotting where they exist within an identified RPA) is too simplistic and not aligned with how trees actually utilise soil.
- 5.1.7 Within around 3 to 4m of the base of mature trees there will generally be a structural root system providing both support and the main structure/ root architecture for smaller roots to originate. These larger roots have the very real capacity to be influence by any significant structures (footings, roads to adoptable standard construction etc) where there may be a physical obstruction close to them and this can affect root morphology in such locations. In addition to this there will generally be a noticeable increase in structural rooting to the south west of mature trees in the UK to reflect the prevailing wind direction, particularly where a tree may be isolated/ open grown increasing its wind exposure. Root growth and location will also be influenced by the presence of other trees, structures sheltering trees etc all of which can combine to affect the shape and location of a structural root system.

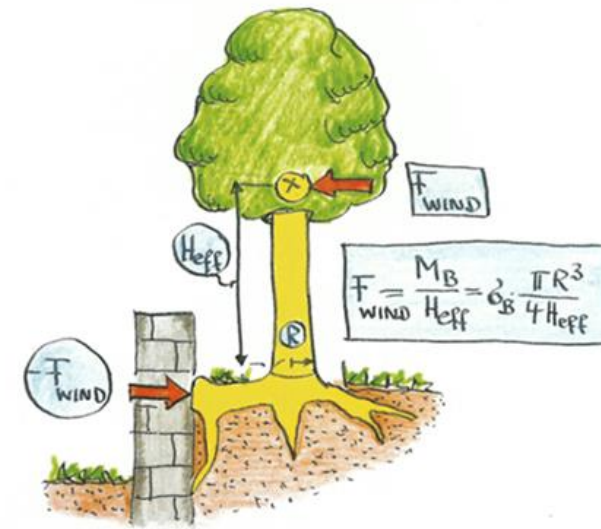
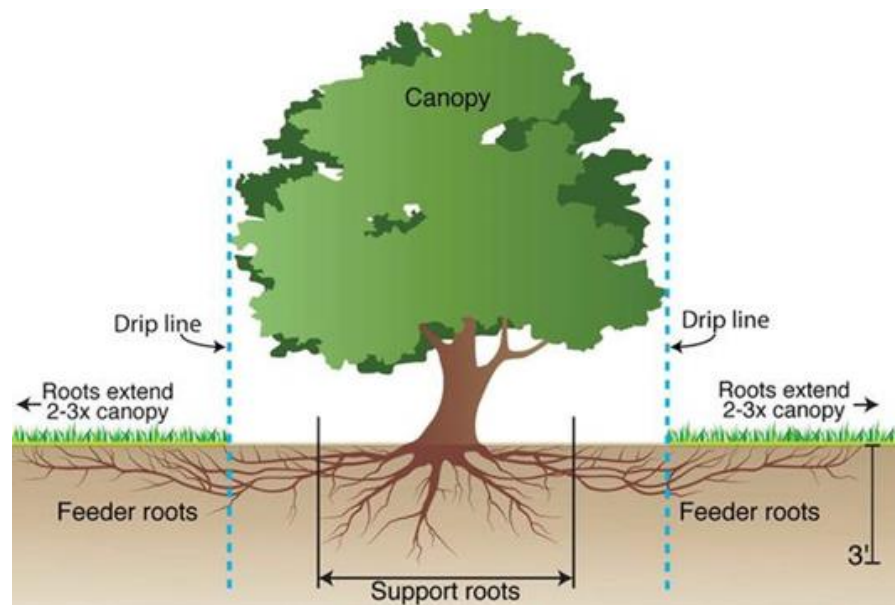


Fig 2 – Open grown trees or those with minimal obstructions close to their stems will have a network of structural roots supporting feeder/ fine root growth beyond (above left). In certain situations root morphology can be affected by structures close to the main stem (above right: Mattheck)

5.1.8 Beyond the structural (and generally permanent) root system will be a network of smaller roots which in turn subdivide to fine roots. Fine roots will also be found throughout the root system (i.e. both close to and distant from a tree) to maximise soil resource uptake and reflect underlying soil conditions. Some larger roots (>25mm and sometimes much larger) can extend away from this area and remain permanent particularly where there may be a constant supply of water (such as a broken downpipe on a building some distance away) which encourages a roots development. Generally the smaller roots (<10mm and particularly fibrous roots) outside of the immediate structural root plate can be considered to be in a state of constant change. They will grow seasonally and tree roots generally grow at night. Small fibrous roots are also mostly short lived (ranging from anything between 10 days to over a year¹). The cyclical death and decay of roots releases both nitrogen and carbon into the soil and is an important part of soil nutrient cycling process. The extent and location of the trees fine root system reflects a trees resource requirement (as resources are removed from certain areas of the soil and exploited in others) as well as the resource capacity required to form such a fibrous root system. Fine roots produced near the soil surface tend to live longer than those deeper in the soil².

¹ Eissenstat & Yanai (1997) The ecology of root lifespan. *Advances in Ecological Research*, 27, 1-60.

² Hendricks & Pregitzer (1992) The demography of fine roots in a northern hardwood forest. *Ecology*, 73, 1094-1104.

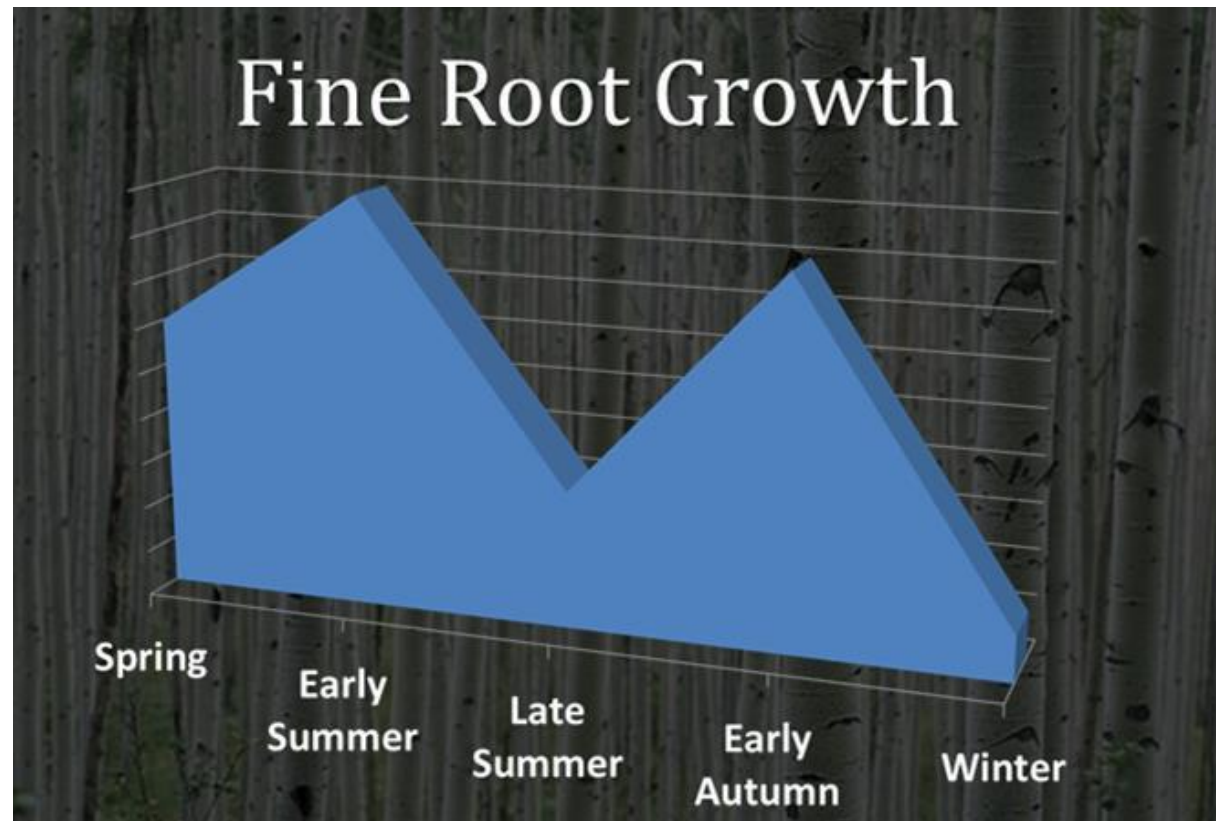


Fig 3 – Fine root growth is (generally) seasonal peaking in late spring and again in early autumn but dying back in winter dormant periods when photosynthetic production ceases. This is an important part of the soil nutrient cycle and demonstrates that a static RPA as calculated by BS5837 is a ‘simplistic’ view of the tree rooting dynamic. (Image Source: Tamla Trees)

- 5.1.9 The fine root system shows species variation and will also vary in depth (depending on species dynamics and underlying soil conditions). Adopted highways generally have a footing that extends < 0.5m and most UK residential properties have footings in the range of 0.5-1.5m depth. Trees will easily root below these depths and this is evidenced by the fact that every year in the UK there are thousands of tree related subsidence cases.

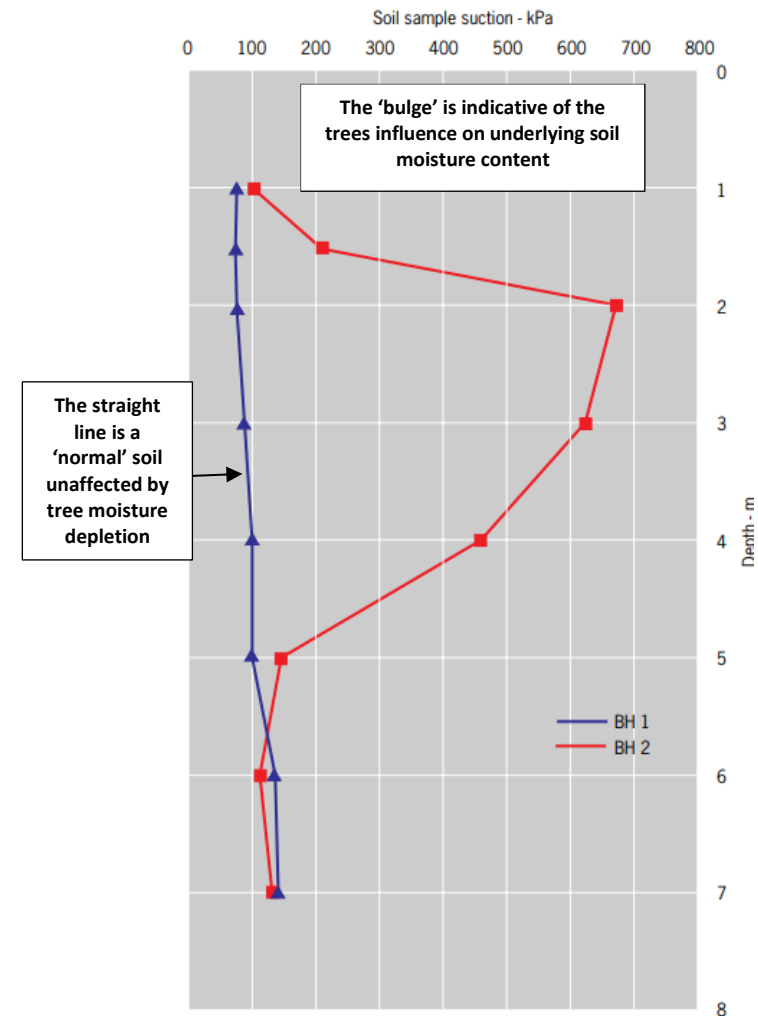
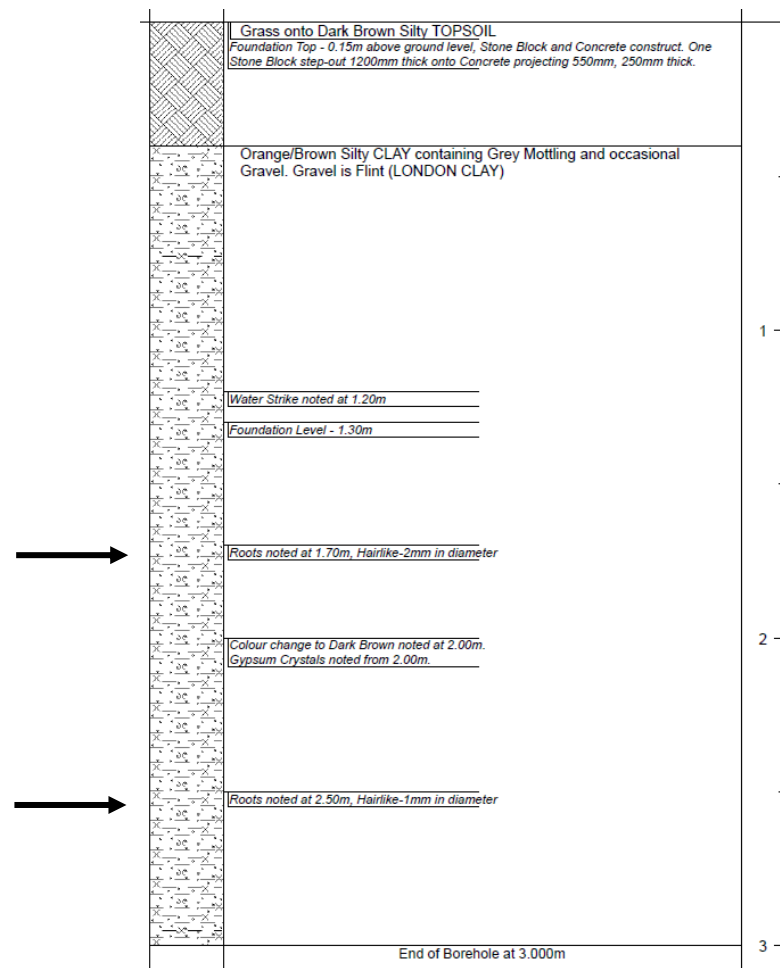


Fig 4 – Borehole log 10m from mature Oak tree on clay soil detailing fine roots to depths of 2.5m indicated with arrows (Source: Tamla Trees project) and annotated soil moisture depletion by trees showing a peak influence at 2m and extending to 5m (above right)³

³ BRE Digest 412: Desiccation in clay soils

5.1.10 Against this backdrop rooting information seeking to manipulate RPA shapes to account for the presence of houses, garages etc outside of the immediate zone of structural rooting (3-4m) is not considered appropriate. Unless ground obstructions are present within the immediate structural rooting area or to such a depth as to nullify potential fine root growth (below basements or retaining wall step changes in levels for example) Tamla Trees Ltd will show RPA's in a circular fashion but seek to maximise the quality and positioning of specified tree protection measures and encourage ground treatments (such as mulching – see Section 5.7). **Clients and developers must implement these measures for them to be effective. A failure to protect trees during the development process adversely affects soil and roots. Symptoms may not present themselves for a number of years following the development as the tree(s) enter a spiral of potentially irreversible decline.**



Fig 5 - Manion's spiral of tree decline for Norway Spruce (modified by Mrkva 1993)

5.1.11 In this instance there is an established brick boundary wall affecting trees within TG1. Depending on the depth of foundation there is a risk that roots are both bracing against and below. Where trees within TG1 are removed a corresponding section of wall is also removed but where trees remain this wall will also remain to reflect the likely relationship with retained trees.

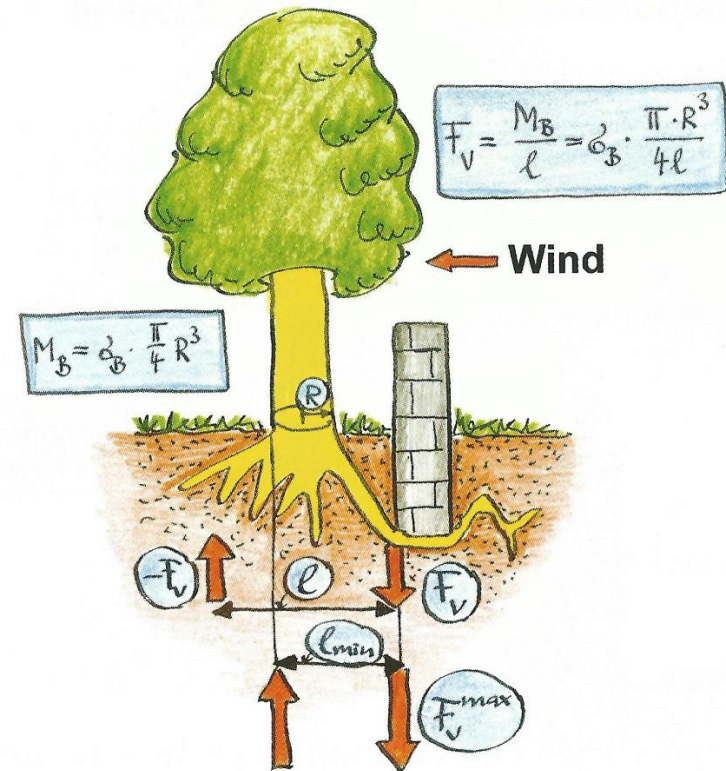


Fig 6 – Roots are likely braced against the face of the wall given the proximity of trees (above left) with some roots also likely extending below the wall (above right). Where TG1 is retained the wall also remains.

5.1.12 BS5837 Section 4.6.3 Site Specific Assessment:

Section	Consideration	Site Specific Comments
4.6.3 (a)	<i>the morphology and disposition of the roots, when influenced by past or existing site conditions (e.g. the presence of roads, structures, and underground apparatus);</i>	• Less relevant given the removal of constraint trees. • Trees which remain retain existing relationships with hard standing/ wall structures.
4.6.3.(b)	<i>topography and drainage;</i>	• The site is level and there is nothing to indicate adverse draining conditions (such as water pooling at the base of the tree). • The underlying soil is clay and as long as adverse compaction of the ground does not occur moisture stress (for remaining trees) is unlikely (as available moisture levels within clay soils are greater than in equivalent sandy soils).
4.6.4.(c)	<i>the soil type and structure;</i>	• Soil is indicated by the BGS data to be a clay. Clays have a greater bulk density and are more prone to ground compaction. Following the removal of the required section of TG1 the remaining trees will be protectively fenced to ensure no adverse impact to their rooting area/ underlying soil (such as compaction)
4.6.4.(d)	<i>the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.</i>	• The removal of the relevant section of TG1 and trees T3 & T4 places all the remaining site works outside the RPA's of further trees. As a result there should be no impact on the underlying roots of these remaining trees.

5.2 Root Protection Area (RPA) Incursions

5.2.1 The following incursions into the RPA's of trees to be retained have been identified:

BS 5837 Cat	A	B	C	Summary
RPA Incursion	-	-	-	Construction – The removal of the relevant section of TG1 and trees T3 & T4 places all the remaining site works outside the RPA's of further trees. As a result, there should be no impact on the underlying roots of these remaining trees. Services – All services will be located outside the protected zone of TG1 and well away from T1 & T2 and as a result there should be no impact on the underlying roots of retained trees. Landscaping – Areas below retained trees (for TG1) are recommended for mulching with composted bark mulch where possible. Detailed further comment on any further landscaping proposals is outside the scope of this report but we would recommend minimal works within TG1. Once the access has been created there may be scope for some selective thinning of remaining trees to allow better long-term development of the trees that remain.

5.2.2 There are no RPA incursions following the relevant tree removal works.

Tree Number	RPA Total (Sqm)	Incursion (Sqm)	As % of trees RPA

5.2.3 The assessed risk based on the likely impact to the health and safety of retained trees within TG1 and the highway trees T1 & T2

Tree & Development Risk Indicator									
^									
• Our assessment has confirmed the presence of probable underlying CLAY soil • This heightens the risk of modifications to the underlying soil from construction activity. • Removal works places retained trees in TG1 well away from the proposal and allows for their effective protection (See TPP Appendix 6) • T1 & T2 are well away from the proposed works and are basally shuttered as a precaution. • The Tree & Development Risk Indicator (TDRI™) is therefore LOW. • Risk lowered by presence of well footed boundary wall. • Note: This level of risk is a visual guide only and is only relevant if all advised tree protective measures are put in place prior to any on site activity and maintained for the duration of the works.									
Note: Only on-site testing can confirm the local soil conditions below foundation level but available information suggests the presence of a CLAY subsoil.									

5.3 Tree Pruning & Removal

5.3.1 It is proposed to remove a section of TG1 and the public highway verge trees to facilitate the proposal.

Tree Surgery

Tree No.	Species	Proposed Tree Works	BS Cat

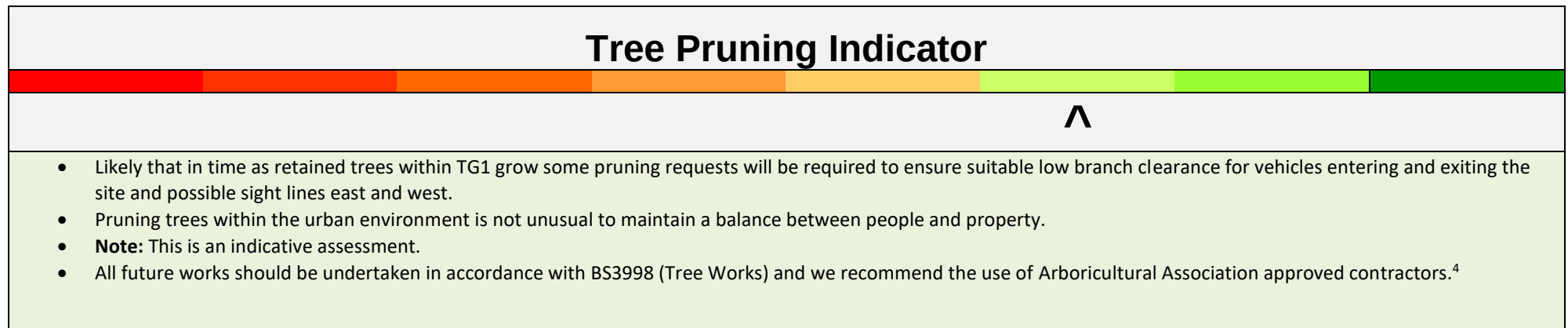
Proposed Removal

Tree No.	Species	Proposed Tree Works	BS Cat
T3	Maple (Norway)	Remove. All works to accord with BS3998 Tree Works.	B2
T4	Plane (London)	Remove. All works to accord with BS3998 Tree Works.	C1
TG1	Mixed Species tree group	Remove section to allow provision of access road. Works to be undertaken to suitable tree or trees with symmetry to from new east and west 'edge' within the group. Implement Ivy management of remaining edge trees. All works to accord with BS3998 Tree Works.	B2

5.3.2 **Birds** - In the event future tree works are required to be completed between 1st March & the 31st July (inclusive) a due diligence check for nesting birds must be completed before work starts in order to comply with the Wildlife & Countryside Act 1981. This check should be recorded in the Site-Specific Risk Assessment. If active nests are found work should not take place until the young have fledged.

5.3.3 **Bats** – It should be noted that in England and Wales, the relevant legislation is the Wildlife and Countryside Act (1981) (as amended); the Countryside and Rights of Way Act, 2000; the Natural Environment and Rural Communities Act (NERC, 2006); and by the Conservation of Habitats and Species Regulations (2010).

5.3.4 Below is a visual representation of the likelihood of pruning requests in light of the proposal. It is considered that once completed there will be only intermittent branch height clearance requests for the remaining trees in TG1 and there should be no pruning requests relevant to T1 & T2.



⁴ <https://www.trees.org.uk/ARB-Approved-Contractor-Directory>

5.4 Demolition & Foundations

5.4.1 The proposal requires no demolition works other than small localised breaking out of the relevant boundary wall where the new access road is located. The proposed tree protection procedure can be summarised as follows:

Stage 1

- Remove T3, T4 & section of TG1 and break out section of brick wall (north & south of TG1)
- Install BS5837 protective fencing and tie in to wall as indicated at Appendix 6. Retain for all site works.
- Basally shutter T1 & T2.

Stage 2

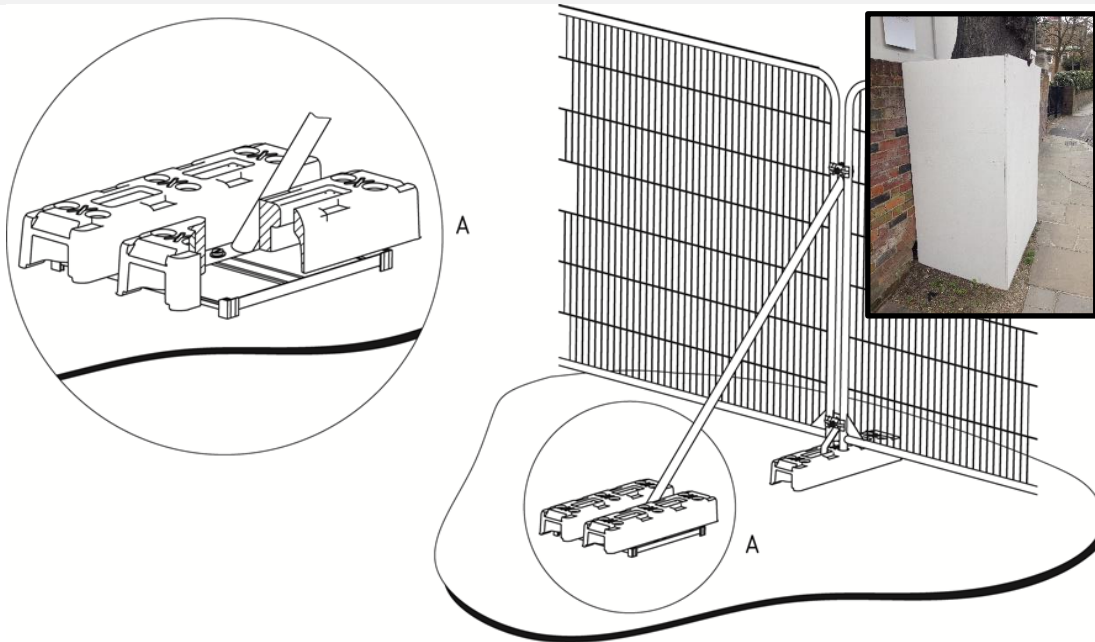
- Construct access road.

Stage 3

- Maintain fencing for the duration of all site works.
- Remove at end of project and 'make good' relevant soft landscaping.

5.4.2 High quality BS5837 compliant tree protection will be installed following the removal of the section of TG1 indicated.

Tree Protection



Overview

- *Tree protection required internally to site following removal of section of TG1.*
- *To tie in to retained boundary wall features (north and south)*
- *Note: To be marked with signs (inset) and purpose to be briefed to all ground workers.*
- *Maintained for duration of the works.*
- *T1 & T2 basally shuttered (inset).*

Threat Level to Retained Trees

LOW

5.4.12 All internal tree protection must be appropriately signed to ensure that all site operatives know its purpose.



e: info@tamlatrees.com w: tamlatrees.com o: 01252 811 233
Tamla Trees Registered England & Wales Companies Act 2006 Reg No: 08815629

Fig 7 – Professional grade weatherproof tree protection signs no smaller than 297 x 420 mm (A3) will be located at 5m intervals and all ‘return’ faces for tree protective fencing.

(Note: High resolution png. image file of above available upon request)

5.5 Surfaces near Trees

5.5.1 No new surfaces will be installed within the retained tree RPA's as trees are removed to facilitate the proposed works.

5.6 Site Service Provision

5.6.1 Any new serviced will be located outside the RPA of retained trees given the advised removal of a section of TG1 and both T3 & T4.

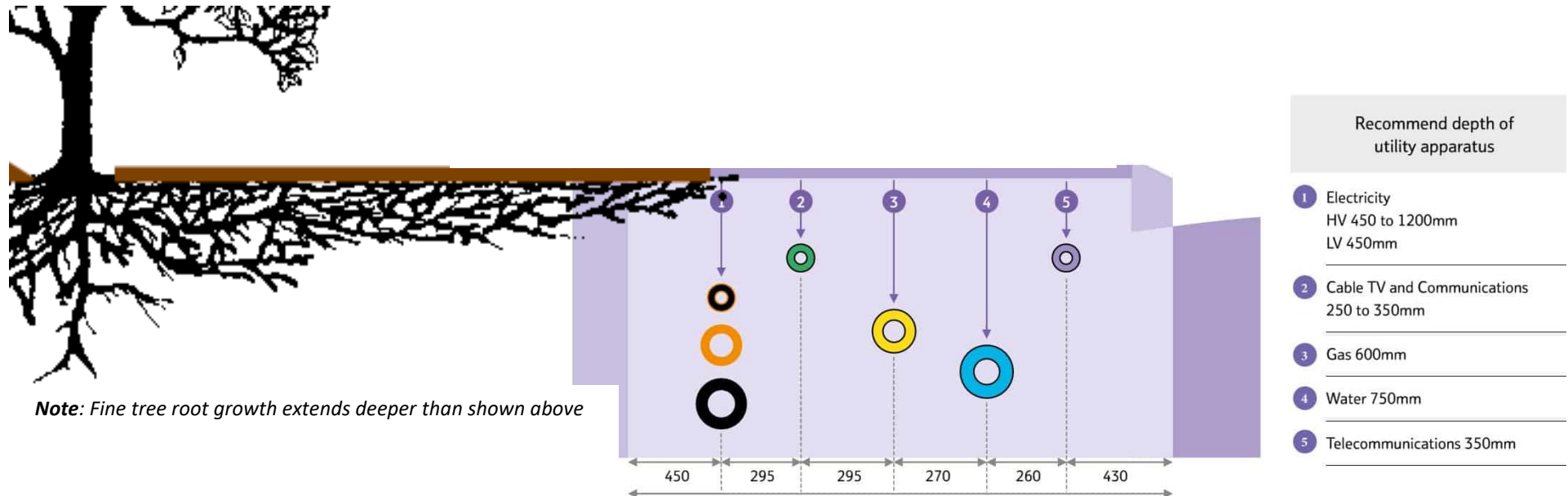


Fig 8 – Annotated service installation depth drawing (source: Thorne & Derrick). Service installations occupy the same soil volume/ depth where the greatest level of tree roots will likely be found but on this project any new services will be within the new access and outside the RPA of retained trees.

5.7 Ground Level Changes & Landscaping

- 5.7.1 Following completion of the project any 'making good' will be with BS3882 compliant topsoil raked out by hand (to no more than 100mm depth within any tree RPA) and then seeded/ planted as appropriate to form the new edge treatment to the remaining sections of TG1 (east and west 'face' areas following removal works). Further comment on proposed landscaping is outside the scope of this report.



Fig 9 – All 'making good' topsoil will be BS3882 compliant and raked out by hand to no greater depth than 100mm

- 5.7.2 Please note that spoil/ soil excavated from any access road scrape/ excavation **must not** be spread within the remaining areas of TG1. We encourage the use of composted bark mulch below tree canopies where possible to aid water retention and increase soil microbial activity. This is particularly relevant to mature retained trees.

Mulching



Overview

- *Composted mulch then spread around below trees on edge of TG1 by hand – no need to lift or remove underlying grass/ shrubs where relevant.*
- *Mulch topped up annually/ as required.*
- *Positive benefits for mulched trees as well as better 'presentation' of the revised landscape and access roadway.*
- *Image Kew Gardens (left) (Source: Tamla Trees)*

Threat Level to Retained Trees

LOW

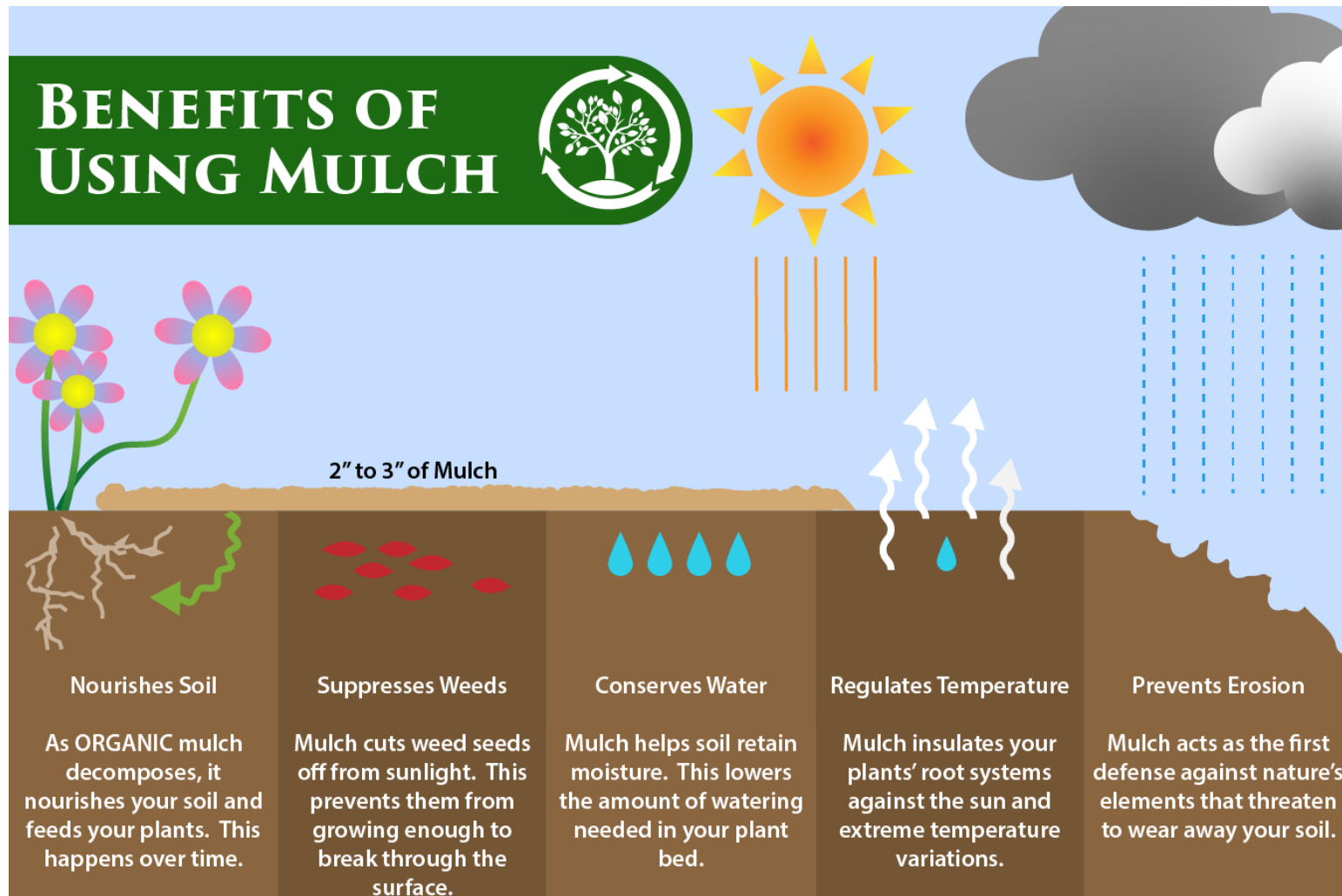


Fig 10 – Benefits of Mulch (Image Source 1st Stop Landscape Supply (US))

5.8 Tree Shading of Proposal

- 5.8.1 The proposal is a new access road and shading issues (associated with a residential development for example) are not considered an issue on this project.]

5.9 Arboricultural Project Supervision

- 5.9.1 Most damage to trees on developments sites is caused inadvertently and to ensure continued protection during development a system of site monitoring is normal.
- 5.9.2 Basic checks will be undertaken as the construction phase progresses to ensure that protective fencing remains intact and ensure the proposed works close to trees are completed in accordance with this report. Any unforeseen issues can be identified and discussed with the consulting arboriculturalist before any damage to trees occurs.
- 5.9.3 This approach allows a strong working relationship with the site manager/ construction staff to identify issues that may affect retained trees and ensure they are addressed before they escalate.
- 5.9.4 After each site inspection is completed a formal record will be sent to the local authority. On this basis we would advise the following inspection regime:

Visit Detail	Date	Status
1st Site Inspection Attend site once section of TG1 removed (and T3 & T4) but tree protection is in place. Inspect/ Toolbox talk with site operatives regarding tree protection measures. Update local authority on findings.	TBC	Incomplete
Final Site Inspection Final site visit to confirm that no damage has been done to retained trees/ identify any remedial actions in the event damage has occurred. Inspect edges of TG1 relative to the access road and identify if any tree pruning work is required. Assess any required tree surgery following construction. Update local authority on findings.	TBC	Incomplete

Note: Actual visit dates subject to change/ confirmation depending on project program.

Appendix 1 – BS5837 Survey Key

BS 5837 Cat	Description
A	Those of high quality and value: in such a condition as to be able to make a substantial contribution (> 40 years)
B	Those trees of moderate quality and value: those in such a condition as to make a significant contribution (> 20 years)
C	Those trees of low quality and value: currently in an adequate condition to remain until new planting could be established (> 10 years)
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 regardless of development (< 10 years)

Note: Subcategories are denoted in the tree survey data (A1, B1, C2 etc.). You are referred to BS5837 for further detail if required.

Tree No.	T (tree), G (group), H (hedge), W (woodland) + Ref No.
Species	Common Name
Ht (m)	Measured height in metres
DBH (m)	Diameter at 1.5m above ground level
No of stems	An indication of the trees form @1.5m (1 = single stem, m/s = multi-stemmed)
Branch Spread	In m to cardinal points
Cr Ht Clearance (m)	Overall height of lowest branches from the ground level on side of proposed development
Life Stage	Young, Semi-Mature, Early Mature, Mature, Over-Mature
General Observations	Observations on the condition of the tree(s)
Tree Work Specification	Proposed tree works in accordance with BS3998
BS Cat	See above
Life Exp	Estimated remaining contribution in years.
RPA Radius(m)	Radius of the trees Root Protection Area measured from the trunk to the edge of the RPA circle in metres

Note: Topographical surveys are sometimes not provided (most commonly for smaller residential surveys) or trees may not be included on supplied topographical surveys but added given their presence/ potential constraints. In such circumstances the positioning is indicative only.

Appendix 2 – BS5837 Tree Classification

The classification of trees is undertaken during the survey to inform decisions as they relate to designs and retention/ removal. The ‘value’ of a tree in terms of its visual amenity is subjective and the full condition of a tree may not be apparent given access and other site-specific factors. If a tree is proposed for retention in many respects its BS category is irrelevant. We encourage the retention of all trees where the design realistically allows this with the exception of U cat trees (as these are usually ‘defect’ trees). There should not be a presumption that all C category trees can or should be removed. Generally A & B Category trees are those of greatest value to a development and designs should be manipulated to retain these where possible. Further detail on classification of trees is contained at Section 4.5 of BS5837. Some selective extracts are detailed below:

***4.5.2** The purpose of the tree categorization method, which should be applied by an arboriculturist, is to identify the quality and value (in a non-fiscal sense) of the existing tree stock, allowing informed decisions to be made concerning which trees should be removed or retained in the event of development occurring.*

***4.5.5** When determining the appropriate category for any given tree, group, or woodland (see 4.4), the arboriculturist should start by considering whether the tree falls within the scope of category U. Assuming that it does not, the arboriculturist should then proceed on the presumption that all trees are considered according to the criteria for inclusion in category A. Trees that do not meet these criteria should then be considered in light of the criteria for inclusion in category B. This process should be repeated, as required, until the appropriate quality or value assessment is reached.*

***4.5.6** Trees of generally high quality and/or value which have a defect or defects that do not reduce their retention span below the suggested 40-year threshold, should be placed in category A, i.e. they should not be downgraded as a result of minor imperfections. **Tamla Trees Note:** We do not apply a simple >40 = Cat A approach as many trees will have retention values in excess of 40 years but not be considered Cat A.*

***4.5.11** The tree survey might identify the presence of veteran trees on the site. The implications of their presence on the use of the surrounding land should be assessed at the earliest possible stage of the design process. Where such trees are to be retained, particular care should be taken in the design to accommodate them in a setting that aids their long-term retention.*

Please note assessments are made based on available access and factors can affect full inspections (3rd party tree location, extensive basal undergrowth, Ivy etc). This survey is not a full health and safety inspection although obvious defects (where noted) will be identified.

BS5837 Table 1 is shown on the following page and provides detail on the relevant categorisation. Elements of this remain subjective and if a tree is shown for retention its category is somewhat irrelevant as we consider all trees should be afforded the same value/ protection if to be retained.

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (Including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) - Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline - Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>			See Table 2
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for retention				
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

Appendix 3 – BS5837 Survey Data

Tree No.	Species	DBH (m)	No of Stems	Ht (m)	Crown Spread				BS Cat	Age Class	Life Expect	Cr Ht (m)	Observation	Recommendations	RPR (m)
					N	E	S	W							
T1	Maple (Norway)	0.22	1	7	3.7	2.7	3	3.6	B2	Early mature	20 to 40	2.5	Established tree but reduced growth given poor growing conditions.	No works	2.6
T2	Maple (Norway)	0.17	1	8	2.2	2.4	2.2	3	B2	Early mature	20 to 40	2.5	Established tree but reduced growth given poor growing conditions.	No works	2
T3	Maple (Norway)	0.23	1	8	3.1	3	3.3	2.7	B2	Early mature	20 to 40	2.5	Established tree but reduced growth given poor growing conditions.	Remove. All works to accord with BS3998 Tree Works.	2.8
T4	Plane (London)	0.14	1	8	2.7	3	2.8	2.8	C1	Early mature	20 to 40	2.5	Establishing tree.	Remove. All works to accord with BS3998 Tree Works.	1.7
TG 1	Mixed Species tree group	0.25	1	14	4	4	4	4	B2	Early mature	>40	1	Sycamore & Cotoneaster dominate but other species present. Appears to be planted screening group. No access to inspect. Area is collecting excessive fly tipping/ rubbish.	Remove section to allow provision of access road. Works to be undertaken to suitable tree or trees with symmetry to form new east and west 'edge' within the	3

Tree No.	Species	DBH (m)	No of Stems	Ht (m)	Crown Spread				BS Cat	Age Class	Life Expect	Cr Ht (m)	Observation	Recommendations	RPR (m)
					N	E	S	W							
														group. Implement Ivy management of remaining edge trees. All works to accord with BS3998 Tree Works.	

Appendix 4 – Tree Works Schedule

Tree Surgery

Tree No.	Species	Proposed Tree Works	BS Cat

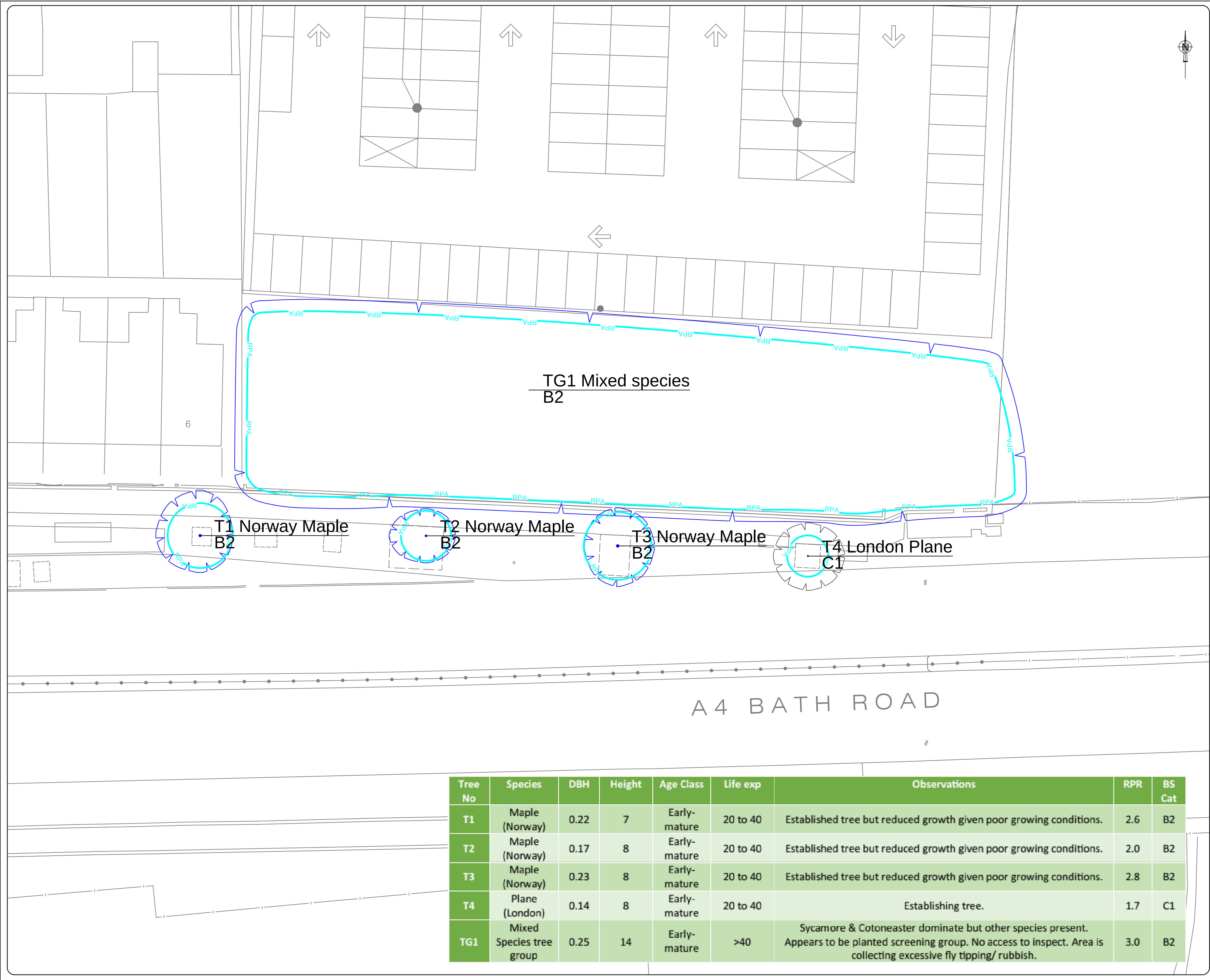
Proposed Removal

Tree No.	Species	Proposed Tree Works	BS Cat
T3	Maple (Norway)	Remove. All works to accord with BS3998 Tree Works.	B2
T4	Plane (London)	Remove. All works to accord with BS3998 Tree Works.	C1
TG1	Mixed Species tree group	Remove section to allow provision of access road. Works to be undertaken to suitable tree or trees with symmetry to from new east and west 'edge' within the group. Implement Ivy management of remaining edge trees. All works to accord with BS3998 Tree Works.	B2

NOTE: All tree works to be undertaken in accordance with BS 3998:2010 'Tree work - Recommendations'.

Note: We recommend using Arboricultural Association approved contractors who can be sourced [here](#)

Appendix 5 - Tree Constraints Plan



COPYRIGHT RESERVED
DO NOT SCALE FROM THIS DRAWING

Tree Survey Drawing Key

See Tamla Trees, Tree Survey for Individual Tree Details

KEY

Please refer to Tamla Trees report for details

- Category A - Trees of high quality
- Category B - moderate quality
- Category C - low quality
- Category U - Dead, Dying or Defect trees with <10 years retention value

RPA - root protection area as defined by Table 2 BS 5837:2012

REV	AMENDMENTS	DRAWN	DATE	AUTHD

PROJECT
Terminals 2-3 Heathrow Heathrow Flightpath, West Drayton UB7 ODU

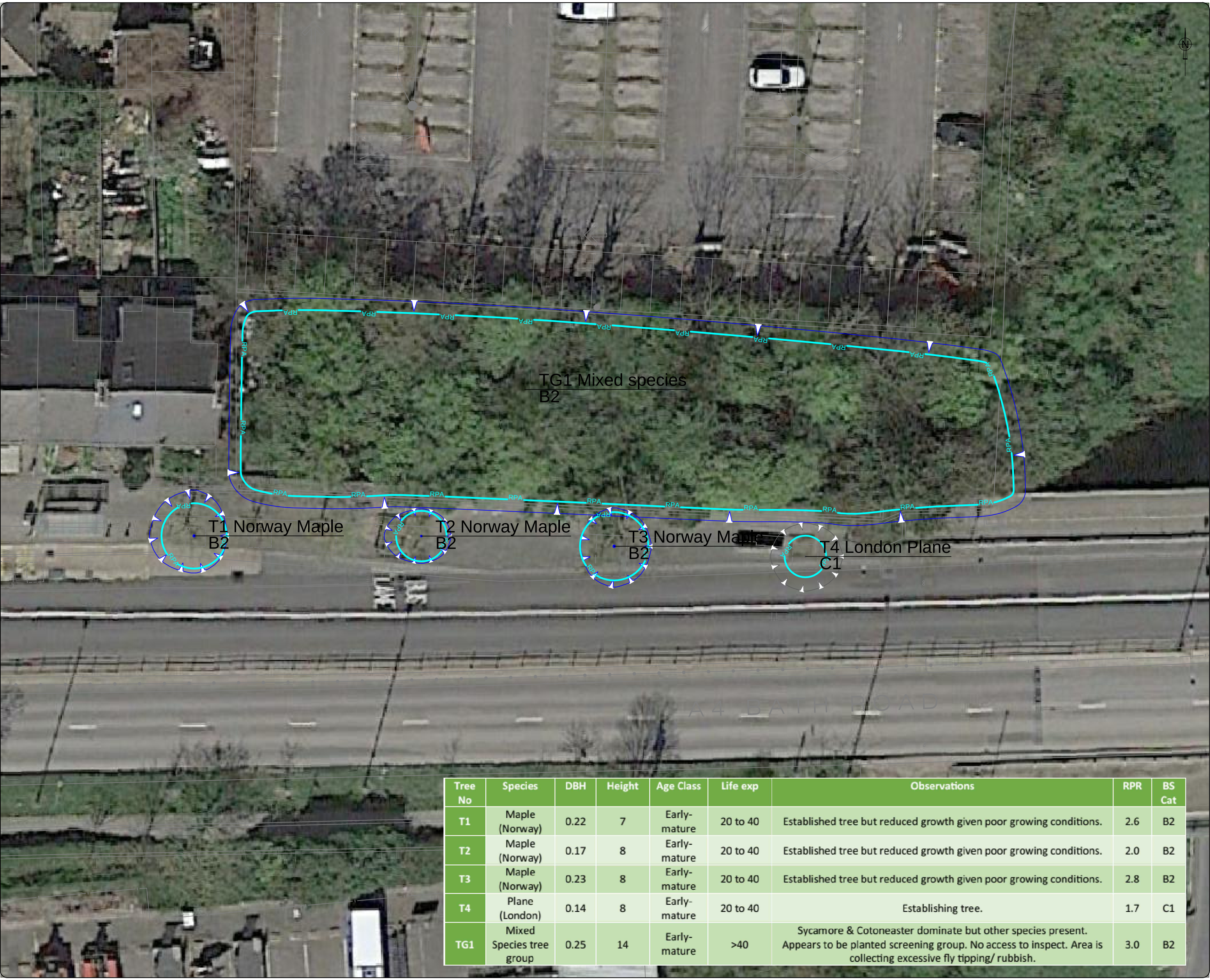
CLIENT
Aprirose Real Estate Investment

TITLE
Tree Constraint Plan (TCP)

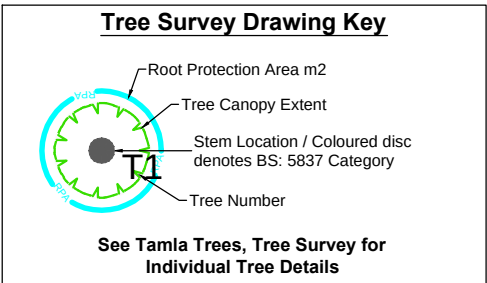
Job 03528R	Scale 1:200 @ A2	DRG NO 03528P_TCP_01	Revision -
Date 22/03/2021	Type a		

Tel: 01252 811 233
Email: info@tamlatrees.com
Web: www.tamlatrees.com

Tamla Trees
consulting arborists



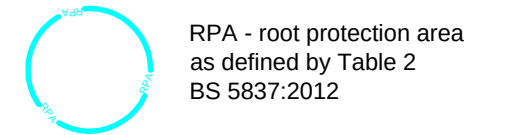
COPYRIGHT RESERVED
DO NOT SCALE FROM THIS DRAWING



KEY

Please refer to Tamla Trees report for details

- Category A - Trees of high quality
- Category B - moderate quality
- Category C - low quality
- Category U - Dead, Dying or Defect trees with <10 years retention value



REV AMENDMENTS DRAWN DATE AUTHD

PROJECT

Terminals 2-3 Heathrow
Heathrow Flightpath,
West Drayton UB7 ODU

CLIENT

Aprirose Real Estate
Investment

TITLE
Tree Constraint Plan (TCP)

Job	Scale	DRG NO	Revision
03528R	1:200 @ A2	03528P_TCP_02	-
Date	Type		
22/03/2021	a		

Tel: 01252 811 233
Email: info@tamlatrees.com
Web: www.tamlatrees.com

Tamla Trees
consulting arborists

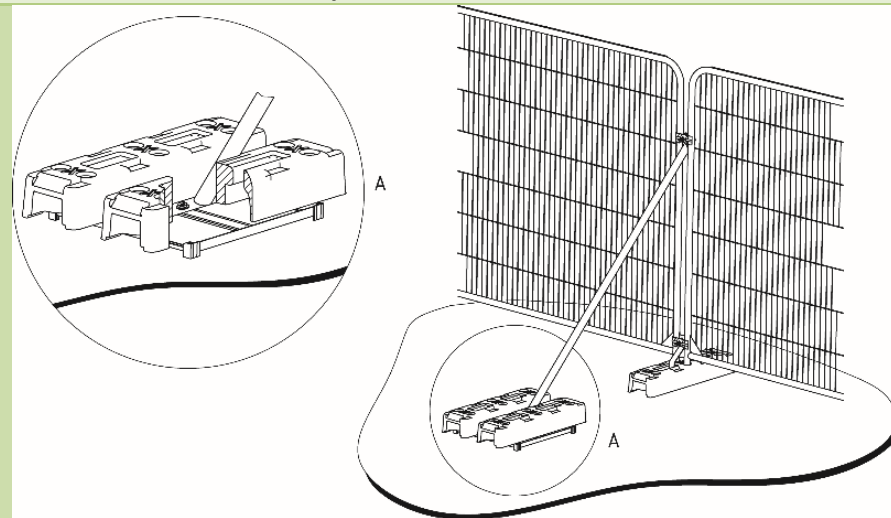
Tree No	Species	DBH	Height	Age Class	Life exp	Observations	RPR	BS Cat
T1	Maple (Norway)	0.22	7	Early-mature	20 to 40	Established tree but reduced growth given poor growing conditions.	2.6	B2
T2	Maple (Norway)	0.17	8	Early-mature	20 to 40	Established tree but reduced growth given poor growing conditions.	2.0	B2
T3	Maple (Norway)	0.23	8	Early-mature	20 to 40	Established tree but reduced growth given poor growing conditions.	2.8	B2
T4	Plane (London)	0.14	8	Early-mature	20 to 40	Establishing tree.	1.7	C1
TG1	Mixed Species tree group	0.25	14	Early-mature	>40	Sycamore & Cotoneaster dominate but other species present. Appears to be planted screening group. No access to inspect. Area is collecting excessive fly tipping/ rubbish.	3.0	B2

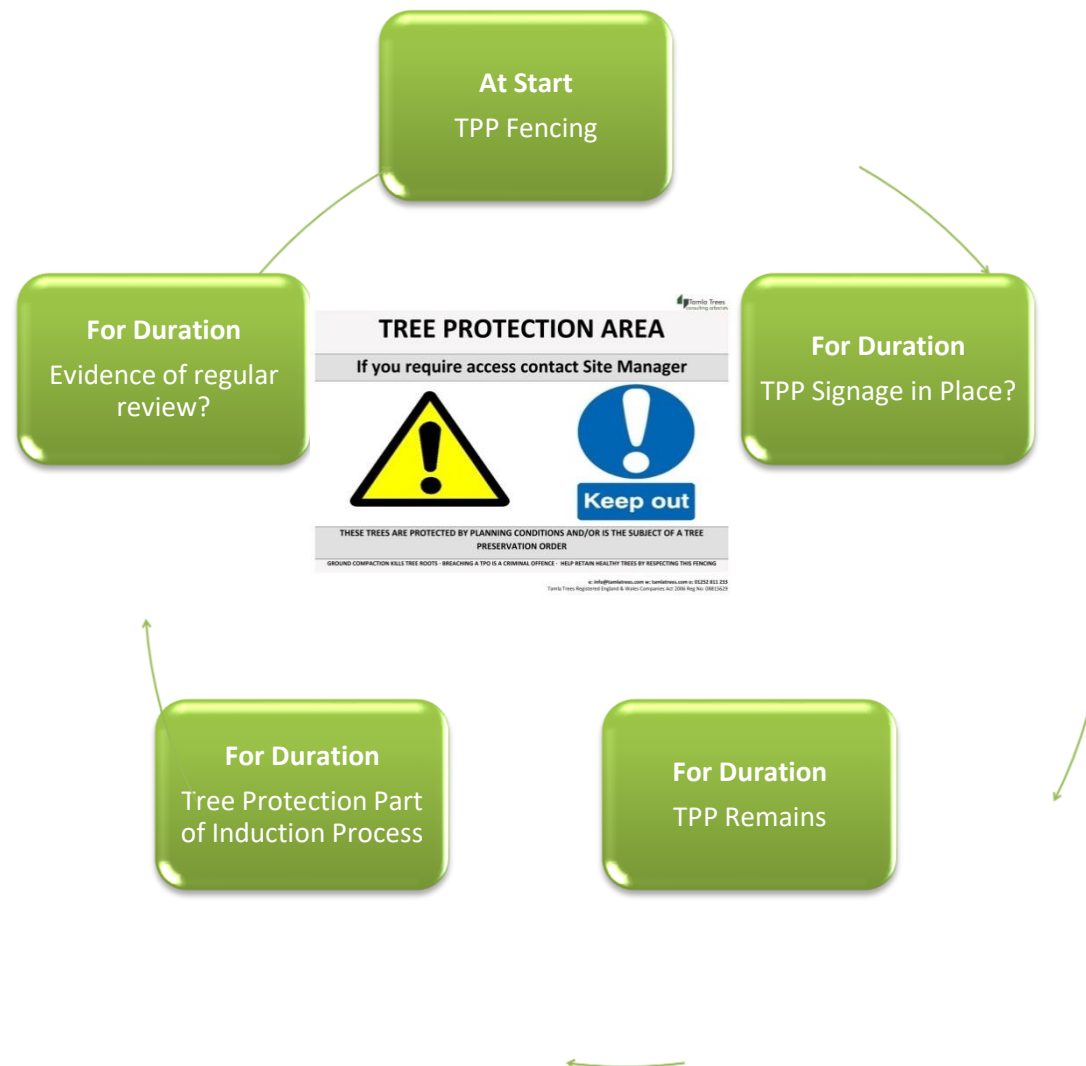
Appendix 6 - Tree Protection Plan

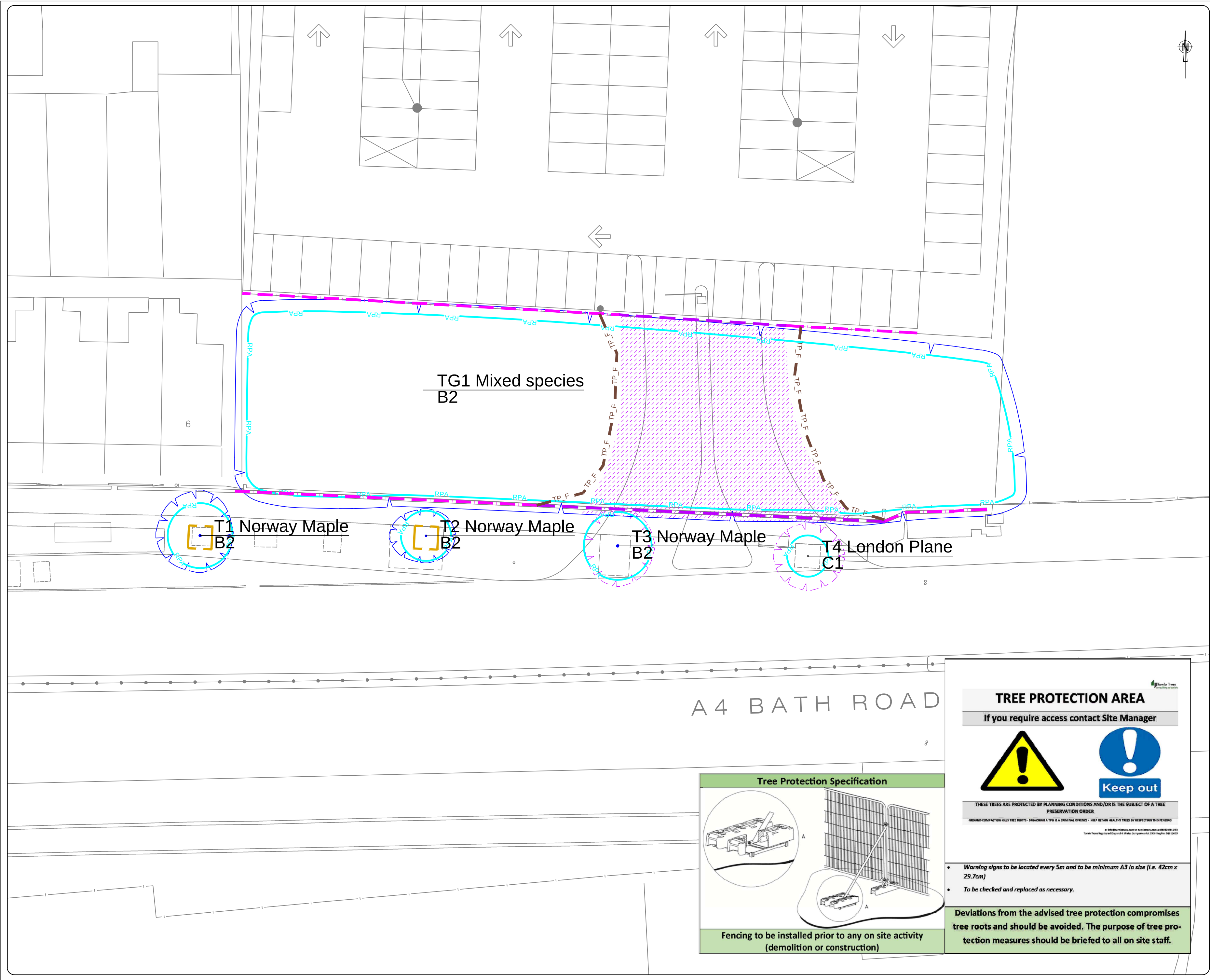
Tree protection is essential to successfully integrate the proposal into the surrounding trees. It is designed to manage the impact on the underlying soil and rooting environment. It must therefore be installed prior to any further site activity. Even apparently minimal tracking of the soil near trees has the capacity to irretrievably modify the soil environment to the detriment of tree health and stability.

All our fencing specifications accord with advice and guidance within BS 5837. Modifications to fence types are possible but should be discussed prior to implementation. In all other instances the form detailed below should be shown. This offers the best protection to retained trees.

- All tree protection must be in place prior to any site activities. It is recommended that this fencing is installed prior to any site works (including demolition).
- To be effective Tree Protection must remain in place for the duration of the development and form part of the site induction process.
- Fencing spec (right) proposed and installed prior to any on site activity.
- To be combined with basal shuttering of T1 & T2.







COPYRIGHT RESERVED
DO NOT SCALE FROM THIS DRAWING

Tree Survey Drawing Key

See Tamla Trees, Tree Survey for Individual Tree Details

KEY

Please refer to Tamla Trees report for details

- Category A - Trees of high quality
- Category B - moderate quality
- Category C - low quality
- Category U - Dead, Dying or Defect trees with <10 years retention value

RPA - root protection area as defined by Table 2 BS 5837:2012

Proposed removal - to facilitate Development

Section of TG1 removed to provide not <2m clearance from adjacent kerbline. Works to be to suitable trees to ensure exposed/ weak specimens not left adjacent to access. On site assessment required.

Location of protective fencing - BS 5837 Feet Fence (or similar)

Tree protection - Plywood Frame 1.2m tall

Existing boundary wall acting as protective fencing

Section of boundary wall removed to form access

TREE PROTECTION AREA

If you require access contact Site Manager

THESE TREES ARE PROTECTED BY PLANNING CONDITIONS AND/OR IS THE SUBJECT OF A TREE PRESERVATION ORDER

GROUND COMPACTION KILLS TREE ROOTS - BREACHING A TPO IS A CRIMINAL OFFENCE - HELP RETAIN HEALTHY TREES BY RESPECTING THIS FENCING

at info@tamlatrees.com or 01252 811 233
Tamla Trees Registered Engineer & Statutory Compliance Ltd 2204 Reg No: 10861629

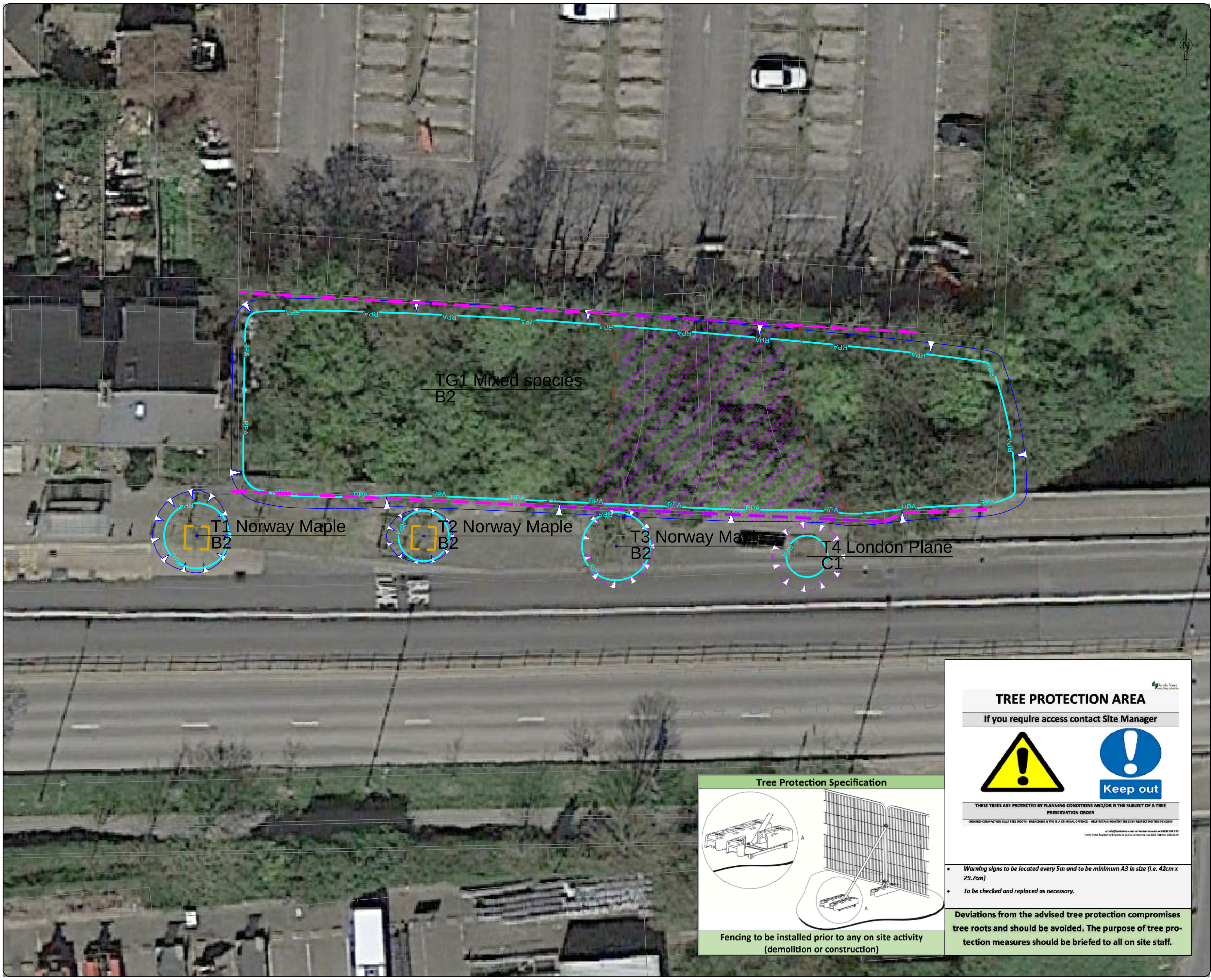
- Warning signs to be located every 5m and to be minimum A3 in size (i.e. 42cm x 29.7cm)
- To be checked and replaced as necessary.

Deviations from the advised tree protection compromises tree roots and should be avoided. The purpose of tree protection measures should be briefed to all on site staff.

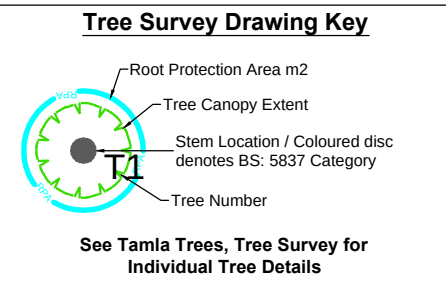
Tree Protection Specification

Fencing to be installed prior to any on site activity (demolition or construction)

REV	AMENDMENTS	DRAWN	DATE	AUTH'D
PROJECT				
Terminals 2-3 Heathrow Heathrow Flightpath, West Drayton UB7 0DU				
CLIENT				
Aprirose Real Estate Investment				
TITLE				
Tree Protection Plan (TPP)				
Job	Scale	DRG NO	Revision	
03528R	1:200 @ A2			
Date	Type			
22/03/2021	a	03528P_TPP_01		-
Tel: 01252 811 233 Email: info@tamlatrees.com Web: www.tamlatrees.com				



COPYRIGHT RESERVED
DO NOT SCALE FROM THIS DRAWING



KEY

Please refer to Tamla Trees report for details

- Category A - Trees of high quality
- Category B - moderate quality
- Category C - low quality
- Category U - Dead, Dying or Defect trees with <10 years retention value

RPA - root protection area as defined by Table 2 BS 5837:2012

Proposed removal - to facilitate Development

Section of TG1 removed to provide not <2m clearance from adjacent kerbline. Works to be to suitable trees to ensure exposed/ weak specimens not left adjacent to access. On site assessment required.

Location of protective fencing - BS 5837 Feet Fence (or similar)

Tree protection - Plywood Frame 1.2m tall

Existing boundary wall acting as protective fencing

Section of boundary wall removed to form access

TREE PROTECTION AREA

If you require access contact Site Manager

THESE TREES ARE PROTECTED BY PLANNING CONDITIONS AND/OR IS THE SUBJECT OF A TREE PRESERVATION ORDER

GROUND COMPACTION KILLS TREE ROOTS - BREACHING A TPO IS A CRIMINAL OFFENCE - HELP RETAIN HEALTHY TREES BY RESPECTING THIS FENCING

at info@tamlatrees.com or 01252 811 233
Tamla Trees Registered Engineer & Arborist Company Ltd 2016 Reg No: 10851629

- Warning signs to be located every 5m and to be minimum A3 in size (i.e. 42cm x 29.7cm)
- To be checked and replaced as necessary.

Deviations from the advised tree protection compromises tree roots and should be avoided. The purpose of tree protection measures should be briefed to all on site staff.

Tree Protection Specification

Fencing to be installed prior to any on site activity (demolition or construction)

REV AMENDMENTS DRAWN DATE AUTHD

PROJECT
Terminals 2-3 Heathrow
Heathrow Flightpath,
West Drayton UB7 0DU

CLIENT
Aprirose Real Estate
Investment

TITLE
Tree Protection Plan (TPP)

Job 03528R	Scale 1:200 @ A2	DRG NO 03528P_TPP_02	Revision -
Date 22/03/2021	Type a		

Tel: 01252 811 233
Email: info@tamlatrees.com
Web: www.tamlatrees.com

Tamla Trees
consulting arborists

Appendix 7 – Site Photographs



Image 1 – looking south towards section of TG1 to be removed.



Image 2 – In places trees are in direct contact with the boundary wall and these trees should be considered for removal on health and safety grounds.



Image 3 – Looking towards T3 (left) and T4 (right) with TG1 beyond.

Appendix 8 – Limitations

Full Legal Disclaimer

This report was prepared as a report of work instructed by client (as specified). Neither Tamla Trees Ltd nor any associated company, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the report and its findings. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favouring by Tamla Trees Ltd or any associated company. The views and opinions of authors expressed herein do not necessarily state or reflect those of Tamla Trees Ltd or any associated company.

Copyright & Non-Disclosure Notice

The content, layout and any supporting digital files associated with this report are subject to copyright owned by Tamla Trees Ltd. Exceptions to this are present where that copyright has been legally assigned to Tamla Trees Ltd by another party/ organisation. In addition Tamla Trees Ltd may utilise content generated under license. Reproduction, scanning, copying or distribution of this report in any form is prohibited without prior written agreement.

Third Party Disclaimer

Tamla Trees Ltd, sub-contractors or suppliers will not be responsible or liable for any claim of loss or damage resulting from the third-party use of the information contained within this report.

Specific - Trees

All tree inspections, unless specified, have been undertaken from ground level and using non-invasive techniques. Comments contained within the report on the condition and risk associated with any tree relate to the condition of the tree at the date and time of survey. Please note that the condition of trees is subject to change. This change may occur but is not limited to biological and non-biological factors as well as mechanical/ physical changes to conditions in the proximity of the tree. Trees should be inspected at intervals relative to risk/ target areas and in accordance with relevant [HSE guidance](#). Tamla Trees Ltd can provide further information on this matter if required. Where full access to trees (Ivy, materials at base, location on 3rd party land) was not possible Tamla Trees Ltd accept no liability for issues that arise.

Please note no statutory control checks have been undertaken (unless specified). Where tree surgery works have been identified these works are based on the assumption that planning is approved, no tree works should be undertaken prior to determination of this application without up-to-date confirmation of the Tree Preservation Order / Conservation Area Status of the vegetation. All works should be undertaken in accordance with the appropriate Duty of Care. This should include, for example, site specific risk assessments and due diligence inspections for the presence of protected species.

Any comment/ measurements relating to 3rd party trees have been made without full access to the tree(s). Should these trees have any impact on the proposed development we would advise you to instruct us to contact the 3rd party and undertake further detailed inspection work.

A legal Duty of Care requires that any tree works specified in this report should be performed by qualified, arboricultural contractors who have been competency tested to determine their suitability for such works in line with Health & Safety Executive Guidelines. Additionally all works should be carried out according to British Standard 3998 (2010) Recommendations for Tree Work.