BS5837 Arboricultural Impact Assessment



Maitland Park Estate, Camden, London, NW3 2EH

Client: London Borough of Camden

Job Reference: 03656R

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MEWI)

Tamla Trees consulting arborists

December 2021



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1. Executive Summary

- 1.1 Tamla Trees Itd has been appointed by London Borough of Camden to provide advice on the arboricultural issues relating to proposed development which can be described as: "Installation of play equipment to form a linear fitness, activity and play trail".
- 1.2 We surveyed the site in October 2021. The survey accorded with BS5837:2012 "Trees in relation to design, demolition and construction Recommendations". No trees will be pruned or removed to facilitate the works.
- 1.3 The only encroachment into the Root Protection Area (RPA) of retained trees is T2 (Acer) but the incursion is so minimal that no special measures are proposed. In summary the incursion is at the periphery of the RPA where only seasonal/ fine root growth would be expected and the tree benefits from being located in existing open (soft) ground with good soil moisture and oxygen exchange capabilities.
- 1.4 A system of tree protection (Herras fencing) will be used to ensure all trees are adequately protected through the equipment installation process (see Appendix 6 Tree Protection Plan). The fencing seeks to guide/ establish areas where contractors cannot store materials/ machinery or access. It seeks to maintain the ground conditions in the protected areas as they currently exist.
- 1.5 All protection measures will be installed prior to any site activity and retained for the duration of works. All site welfare/ storage etc will be located in areas outside of the designated protection (and not within the proximity of other trees in the area not shown on the plans and detailed within this report).
- 1.6 The tree issues can be summarised as: Effective Tree Protection> Installation of Equipment> Site operative knowledge of tree protection issues> Soft landscaping to make good.
- 1.7 At the time of writing Camden Council have not yet advised whether the site is affected by a Tree Preservation Order or located within a Conservation Area. Subject to the working practices detailed within this report there should be no discernible impact on the site trees. This report is based on the client plans ref: TM122L24 Proposed Landscape GA



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?	ТВС
Notes: (i)All trees larger than 7.5cm diameter at 1.5m above ground level are subject to regulations within a Cons which are dead and dangerous but clarification before any tree works is advised. A <u>notification</u> is required in many	
Tree Preservation Order Status	
Are inspected trees subject to a TPO?	ТВС
Type of TPO	Area
	Individual
	Group
	Woodland
TPO Reference	-
Date TPO Made	-
Notes (i) The time and details of any TDO determine which trees are (must ested). Every principle and provide a provide a subject of the contract of the contr	a ana alaad ahad dahaanna hiik alauttaatian

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 <u>application</u> may be required before undertaking works. (ii) At the time of writing Camden Council have not yet responded to our statutory search request.



3. Terms of Reference

- 3.1 <u>BS5837:2012</u> 'Trees in relation to design, demolition and construction recommendations'
- 3.2 <u>BS3998:2010</u> '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 https://www.camden.gov.uk/web/guest/tree-preservation-orders#myland



4. The Trees

4.1 The trees can be summarised as follows:

BS 5837 Cat	А	В	С	U
Specific Trees	ТЗ	T1, T2, T5, T6, T11, T15, T18, T26, T27, T28, T29, T30 & T31	T3, T7, T9, T10, T12, T13, T14, T16, T17, T19, T20, T21, T22, T23, T24, T25, T32	T8
Total Number	1 individual	13 trees	17 individuals	1 individual

- 4.2 The trees make a general contribution to the amenity of Maitland Park Road and Maitland Park Villas by virtue of their location within public open space meaning they are generally visible from public locations.
- 4.3 There were no hedgerows that qualify for consideration under the 1997 Hedgerow Regulations.



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 British Geology Survey (BGS) data indicates the site is located within what is defined as clay (up to 150m deep)¹.



Soil Description

Bedrock Deposits: 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 Deposit: Clay-with-flints Formation – None recorded.

¹ http://mapapps.bgs.ac.uk/geologyofbritain/home.html?



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 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 southwest 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.



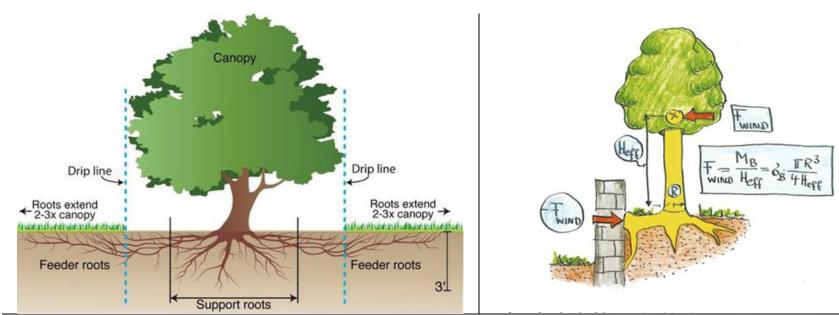


Fig 1 – Open grown trees or those with minimal obstructions close to their stems will have a network of structural roots supporting feeder/ fine root growth beyond (above left). In certain situations root morphology can be affected by structures close to the main stem (above right: Mattheck).

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 year²). 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 soil³. 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.

² Eissenstat & Yanai (1997) The ecology of root lifespan. Advances in Ecological Research, 27, 1-60.

³ Hendricks & Pregitzer (1992) The demography of fine roots in a northern hardwood forest. *Ecology*, 73, 1094-1104.



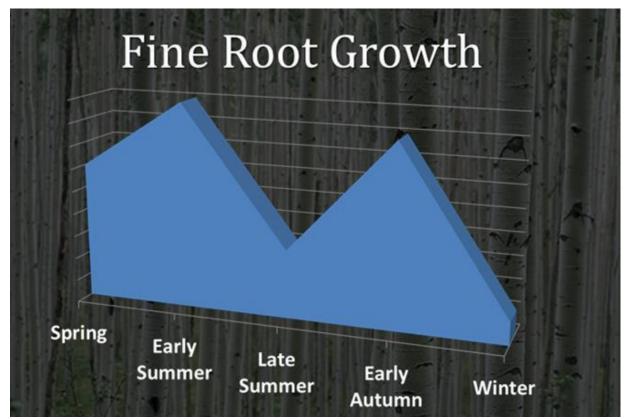


Fig 2 – Fine root growth is (generally) seasonal peaking in late spring and again in early autumn but dying back in winter dormant periods when photosynthetic production ceases. This is an important part of the soil nutrient cycle and demonstrates that a static RPA as calculated by BS5837 is a 'simplistic' 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.



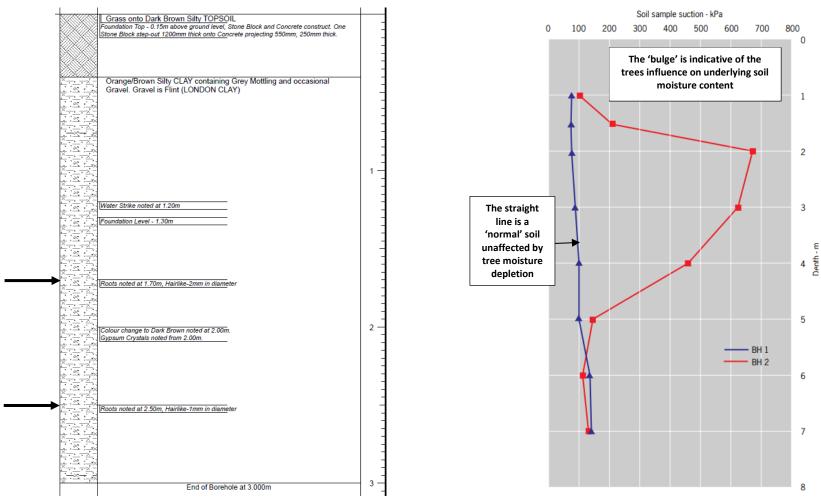


Fig 3 – Borehole log 10m from mature Oak tree on clay soil detailing fine roots to depths of 2.5m indicated with arrows (Source: Tamla Trees project) and annotated soil moisture depletion by trees showing a peak influence at 2m and extending to 5m (above right)



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 Itd 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.

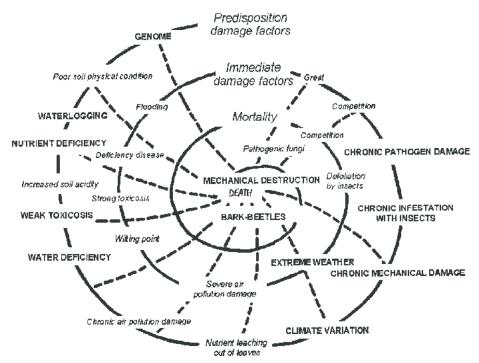


Fig 4 - Manion's spiral of tree decline for Norway Spruce (modified by Mrkva 1993)



5.1.11 BS5837 Section 4.6.3 Site Specific Assessment:

Section	Consideration	Site Specific Comments
4.6.3 (a)	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);	 Along the eastern side of the survey ware there is a retaining wall with a step (down) in levels to parking and the highway beyond. This will likely have locally manipulated rooting of the trees closest to this feature but in the context of the overall proposal and implication of work there are no features of likely impact to its delivery in terms of existing root morphology issues.
4.6.3.(b)	topography and drainage;	 There are localised undulations on the site with step changes in levels (particularly to the eastern boundary) but no issues of adverse topography or drainage were noted.
4.6.4.(c)	the soil type and structure;	 Soil is indicated by the BGS as a clay. Clay soils can undergo adverse compression (when tracked by machinery for example) and this can adversely affect retained trees. Protection measures detailed in this report will only be effective if these are instated immediately prior to all site works and maintained for the duration of the works.
4.6.4.(d)	the likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.	 T2 (Acer spp) has a minor encroachment for the installation of equipment. The surface will be formed of Wet pour surface 80mm: Play top Rubber wearing course on 70mm rubber base, on 150mm Type 1 sub-base With a flexible aluminium edging, 150mm deep, pinned to type 1 foundation. It is a minimal encroachment located at the periphery of the trees RPA and to a level well within the tolerable amount subject to the relevant protection measures being installed for the duration of works. Acer spp show tolerance to root loss/ pruning⁴ No other RPA ground encroachments for the works are proposed.

Report Ref: 03656R

⁴ Matheny & Clark (1998) Trees and Development: A Technical Guide to Preservation of Trees During Land Development



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	А	В	С	Summary	
RPA Incursion	-	T2	-	Equipment installation – T2 (Acer spp) has a minor encroachment for the installation of equipment. The encroaching surface will be formed of Wet pour surface 80mm: Play top Rubber wearing course on 70mm rubber base, on 150mm Type 1 sub-base with a flexible aluminum edging, 150mm deep, pinned to type 1 foundation. It is a minimal encroachment located at the periphery of the trees RPA and to a level well within the tolerable amount subject to the relevant protection measures being installed for the duration of works.	
				In the event that there is insufficient space (given the site protection proposed) we represent to any manipulations to fencing locations in the event accestorage/ welfare in protected areas is required.	
				Services – No new services are proposed.	
				Landscaping – Further to the proposal being completed there will be a need to make good. BS3882 compliant topsoil will be spread/ raked out by hand to a depth no greater than 100mm and any localized grass seeding, shrub and tree planting completed.	
				Areas below retained trees are recommended for mulching with composted bark mulch where possible. Detailed further comment on landscaping proposals is outside the scope of this report.	



5.2.2 The relative incursion into the RPA is summarised as follows

Tree Number	RPA Total (Sqm)	Incursion (Sqm)	As % of trees RPA
Т2	127	7	5.5%

- 5.2.3 It is recognised that BS5837 recommends all structures be placed outside the RPA of retained trees: 5.3.1 The default position should be that structures (see 3.10) are located outside the RPAs of trees to be retained. However, where there is an overriding justification for construction within the RPA, technical solutions might be available that prevent damage to the tree(s) (see Clause 7). If operations within the RPA are proposed, the project arboriculturist should: a) demonstrate that the tree(s) can remain viable and that the area lost to encroachment can be compensated for elsewhere, contiguous with its RPA; b) propose a series of mitigation measure.
- 5.2.4 It is considered in this instance that there is 'overriding justification' on the basis that the surface works within the RPA of T2 are minimal and well within the tolerable '20%' detailed at BS5837 Section **7.4.2.3** "New permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA." On this project the incursion is 5.5%.

Tree & Development Risk Indicator

Λ

- Our assessment has confirmed the presence of probable underlying CLAY soil
- T2 is the main issue tree. Tree Protection to be installed for all site trees as indicated.
- The Tree & Development Risk Indicator (TDRI™) is therefore LOW.
- Arboricultural oversight and competent ground workers will be key to the effective delivery of this project.
- Note: This level of risk if 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.



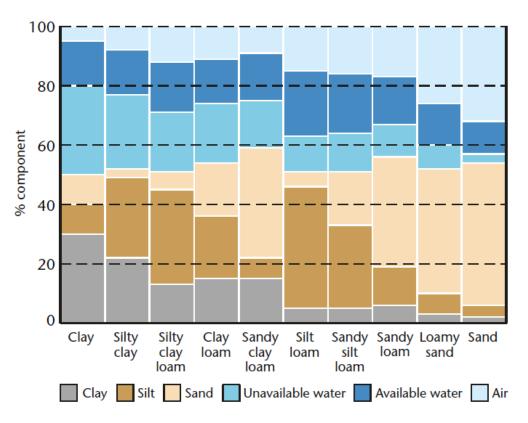


Fig 5 – Diagram showing the typical particulate composition and air/ water content at field capacity for mineral soil types⁵ The variation in soil type has a direct bearing on the potential impact of adverse construction techniques (such as soil compaction) as well as overall root system morphology & development. Clay soils tend to have shallower rooting as moisture remains readily available while soils containing free draining gravel and sand can encourage deeper rooting based on reduce soil bulk density and greater seasonal variations in moisture availability. The immediate underlying soil is identified from BGS data as CLAY.

⁵ Forestry Commission (2005) The Influence of Soils and Species on Tree Root Depth



5.3 Tree Loss

5.3.1 No trees will be pruned or removed to facilitate the proposed scheme. T8 is highlighted as a Cat U tree to the client for them to consider works to this tree as appropriate based on their own health and safety assessment.

Tree Surgery

Tree	No. Specie	s Proposed Tree Works	BS Cat

Proposed Removal

Tree No. Species		Proposed Tree Works	
Т8	Cherry	Consider removal and replacement based on condition.	Cat U

- 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).



Tree Pruning Indicator

Λ

- The nature of the proposal is such that it is generally away from/out from under the canopy of retained trees significantly limiting likely pruning requests/ requirements.
- The council retain control over the pruning/ removal works on the basis of their ownership.
- **Note:** This is an indicative assessment. All and any future works should be undertaken in accordance with BS3998 (Tree Works) and we recommend the use of Arboricultural Association approved contractors.⁶

5.3.4 Please note that this is not a health and safety assessment report and that vigilance for the emergence of any fungal pathogens is advised. A number of Ash trees were evident on site and vigilance for Ash Dieback is advised with further information on this available here.

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⁶ https://www.trees.org.uk/ARB-Approved-Contractor-Directory



5.4 Demolition & Foundations

5.4.1 All tree protection will be installed prior to any on site activity. The proposed tree protection procedure can be summarised as follows:

Stage 1

- Install BS5837 full spec protective fencing.
- Brief all contractors on purpose of fencing.

Stage 2

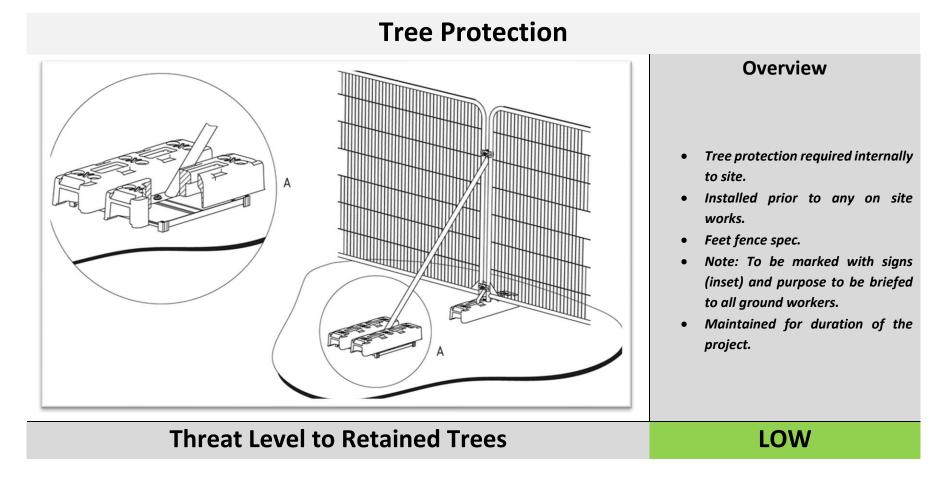
• Install new equipment.

Stage 3

- BS3882 compliant topsoil imported and raked out where required to 'make good'.
- Undertake soft landscaping (to include mulch below retained trees where possible).



5.4.2 High quality BS5837 compliant tree protection will then be installed prior to any further on site works:





5.4.3 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 6 – 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



5.4.4 **Site Manager/ Consultant Sign Off:** At this point a site inspection is required to confirm the appropriate tree protection measures have been completed.

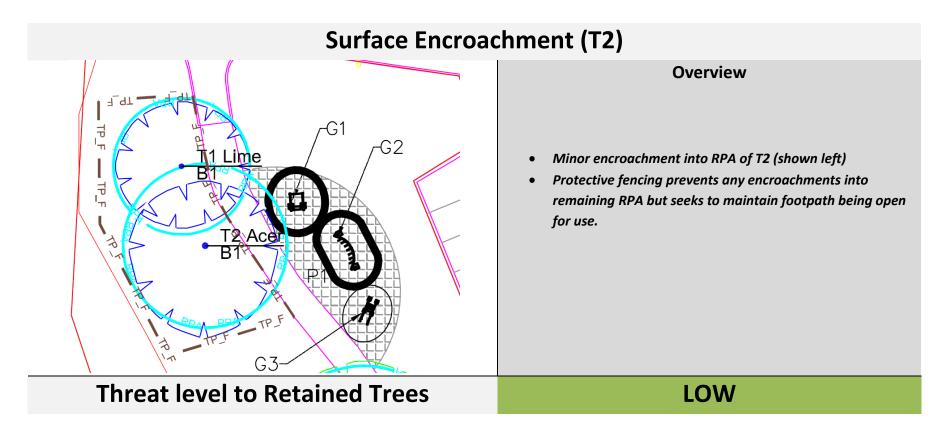
Date of Inspection	Compliance with Tree Protection Plan?			
	Yes		No	
Rectification Actions (insert notes)				
Site Manager Signature:				
Print Name:				
Arboricultural Consultant Signature:				
Print Name:				

SITE TREES ARE NOW ADEQUATELY PROTECTED AND CONSTRUCTION ACTIVITY CAN COMMENCE



5.5 Surfaces near Trees

5.5.1 No temporary surfaces are required and the surface installation within the RPA of T2 is minimal in terms of both its form of construction and level of RPA encroachment. The encroaching surface will be formed of Wet pour surface 80mm: Play top Rubber wearing course on 70mm rubber base, on 150mm Type 1 sub-base with a flexible aluminium edging, 150mm deep, pinned to type 1 foundation.





5.5.2 It is considered that there is ample space around the site to respect the proposed fencing and provide site welfare/ movement/ storage etc but in the event any fencing requires manipulation (for temporary access/ low level material storage) the exposed ground must be covered with temporary ground protection immediately following removal of any fencing.

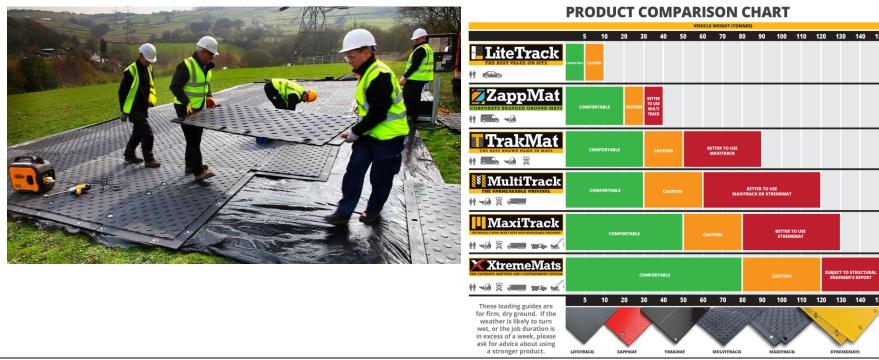


Fig 7 –The construction firm/ contractors must ensure that any areas where fencing may be moved (temporary) leads to exposed ground being covered with suitable temporary ground protection. This approach maximises the integrity of retained tree RPA's.





Fig 8 – Temporary ground protection is an effective way of allowing access through the RPA of retained trees. It must be installed prior to any on site activity and maintained for the duration of all works to be effective. Above left Tamla Trees project ground protection in place and above right being removed following the completion of site works. (Note: depending on the length of time it is in place it will adversely affect underlying grass ground cover which will need reseeded/ turfed accordingly)



5.6 Site Service Provision

5.6.1 We are advised that there are no new services required.

5.7 Ground Level Changes

5.7.1 Ground levels remain unchanged other than the small incursion into the RPA of T2 detailed elsewhere within this report. 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. Further comment on 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 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

- Circular area edged to 50-100mm depth to stop mulch from 'creeping' on to surround lawn.
- Composted mulch then spread around below tree by hand – no need to lift or remove underlying grass.
- Mulch topped up annually/ as required.
- Positive benefits for mulched trees

Threat Level to Retained Trees

LOW



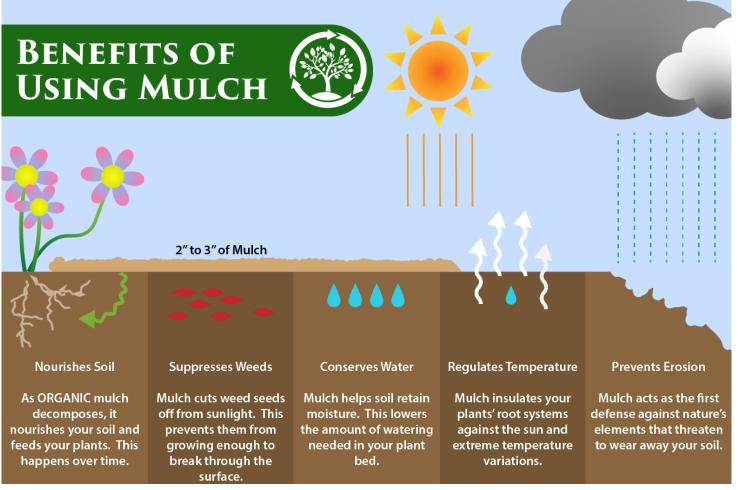
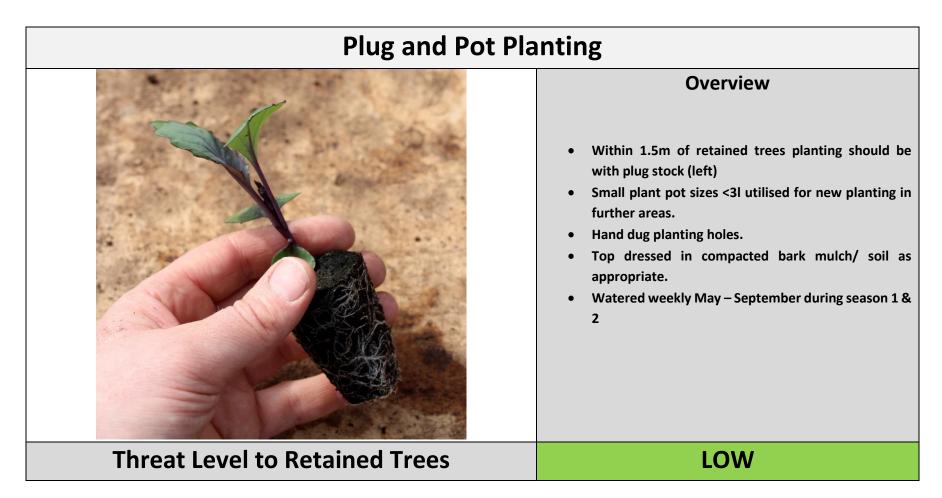


Fig 10 – Benefits of Mulch (Image Source 1st Stop Landscape Supply (US)



5.7.3 Where soft landscape planting occurs within the RPA of retained trees, we advise the use of small pot sizes and plug planting where possible to minimize the risk of root disturbance.





5.8 Tree Shading of Proposal

5.8.1 The proposal for open air play equipment and as such there are not considered any issues associated with shading from retained trees.

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 tree protection is in place. Inspect/Toolbox talk with site operatives regarding tree protection measures. Update local authority on findings.	ТВС	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. Assess any required tree surgery following construction. Update local authority and project team on findings.	ТВС	Incomplete

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



Appendix 1 – BS5837 Survey Key

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



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)			
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) 			See Table 2
	 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 			
	NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.			
	1 Mainly arboricultural qualities	2 Mainly landscape qualities	3 Mainly cultural values, including conservation	
Trees to be considered for rete	ention			
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 that might be included in	, , , , , , , , , , , , , , , , ,	Trees with material	See Table 2
Trees of moderate quality with an estimated remaining life expectancy of at least 20 years	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	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	conservation or other cultural value	
Category C	Unremarkable trees of very limited	Trees present in groups or woodlands, but without this conferring on them conservation or other significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits		See Table 2
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	merit or such impaired condition that they do not qualify in higher categories			



Appendix 3 – BS5837 Survey Data

Tree No.	Species	DBH (m)	No of Stems	Ht (m)				BS Cat	Age Class	Life Expect	Cr Ht Observation (m)	Recommendations	RPR (m)		
					N	E	S	W				(111)			
T1	Lime	0.44	1	13	5	5.3	4.8	5.1	B1	Mature	> 40	1.7	Good form. Pronounced surface basal rooting.	No works	5.3
Т2	Acer	0.53	1	16.5	5	5.6	7.1	5.9	B1	Mature	> 40	2	Good overall form. Pronounced epicormic growth at stem base.	No works	6.4
Т3	Sycamore	0.62	1	19	7.8	7.6	9	7.9	A1	Mature	> 40	2	Good overall form. V union at 2.5m. Minor pruning wounds. Play area to south.	No works	7.4
Т3	Maple (Norway)	0.1	1	5.6	1.9	1.8	2	1.6	C1	Young	10 to 20	1.5	Small suppressed tree with large stem wound.	No works	1.2
Т5	Cherry	0.38	1	13	6	5.7	5	6.1	В2	Mature	> 40	2	Slight suppression. Surface rooting. Spring feature.	No works	4.6



Tree No.	Species	DBH (m)	No of Stems	Ht (m)		Crowr	ı Spread		BS Cat	Age Class	Life Expect	Cr Ht (m)	Observation	Recommendations	RPR (m)
					N	E	S	w				("",			
Т6	Lime	0.5	1	17	5.8	6	5.8	5.7	B1	Mature	> 40	1.5	Pruning wounds on main stem. Possibly topped in past.	No works	6
Т7	Cherry	0.29	1	13	3	4.4	3.2	3.6	C1	Mature	10 to 20	2.5	Slight suppression. Basal wound with decay establishing. Thinning canopy. Monitor closely.	No works	3.5
Т8	Cherry	0.34	1	11	4.5	4.5	3	5.1	U	Mature	<10	2.5	Very thin canopy. Nearly dead.	Consider removal and replacement based on condition.	4.1
Т9	Cherry	0.42	1	12	5	5	5.7	4.4	C1	Mature	10 to 20	2.5	Some canopy thinning. Surface roots. V union at 2.2m.	No works	5
T10	Lime	0.45	1	17	5.2	5.5	5	5.4	C1	Mature	10 to 20	1.2	Surface rooting. Large pocket of stem decay at 2.4m.	Crown reduce by 2-3m to suitable side growth points and monitor wound for decay progression.	5.4



Tree No.	Species	DBH (m)	No of Stems	Ht (m)		Crowr	n Spread		BS Cat	Age Class	Life Expect	Cr Ht (m)	Observation	Recommendations	RPR (m)
					N	E	S	W				()		All works to accord with BS3998.	
T11	Lime	0.44	1	15	5.3	5	5.3	5.1	B1	Mature	> 40	1	Reasonable form. Possible canopy stress from play area installation.	No works	5.3
T12	Lime	0.5	1	13.5	3	3.5	3	2.9	C1	Mature	> 40	0	Previously reduced heavily. Significant epicormic regrowth. No visibility to fully inspect given foliage.	No works	6
T13	Lime	0.5	1	13.5	3	1.8	3	3	C1	Mature	> 40	0	Previously reduced heavily. Significant epicormic regrowth. No visibility to fully inspect given foliage.	No works	6
T14	Lime	0.22	1	4.8	3.9	2.8	3.2	2.7	C1	Semi- mature	20 to 40	2	Establishing tree located in planter with shrubs hindering basal inspection.	No works	2.6



Tree No.	Species	DBH (m)	No of Stems	Ht (m)		Crown Spread N E S W			BS Cat	Age Class	Life Expect	Cr Ht (m)	Observation	Recommendations	RPR (m)
T15	Cherry	0.6	1	12	N	5.7	5.8	5.9	B1	Mature	20 to 40	1.6	Large domed example. Major surface roots. Defects consummate with age. Spring feature.	No works	7.2
T16	Ash Leaf Maple	0.44	1	15	5.8	4.8	5.8	6	C1	Mature	20 to 40	2	Slightly suppressed and asymmetric.	No works	5.3
T17	Ash	0.48	1	19	7	7	6.3	6.9	C1	Mature	10 to 20	2	Large significant basal wound. Species means vigilance for Ash Dieback advised.	Monitor closely for Ash Die Back	5.8
T18	Cherry	0.59	1	14.5	8	5.7	7	7.5	B1	Mature	10 to 20	1.6	Large domed example. Major surface roots. Defects consummate with age. Spring feature. Verging on over mature limiting retention span.	No works	7.1
T19	Ash Leaf Maple	0.33	1	13	4.8	5	5	5.2	C1	Mature	20 to 40	2	Slightly suppressed and asymmetric. Wounds at basal flare.	No works	4



Tree No.	Species	DBH (m)	No of Stems	Ht (m)			BS Cat	Age Class	Life Expect	Cr Ht (m)	Observation	Recommendations	RPR (m)		
					N	E	S	W				(,			
T20	Hawthorn	0.1	1	2.3	1.7	2	1.7	1.7	C1	Young	> 40	1	Small establishing tree.	No works	1.2
T21	Sorbus	0.07	1	2.8	1.7	1.6	1.7	1.7	C1	Young	> 40	1	Small establishing tree.	No works	0.8
T22	Ash Leaf Maple	0.31	1	10	3.3	4	5.7	3.9	C1	Mature	10 to 20	2	Slightly suppressed and asymmetric. Wounds at basal flare. Thinning canopy.	No works	3.7
T23	Sorbus	0.07	1	3.9	1.6	1.7	1.7	1.7	C1	Young	> 40	1	Small establishing tree.	No works	0.8
T24	Ash Leaf Maple	0.27	1	10	4	4.5	4.6	4.4	C1	Mature	10 to 20	2	Slightly suppressed and asymmetric. Wounds at basal flare. Thinning canopy.	No works	3.2



Tree No.	Species	DBH (m)	No of Stems	Ht (m)					BS Cat	Age Class	Life Expect	Cr Ht (m)	Observation	Recommendations	RPR (m)
T25	Ash	0.49	1	17	N 6.6	E 8	S 5.8	5.4	C1	Mature	10 to 20	3	Asymmetric. V union at 2.2m. Vigilance or Ash Dieback required. Open canopy indicative of possible early decline.	Monitor closely for Ash Die Back	5.9
T26	Cherry	0.55	1	14.5	5.6	8	7	5.5	B1	Mature	10 to 20	1.6	Large domed example. Major surface roots. Defects consummate with age. Spring feature. Verging on over mature limiting retention span.	No works	6.6
T27	Sycamore	0.73	1	20	8.9	5.3	7.6	8.5	B2	Mature	20 to 40	4.5	Slightly lopsided given building and historic pruning. Bulges and occluded wounds in main stem suggest some stem decay.	No works	8.8
T28	Norway maple 'Drummondi i'	0.39	1	13.5	5.5	4.7	3.7	5.7	B2	Mature	> 40	2.2	Established ornamental with some relatively minor stem wounds.	No works	4.7
T29	Norway Maple 'Crimson King'	0.36	1	13.5	2.9	3.4	2.4	3.5	В2	Mature	> 40	2.2	Established ornamental with some relatively minor stem wounds.	No works	4.3



Tree No.	Species	DBH (m)	No of Stems	Ht (m)			Spread		BS Cat	Age Class	Life Expect	Cr Ht (m)	Observation	Recommendations	RPR (m)
Т30	Norway Maple 'Crimson King'	0.36	1	13.5	3.6	2.5	3.2	3.5	B2	Mature	> 40	2.2	Established ornamental with some relatively minor stem wounds.	No works	4.3
T31	Lime	0.54	1	18	8	7	3.8	5.6	B1	Mature	> 40	2	Established tree of good form.	No works	6.5
T32	Maple (Silver)	0.5	1	18	6.8	7.5	3.2	2.5	C1	Mature	20 to 40	3	Suppressed asymmetric tree.	No works	6



Appendix 4 – Tree Works Schedule

Tree Surgery

Tree No.	Species	Proposed Tree Works	BS Cat

Proposed Removal

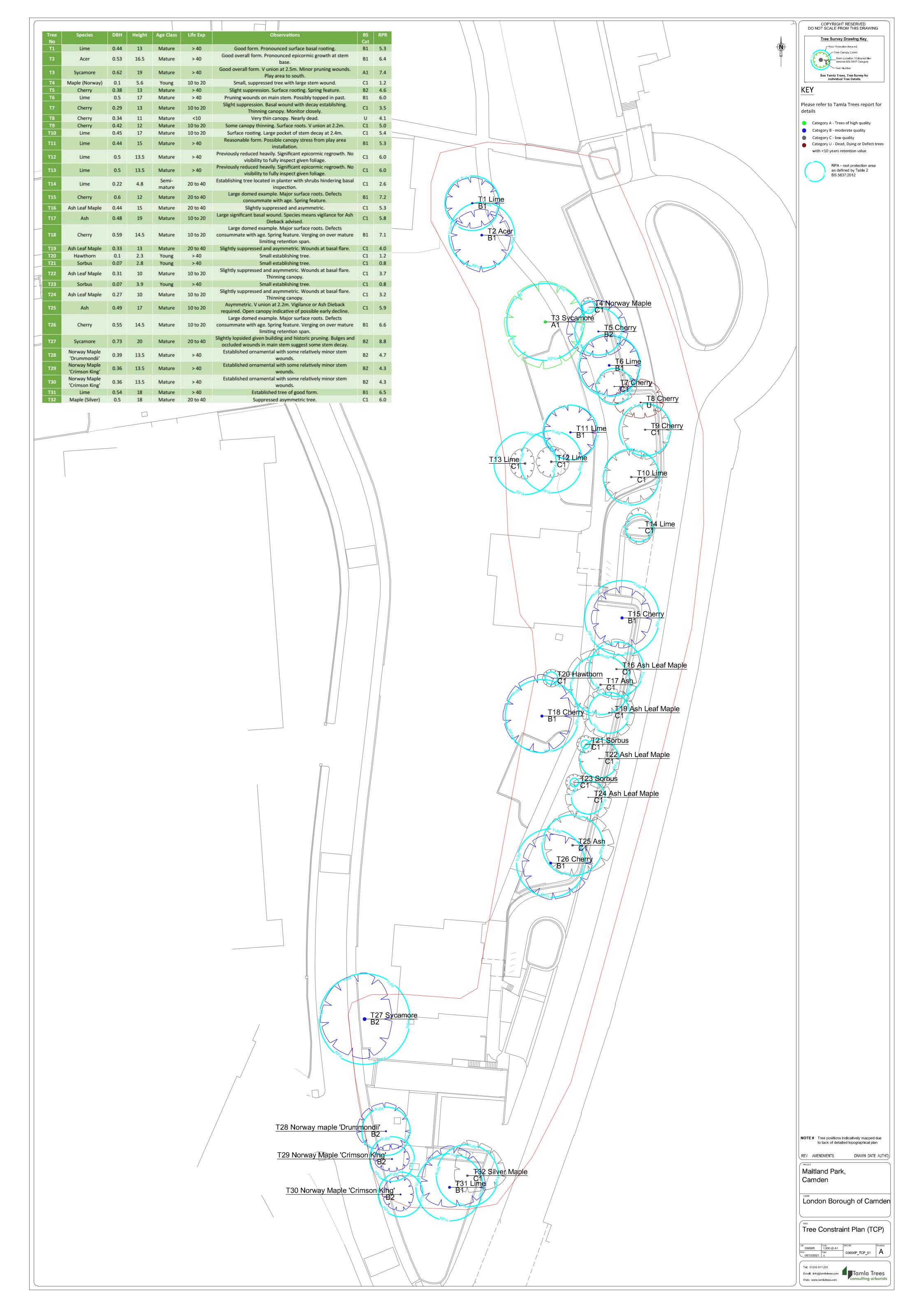
Tree No.	Species	Proposed Tree Works	BS Cat
Т8	Cherry	Consider removal and replacement based on condition.	Cat U

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



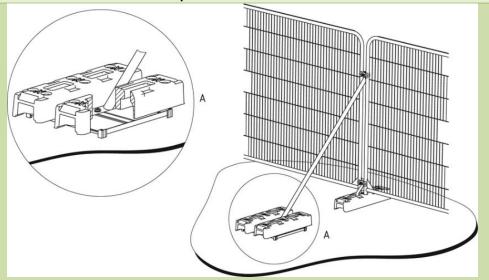


Appendix 6 - Tree Protection Plan

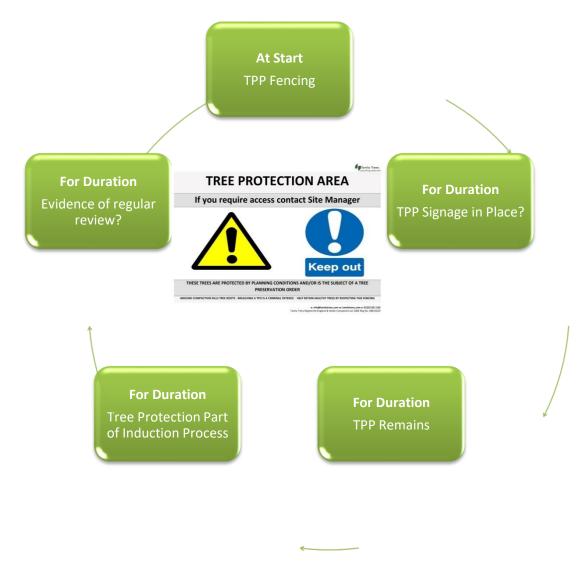
Tree protection is essential to successfully integrate the proposal into the surrounding trees. It is designed to manage the impact on the underlying soil and rooting environment. It must therefore be installed prior to any further site activity. Even apparently minimal tracking of the soil near trees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

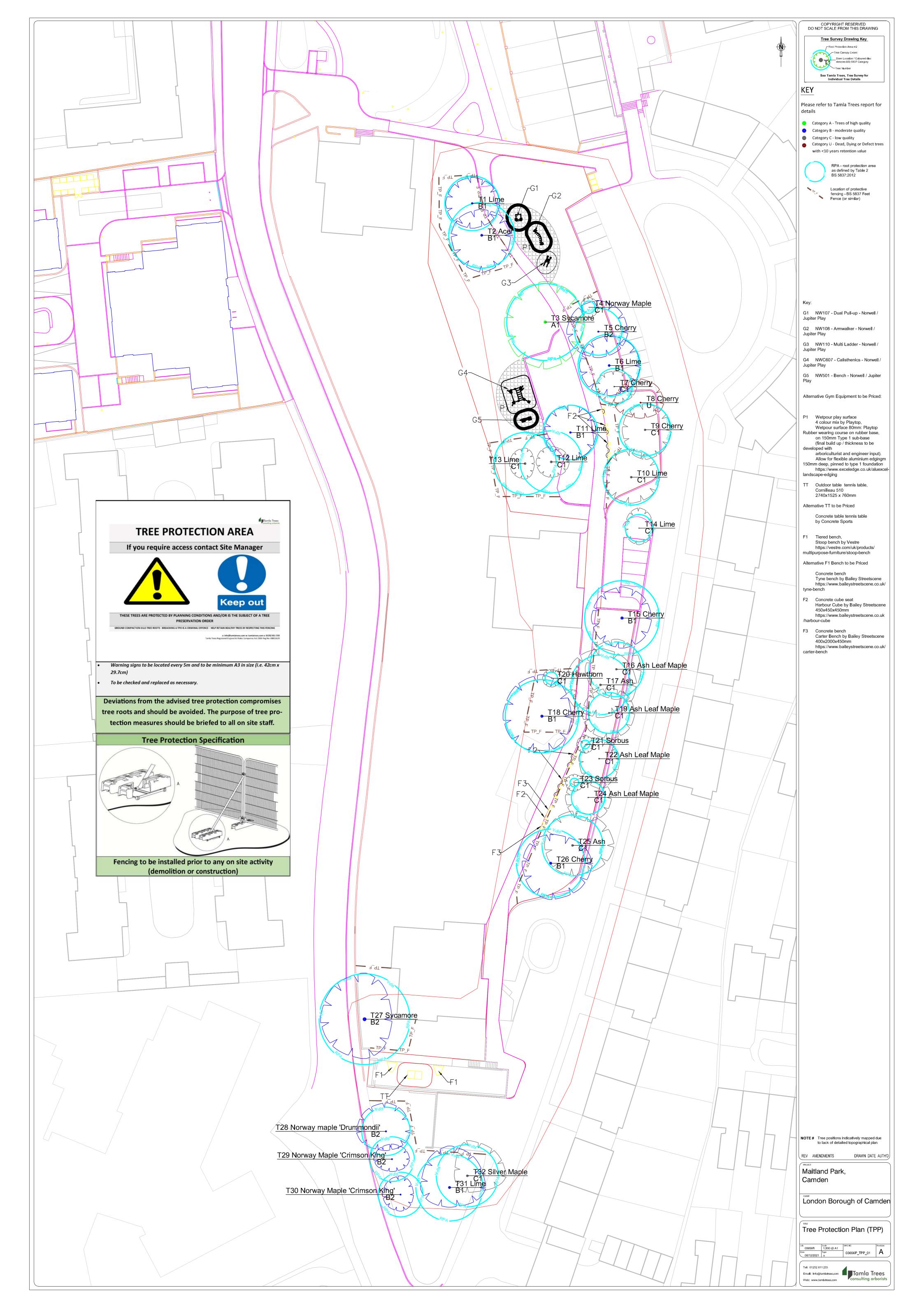
All our fencing specifications accord with advice and guidance within BS 5837. Modifications to fence types are possible but should be discussed prior to implementation. In all other instances the form detailed below should be shown. This offers the best protection to retained trees.

- 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 following no dig surface and prior to any on site demolition/ construction activity.
- Maintained for the duration of all site works.











Appendix 7 – Site Photographs



Image 1 – Looking north along Maitland Park Road







Image 2 – Looking north towards T2 & T1

Image 3 –Surface rooting on the site Cherries (example)



Appendix 8 – Limitations

Full Legal Disclaimer

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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 quidance. Tamla Trees Itd 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 Itd 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.