Oriel

Tree Survey Report

October 2020

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Oriel
Creating the centre for advancing eye health

Moorfields Eye Hospital NHS Foundation Trust

NHS

Moorfields Eye Charity

UCL INSTITUTE OF OPHTHALMOLOGY

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Tree Survey Report

Prepared for:

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UCL Institute of Ophthalmology
Moorfields Eye Charity

Prepared by:

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1 Introduction

1.1 Background

1.1.1 AECOM has been commissioned by Moorfields Eye Hospital NHS Foundation Trust, on behalf of Oriel[1], to undertake a Tree Survey of trees with the potential to be affected by the construction of a new facility that would allow the existing Moorfields Eye Hospital (Moorfields at City Road) and University College London (UCL) Institute of Ophthalmology (IoO) services at Bath Street to relocate into a single building at the existing St Pancras Hospital Site (hereafter referred to as the 'Proposed Development'). The tree survey considers trees within or immediately adjacent to the site of the Proposed Development, located between St Pancras Way and Granary Street in the London Borough of Camden (LBC) (hereafter referred to as the 'Site'). The Tree Survey has been undertaken in accordance with the British Standard BS5837:2012 Trees in relation to design, demolition and construction – Recommendations (BS5837) (Ref. 1).

1.1.2 This report presents preliminary information in relation to the nature and level of constraints posed by existing trees on Site and is intended to inform the development of any design proposals and working methodologies to ensure that the potential impacts on significant trees are fully considered.

1.2 Trees and the Planning Process

National Policy Context

1.2.1 The National Planning Policy Framework (NPPF) (Ref. 2) seeks to ensure that new development is sustainable and underlines the importance of Green Infrastructure, of which trees form an integral part. This encompasses a recognition of the importance of trees in relation to the management of air, soil and water quality along with other associated ecosystem services and climate change adaption. The NPPF also seeks to achieve the protection and enhancement of landscapes and a net gain in biodiversity. Finally, it specifically identifies veteran and ancient trees and woodland as a highly valuable and irreplaceable habitat.

1.2.2 Local Planning Authorities (LPA) have a statutory duty to consider both the protection and planting of trees when considering planning applications. The potential impact of development on all trees (including those not protected by a Tree Preservation Order or other statutory designation) is therefore a material consideration in determining planning applications.

1.2.3 BS5837:2012 Trees in relation to design demolition and construction – Recommendations (BS5837) (Ref. 1) provides a framework which sets out how trees should be considered in this context and also explicitly applies to development where planning consent is not required.

[1] Oriel is a joint venture between Moorfields Eye Hospital NHS Foundation Trust, University College London Institute of Ophthalmology and Moorfields Eye Charity.

1.2.4 BS5837 recommends that a tree survey is undertaken to identify the quality and benefits of trees and the spatial constraints associated with them. This is then used to produce a Tree Constraints Plan showing the above and below ground constraints associated with those trees. This drawing is used to inform the design process and to allow the retention of good quality trees where appropriate.

1.2.5 An Arboricultural Impact Assessment is then developed to identify the likely direct and indirect impacts of the Proposed Development, and a Tree Protection Plan is prepared to identify trees to be removed or retained and to illustrate how retained trees are to be protected. An Arboricultural Method Statement is often required as a condition of planning consent to detail how sensitive operations are to be achieved in proximity to retained trees. These elements are the minimum normally required for a planning application and are intended to ensure a sustainable and harmonious relationship between trees and new development.

1.3 Policy Context

Regional Policy

1.3.1 The London Plan (Ref. 3) (The Spatial Development Strategy for London Consolidated with Alterations Since 2011) (March 2016), Policy 7.21 recognises the value of trees and woodlands and recommends that in relation to planning decisions ‘existing trees of value should be retained and any loss as the result of development should be replaced following the principle of ‘right place, right tree’. Wherever appropriate, the planting of additional trees should be included in new developments, particularly large-canopied species.

1.3.2 The draft London Plan was first published on 27 November 2017. Consultation took place on the draft document up until 2 March 2018. The Mayor’s Minor Suggested Changes to the London Plan were published on 13 August 2018. The London Plan then went through an Examination in Public (EiP), with Consolidated Suggested Changes published in July 2019 a vernd the latest version comprises the Intend to Publish version which was issued to the Secretary of State in December 2019 (Ref. 4). Adoption of the London Plan is anticipated in 2020.

1.3.3 Policy G7 Trees and Woodlands of the emerging London Plan recognises the importance of protecting trees and woodland and the importance of planting trees in appropriate locations. It also identifies that new development proposals should retain trees of quality (Category A and B) and that the removal of trees of this quality must be essential to the development. Where trees of quality are to be removed there must be adequate replacement based on the existing value of the benefits of the trees removed which could be determined by a Capital Asset Value for Amenity Trees (CAVAT) system or i-tree evaluation (or other suitable methods). Regardless of tree removals, the planting of additional trees is generally expected within new developments, particularly larger canopied trees due to these providing more benefits.

Local Policy

1.3.4 The LBC Local Plan (Ref. 5), adopted in July 2017, includes a specific policy on biodiversity with reference to trees and vegetation. It states the following:

Policy A3: Trees and vegetation

The Council will protect, and seek to secure additional, trees and vegetation.

We will:

j. resist the loss of trees and vegetation of significant amenity, historic, cultural or ecological value including proposals which may threaten the continued wellbeing of such trees and vegetation;

k. require trees and vegetation which are to be retained to be satisfactorily protected during the demolition and construction phase of development in line with BS5837:2012 'Trees in relation to Design, Demolition and Construction' and positively integrated as part of the site layout;

l. expect replacement trees or vegetation to be provided where the loss of significant trees or vegetation or harm to the wellbeing of these trees and vegetation has been justified in the context of the proposed development;

m. expect developments to incorporate additional trees and vegetation wherever possible.

1.3.5 LBC have also published Camden Planning Guidance - Trees (March 2019) (Ref. 6) which sets out how the council expects trees to be considered during the development process.

1.3.6 The following extract sets out some important points from the planning guidance in relation to tree quality and value and how this should be considered during the design process.

- *"Camden's trees and canopy cover have valuable amenity and are an integral asset to the borough's green environment and quality of life.*
- *Using our planning powers and British Standard BS5837:2012 the Council will aim to preserve existing tree and canopy coverage where possible as well as increase and improve tree coverage in the design of new developments and through planning contributions.*

With all proposals, we will expect:

- *A survey of existing trees (and woody vegetation) to be undertaken prior to the developer deciding on a design of a scheme;*
- *Retention and integration of existing significant trees in the design of a scheme.*
- *New trees to sustain or increase canopy coverage and visual amenity, applying a "right place, right tree" approach;*
- *Other planting to be provided to contribute to Camden's green infrastructure, where appropriate.*

2.32 The design of the scheme should seek to retain Category A and B trees and Category C trees should be considered for retention where they would not impose a significant restraint on development. For full definitions of these categories, please refer to BS 5837.

2.33 There is often a misconception that Category C trees, being those of lower quality and value, are dispensable. However, in certain situations the Council may expect certain Category C trees to be retained until new planting has become established.

2.34 Normally, the retention of existing mature trees and vegetation can make an important contribution to the sustainability of a project. For example by reducing the impacts and energy demand associated with the provision of new planting, such as in their transportation and the irrigation required. We will also seek the retention of landscape features and habitats which are important to the character of the site or local townscape.

2.35 Inclusion of trees on neighbouring land should be guided by whether they would influence the development site itself and whether the trees are an important part of the local landscape character. It will always include trees where the crown or RPA (root protection area) encroach upon the application site.

2.36 Existing trees within a development site should be assessed using the Capital Asset Value for Amenity Trees (CAVAT).

The resulting value calculated for each tree should accompany the Tree Survey."

1.4 Methodology

1.4.1 The tree survey has been based on the topographical survey plan provided (Ref. 7).

1.4.2 A Tree Constraints Plan showing the position of trees and their associated spatial constraints is included as Appendix A of this report, which corresponds with the Tree Survey Schedule presented in Appendix B.

1.4.3 A small number of trees were not included on the topographical survey plan (these may have been missed or deemed not significant enough for inclusion) and have been plotted indicatively with reference to Site features and publicly available aerial photography. Such trees have been marked with an asterisk ('*') on the Tree Survey Schedule included as Appendix B. As such the positions for these trees must be considered to be indicative only and the relative distances of features must be measured out on Site as required.

1.4.4 The tree survey was otherwise conducted in accordance with the requirements of BS5837.

1.4.5 Fieldwork was undertaken on 31st July 2020**,** during which dimensional data and observational information were collected. A diameter tape measure was used to measure stem diameters where feasible.

1.4.6 The fieldwork informing this report has comprised a preliminary, non-intrusive, visual survey undertaken from ground level with the specific intention of evaluating the quality and benefits of trees on the Site. Where further inspection is deemed appropriate to ascertain the condition of the tree or other arboreal features, this has been identified within the preliminary management recommendations. Average dimensions or dimensional ranges have occasionally been used, where appropriate, to best describe features.

1.4.7 The Root Protection Area (RPA) is the notional extent of what is considered to be the key rooting area for tree health and function. This is generally depicted as a circle but can be amended to a polygon with an equivalent area in accordance with Section 4.6.2 of BS5837 where the RPA is likely to have developed asymmetrically. The RPA of all surveyed trees is depicted as a circle on the Tree Constraints Plan (Appendix A) and no RPAs have been amended.

1.4.8 The tree categorisation process recommended by BS5837is summarised in Table 1-1 and corresponds with the tree canopy outline shown on the Tree Constraints Plan (Appendix A) and the information in the Tree Survey Schedule (Appendix B).

Table 1-1 BS5837:2012 Tree Categorisation process

Category	Definition
A	High quality, minimum of 40+ years remaining contribution
B	Moderate quality, minimum of 20+ years remaining contribution
C	Low quality, minimum of 10+ years remaining contribution
U	Unsuitable for retention, <10 years remaining contribution
1	Arboricultural value
2	Landscape value
3	Conservation or cultural value

2 General Arboricultural Principles

2.1 General Principles

2.1.1 Trees are dynamic, living organisms which provide essential benefits to society and the wider environment. Any proposed development with the potential to impact on trees must take into consideration the value of trees on site; the impact of any proposed activity along with any potential future conflicts on the site. Suitable measures to safeguard retained trees or mitigate the loss of trees (to be removed) will need to be fully considered and may be subject to a condition of planning consent.

2.1.2 Tree branches and roots frequently grow across site boundaries and off-site trees can pose a significant constraint and should be carefully considered when assessing the developable space within a site.

2.2 Below Ground Constraints

2.2.1 Below ground tree roots and the soil environment in which they grow need to be protected if the tree is to be retained. Trees grow in association with fungi and other soil organisms which are of key importance to tree health. Roots are essential for anchorage, the uptake of water and nutrients, and the storage of energy (carbohydrates) for the future growth and function of the tree.

2.2.2 Roots can be damaged by physical severance or wounding (e.g. following excavation of the soil) which can lead to the development of decay and a decline in vitality and/or instability. Raising the soil level can bury tree roots at a depth where suitable conditions for growth are less available. Toxic materials discharged into the soil (such as cement based aggregates, fuel and chemicals) can lead to root death and dysfunction. Soils can be compacted to levels which are inhospitable to tree growth with even a single pass of machinery, regular pedestrian traffic or the storage of plant and materials. Relieving compaction can be problematic and may require costly remedial works. Changes in drainage/water levels can also have significant long-term impacts for tree health.

2.2.3 The effects of these incursions may take many years to manifest, with a resulting decline in amenity value and potentially the death or failure of the tree. It should be noted that older trees are particularly sensitive to damage and changes in conditions.

2.2.4 The RPA is a notional area considered to be the minimum zone that must be protected to avoid any adverse impacts on retained trees. This area is deemed to be particularly important for tree stability, growth, function and health. However, roots may extend far greater distances, with the distribution of the root system relating directly to the availability of suitable conditions for growth (namely oxygen, water and nutrients). It is generally accepted that tree roots are predominantly located in the upper 1000mm of soil; however, roots may develop at deeper levels where conditions allow.

2.2.5 RPAs are calculated as per BS5837: 2012 Annexe C, D and Section 4.6 in the BS 5837.

2.2.6 The RPA of the existing tree stock is an important material consideration when considering site constraints and planning development activities. The RPA of significant trees on site has been calculated and is shown on the Tree Constraints Plan (Appendix A).

2.2.7 The default position must be that all development, including any associated services, should occur outside the RPAs of retained trees. Where this is unavoidable, it may be appropriate to use special measures to install structures, services or surfacing within RPAs which allow the protection of roots and soil structure which are essential for tree growth and keep any incursion to a minimum.

2.2.8 Further steps to improve or increase the useable rooting area available to the tree may also be required.

2.3 Soils

2.3.1 On shrinkable clay soil, tree growth can lead to the differential movement of structures as moisture is removed from the soil during the growing season. Soils must be carefully assessed, and any foundations must be installed following the recommendations of National House Building Council (NHBC) Standards Chapter 4.2: Building Near Trees (2020) to avoid potential future damage (Ref. 8). Where trees which predate existing structures are to be removed, this can result in heave as the soils are re-wet.

2.3.2 The advice of a suitably qualified engineer must be obtained during the detailed design stage to inform any potential risk of heave. Specific advice in relation to this issue is beyond the scope of this report.

2.4 Above Ground Constraints

2.4.1 Tree stems and branches can restrict available space on site. Damage or wounding (including excessive pruning) can significantly reduce the amenity contribution of the tree and may lead to the development of dysfunction and decay, with significant long-term implications for tree health. The future impact of existing trees should be carefully considered, including individual species characteristics (such as potential future size, fruit fall, shade etc.) and how the tree will interact with any proposed development and future land use. Annual tree growth can lead to direct damage if stems/branches (or roots) come into physical contact with structures and this must also be taken into consideration.

2.5 Trees and Risk in the Context of Development

2.5.1 Tree owners/managers have a legal duty to prevent foreseeable harm. It is generally accepted that this duty can be fulfilled by undertaking proactive inspections of significant trees to identify obvious defects and by taking appropriate remedial action or gaining further advice as appropriate.

2.5.2 Further guidance is available from the National Tree Safety Group (Ref. 9).

2.5.3 The tree survey undertaken on the 31st July 2020 to support this report is primarily for planning purposes, focusing on the quality and benefits of the trees and is not specifically designed to assess the safety of trees on the Site. However, where safety issues have been identified, recommendations have been included in the Tree Survey Schedule (Appendix B).

2.5.4 The Construction (Design and Management) Regulations (Ref. 10) states that developers and contractors have responsibilities for health and safety as a result of their actions. Should trees be left in an unstable or hazardous condition the Health and Safety Executive (HSE) could seek to prosecute those responsible along with the potential for further Civil claims for damages.

2.6 Trees and Wildlife

2.6.1 Full consideration must be given to the presence of species protected under the Wildlife and Countryside Act (1981 - as amended), the Countryside Rights of Way Act (2000) and the Conservation of Habitats and Species Regulations (2017), in particular the presence of bats and nesting birds. It is

recommended that wherever possible, significant tree/hedge works take place outside of the typical bird nesting season of March to September. The advice of a suitably qualified Ecologist is recommended in relation to any potential impacts on protected species.

2.7 Tree Works

2.7.1 Any tree surgery recommendations contained within this report are to be undertaken by suitably qualified and insured contractors in accordance with BS3998: 2010 Tree work – Recommendations (BS3998) (Ref. 11). Significant pruning works are best undertaken when trees are dormant or outside periods of high functional activity to reduce the overall impact on energy available to the tree for growth and processes. In general, the optimum period for works is between November to February and July to August (subject to the presence of protected species) when the tree is less active and better placed to respond to wounding and a reduction in leaf area.

3 Field Work Observations

3.1 The Site

3.1.1 The Site boundary is shown on the Site Boundary Plan included within Appendix D of this report.

3.1.2 The Site forms part of the existing St Pancras Hospital in the London Borough of Camden. Granary Street borders the Site to the north and St Pancras Way to the west. To the south and east of the Site is the wider St Pancras Hospital including a range of buildings, areas of hard surfacing, parking and landscaping.

3.1.3 The existing Site is predominantly used for the provision of a range of medical services and is predominantly covered by hardstanding and buildings, with isolated areas of landscaping.

3.2 The Trees

3.2.1 All relevant trees within or immediately outside of the Site boundary were surveyed. In total thirty tree features were included within the tree survey and are located within the study area.

3.2.2 The trees on the Site are predominantly semi mature to mature and in fair to good condition. However a number of young, recently planted trees located on Granary Street to the north of the Site were also included in the survey.

3.2.3 Species present include false acacia (*Robinia pseudoacacia*), Monterey cypress (*Cupressus macrocarpa*), sycamore (*Acer pseudoplatanus*), cherry laurel (*Prunus laurocerasus*), silver birch (*Betula pendula*) and flowering cherry (*Prunus sp*). Along Granary Street the newly planted trees consisted of hornbeam (*Carpinus betulus*) and Lebanese wild apple (*Malus trilobata*).

3.2.4 The most significant trees included within the tree survey are the Monterey cypress T28, the false acacia T29 which were both assigned to Category B (moderate quality) and the London planes located outside of the Site boundary to the south east T20 and T24 which were considered to be of high quality (Category A). The locations of these trees are shown on the Tree Constraints Plan (Appendix A).

3.2.5 Site photographs can be found at Appendix E of this report.

3.3 Statutory and Non Statutory Designations

Statutory Designations:

3.3.1 The majority of the Site is located within the Kings Cross St Pancras Conservation Area (excluding the land to the north of Granary Street and T1, T8, T11 and T12 which are located within the Regents Canal Conservation Area) , as shown in London Borough of Camden online mapping (Ref. 12). Therefore, all trees with a stem diameter greater than 75mm (measured at a height of 1.5m) within this area are subject to statutory protection, equivalent to that of a Tree Preservation Order.

3.3.2 The LBC Tree Preservation Team provided confirmation[2] that a single false acacia tree within the Site is protected by a Tree Preservation Order (Reference C402 2003 at 4 St. Pancras Way – entrance to St. Pancras Hospital confirmed 04/02/04). This corresponds with tree T29 included within the tree survey.

3.3.3 A felling licence may be required by the Forestry Commission to fell more than $5m^3$ in any calendar quarter (subject to relevant exceptions including trees in gardens, designated public open spaces or churchyards). However, full planning consent is an exemption from the need to apply for consent for works to trees protected by a Tree Preservation Order, the need to give notice of the intention to undertake works within a Conservation Area and the need to apply for a Felling Licence with the Forestry Commission (to fell more than $5m^3$ per calendar quarter). Prior to any tree works the status of trees to be removed or pruned must be verified with the LBC and the Forestry Commission as appropriate.

Non Statutory Designations

3.3.4 Following a review of the Department for Environment, Food and Rural Affairs. Multi-Agency Geographic Information for the Countryside (MAGIC) website (Ref. 13), there are no non-statutory designations relating to trees within or immediately adjacent to the Site. There are also no recorded ancient or veteran trees shown on the Woodland Trusts Ancient Tree Inventory (Ref. 14) and no trees of this nature were identified during the survey.

[2] Via email correspondence on 11th August 2020

3.4 Tree Valuation

3.4.1 Trees are highly valued features which provide a broad range of essential benefits to both rural and urban landscapes including managing flood water, improving air quality, buffering extremes in temperature, capturing carbon and improving both physical and psychological wellbeing.

3.4.2 There are a range of tree valuation methodologies available. The asset value of the individual trees included within the tree survey has been calculated in monetary terms using the CAVAT system (Full Method). Many local authorities in the UK use this system to inform decision making and compensation valuations in relation to publicly owned trees and the method is specifically suggested in the draft London Plan as an appropriate approach to determine tree value in relation to development.

3.4.3 The following describes how the CAVAT value is derived:

'CAVAT works by calculating a unit value for each square centimetre of tree stem, by extrapolation from the average cost of a range of newly planted trees. In the Full Method this basic value is adjusted to reflect the degree of benefit that the tree provides to the local population. The adjustment is designed to allow the final value to reflect realistically the contribution of the tree to public welfare through tangible and intangible benefits' (Ref. 15).

3.4.4 The CAVAT value for the trees considered within this report which have the potential to be affected by any work associated with the Proposed Development are stated in the final column in the Tree Survey Schedule which is included as Appendix B.

3.4.5 The surveyed trees have a total combined CAVAT value of £364,535.

4 Tree Related Constraints and Opportunities

4.1.1 The Tree Constraints Plan (Appendix A) shows the area of constraints associated with the trees on the Site. As identified within the drawing key, the green shaded area shows the extent of tree canopies, the canopy outline colour indicates the quality category of the tree and the dashed black line is indicative of the RPA, which is the nominal area of tree roots which are generally considered essential to tree health and function. Roots are likely to extend outside of this point but beyond the RPA extent tree roots are not considered a significant constraint.

4.1.2 The default position is generally that all new features and associated works should be located outside of areas where trees are to be retained.

4.2 Tree Categorisations as per BS5837:2012

4.2.1 The trees on the Site and in the vicinity of the Site have been assigned to a quality category as per BS5837, which relates to their arboricultural, landscape and cultural/conservation value.

4.2.2 Category C trees are shown by a grey canopy outline on the Tree Constraints Plan (Appendix A). This means they are of relatively low quality and would not normally be considered a significant constraint to future development. However, these trees may still provide some useful value and should be considered for retention where they do not pose a significant constraint to the Proposed Development.

4.2.3 Category B trees (blue canopy outline) are described as being of moderate quality and it is generally desirable to retain trees of this standard and incorporate them within the Proposed Development wherever feasible.

4.2.4 Category A trees (green canopy outline) are classified as being of high quality and trees of this nature should be retained and incorporated into the design of the Proposed Development due to the high level of benefits they provide.

4.2.5 Category U trees (red canopy outline) are trees with less than ten years of reasonable useful life expectancy or those in such poor condition that they should be removed, regardless of any development activity. Trees of this nature represent no constraint to development.

4.2.6 The table below summarises the number of trees in each category recorded within or adjacent to the Site.

Table 4-1 Summary of trees in each quality category.

Quality Category	A	B	C	U
Number of trees	2	5	21	2

4.3 Considerations

4.3.1 In planning terms, lower quality trees can often be straightforwardly removed to facilitate development where their loss can be mitigated with replacement tree planting or where no replacement planting is necessary. This is likely to apply to Category C and Category U trees where there are no other constraints in place (e.g. ecological or heritage). Young and recently planted trees are likely to be easily replaceable with equivalent new planting or by transplanting recently planted trees (such as those in the footway along Granary Street).

4.3.2 The default position must be that higher quality trees (Category A and B) be retained and protected. However, where there is no reasonable alternative, and where the benefit of the development outweighs the impact of the loss of the tree/s, it may be feasible to remove trees of this quality Should this be required pre-application discussions with LBC are recommended to manage the risk of refused consent.

4.3.3 If any of the trees are owned by third parties (such as those growing in the public footway and beyond the Site boundary to the north and south east) prior consent must be in place before any tree works are carried out. Prior to any works, the ownership of these trees must be established and the consent of the tree owner obtained in writing

4.3.4 While it is often feasible to install new hard surfacing on existing soft ground within a tree RPA, this generally requires the use of raised surfaces supported by carefully located piles or the use of proprietary load bearing surfaces (such as CellWeb, ArborRaft or equivalent) installed on top of the existing unsurfaced ground level using 'no dig' techniques. The default position is that new structures should not be located within or close to RPAs. Where this is unavoidable, limited structures such as non-residential low rise buildings may be feasibly installed within the outer area of an RPA if alternative foundations such as piles or pads are installed to avoid significant tree roots and any beams are set above or on the ground level to avoid disturbance of the roots. There must also be a harmonious and sustainable long-term interaction with the above ground parts of the tree and the proposed new structure.

4.3.5 New areas of hard surfacing or building footprints should not generally occupy more than 20% of the RPA of a retained tree, as set out in Section 7.4.2.3 of BS5837.

4.3.6 New services or the diversion or removal of existing services must be carefully considered. Generally, all new services should be routed outside the RPA of retained trees. Where this is unavoidable alternative methodologies such as the use of directional drilling or equivalent trenchless techniques can facilitate service installation beneath tree root systems (which are likely to occupy a depth of at least 1m+ dependent on ground conditions and tree species affected).

4.3.7 Shallow service runs may be installed using hand excavation where all significant tree roots can be retained, and services be threaded beneath. Existing services can be winched out from a manhole/chamber located outside of an RPA and redundant pipework can be decommissioned using pipe bursting techniques to avoid excavation which could damage roots. Utility installations should comply with the principles set out in the BS5837 (Ref. 16) and National Joint Utilities Group Guidance (Ref. 17).

4.3.8 These operations typically require a detailed Arboricultural Method Statement to set out in detail how they can be successfully achieved whilst avoiding impacts on retained trees.

4.4 The Future Impact of Trees

4.4.1 The future impact of trees on the Site must be considered in relation to any development proposals. Trees and groups to be retained must be afforded suitable space to ensure they remain viable in the long term. Trees which are currently not fully grown will increase in size and this must be considered in conjunction with the Proposed Development and future use of the Site.

4.4.2 The young trees along Granary Street are either of relatively small ultimate size (Lebanese wild apple) or are likely to be maintained in a formal boxed form (hornbeam) and therefore should not have a significant influence on the future use of the Site to the south.

4.4.3 The Tree Constraints Plan shows the notional area of shade produced by the trees on Site (based on their current height) and this should inform the layout of the Proposed Development. Due consideration must also be given to the likely future growth of the tree (which for younger trees is likely to involve a significant increase in the level of shade produced) and the advice of an arboriculturist should be obtained to inform this assessment. Areas of open space should be positioned to avoid areas of shade associated with trees. This is likely to be most significant for the trees to the south and west of the Site (T21-23 and T25-30).

4.4.4 Sycamore, such as trees T14, are often associated with aphids which secrete a sticky liquid called 'honeydew'. This can be a nuisance for parked cars and potentially areas of hard surfacing and structures as the deposits can lead to the development of sooty moulds and staining. This can be easily cleaned with warm soapy water or equivalent and is likely to be less visible on darker surfaces. This potential future maintenance requirement should be considered in relation to the future use of the Site beneath the canopy of these trees where they are to be retained.

4.4.5 Deciduous trees (which includes all the trees surveyed with the exception of T28) will drop leaves each autumn and this is likely to result in a maintenance requirement to manage leaves on hard surfaced footways and to clear gutters where tree canopies extend over or immediately adjacent to roofs. Leaf fall can be easily cleared as required from hard surfacing. Non slip surfacing can reduce the frequency that clearing is required. Measures such as Gutter Guards or equivalent can be used to reduce the potential for leaves to block guttering and these should be employed where trees overhang or grow in proximity to structures.

4.4.6 Evergreen trees (which includes T28) will deposit leaves/needles, seeds and other detritus throughout the year.

4.5 Tree Protection

4.5.1 Trees to be retained in proximity to areas of development activity, including areas for new surfacing, services, work site compounds and storage will need to be protected to ensure they are not damaged. This is generally achieved with the use of robust, immovable temporary tree protection fencing, to prevent access within the RPA or canopy spread of trees. Where access is unavoidable, alternative protection arrangements such as ground protection (sufficient to protect the structure of the soil from compaction), and /or access facilitation pruning (to ensure a reasonable clearance for operations is provided) may be required. The advice of an arboriculturist should be sought to inform this assessment.

4.6 Tree Planting

4.6.1 Where trees are to be removed due to a conflict with the proposed design, mitigation planting is likely to be required to ensure a continuity of tree cover for the Site and to address any negative impact on local amenity and landscape character. Consideration should be given to the reasonable provision of space for new tree planting to off-set any necessary tree loss.

4.6.2 Soil structure in areas for new planting will need to be maintained and may require protection during operation of the Proposed Development to ensure reasonable conditions for future tree growth are available.

4.6.3 New planting should consider the existing species mix present on site in relation to both arboricultural and ecological considerations. New planting also offers an opportunity to increase the species and age class diversity for a given area which can boost the resilience of the local tree stock in relation to pests, disease and climate change as well as providing a greater range of amenity and other benefits.

4.6.4 New trees should be planted in accordance with the guidance set out in BS8545:2014 Trees: from nursery to independence in the landscape - Recommendations (BS8545) (Ref. 16) and with the minimum distances from new structures, services and surfacing set out in Table A.1 of BS5837.

5 Summary and Conclusion

5.1.1 The survey recorded thirty tree features which range from young to mature and from low to high quality. In general, the trees contribute to the character of the Site and local amenity.

5.1.2 The majority of the trees surveyed are protected by virtue of the Conservation Area designation (excluding those to the north of Granary Street which are located within the Regents Canal Conservation Area) and one tree within the Site (T29) is subject to a Tree Preservation Order.

5.1.3 The trees on the Site form a significant spatial constraint to any potential development. The CAVAT value for the surveyed trees has been valued at a combined total of £364,535. Any tree loss should be mitigated with a new planting scheme to secure an equivalent asset value.

5.1.4 Where it is not possible to completely avoid the area of constraint associated with significant trees it may be possible to utilise special measures to facilitate the works.

5.1.5 A key consideration for any development activity will be the protection of the surrounding trees including the structure of the soil in which they grow, including from indirect damage via the storage or discharge of materials and the movement and use of plant and machinery. The default position is that all RPA and canopies of retained trees be fenced off as exclusion zones with no access. Where this is not feasible limited access may be acceptable using fit for purpose ground protection or other protective measures in accordance with BS5837.

5.1.6 Outside of the canopy and RPA, development works are not likely to be significantly constrained by trees, however it is important not to significantly impact on ground water levels in proximity to trees and where this could be a potential impact specific arboricultural advice must be obtained.

5.1.7 Lower quality trees (Category C and U) are not likely to be a significant constraint to development where they can be satisfactorily replaced with new tree planting (or where their loss will not have a significant impact - e.g. due to the retention of adjacent trees) and therefore it may be acceptable to remove some sections of lower quality tree cover from a planning perspective.

5.1.8 All moderate and high value trees should be afforded full protection where possible. If the potential removal of higher value trees (Category A and B) is unavoidable this should be discussed in advance with LBC, however the default position must be that trees of this quality are to be retained and protected where possible.

5.1.9 As the design progresses, it is recommended that the advice of an arboriculturist is sought to inform this process, particularly in relation to new features in proximity to trees.

5.1.10 Draft layouts should be overlaid onto the Tree Constraints Plan to allow an assessment of the impact of the Proposed Development, including the identification of any trees which are to be removed.

5.1.11 An Arboricultural Impact Assessment is submitted with the planning application, and this will allow the identification and assessment of the direct and indirect effects of the Proposed Development along with appropriate mitigation measures where necessary.

6 References

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Ref. 4. Greater London Authority (2019). Draft London Plan – Intend to Publish Version https://www.london.gov.uk/sites/default/files/intend_to_publish_-_clean.pdf

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Ref. 6. London Borough of Camden (2019). Camden Planning Guidance – Trees. March 2019

Ref. 7. Terrain Surveys Ltd. (2018). Topographical Survey, prepared for the Royal Free London NHS Foundation Trust in November 2018. Ref. TS18-464T-C1&C2).

Ref. 8. National House Building Council Standards (2020). Chapter 4.2: Building Near Trees

Ref. 9. National Tree Safety Group (2011). Common sense risk management of trees. Forestry Commission.

Ref. 10. Construction (Design and Management) Regulations (2015).

Ref. 11. British Standards Institution BS3998:2010 (2010). Tree work – Recommendations. BSI

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Ref. 15. London Tree Officers Association, http://ltoa.org.uk/component/docman/cat_view/98-capital-asset-value-for-amenity-trees-cavat [Accessed 10 August 2020]

Ref. 16. British Standards Institution (BSI) BS8545: 2014 (2014). Trees: from the nursery to independence in the landscape - Recommendations

Ref. 17. National Joint Utilities Group (NJUG) Volume 4, Issue 2, (2007). NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.

Appendix A Tree Constraints Plan

Project Management Initials: Designer: CC Checked: AW Approved: AK

Last saved by: CHRISTOPHER.COUPLAND (2020-08-19) Last Plotted: 2020-08-27
Filename: K:\PROJECTS\ARBORICULTURE PROJECTS - BASINGSTOKE LINKED\P\PROJECT ORIEL - MOORFIELDS HOSPITAL\PROJECT ORIEL - TREE CONSTRAINTS PLAN.DWG

FOR INFORMATION BEYOND THIS POINT REFER TO INSERT

0 5 10 15 20 25m
SCALE 1:250 @ ISO full bleed A1 (594.00 x 841.00 MM)

AECOM

PROJECT

Project Oriel

CLIENT

Moorfields Eye Hospital NHS Foundation Trust

CONSULTANT

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GENERAL NOTES

1. TREE CATEGORIES AS DEFINED BY BS 5837:2012
2. TREE LOCATIONS ARE BASED ON THE TOPOGRAPHICAL SURVEY AND GPS CO-ORDINATES FROM ON SITE WALKOVER.
3. * INDICATES A TREE / GROUP WHOSE POSITION IS APPROXIMATE AS BASED UPON AERIAL PHOTOGRAPHY AND ON SITE OBSERVATIONS.
4. PLANS SHOULD BE READ IN CONJUNCTION WITH THE AECOM ARBORICULTURAL REPORT.
5. THE ORIGINAL OF THIS DRAWING WAS PRODUCED IN COLOUR - A MONOCHROME COPY SHOULD NOT BE RELIED UPON.
6. DRAWING REFERNCES: 'TS18-464T-C1-2D'

KEY

- SITE BOUNDARY
- **A - CATEGORY TREES** *(HIGH QUALITY & VALUE)*
- **B - CATEGORY TREES** *(MODERATE QUALITY & VALUE)*
- **C - CATEGORY TREES** *(LOW QUALITY & VALUE)*
- **U - CATEGORY TREES** *(UNSUITABLE FOR RETENTION)*
- **ROOT PROTECTION AREAS (RPA)** *(AS DEFINED BY BS 5837:2012)*
- **APPROXIMATE SHADING ARC** *(AS DEFINED BY BS 5837:2012)*

ISSUE/REVISION

I/R	DATE	DESCRIPTION
A	14-08-2020	First Issue

DRAWING STATUS

ISSUE

PROJECT NUMBER

60588325

SHEET TITLE

TREE CONSTRAINTS PLAN

SHEET NUMBER **REV.**

60588325-ACM-XX-XX-DR-AB-TCP001 A

Appendix B Tree Survey Schedule

Tree ID	Species	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (N)	Canopy Spread (S)	Canopy Spread (E)	Canopy Spread (W)	First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Life Stage	Structural Condition	Condition Comments	Preliminary Management Comments	Estimated Remaining Contribution	Category	CAVAT Value (£)
T1	Sycamore (Acer pseudoplatanus)	10	300#	4	4	4	4	2.0/S	1.5	Good	EM	Good	No access, no canopy overhang into footway, slight yellow foliage. Eastern and largest of 2 southerly trees plotted. Outside of Conservation Area.		20+	B2	£7,998
T2	Hornbeam (Carpinus betulus)	2	50	0.5	0.5	0.5	0.5	0.2/N	0	Good	Y	Good	Boxed form		10+	C1,2	£549
T3	Hornbeam (Carpinus betulus)	2.5	60	1	1	1	1	0.2/E	0	Good	Y	Good	Boxed form, obstructs footway	Crown lift to clear path by 2.5m (< 12 months)	10+	C1,2	£790
T4	Hornbeam (Carpinus betulus)	2.5	60	1	1	1	1	0.2/E	0	Good	Y	Good	Boxed form, obstructs footway	Crown lift to clear path by 2.5m	10+	C1,2	£790
T5	Hornbeam (Carpinus betulus)	2.5	60	1	1	1	1	0.2/E	0	Good	SM	Good	Boxed form, obstructs footway	Crown lift to clear path by 2.5m (< 12 months)	10+	C1,2	£790
T6	Lebanese Wild Apple (Malus trilobata)	3.5	60	0.5	0.5	0.3	0.5	1.8/W	2	Good	Y	Good	Recent planting, maple leaved crab.		10+	C1,2	£790
T7	Lebanese Wild Apple (Malus trilobata)	3.5	50	0.5	0.5	0.5	0.5	1.8/W	2	Good	Y	Good	Recent planting, maple leaved crab. Branch impact wound to north from road.		10+	C1,2	£549
T8	Lime (Tilia sp)	3.5	120	3	3	3	3	1.5/S	0.5	Good	Y	Good	No overhang of footway, off Site tree, no access. Outside of Conservation Area.		10+	C2	£2,694

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Tree Survey Report

Tree ID	Species	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (N)	Canopy Spread (S)	Canopy Spread (E)	Canopy Spread (W)	First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Life Stage	Structural Condition	Condition Comments	Preliminary Management Comments	Estimated Remaining Contribution	Category	CAVAT Value (£)
T9*	Firethorn (Pyracantha sp)	3	75	1.5	1	1	1.5		0	Fair	EM	Fair	Firethorn shrub not included on topo		10+	C1	£617
T10	Lebanese Wild Apple (Malus trilobata)	3.5	50	0.5	0.5	0.5	0.5	1.8/E	2	Good	Y	Good	Recent planting, maple leaved crab.		10+	C1,2	£549
T11	Lebanese Wild Apple (Malus trilobata)	3	50	0.5	0.5	0.5	0.5	1.8/W	1.8	Good	Y	Good	Recent planting, maple leaved crab. Outside of Conservation Area.		10+	C2	£499
T12	Lebanese Wild Apple (Malus trilobata)	3	50	0.5	0.5	0.5	0.5	2.0/W	1.8	Good	Y	Good	Recent planting, maple leaved crab. Outside of Conservation Area.		10+	C2	£499
T13	Lebanese Wild Apple (Malus trilobata)	3.5	50	0.5	0.5	0.5	0.5	1.8/W	1.8	Good	Y	Good	Recent planting, maple leaved crab.		10+	C1,2	£549
T14	Sycamore (Acer pseudoplatanus)	12	250,270	4	4	4	4	6.0/E	5	Fair	EM	Fair	Heavily covered and supressed by grape vine in area of dense inaccessible vegetation, large pruning wound at 1m to east, good wound wood. Rubble at base.		10+	C1,2	£9,362
G15	Cherry Laurel (Prunus laurocerasus)	3	100	2	2	2	2	n/a	n/a	Good	SM	Fair	In raised brick planter with extensive cracking to south.	Repair wall or consider tree removal. (< 12 months)	<10	C2	£1,132
T16	Hornbeam (Carpinus betulus)	2	50	0.5	0.5	0.5	0.5	0.3/E	0	Good	Y	Good	Recent planting, boxed form, obstructs path	Crown lift to clear path by 2.5m (< 12 months)	10+	C1,2	£549
G17	Cherry Laurel (Prunus laurocerasus)	5	100	3.5	3.5	3.5	3.5	n/a	n/a	Good	M	Fair	Dense area of predominantly laurel with some other shrubs such as privet, ,extensive vine, branches rest on bike store to west		10+	C2	£755

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Tree Survey Report

Tree ID	Species	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (N)	Canopy Spread (S)	Canopy Spread (E)	Canopy Spread (W)	First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Life Stage	Structural Condition	Condition Comments	Preliminary Management Comments	Estimated Remaining Contribution	Category	CAVAT Value (£)
T18	Cherry (Prunus sp)	5	510	4	4	4	4	1.5/NE	2	Poor	M	Poor	Hanging dead foliage, potentially drought induced, no live growth, graft from 1.5m.	Reinspect in 6 months in spring to assess extent of any live foliage (< 12 months)	<10	U	£321
T19	Sycamore (Acer pseudoplatanus)	4	70	1	1	1	1	0.5/NE	n/a	Good	Y	Fair	Self sown adjacent to wall and hard standing, not suitable for long term retention.	Fell and poison stump (<12 months)	<10	U	£67
T20	London plane (Platanus x acerifolia)	15	550	7	7	5	7	4.0/NW	n/a	Good	EM	Good	Previously reduced - 1-2m regrowth		40+	A2	£58,101
T21	Cherry (Prunus sp)	8	240,190	2.5	4	4	2	2.0/E	2	Good	EM	Fair	Compression fork 1m, resilient species, touching roof, low over parking and road, likely lifting paving to north	Crown lift to clear structure by 2m crown lift to 5.2m over road and 3m over parking bay (< 12 months)	10+	C2	£7,199
T22	Cherry (Prunus sp)	8	150,190	2	4.5	2	2	2.5/S	2	Good	EM	Fair	Compression fork 1m, resilient species, touching roof, low over parking and road, likely lifting paving to north	Crown lift to clear structure by 2m crown lift to 5.2m over road and 3m over parking bay (< 12 months)	10+	C2	£4,502
T23	Cherry (Prunus sp)	8	210,140	2	4	2	3	1.0/E	1.5	Good	EM	Fair	Lower stem burrs, epicormic growth, touching roof, low over parking and road.	Crown lift to clear structure by 2m crown lift to 5.2m over road and 3m over parking bay (< 12 months)	10+	C2	£4,894

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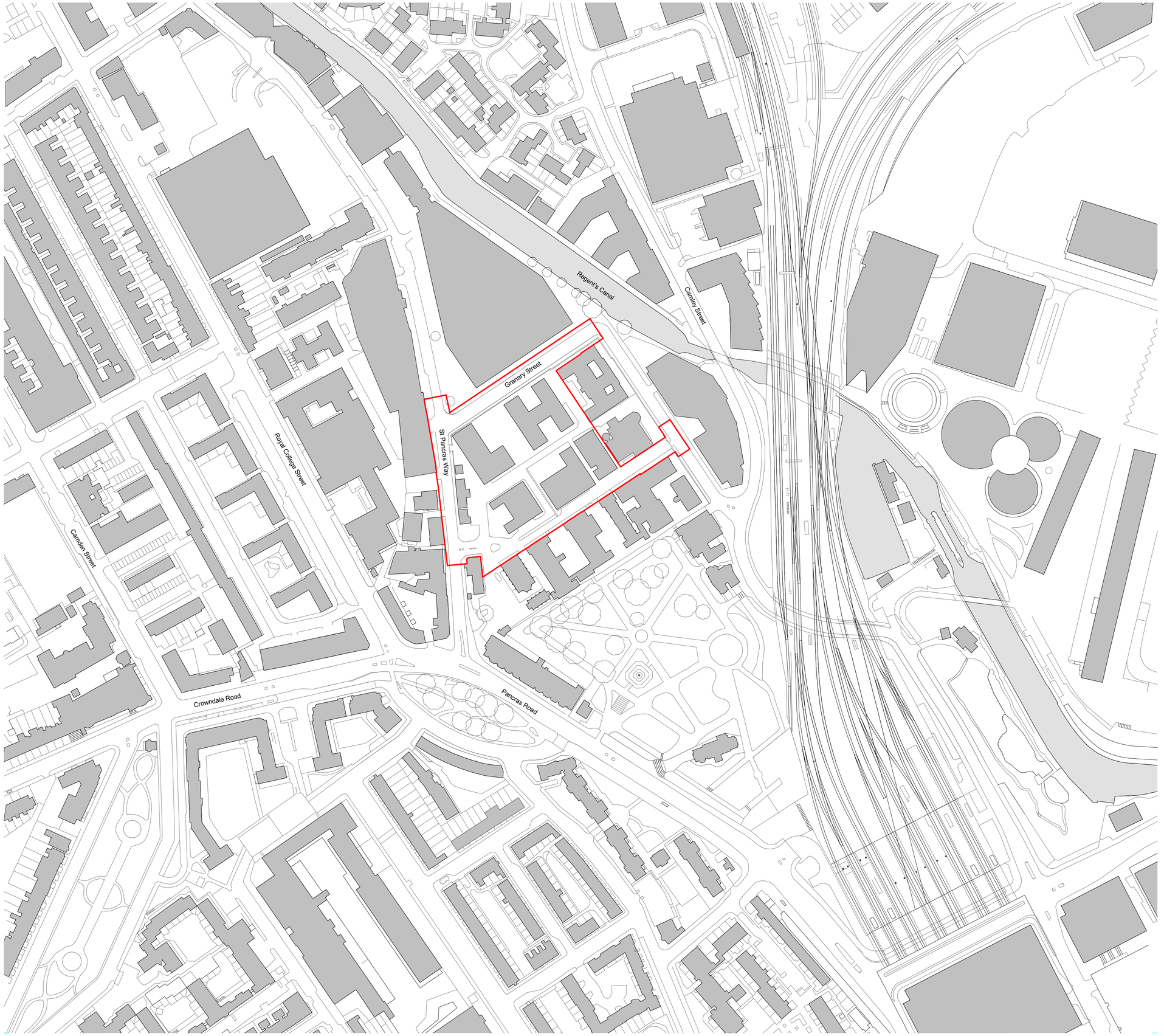
Tree Survey Report

Tree ID	Species	Estimated Height (m)	Stem Diameter (mm)	Canopy Spread (N)	Canopy Spread (S)	Canopy Spread (E)	Canopy Spread (W)	First Significant Branch (m)	Canopy Clearance (m)	Physiological Condition	Life Stage	Structural Condition	Condition Comments	Preliminary Management Comments	Estimated Remaining Contribution	Category	CAVAT Value (£)
T24	London plane (Platanus x acerifolia)	17	900#	9	9	9	9	5.0/NE	3.5	Good	M	Good	No access beyond locked gate, part of row of three trees forming an avenue feature with trees opposite		40+	A2	£100,014
T25	Silver Birch (Betula pendula)	10	290	5	4	3	5	3.0/S	1.5	Good	EM	Fair	Flattening to stem base to west, strong buttressing adjacent, sounds normal. Within 40cm of building to east.		20+	B1	£13,846
T26	False acacia (Robinia pseudoacacia)	8	190	2.5	2.5	2.5	2.5	3.0/W	1	Good	SM	Good	90mm stem diameter Norway maple developing immediately to east of stem base. Good potential.	Fell small Norway maple to east to improve growth of Robinia (< 12 months)	20+	B1,2	£5,646
T27	Elder (Sambucus nigra)	6	260,200	2	2	2	3	2.5/W	2	Fair	M	Fair	Dense ivy, restricts access, stem is 0.5m from brick outbuilding with inlet pipe	Sever ivy (< 12 months)	10+	C2	£10,961
T28	Monterey Cypress (Cupressus macrocarpa)	17	725	7	7	7	5	2.0/SW	1.5	Good	M	Good	Compression fork at 3m with enclosed canopy, low diameter dead branches over verge, touching adjacent roof, circa 4m clearance of access road	Cut back to clear structure by 2m and lift over road to 5.2m (< 12 months)	20+	B1	£82,208
T29	False acacia (Robinia pseudoacacia)	15	700	5	7	3	7	3.5/SW	n/a	Fair	M	Fair	Dieback central crown, and deadwood throughout over tank, substation building and verge, Russian vine covers scaffold limbs. old branch stub adjacent main fork at 2.5m. stem sounds normal. Tree subject to Tree Preservation Order.	Remove dead wood and sever climber (< 3 months)	20+	B1	£45,982
T30	Cypress (Chamaecyparis sp)	6	210	2	2	2	2	1.5/SE	0.5	Poor	EM	Poor	Heavily supressed by ivy, located in shrub bed with Elaeagnus.	Sever ivy (< 12 months)	10+	C2	£1,334

Appendix C Key to Abbreviations Used in the Survey

Ref No	Specific identification number given to each tree or group. T=Tree/H=Hedge/G=Group.	
Species	Common name followed by botanical name shown in *italics*	
RPA	Root Protection Area (As defined by BS5837)	
Stem diameter	Diameter of main stem, measured in millimetres at 1.5 m above ground level. (MS = Multi-stem tree measured in accordance with BS5837 Annexe C)	Av / Average: indicates an average representative measured dimension for the group or feature
Spread	The width and breadth of the crown. Estimated on the four compass points in metres.	
Crown clearance	The estimated height (in metres) above ground level of the lowest significant branch attachments.	
#	Estimated dimensions	
*	Indicates estimated position of tree (not indicated on topographical survey).	
Category	Categorisation of the quality and benefits of trees on Site as per Table 1 and 2 of BS5837:2012. 1=Arboricultural quality/value 2=Landscape quality/value 3=Cultural quality/value (including conservation)	
	A=High quality/value 40yrs+ (light green). B=Moderate quality/value 20yrs+ (mid blue) C=Low quality/value min 10yrs/stem diameter less than 150mm (grey). U=Unsuitable for retention (dark red).	
Life stage	**Young (Y):** Newly planted tree 0-10 years. **Semi-Mature (SM):** Tree in the first third of its normal life expectancy for the species (significant potential for future growth in size). **Early Mature (EM):** Tree in the second third of its normal life expectancy for the species (some potential for future growth in size) **Mature (M):** Tree in the final third of its normal life expectancy for the species (having typically reached its approximate ultimate size). **Over Mature (OM):** Tree beyond the normal life expectancy for the species. **Veteran (V):** Tree which is of interest biologically, aesthetically or culturally because of its condition, size or age.	
Structural condition	**Good:** No significant structural defects **Fair:** Structural defects which can be resolved via remedial works. **Poor:** Structural defects which cannot be resolved via remedial works. **Dead:** Dead.	
Physiological condition	**Good:** Normal vitality including leaf size, bud growth, density of crown and wound wood development. **Fair:** Lower than normal vitality, reduced bud development, reduced crown density, reduced response to wounds. **Poor:** Low vitality, low development and distribution of buds, discoloured leaves, low crown density, little extension growth for the species. **Dead:** Dead **Fair/Good** = Indicates an intermediate condition **Fair – Good** = Indicates a range of conditions (e.g. within a group)	
Preliminary management recommendations	Works identified during the tree survey as part of sound arboricultural management, based on the current context of the Site (where relevant reference has been made to tree management based on the potential future context of the site).	

Appendix D Site Boundary



Site Location Plan

SCALE:1 : 1250

1:1250m

0 25 50 125

N

KEY

- Development zone boundary
- Existing buildings
- Canal / waterways

Rev	Date	Prep	Check	Description
P4	13.10.20	AR	KE	Development zone boundary updated; Issued for Planning
P3	25.09.20	NVA	KE	Planning Issue
P2	28.07.20	KE	RM	Development zone boundary updated; Issued for Planning
P1	22.07.20	KE	RM	Development zone boundary updated; Issued for Planning - E.I.A
	22.04.20	KE	RM	First Issue

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Client

Moorfields Eye Hospital and UCL Institute of Ophthalmology

Project

Oriel

Drawing Title

Site Location Plan

Purpose of Issue

Planning

Status code: A1

Scale @ A1: 1:1250

Drawing Number

Project	Originator	Volume	Level	Type	Role	Number
ORL	PPA	XX	XX	DR	A	20100

Revision

P4

Appendix E Site Photography

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Tree Survey Report

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