KENNINGTON BOWL SKATEPARK, LONDON

Preliminary Tree Assessment

JSL4040_770

KENNINGTON BOWL SKATEPARK, LONDON V1

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Prepared by:

RPS Consulting Services Ltd

Thomas Flood

Principal Arboriculturist

Noble House, Capital Drive,

Linford Wood, Milton Keynes

MK14 6QP

T 01908 302634

E **thomas.flood@rpsgroup.com**

Prepared for:

London Borough of Lambeth

Caroline Streeks

Project Manager

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1 INTRODUCTION

1.1 RPS were instructed in March 2021, by London Borough of Lambeth, to undertake a Tree Survey and then to prepare a Preliminary Tree Assessment in respect of the constraints trees pose to development, the condition of the trees and the likelihood that they may be affecting the Kennington Bowl Skatepark structure in Kennington Park, London.

1.2 The report comprises a combination of standard arboricultural assessments to help guide the client in the planning of repairs to the structure and the management of the trees. The survey was undertaken in accordance with BS5837:2012 – *Trees in relation to design, demolition and construction*, as described within the survey methodology attached to this report at Appendix A.

1.3 While the survey was undertaken in accordance with BS5837:2012, a condition assessment was also undertaken during this survey and works recommended to trees are shown in Table 3 and 4 attached to this report.

1.4 The report includes a Tree Constraints Plan (see drawing 700) which shows the quality of the trees, their crown extents and potential areas where roots may have encroached. Appendix B – *The Tree Constraints Plan* explains the process of interpreting the plan and how it is used during the design and impact assessment process.

1.5 The report also includes a Tree Location & Analysis Plan (see drawing 701) which shows the trees which assesses the trees in general accordance with NHBC Chapter 4.2 – *Building near trees*. This assessment has been partially incorporated into this report as it can show different trees potential zones of influences on structures.

1.6 This report should be read in conjunction with the supplied Tree Constraints Plan (see drawing 700), Tree Protection Plan (see drawing 710) and all other relevant Tables and Appendices as detailed within the table of contents.

1.7 The tree positions were plotted using Ordnance Survey information provided and a sub metre GPS plotting device (Trimble Geo 7x).

1.8 The survey and this assessment were undertaken by RPS Principal Arboriculturist Thomas Flood BSc (Hons) MICFor MArborA.

2 SITE INFORMATION

2.1 The site under consideration comprises the historic Kennington Bowl Skatepark which was built during the 1970's and is one of the original structures of this nature in the UK. It is located amongst a number of trees on the north-west edge of Kennington Park, London and is rectangular in shape.

2.2 The park was subject to resurfacing in 2012 by shoe manufacturer Converse under their 'Fix to Ride' scheme. Since this time, further concerns have come to light regarding the structural integrity of the park and whether the presence of trees, two of which are large London plane (*Platanus* x *hispanica*), are contributing to possible movement.

2.3 The site is centred at Ordnance Survey Grid Reference TQ 31425 77958 and runs parallel to Kennington Park Road. The site is nestled among a number of trees of varying species and maturity.

2.4 The disease Massaria (*Splanchnonema platani*) affects London Plane trees and presents a challenge for managers of this species in the built environment. This is because the fungus appears to take advantage of branches predisposed by drought stress, leading to larger branches being affected, that are then shed. Massaria has been recorded in London since 2007 and poses a problem in terms of safety due to the shedding of limbs and possible decline of the trees overall. Given there are plane trees present within close proximity to the structure, the trees were assessed for this during the survey.

2.5 A Tree Preservation Order (TPO) check was made using the London Borough of Lambeth TPO schedule on their website to ascertain if any of the trees form part of a TPO. The check revealed that no trees recorded during the survey appear subject to such controls.

3 TREE QUALITY ASSESSMENT

Retention Values

3.1 All trees inspected were categorised using BS5837:2012 and the attached Tree Constraints Plan (see drawing 700) shows tree positions, numbers, and retention categories. Trees were recorded as individuals and as groups.

3.2 Trees have been surveyed as groups where they can be considered as forming a group as they form cohesive features either aerodynamically (i.e. they form a discrete group feature providing companion), culturally (i.e. they are composed of trees of a similar size, age and species subject to the same management) or visually (i.e. where the value of the trees within the group is as a whole rather than individually).

3.3 Where trees have been surveyed as groups the details recorded with respect to condition and retention value intend to represent an average tree within the group; however, on occasion, it must be noted that there will be exceptions within any group that do not conform to the typical character of that group.

3.4 The initial stage of a tree survey in accordance to BS5837:2012 looks at the trees on the site in terms of life expectancy and condition. Trees are then categorised according to their retention value.

3.5 **Category A** trees are those that have been assessed as being of a high quality and value; significant amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in Green on the Tree Constraints Plan.

3.6 **Category B** trees are those that have been assessed as being of a moderate quality and value; amendments to the proposed scheme should be considered in preference to their removal. These trees are shown in Blue on the Tree Constraints Plan.

3.7 **Category C** trees are those that have been assessed as being of a low quality and value; the loss of these specimens should not be considered as a constraint to development. These trees are shown in Grey on the Tree Constraints Plan

3.8 **Category U** trees are those that have been assessed as being in poor condition and having no retention value; these trees should not be a material consideration in the planning process. These trees are shown in Red on the Tree Constraints Plan.

3.9 A total of 23 individual trees were surveyed during the visit in addition to two groups of trees.

3.10 Of the 23 individuals recorded, three were classed as Category A (good quality), six were classed as Category B (moderate quality), 12 as Category C (low quality) and two as Category U (poor quality). The two groups were both recorded as Category B.

Physiological Condition

3.11 Trees considered to be in a good physiological condition are those with crown density and shoot extension growth levels within the expected ranges for their age and species. Generally, these trees, subject to being of a suitable structural condition, can be expected to make a lasting contribution to the site. Additionally, trees within the good condition class are likely to tolerate

changes within their growing environment that occur as a result of development, as such their successful retention will be easier to achieve.

3.12 Trees considered to be in a fair physiological condition are those specimens exhibiting lower shoot extension growth and reduced crown density than would typically be expected. These specimens have a lower life expectancy than those within the good condition class and will not tolerate significant changes as a result of development as well as those in the good condition class.

3.13 Trees considered to be in a poor physiological condition are those exhibiting crown and shoot dieback and significantly reduced crown density. Trees of a poor physiological condition are not likely to make a lasting contribution to the site and whilst their retention in the short term may be beneficial such retention will only be achievable if the trees are fully protected throughout development as they will not tolerate changes in their growing environment.

3.14 Of the 23 individual trees recorded, seven were considered to be in good physiological condition, 14 in fair condition and two in poor condition. While variations in condition will be present within the groups, one was recorded as being of generally good physiological condition and the other as fair.

Structural Condition

3.15 There are variations in the structural condition of the trees surveyed; however individual tree condition is largely consistent with expectations for the age, management, and species of the tree.

3.16 The majority of structural defects that were noted across most of the tree stock on the site, such as minor deadwood in tree crowns, were not considered highly significant and are unlikely to result in the premature failure of the tree or pose any significant risk to the public.

3.17 While the above is true, there were exceptions with the most significant issue recorded being in relation to the large London plane tree, T3, located to the north of the structure. This tree was observed to have shed limbs in the past, one being still in situ at its base with evidence of Massaria infection. An assessment of the crown shows the tree is in severe decline with sporadic / limited budding, poor extension growth and limbs dying back. Massaria was clearly observed to lower limbs on both the north and south side but is likely present in others higher up judging by the appearance of the tree in general. It is likely the tree became stressed in the past due to drought or a reduction in water availability from nearby competition and this likely allowed Massaria to gain a foothold within it.

3.18 It was also noted that a sycamore (*Acer pseudoplatanus*), T6, has a major wound to its stem which is tear-shaped and probably from the failure of a large limb at a point of weakness (likely an included union). The wound is large and open with exposed heartwood decaying internally and while there is some occlusion occurring to the edges of the wound, this will inevitably be a point of weakness.

Age Distribution

3.19 Trees assessed as being young (Y) in age are those considered to be less than 10 years old. These trees can generally be considered to have the potential for rapid and significant future growth. Whilst these specimens are not likely to make a substantial contribution to the landscape character of the site at present they will, if retained, provide succession for the eventual removal of mature or over-mature trees as a result of declining physiological or structural condition.

3.20 Trees assessed as being semi-mature (SM) are those of more than 10 years old but having attained less than 40% of the maximum lifespan expected for the species. These trees will generally make

some contribution to the current landscape character and appearance of the site and their retention will provide a more immediate succession of mature trees. As with young trees these specimens will have the potential for rapid and significant future growth.

3.21 Early-mature trees (EM) are those considered to have reached between 40% and 70% of their ultimate life expectancy. These trees are generally not considered to have a significant potential for future growth though they will increase in size at a slower rate than young and semi-mature trees.

3.22 Mature trees (M) are those considered to have reached between 70% and 100% of their species life expectancy. These trees will have little future growth potential and they have generally reached their maximum expected size for the location. These trees will generally make the highest contribution to the landscape character of the site at this time; however, a tree stock over dominated by mature trees will require careful management to ensure that a continuation of canopy cover can be achieved.

3.23 Over-mature trees (OM) are those considered to have existed for longer than typical of their species. They do not have the potential to increase in size and may in fact reduce in size as their crowns begin to break up. These trees will often make a significant contribution to the landscape character of the site and are likely to have ecological value. However, the retention of these trees within new development must be carefully planned as they are approaching the end of their useful life expectancy and they will often have structural defects. Where over-mature trees are to be retained in new development it is essential that access is available for their eventual removal.

3.24 Veteran trees (V) are those that show features of biological, cultural, or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species. These trees have negligible potential to increase in size. Veteran trees are usually of a high ecological value and they will require sensitive management where they are to be retained in new development. As such it is again essential that they are located in areas where access is available to undertake management operations and where there is a reduced risk of harm occurring from failure of the trees.

3.25 Of the 23 individual trees, their age class distributions are distributed as four young, five semi-mature, seven early mature and seven mature. The two groups were recorded as one semi-mature and one early mature.

Species Distribution

3.26 The tree species recorded during the survey are listed below:

BOTANICAL NAME	COMMON NAME
Acer campestre	Field maple
Acer pseudoplatanus	Sycamore
Ailanthus altissima	Tree of Heaven
Corylus colurna	Turkish hazel
Cotoneaster sp.	Cotoneaster species
Ilex aquifolium	Holly
Laburnum anagyroides	Laburnum
Platanus x *hispanica*	London plane
Prunus sp.	Plum species

BOTANICAL NAME	COMMON NAME
Robinia pseudoacacia	False acacia
Syringia vulgaris	Lilac
Taxus baccata	Yew

4 TREE CONDITION & HAZARDS

General

Deadwooding

4.1 False acacia is mainly growing in an area around the north side of the Kennington Bowl Skatepark (G1, T1 & T2) and comprise trees ranging between early mature and mature. A further two trees of the same species, but younger, were recorded adjacent the north-west edge of the structure (T21 & T22). This tree species has two main drawbacks in terms of common characteristics, it frequently develops deadwood within its crown and can also sucker (regenerating via shoots from its root system) which can cause it to spread via clones. In the case of the trees at the site, two individual trees (T1 & T9) and the group G1 have minor deadwood which would benefit from being removed as a general maintenance process.

4.2 Two other trees were also recorded as having minor deadwood in their crown and this relates to one tree of heaven (T10), the larger of the two and located adjacent the park footpath, and one cotoneaster species (T18) located along the western side of the skatepark.

Massaria (London Plane)

4.3 One London plane (T3) was recorded as being affected by an overall decline in physiological health and with a visible infection of Massaria (see Section 2. Site Information, para. 2.4 for more information). It is possible this tree became drought stressed in the past, perhaps due to the false acacia growing adjacent to it competing for available moisture it had previously been accustomed to having for itself. The tree has shed limbs in the past, one of which remains in situ at the base, and this was shed due to Massaria judging by its appearance. This tree is likely to have a limited remaining life expectancy and will probably shed further limbs as Massaria was observed within the crown. It therefore poses a safety concern to the public given the high levels of footfall at Kennington Park. It is recommended that this tree be removed.

Stem Defects

4.4 The most significant stem defect present is that of T6, a sycamore growing directly adjacent the east side of the structure. This tree has a large tear-shaped opening to its stem where it appears to have lost a limb in the past which has likely torn downward. This has severely exposed the heartwood which is decaying and while there is some occlusion to the edges of the large wound it poses a risk given its size and location. It is recommended that this tree be removed.

4.5 A laburnum (*Laburnum anagyroides*), T16, is located along the western side of the structure and this tree has a decay cavity below the point where the crown forks. As is fairly typical for laburnum, it previously developed an inclusion at its fork union which provides an entry point for decay and this is the likely cause of the stem cavity. Unfortunately, the tree has the potential to lose its main limbs due to this and both have potential targets of significance adjacent them. It is recommended this tree be removed to remove the risk it poses.

4.6 Of less significance, the removal of the small cotoneaster species (T8) growing close to the south side of the skatepark should be removed under general maintenance as one stem has died and the remaining stem is in poor condition.

4.7 All tree works can be found within Tables 3 and 4 attached to this report and can be seen on the Tree Constraints & Works Priority Plan (see drawing JSL4040_700).

5 GENERAL TREE CONSTRAINTS TO STRUCTURAL WORKS

Below Ground

5.1 Tree roots require moisture and nutrients to grow successfully, if these are not available then they will not be able to colonise the area surrounding the main stem. The tree will form a root system and exploit any water and nutrient resources that are available to them. Roots do not form in hostile environments and the tree will adapt its size and shape if any of these items are in limited supply.

5.2 Trees in many urban areas are limited by the harsh conditions that the tree finds itself in. They are woodland species that find themselves severely limited in some urban situations. The older trees within the site have been able to establish themselves and have achieved what should be considered a maximum size for their species and location.

5.3 Sealed surfaces and good urban drainage are bad for root and tree growth. The soil becomes desiccated in these situations and available moisture is greatly reduced. This along with the high levels of compaction found associated with hard surfaces restrict rooting.

5.4 All activities that could directly affect the roots to the trees within the site and the works to achieve any future refurbishment considered. Construction method statements and detailed arboricultural assessment of the works should be fully specified before any works adjacent to trees are carried out. Where they are likely to be adjacent to the rootable area, supervision by a qualified arboriculturist should be considered.

5.5 Any trenching near trees has the likelihood to cause root severance and should be avoided. The use of trenchless techniques offers an alternative to the traditional trenching and should be considered whenever works have to be located in the RPA of retained trees.

Above Ground

5.6 The above ground constraints that trees provide are largely concerned with their mass (crown and main stem) and these constraints are usually abated by pruning or removal. Pruning is used to allow access and prevent damage to the tree in a site development. Removal is considered when the tree is in a poor condition (see Section 4) and would fail in a reasonable time scale or the development could not be achieved with the tree in its current position and the benefits of the development outweigh the retention of the tree.

5.7 A specification for any required pruning should be compiled once a proposed plan of action is agreed. The pruning requirement would be primarily to allow access for any adjacent works to ensure no physical damage to the crowns occur while any building works are being carried out.

5.8 All crown pruning works should be carried out to the specifications contained within BS3998:2010 Tree Work – Recommendations and the guidance below. They should be carried out sensitively and maintain or improve the crowns balance and form for each individual tree.

Root Protection Areas

5.9 Root Protection Areas (RPAs) for each tree surveyed have been determined in accordance with BS5837:2012 Section 4.6 Root Protection Area in the Standard. This was to help inform any future development works at the site which may be being considered to remediate structural damage to the Kennington Bowl Skatepark.

5.10 Initial RPAs for the trees were plotted onto the Tree Constraints & Works Priority Plan (see drawing 700) shows the extent to which trees roots would need to be protected during the works.

5.11 The use of CEZ (Construction Exclusion Zone) would likely be required during any refurbishment works which would be achieved using Heras style fence panels, the position of which would need to be specified on a Tree Protection Plan following detailed arboricultural assessment.

Links to Damage in Structure

5.12 The RPA guidance within BS5837:2012 is by no means an exact science and should in general be considered a minimum protective area for root zones. The RPA extents shown on the Tree Constraints & Works Priority Plan (see drawing 700) can however give an indication to which trees likely have roots extending beneath the structure. Based on this, the two trees likely to be the most significant due to their size and proximity to the structure are the mature Category A London plane (T7) and the mature Category C sycamore (T6), however other trees also have minor encroachments.

5.13 At the time of the survey there was no visible evidence observed at ground level of roots causing direct contact damage to the structure. If the trees are contributing to the damage at the property, it is more likely to be the influence of roots on soil moisture levels (see Section 6) than direct damage caused by roots disrupting the structure.

Existing Canopy Spreads

5.14 A number of trees have canopies which extend over and within the footprint of the Kennington Bowl Skatepark and these would need to be given consideration prior to any refurbishment of the structure. This would need to take into account the operations required to carry out the works, the machinery required and the space necessary.

5.15 It is better to prune a trees crown to provide the necessary space required for an appropriate works to be undertaken than to damage the limbs during the works, which would be more likely to result in jagged wounds which fail to heal and regenerate from.

Planning of Future Site Operations

5.16 Planning of site operations will take sufficient account of trees to ensure that no access and movement of material into and around the site impact on trees. Physical damage can result if this is not considered. Consequently, any movement of plant or materials in proximity to trees will be conducted under the supervision of a banksman (or Arboriculturist if required), to ensure that adequate clearance from trees is always maintained.

5.17 All materials or fluids would need to be stored away from the RPA of retained trees, particularly those whose accidental spillage would cause contamination and damage to a tree. Fluids must be handled well away from the outer edge of the RPA of trees.

5.18 Correct planning of access routes and storage areas prior to start on site will ensure no impacts from these activities will occur.

6 NHBC CHAPTER 4.2 ASSESSMENT

Assessment Scope

6.1 The NHBC Chapter 4.2 – *Building near trees* guidance is the standard by which structures need to adhere when being built near to trees where soils comprise shrinkable clay elements. While this would usually apply to the construction of foundations and deciding their required depth, for the purpose of this assessment this guidance is being used to ascertain the likely areas which the trees would influence. By this, it is meant that different tree species, their moisture demand along with their current height will dictate the range that they may be able to influence clay soil moisture levels adjacent and beneath a structure. This can in the correct soil conditions promote differential movement in soils due to their moisture volume which can lead to damage of the structures above (commonly known as subsidence).

6.2 The assessment uses the information provided in NHBC Guidance 10, Chapter 4.2 - Building near trees as a basis for determining this.

Soil Type

6.3 The British Geological Society describes the soils in the area of the site as River Terrace (Sand / Gravel).

6.4 A Structural Report was recently produced for the structure by Price & Myers for London Borough of Lambeth and a trial pit was excavated to a depth of 450mm which revealed that underlying soils were clay and made ground. This confirmed that the structure is built on top of clay soils and therefore will likely have potential to be influenced by the seasonal uptake of moisture by trees.

Tree Moisture Demand

6.5 The tree species recorded during the survey range between low to medium moisture demand with all the more significant trees adjacent the structure falling within the moderate end of the range (e.g. London plane, false acacia and sycamore) in accordance with NHBC Chapter 4.2 guidance. The majority of these trees are also of a height that would put them in the group of having reached mature height, thus their potential influence on soil moisture levels will be at or nearing its peak.

6.6 It should also be noted that years where drought are experienced will also exacerbate potential soil movement, causing spikes in tree related subsidence due to increased water demand and drying of substrata. These events are fairly common in England, experiencing drought conditions roughly every 5-10 years.

6.7 When a tree predates a structure, or where there are insufficient foundations to prevent roots proliferating beneath it, the removal of said tree can cause an effect called heave. This occurs when a tree such as this is removed and no longer negatively influences moisture levels within the clay soils and the clay rehydrates. This causes the opposite effect of subsidence and ground levels will swell, which can cause significant damage to a structure due to movement in the opposite direction.

6.8 In the event that trees which have a zone of influence extending within the footprint of this structure are to be removed for any reason, a heave assessment may be necessary to ascertain potential for heave damage.

6.9 The trees shown on the Tree Location & Analysis Plan (see drawing JSL4040_701) are colour coded based on their species moisture demand.

Zones of Influence

6.10 It can be seen on the Tree Location & Analysis Plan (see drawing JSL4040_701) that the potential zones of influence are marked as orange dashed circles. These are calculated in accordance with the NHBC Chapter 4.2 guidance based on a tree's height and moisture demand and it indicates the potential range by which a tree has a potential to effect soil moisture levels.

6.11 It can be seen that trees with zones of influence which overlap with the Kennington Bowl Skatepark most significantly are sycamore T6 and London plane T7, which is to be expected as they are mature specimens located within very close proximity.

6.12 Other trees also have potential to influence the structure but to a lesser extent than T6 and T7. These comprise the numerous false acacia to the north of the structure (T1, T2 and G1), the Category U London plane (T3) and the Category B yew group to the south (G2).

Discussion

6.13 The soils beneath the structure have been confirmed to comprise of clay, likely with a plasticity that would leave it susceptible to shrinkage due to tree roots. It is therefore likely that certain trees at the site, in particular T6 and T7, are likely to be influencing the moisture levels within the clay and causing it to move in correlation with the seasons.

6.14 It is understood that there are two options being explored by Price & Myers (Structural Engineers) with regard to remediating the damage to the structure. One which involves jacking up the precast concrete sections of the structure to provide a level skating surface or the rebuilding of the structure on foundations.

6.15 From an arboricultural standpoint, there would be less potential for damage to adjacent trees should the former option be successful, albeit the cause of the movement will not go away and therefore would likely need to be periodical levels assessments to adjust the structure. This relies on the original framework for the structure still being operational and not irrevocably seized.

6.16 If this fails and there is a need to reassemble the structure on new foundations, consideration must be given to the protection of roots. Traditional strip foundations have high potential to sever root systems and would therefore not be supported unless they could be arranged to avoid the underlying roots of significant trees, which seems unlikely. The Structural Report suggests screw piles which would provide a low impact option as they can be driven into the ground by hand, removing the need for piling rigs which could cause crown damage to overhanging trees. It seems that both options would be acceptable from an arboricultural perspective, but would require an Arboricultural Impact Assessment and Tree Protection Plan to guide the works in relation to ensuring tree protection.

Tables

Table 1: Tree Survey Data

Key to Inspection Report Form

Species	Genus and variety
Height	Measured Clinometer Reading or Estimated Height in Metres
Girth (dbh @ 1.5m)	Diameter measured in cms, or estimated, Where multi stemmed below 1.5m the diameter is taken as that just above the root flare
Spread (m)	Canopy height estimated in metres above ground level
Canopy height (m)	Crown Spread, radius estimated in metres
Physiological Condition	Good, Fair, Poor, Dead
Age Class	Y – Young, SM – Semi mature, EM – Early Mature, M – Mature, OM - Over mature, V – Veteran
Useful Life Expectancy (years)	<10, 10-20, 20-40, 40+
BS Categorization	See Cascade Appendices 2

Table 1: Tree Data Schedule

Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
1	Robinia pseudoacacia	540	12	0.0	5.0	2.5	2.5	5.0	SE	6.0	M	Fair	20-40	Tree is leaning at a 10angle in a Southdirection.Deadwood in the crown of minor extent.Branch dieback of minor extent.	B2
2	Robinia pseudoacacia	390	10	5	1	5	2.5	3.5	East	3	EM	Fair	20-40	Tree is leaning at a 15angle in a Eastdirection.Deadwood in the crown of moderate extent.Hanging branches in the crown.	B2
3	Platanus x hispanica	990	14	6	3	7	6	8	South	4	M	Poor	<10	Pruning wounds to crown.Bifurcated stem formed at 4.0metres.Deadwood in the crown of moderate extent.Branch dieback of moderate extent.Previous branch failures noted.Tree has no long term potential. In severe decline. Massaria visible in lower northern primary limb and limb on south side approx. 1m higher, although likely the cause of overall decline and present in others. Very sporadic poor quality new growth.	U
4	Platanus x hispanica	1040	20	5	9	6	9	1.5	SE	7	M	Good	40+	Pruning wounds to crown.Hard surface located in RPA. No Massaria visible in crown from ground level.	A2
5	Platanus x hispanica	1270	23	9	7	9	6	2	SW	8	M	Good	40+	Pruning wounds to crown.Trifurcated stem formed at 8.0 metres.Deadwood in the crown of minor extent.Hard surface located in RPA. No Massaria visible in crown from ground level.	A2
6	Acer pseudoplatanus	660	16	5.0	4.0	6.0	7.0	5.0	SW	4.0	M	Good	10-20	Epicormics growth on stem.Pruning wounds to stem and crown. Major tear shaped stem cavity due to previous limb failure. Significant decay in heartwood with partial occlusion to edges.	C2
7	Platanus x hispanica	1520	17	7.0	7.0	7.0	7.0	3.0	SE	5.0	M	Fair	40+	Pruning wounds to crown.Multi stemmed stem formed at 5.0 metres.Deadwood in the crown of minor extent.Hard surface located in RPA. No Massaria visible in crown from ground level.	A2
8	Cotoneaster sp.	150	4	0	4	2	2	2	South	2	SM	Poor	<10	Epicormics growth on stem.Heavily suppressed crown.Tree has no long term potential. Twin stemmed cotoneaster. One stem dead, the other with cavities and declining.	U
9	Robinia pseudoacacia	410	11	1.5	6.0	3.0	5.0	2.0	West	3	EM	Good	20-40	Pruning wounds to crown.Bifurcated stem formed at 1.0metres.Deadwood in the crown of minor extent.	B2
10	Ailanthus altissima	390	12	2	4	5	1	3	SE	3	EM	Good	20-40	Deadwood in the crown of minor extent.	B2
11	Prunus sp.	200	6	3	2	2	1.5	1	North	2	SM	Good	20-40	Epicormics growth on stem & crown. Crown suppression from larger adjacent trees.	B2
12	Ilex aquifolium	310	8	2	4.0	2.0	2.0	1	North	2	SM	Fair	10-20	Twin stemmed holly. Suppression from larger adjacent trees.	C2

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied

Tree No.	Species	Diameter (mm)*	Height	Crown Spread				Crown Height	First Branch Direction	Branch Height above Ground	Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
				N	S	E	W								
13	Ilex aquifolium	290	7	3.0	2.0	1.5	3.0	1.0	North	2.5	SM	Fair	10-20	Epicormics growth on stem.Deadwood in the crown of minor extent.General poor form to tree. Multi stemmed holly.	C2
14	Corylus colurna	290	10	3.0	2.0	2.0	4.0	1.5	West	2	EM	Good	20-40	Epicormics growth on stem.Pruning wounds to crown.	B2
15	Cotoneaster sp.	300	6	5.0	1	3	4.0	1.5	NW	1	EM	Fair	10-20	Tree is leaning at a 30angle in a NWdirection.Pruning wounds to stem and crown.Deadwood in the crown of minor extent.	C2
16	Laburnum anagyroides	250	8	3	1.0	2	3	3.5	NW	2	EM	Fair	10-20	As is typical for species, it has included union at fork. Decay cavity below fork extending into base of smaller primary limb (can now see through).	C2
17	Corylus colurna	90	5	1	1.0	1	1	1.5	South	2	Y	Fair	10-20	Young Turkish hazel.	C2
18	Cotoneaster sp.	310	6	5	2	2.5	4	1.5	North	1.5	M	Fair	10-20	Bark damage.Deadwood in the crown of minor extent.	C2
19	Robinia pseudoacacia	160	8	1.5	1.5	0	4.0	3	North	2	Y	Fair	10-20	Tree is leaning at a 10angle in a Westdirection.General poor form to tree. Twin stemmed false acacia. Crown suppression from larger adjacent tree.	C2
20	Syringia vulgaris	120	4	2	1.0	0.0	2.5	0.0	North	0.0	EM	Fair	10-20	Heavily suppressed crown.Deadwood in the crown of minor extent.	C2
21	Robinia pseudoacacia	305	8	2.0	4	3.0	3	3	South	4	SM	Fair	10-20	Deadwood in the crown of minor extent.Restricted inspection due to vegetation.General poor form to tree. Multi stemmed false acacia.	C2
22	Robinia pseudoacacia	130	7	2.0	2	0	3.0	4	South	0.0	Y	Fair	10-20	Heavily suppressed crown.Restricted inspection due to vegetation.	C2
23	Ilex aquifolium	130	4	2.0	2.0	1	2	1	West	1.5	Y	Fair	10-20	Heavily suppressed crown.	C2

* Where the tree is multi-stemmed the conventions within BS5837:2012 are applied

Table 2: Group Data Schedule

Group No.	Species	Min/Max Diameter (mm)	Average Height (m)	Average Crown Spread	Ave. Crown Height	Max. Age Class	Vigour	Life Expectancy	Structural Condition/Comments	BS5837 Category
G1	Robinia pseudoacacia	320 400	10	5	4	EM	Fair	20-40	Deadwood present of minor extent, 3 x False acacia, all leaning outward.	B2
G2	Taxus baccata	340 420	8	3	1.5	SM	Good	20-40	Deadwood present of minor extent,Pruning wounds present.	B2

Table 3: Tree Works Required

Tree No.	Species	Diameter (mm)*	Height	Age Class	Vigour	Structural Condition	Life Expectancy	Comments	BS5837 Category	Works Required
1	Robinia pseudoacacia	540	12	M	Fair	Fair	20-40	Tree is leaning at a 10angle in a Southdirection.Deadwood in the crown of minor extent.Branch dieback of minor extent.	B2	Deadwood the tree crown.
3	Platanus x hispanica	990	14	M	Poor	Poor	<10	Pruning wounds to crown.Bifurcated stem formed at 4.0metres.Deadwood in the crown of moderate extent.Branch dieback of moderate extent.Previous branch failures noted.Tree has no long term potential. In severe decline. Massaria visible in lower northern primary limb and limb on south side approx. 1m higher, although likely the cause of overall decline and present in others. Very sporadic poor quality new growth.	U	Fell the tree.
6	Acer pseudoplatanus	660	16	M	Good	Poor	10-20	Epicormics growth on stem.Pruning wounds to stem and crown. Major tear shaped stem cavity due to previous limb failure. Significant decay in heartwood with partial occlusion to edges.	C2	Fell the tree. Given the size of the cavity and extent of decay in main stem, the tree poses a risk of failure despite partial occlusion of the wound to the edges.
8	Cotoneaster sp.	150	4	SM	Poor	Poor	<10	Epicormics growth on stem.Heavily suppressed crown.Tree has no long term potential. Twin stemmed cotoneaster. One stem dead, the other with cavities and declining.	U	Fell the tree.
9	Robinia pseudoacacia	410	11	EM	Good	Fair	20-40	Pruning wounds to crown.Bifurcated stem formed at 1.0metres.Deadwood in the crown of minor extent.	B2	Deadwood the tree crown. General maintenance.
10	Ailanthus altissima	390	12	EM	Good	Fair	20-40	Deadwood in the crown of minor extent.	B2	Deadwood the tree crown. General maintenance.
15	Cotoneaster sp.	300	6	EM	Fair	Fair	10-20	Tree is leaning at a 30angle in a NWdirection.Pruning wounds to stem and crown.Deadwood in the crown of minor extent.	C2	Deadwood the tree crown. General maintenance.

Tree No.	Species	Diameter (mm)*	Height	Age Class	Vigour	Structural Condition	Life Expectancy	Comments	BS5837 Category	Works Required
16	Laburnum anagyroides	250	8	EM	Fair	Poor	10-20	As is typical for species, it has included union at fork. Decay cavity below fork extending into base of smaller primary limb (can now see through	C2	Fell the tree. Potential for limbs to fail into road/footpath or into skatepark.
18	Cotoneaster sp.	310	6	M	Fair	Fair	10-20	Bark damage.Deadwood in the crown of minor extent.	C2	Deadwood the tree crown. General maintenance.

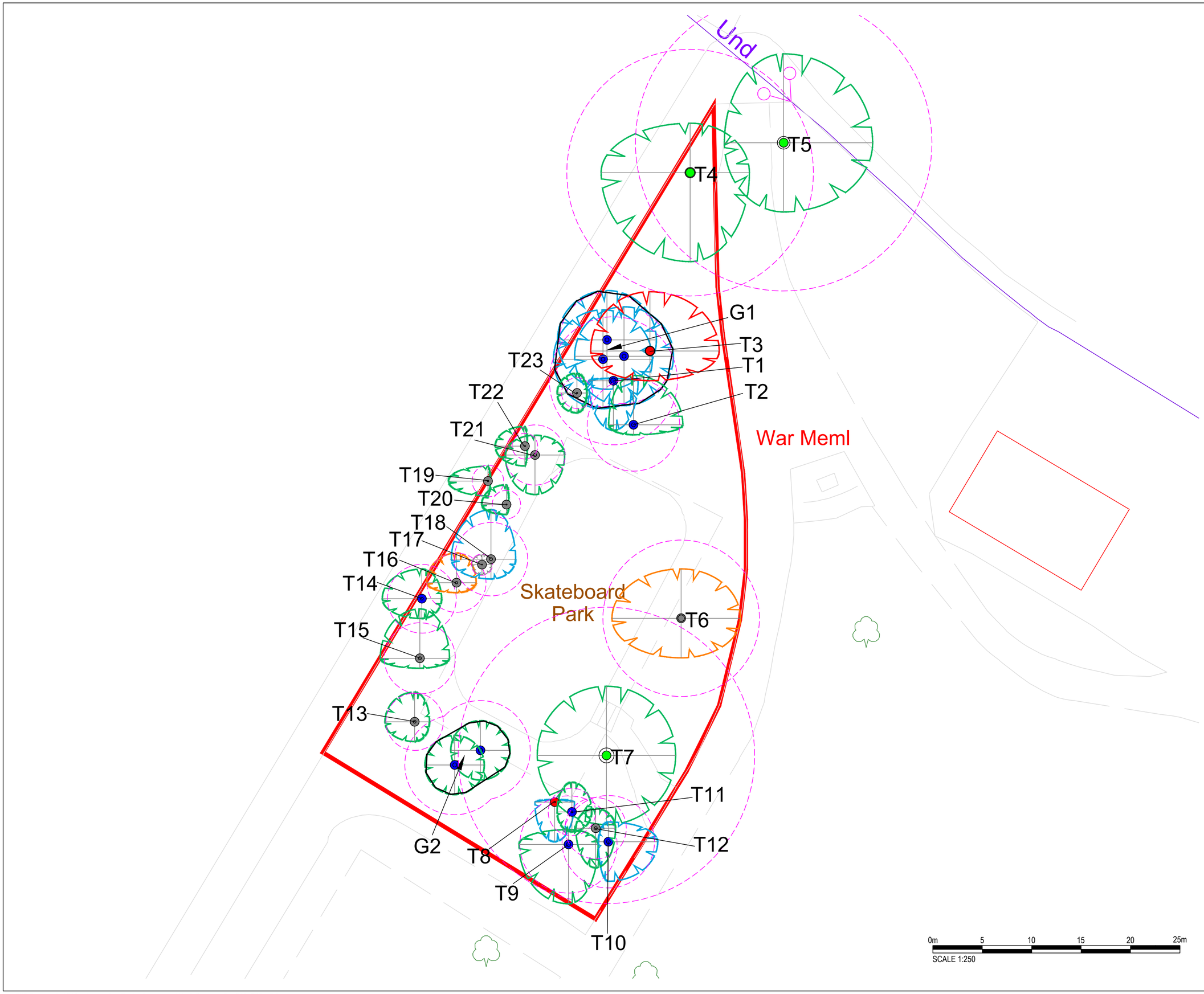
Table 4: Group Works Required

Group No.	Species	Diameter (mm)*	Height	Max.Age Class	Vigour	Structural Condition	Life Expectancy	Comments	BS5837 Category	Works Required
G1	Robinia pseudoacacia	400	10	EM	Fair	Fair	20-40	Deadwood present of minor extent, 3 x False acacia, all leaning outward.	B2	Deadwood the tree crown,

Figures

JSL4040_700: TREE CONSTRAINTS & WORKS PRIORITY PLAN

JSL4040_701: TREE LOCATION & ANALYSIS PLAN



Notes

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Key

Site boundary.

T1/G1 Green - No works recommended

T1/G1 Red - Works recommended within 3 months

T1/G1 Orange - Works recommended between 6-12 months

T1/G1 Red - Works recommended for general maintenance

BS 5837:2012 Tree Quality Categories - Table 1

- Category A - High quality
- Category B - Moderate quality
- Category C - Low quality
- Category U - Unsuitable for retention

Root protection area (RPA) calculated in accordance with Section 4.6 - BS5837:2012

NOTES:

- Refer to RPS Tree Schedule for further details.
- Survey based on a visual inspection from the ground and is not intended as a full arboricultural inspection.
- Plan produced in accordance with recommendations set out in BS 5837:2012 - 'Trees in Relation to design, demolition and construction'.
- Due to the legal protection afforded to breeding birds vegetation removal should not take place during the bird nesting period; generally, although not restricted to, March - August inclusive.
- Survey carried out using sub metre GPS survey device and OS digital mapping.

N

Rev	Description	By	CB	Date

MAKING COMPLEX EASY

Lakesbury House, Hiltingbury Road, Chandlers Ford, Hampshire SO53 5SS

T: 02380 810 440 **E:** rpsso@rpsgroup.com

Client LONDON BOROUGH OF LAMBETH

Project KENNINGTON SKATE PARK, LONDON

Title TREE CONSTRAINTS & WORKS PRIORITY PLAN

Status	Drawn By	PM/Checked by
FOR INFO	TF	BW

Job Ref	Scale @ A2	Date Created
JSL4040	1:250	APR 21

RPS Drawing / Figure Number	Rev
700	-

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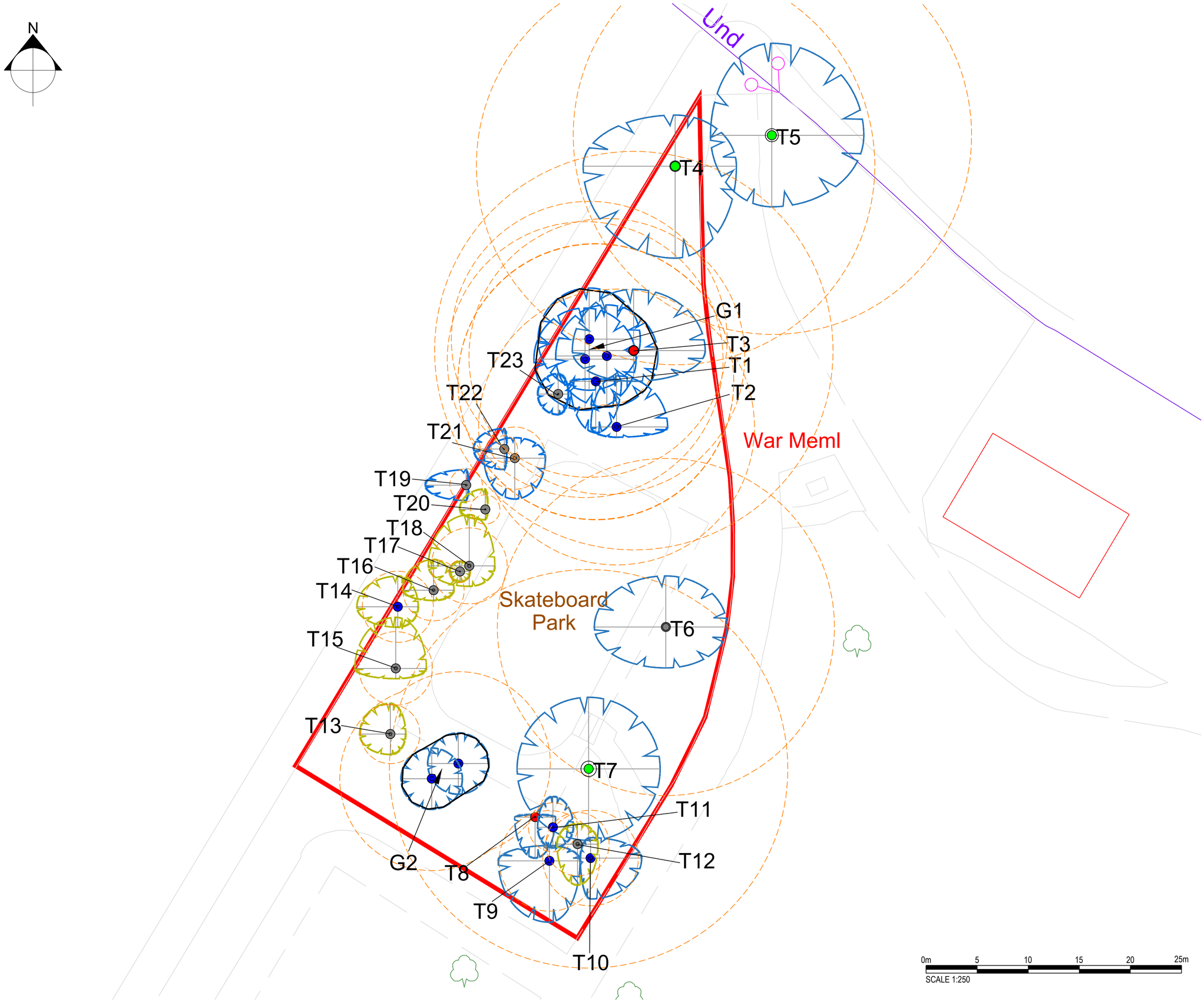

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Key

- Site boundary.
- T1 — Tree species of moderate moisture demand
- T1 — Tree species of moderate moisture demand

Tree Condition Categories

- Good Condition
- Moderate Condition
- Low Condition
- Poor Condition

- Tree Zone of Influence in accordance with NHBC 2010

Rev	Description	By	CB	Date

MAKING COMPLEX EASY

Lakesbury House, Hiltingbury Road, Chandlers Ford, Hampshire SO53 5SS

T: 02380 810 440 **E:** rpsso@rpsgroup.com

Client: LONDON BOROUGH OF LAMBETH

Project: KENNINGTON SKATE PARK, LONDON

Title: TREE LOCATION & ANALYSIS PLAN

Status	Drawn By	PM/Checked by
FOR INFO	TF	BW

Job Ref	Scale @ A2	Date Created
JSL4040	1:250	APR 21

RPS Drawing / Figure Number: 701

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Appendix A

Methodology

General

Trees were inspected from ground level during a site visit. All data was recorded electronically within a ESRI ArcPad project and then upon return to the office it was imported into an MS Access database. Individual tree numbers and locations were plotted by eye on to a drawing at the time of the survey. Tree positions were then related to a Topographical survey of the site provided, where not shown on the topographical survey tree positions have been plotted by eye only and require confirmation. Colour coded versions of the drawings form part of this report (see drawing 700).

The data recorded includes:

- Height - data gathered using a Suunto optical clinometer PM - 5/1520. Where access to the tree was not possible the Heights were estimated.
- Diameter - measurements taken at 1.5 metres above ground level (or where multiple stems exist complying with requirements for BS5837).
- Tree crown spread – estimated measurement of the four cardinal points to provide information to be used with the arboricultural constraints plan
- Tree Crown Clearance – crown height above ground level
- Tree Condition - judged visually using the guidelines produced in the report. The condition is indicated with the appropriate colour on the map found in the report. (see drawing 700)
- Age class - estimated from an examination of the tree in question.

Age Classification

The following classification is employed:

Y - Young:	Saplings and young trees under 10 years of age
SM – Semi-Mature:	Trees older than 10 years but less than 40% of the life expectancy of their species.

EM – Early-Mature:	Trees between 40% and 70% of the life expectancy of their species.
M - Mature:	Trees between 70% and 100 of the life expectancy of their species.
OM - Overmature:	Trees considered to be beyond the normal life expectancy of their species.
V – Veteran:	Trees that show features of biological, cultural or aesthetic value that are characteristic of an individual surviving beyond the typical age range for the species.

Estimated Remaining Contribution in Years

The estimated remaining contribution in years is an estimate based on currently known factors of the possible remaining life of the tree as an asset. Clearly, it is impossible to predict changes in condition which may occur in the future and this reflects what is considered reasonable under existing circumstances. The following classification is employed:

Death or removal is likely within less than 10 years
Death or removal is likely within 10+ years.
Death or removal is likely within 20+ years.
Death or removal is likely beyond 40 years
The estimated remaining contribution in years will be dependent on the interaction of the typical longevity of the species, its current age and condition with prevailing environmental factors. The estimated remaining contribution in years also dependent on future tree management that can extend useful life in some instances.

Tree Condition.

The tree survey assessed the individual condition of all trees identified on the site. The assessment of condition is based on a visual and professional view.

The categories considered for Physiological Condition are good, fair, poor and dead.

Structural Condition is also commented on and this will include such items of presence of decay and physical defects.

Trees are living organisms and their condition can change rapidly in response to environmental variables. Condition remarks refer to the date of survey and cannot be assumed to remain unchanged. While there is no such thing as a safe tree, regular inspection of trees is recommended to reduce the foreseeable risks associated with trees. There is currently no published guidance from the UK insurance industry on the frequency of tree inspections. In the

German courts a bi-annual routine inspection is normally expected for older street trees, giving an indication of the rapidity of change in condition that can occur.

Preliminary Management Recommendations

Recommendations are given where it is felt by the arborist that further investigations are required due to suspected defects and work recommendations for pre-construction tree work.

Tree Categorisation Using BS 5837 Methodology

The trees surveyed were categorised using the method explained in BS5837:2012. This method categorizes individual trees, groups and woodlands in a systematic way. Each tree, group or woodland is identified on an attached plan.

Groups are identified as those trees forming a single arboricultural feature with trees that provide companion shelter, are avenues or screens or cultural.

Initially the surveyor will determine if the tree should be regarded as a U category tree. U category trees are those that are low value trees that have little future due to physiological and structural condition.

Other trees are graded A, B or C. The initial category should reflex the trees value in making an important contribution to the amenity of the site over a period of time. The higher the category the longer the perceived time period.

A sub category is included 1, 2 or 3. This sub category reflects the type of value the surveyor feels the tree presents in regards its value to 1 – arboricultural, 2 – landscape, 3 – cultural or conservation.

The cascade chart used is included as Appendix C of this report.

Appendix B

The Tree Constraints Plan

The Tree Constraints Plan (see drawing 700) is designed to show the influence that the trees have upon the site by virtue of their size and position. The plan seeks to act as a design tool that shows both the above and below ground constraints presented by the trees.

The information provided within this section of the report is to assist in the interpretation of the Tree Constraints Plan and aims to ensure that those trees selected for retention can be successfully integrated within the proposed development.

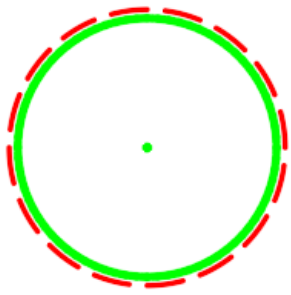
It should be noted that some of the tree positions shown on the plan have been plotted by eye to an Ordnance Survey base map and as such should be considered to be of a provisional nature.

Below Ground Constraints

Root Protection Areas

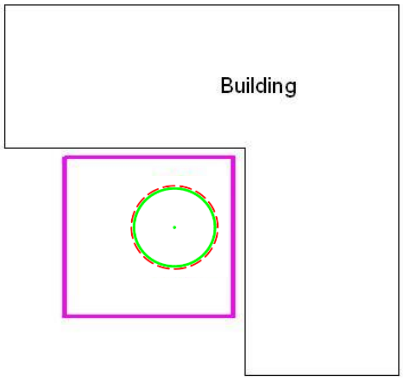
Root Protection Areas for each tree and group of trees surveyed have been determined in accordance with BS5837:2012 and a schedule of Root Protection Areas is attached to this report as Table 2.

As shown below Root Protection Areas (RPA's) for the trees, where no significant constraints to root development are considered to be present, have been plotted onto the Tree Constraints Plan as circles, with the tree located centrally, extending to encompass the area of ground, and thus the rootable soil volume, required for protection.



Where tree root spread is considered to have been influenced by site conditions the trees RPA's have been plotted to the Tree Constraints Plan as a polygon. The plotted polygon is of the same area as it would be as a circle and its shape reflects an arboricultural assessment of likely root distribution.

An example of a polygonal RPA, considered appropriate due to the presence of a building in close proximity to a tree, is shown below.

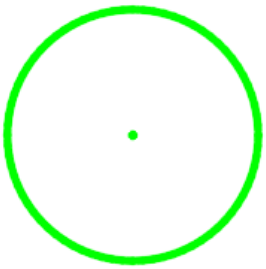


Where possible all development, including new hard landscaping, shall be situated outside of the retained trees designated Root Protection Areas.

Above Ground Constraints

Existing Canopy Spreads

The existing canopy spreads of the trees on site are shown on the Tree Constraints Plan as depicted below.



The current spread of the tree is a constraint due to its dominance, size and movement in strong winds.

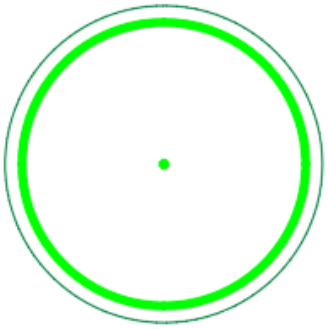
It will typically be unacceptable to design any built development within the current spread of a tree.

Where built development is proposed in close proximity to existing trees consideration should be given to the amount of working space required to allow its construction.

Future Tree Growth

Some of the trees surveyed are not yet mature and they have the potential for future growth. Where these are to be retained consideration to their ultimate crown spread should be given as future branch growth may result in interference with proposed development, damage to branches and the need for a tree pruning regime.

To facilitate assessment of future tree growth maximum expected canopy spreads have been marked on the Tree Constraints Plan (see drawing 700) as shown below.



The area of mature tree spread is estimated by the arboriculturist and is their best judgement of mature crown spread based on experience and with regard to the current tree growth observed on the site.

Within the area of maximum branch spread construction activities should be restricted for the long-term health and vigour of the trees.

In this respect it is considered that within the area of maximum branch the construction of utility buildings, such as single storey garages or sheds and the installation of hard surfaces would generally be an appropriate form of construction, however should car parking be proposed beneath the ultimate spread of trees the likelihood of fruit fall, leaf litter or sap exudate causing a nuisance must be considered.

In addition it is important to consider the likelihood of damage to trees or structures that may be caused by continuous whipping of branches in windy conditions. In such circumstances branches may have to be repeatedly cut back which will introduce wounds in the tree and may spoil its form or shape. In general terms trees should not be retained upon the basis that their ultimate branch spread can be significantly controlled by periodic pruning.

Canopy Height / Clearance

The height and growth direction of the lowest branch of each tree is recorded in the Tree Data Schedule contained within this report as Table 1. Additionally the vertical clearance of the trees canopy above ground level is recorded within the Tree Data Schedule.

The two figures can be used to inform the extent to which a trees crown may be at risk of damage during development as a result of vehicular or plant movements within the site and to assess the need for additional protective measures to be implemented to protect low branches.

In particular it should also be noted that where the Root Protection Areas for retained trees do not extend to the edge of existing canopy spreads it is possible that those parts of the trees extending beyond the RPA fencing may sustain damage during construction.

Where this occurs there are two primary options available to manage and minimise the potential for damage to tree canopies to occur during development and these may be used singularly or in combination.

The first option is to create a Construction Exclusion Zone (CEZ), by the erection of protective fencing, around the full extent of the trees. The second is to undertake pre-development pruning works to the trees to reduce the potential for branch damage to occur.

Appendix C

BS5837 Cascade Chart for Tree Quality Assessment

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 *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see **4.5.7**.*			Dark Red
	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)	Light Green
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	Mid Blue
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	Grey