David Clarke Chartered Landscape Architect and Consultant Arboriculturist Limited

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ARBORICULTUAL REPORT:

ARBORICULTURAL IMPACT ASSESSMENT and

ARBORICULTURAL METHOD STATEMENT

In relation to a Planning Application

at:

Brockley Hill, Stanmore, HA7 4LR -New Banqueting Facility

Compiled by: David Clarke BSc (Hons) Land Man, PD ARB (RFS), CMLI, M Arbor A

January 2021

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1.0 Instruction

- 1.1 I have been instructed by my client Sairam (Holdings) Ltd to provide an appraisal of the likely impact to, and implications for trees on, or adjacent to, `Brockley Hill, Stanmore, HA7 4LR' in relation to a planning application on the site. This is an updated report to reflect the change to the red line planning application site boundary of Planning Application Ref: P/3088/20.
- 1.2 This application is for `the demolition of the existing golf club buildings (Use Class D2) and construction of a new banqueting facility, (Use Class D2), widening of existing vehicular access from Brockley Hill, car and cycle parking, waste / recycling storage, landscape enhancements and associated works'.

2.0 Introduction

2.1 Qualifications and Experience

2.1.1 I am David Clarke, I have a Bachelor of Science Honours Degree in Landscape Management from Reading University and I am a Chartered Landscape Architect and Chartered Member of the Chartered Landscape Institute (1998). I hold the Professional Diploma in Arboriculture (RFS) (2012) and I am a Professional Member of the Arboricultural Association. I have 29 years' experience of working in both the private and public sector in relation to arboricultural and landscape issues.

2.2 Scope of this Report

- 2.2.1 This Arboricultural Impact Assessment and Arboricultural Method Statement form the Arboricultural Report for the Planning Application. They should be read in conjunction with Tree Protection Plan (TPP/BHGCBHS/010 B) and Arboricultural Survey (Appendix A). The Arboricultural Report is aimed at identifying and addressing those matters concerning trees in relation to the proposed planning application. It will clarify these issues:
 - The principles and procedures to be applied to achieve a harmonious and sustainable relationship between retained trees and structures.
 - The species, size, position and condition of those trees within the area of the proposed development where trees may potentially have some significance to the proposed development. The full survey schedule is set out in Appendix A.

- The impact of the proposed development upon these trees (and vice versa) including those trees to be removed due to the proposed development.
- Any measures that are required to protect retained trees during the proposed works.
- 2.2.2 The trees have been assessed (see Arboricultural Survey Appendix A) as set out in BS BS5837: 2012 `Trees in relation to design, demolition and construction. Recommendations.' Arboricultural Surveys were undertaken by myself in April 2020 and January 2021 in relation to the development of the site.
- 2.2.3 Tree numbers within the text (T1-T4 and G1-G8) relate to numbers designated as part of the Arboricultural Survey unless otherwise stated. The trees are plotted on Tree Protection Plan
 TPP/BHGCBHS/010 B which accompanies the planning application.
- 2.2.4 BS 5837: 2012 `Trees in relation to design, demolition and construction. Recommendations' provides recommendations for the assessment of trees on development sites and suggests four categories into which trees should be placed for assessment purposes. These categories have been used as part of the assessment of trees within this report.

2.3 Relevant Background Information

- 2.3.1 It is understood from my client that none of trees on the site are protected by Tree Preservation Order (TPO) and that the site is not located within a Conservation Area. It is noted that trees are located to the site boundaries and that the ownership of some along these boundaries is uncertain.
- 2.3.2 It is recommended that this information on protected trees be confirmed by anyone proposing to undertake any (future) works to trees both inside and outside the application site. This should be undertaken in writing with the Local Planning Authority (LPA) before proceeding with any tree works unless works within this report are agreed as part of a Planning Approval.

2.4 Documents and Information Provided

2.4.1 All plans within this report are based upon drawings supplied by 5plus architects, London.

2.4.2 This document has been prepared in accordance with guidance set out in British Standard BS 5837: 2012 `Trees in relation to design, demolition and construction. Recommendations' (BS 5837:2012).

3.0 Report Limitations

- 3.1 The report is for the sole use of the client and its reproduction or use by anyone else is prohibited unless written consent is given by the author.
- 3.2 The report observations are to be considered as correct at the time of inspection only. Trees are a growing, living organism, and are readily affected by many environmental factors. As such their condition and circumstances can change in a very short period of time. Therefore this report should be construed as valid for an absolute maximum of 12 months from the date of the Arboricultural Survey provided all factors remain unchanged.
- 3.3 This is an arboricultural report and as such no reliance should be given to comments relating to buildings, engineering, soils or other unrelated matters. The inspection of trees was undertaken from ground level and they were not climbed. No samples of wood, roots, soils or fungus were taken for analysis. Observations of the trees were confined to what was visible from within the site and surrounding public places. A full hazard risk assessment of the trees was not undertaken.
- 3.4 The presence of TPOs, a Conservation Area, or other designations, may affect the use of the site and the management of trees on the site. These designations can be served on the application, or adjacent, sites at any time. The landowner, or his representatives, should therefore satisfy themselves as to the presence (or absence) of these designations prior to:
 - Undertaking any works to trees on, or adjacent to, the site. Where necessary written permission from the Local Authority will be required prior to undertaking tree works.
 - Undertaking any of the works specified in this Arboricultural Report before planning permission is granted.

4.0 Brief Description of the Application Site and the Proposed Development

- 4.1 The site is occupied by a building that was used as part of the operation of the former golf course and driving range on the site. This building suffered extensive fire damage in June 2020 and only the shell of the building remains. The large grassed area to the north of the building formed the driving range and this is screened to its northern end by a dense screen of Common Alder (Alnus glutinosa). These are planted closely together. The land rises to the north. To the south of the building is a tarmac access road and a gravel car parking area which is broken up into bays with Beech hedging between. There are establishing trees (Golden Ash) within this car park area both within the rows of hedging but also within shrub areas to the heads of the bays. These shrub areas contain a range of common species such as Lonicera pileata, Dogwood, Phormium and Brachyglottis. A tree screen consisting of a range of species is located to the south of the car park. Brockley Hill runs to the eastern boundary and this is bounded by a ditch and bank. Native trees – including Common Ash (Fraxinus excelsior) and English Oak (Quercus robur) - are located in the area between the car park and the road. The western boundary is open. Significant areas of fly-tipping have recently appeared on the site.
- 4.2 This application is for `the demolition of the existing golf club buildings (Use Class D2) and construction of a new banqueting facility, (Use Class D2), widening of existing vehicular access from Brockley Hill, car and cycle parking, waste / recycling storage, landscape enhancements and associated works'.



Photograph A – Showing the remnants of the existing building.



Photograph B – Showing recent fly-tipping within the site.



Photograph C – Showing trees and hedging within the existing car park area.

5.0 General principles for protection of trees during development

- 5.1 It is equally important to ensure the protection of trees both above and below ground.Guidance is provided in BS 5837: 2012 as to the protection of trees, before, during and after development.
- 5.2 The Arboricultural Impact Assessment will set out the potential impact of the proposals on trees and vice-versa. There is a need to protect trees and provide an Arboricultural Method Statement where proposals will impinge, or impact on the Root Protection Areas (RPAs) of retained trees. Root Protection Areas (RPAs) are a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority. These are set out as Construction Exclusion Zones and have been calculated as part of the Arboricultural Survey.

- 5.3 The RPA for each tree is initially plotted as a circle centered on the base of the stem. Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area will be produced. These factors include the morphology and disposition of the roots, when known to be influenced by past or existing site conditions such as the presence of roads and structures and site topography. Modifications to the shape of the RPA within this report reflect a soundly based arboricultural assessment of likely root distribution. The RPA may change its shape but not reduce its area whilst still providing adequate protection for the root system.
- 5.4 Proposals may impinge on RPAs but these should be minimal and construction techniques such as specialized foundation designs should be considered to reduce the impact of development. The proposals will relate specifically to the site conditions and each individual tree and its category within the BS 5837 grading system.



Photograph D – Showing fly-tipped soil within the existing car park area.

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6.0 Arboricultural Impact Assessment (AIA)

- 6.1 As stated above British Standard recommendations (BS5837: 2012) provides a formula for calculating the Root Protection Area (RPA) recommended to protect existing trees that are to be retained. The shape of the root protection area and its exact location will depend upon arboricultural considerations but the area will normally be represented on a plan as a circle. The purpose of the RPA is to prevent physical damage to tree roots and to prevent damage to the soil structure in which they live by soil compaction, changes in soil levels or prevention of gas exchange to living roots.
- 6.2 These RPAs are shown on the Tree Protection Plan (TPP/BHGCBHS/010 B) which also forms part of the Arboricultural Method Statement. Where incursion within the RPA of a retained tree is necessary as part of the construction process then a methodology will be in place to prevent, or reduce to an insignificant level, damage to trees.
- 6.3 Below I have discussed the significance of the trees and the constraints that they are likely to pose to the proposed development (and vice-versa). Together with the Arboricultural Survey the AIA sets out any tree works required in order to facilitate the development as well as identifying works to trees (including removal) that should be undertaken as part of the management of trees on the site.

6.4 Summary of Tree Impact Assessment

6.5 There are 4 no. individual tree and 8 no. groups of trees which form the basis for this report and which could potentially be affected by the proposal.

6.6 <u>Trees recommended for removal for Arboricultural Reasons</u>

Of the trees within this report a tree within a group (G6) is recommended for removal irrespective of the planning application. Additionally a limb of the Willow to the eastern end of G5 has recently failed around a previously identified crack or split at its base. This defect may affected the structural integrity of the remaining limbs and may expose the remaining limbs to windthrow. The tree therefore presents a potential risk to users of the adjacent car park. It is recommended that the tree is further assessed at the earliest opportunity to assess its stability and structural integrity. These will guide the future management of this tree: either a significant canopy reduction to remove weight loading on the weakened area or the removal/`coppicing' of the tree and the planting of a suitable replacement. It is also noted that several trees within G7 have damage – probably squirrel

damage – to trunks and limbs and this may affect their long-term viability. The condition of these trees will be monitored over the next growing season – and beyond – to assess if they are suitable to be retained in the long term. If they show signs of long-term decline they will need to be managed accordingly. This will include the removal and replacement of specific trees.



Photograph E – Showing failed limb to base of Willow (G5).

6.7 Schedule of trees recommended for removal for Arboricultural Reasons

<u>Tree</u> <u>No.</u>	<u>Species (</u> Common Name <u>)</u>	<u>BS</u> <u>Category</u>	Reason for recommended removal
G5	1 no. Willow (part of group)	U/C2	Possible due to failed limb to base of tree which affects its ongoing viability in this area.
G6	1 no. Birch (part of group)	U	Dead.

6.8 <u>Trees removed due to the application</u>

An individual tree (Goat Willow T1) and a tree within a group (Golden Ash G3) will need to be removed, or are proposed to be removed to implement the development. This relates to the implementation of the proposed building and associated hardstanding.

6.9 These are low quality or unremarkable `C' Category trees as set out in BS 5837:2012. They are not readily visible to the general public due to their internal position within the application site, relatively small size and intervening trees and other vegetation. However to mitigate for their removal it is proposed to undertake replacement tree planting within the site as part of the landscape proposals for the development. It is therefore assessed that the removal and replacement of these trees as part of the proposals will mean that the site development will not have a long term or significant impact on the visual amenity of the local area or its enjoyment by the general public. It is not so significant that it would lead to the refusal of Planning Permission.

6.10 Schedule of trees removed due to the application

<u>Tree</u> <u>No.</u>	<u>Species</u> (Common Name)	<u>BS</u> Category	Reason for removal
T1	Goat Willow	C2	Due to proximity to proposals and introduction of hardstanding within its RPA.
G3	1 no. Golden Ash	C2	Due to installation of hardstanding within the site.

6.11 Trees potentially affected by the application

The construction of the replacement building will take place outside the RPAs and canopy spreads of retained trees. However site access and the demolition of the existing building and ancillary structures will take place within the RPAs and canopy spreads of retained trees. Additionally the removal and replacement of hardstanding and construction activity will take place within, or adjacent to, the RPAs of retained trees and their canopy spreads. Pre-development tree works will be carried out prior to the implementation of the proposed development.

6.12 These potential impacts are set out and evaluated below and measures to prevent, or reduce, the effects of the proposals on these trees are set out in the Arboricultural Method Statement. The impact on retained trees from this development will not be significant as long as the proposals set out in this report are followed.

<u>Tree</u> <u>No.</u>	<u>Species</u> (Common Name)	<u>BS</u> <u>Category</u>	Reason for potential impact
T2	Walnut	C1	 Removal of structures within, or adjacent to RPA and canopy spread.
Τ4	Oak	B1	 Site Access on line of existing access within RPA and canopy spread.
G3	23 no. Golden Ash	C2	 Removal and replacement of existing surface within RPAs and canopy spreads.
G5	1 no. Willow (part of group)	B2	 Removal and replacement of existing surface within RPA and canopy spreads.
G6	9 no. Ash	C2	 Removal and replacement of existing surface within RPA and canopy spreads.
G8	2 no. Ash (part of group)	B2	• Removal and replacement of existing surface within RPA and canopy spreads.

6.13 Schedule of trees potentially affected by the application

<u>NB</u>: The installation of boundary treatments (fencing) may occur within the RPAs of several trees within this report.

6.14 Assessment of potential impacts on retained trees

6.15 Assessment of Distribution of Roots of Trees

As set out above the RPAs have been calculated as part of the Arboricultural Survey. The shape of the RPA and its exact location will depend upon arboricultural considerations but the area will normally be represented on a plan as a circle. Pre-existing site conditions or other factors may indicate that rooting has occurred asymmetrically.

6.16 With regard to some of the retained trees within this report there are potential restrictions on their root activity. This relates to the presence of hard standing (the surface of Brockley Hill and Car Parking Areas), the presence of structures and changes in level (banks and ditches) outside the site boundaries. The exact construction or layout of all these elements is unknown but some fundamental principles will apply:

The capping of the underlying soils by structures and hardstanding will reduce the availability of resources (such as water) to potential root activity and reduce gaseous exchange between the soils and the atmosphere. Factors such as soil compaction during the construction of the structures and the physical presence of foundations and hardstanding would also significantly reduce or prevent rooting activity in these areas. The level change associated with the ditches will have prevented root activity beyond these. It is assessed that the surface of Brockley Hill will have been constructed to a higher standard (bulk density) than the other surfaces within the site. It is also considered that the structures may sit on a simple foundation and that the gravel surface of the car parking areas will allow some water percolation/gaseous exchange even if they are compacted.

Therefore for the purposes of this report it is assumed that root activity will have been prevented in the area of Brockley Hill, the ditch along Brockley Hill and the drainage ditch to the south of the site. Asymmetrical RPAs are shown where trees are potentially affected here. All other trees are shown with circular RPAs which represents the `worst case' scenario in relation to the potential impact on these trees. The exact distribution of roots could only be confirmed by undertaking further site investigations such as trial trenches. In relation to the site development and the potential impact on trees it is considered that these are not required at this stage.

6.17 Site Access

During the site development access will be via the existing (widened) access point from Brockley Hill. This is within the potential RPA of Oak (T4). Therefore Ground Protection Measures are required as part of this element of the development. This will include the retention of the existing hardstanding with additional materials added as required.

6.18 Demolition

The demolition of the existing building and infrastructure will take place within the RPA and canopy spread of Walnut (T2). To prevent unnecessary tree loss this phase of the project will be undertaken in a controlled manner as part of the phased operation of the development. This will include the use of Tree Protection Fencing and a dedicated banksman if required.

6.19 Removal and Installation of Hard Standing within RPAs

Hardstanding forming the existing access and car parking areas may either be retained or removed and replaced. This is within the RPAs of retained trees. Where the surfacing is replaced to the same construction depth this will have a neutral impact on retained trees. Where it forms part of the landscaped areas it will have some benefit to the trees by improving their rooting environment. Care must be undertaken during this process to ensure that trees are not damaged. Hardstanding will occur within 6% of a Birch within G1 and less than 1% of the RPAs of trees within G2 and G3. These are considered to be minor and insignificant incursions to the long-term viability and retention of these trees. The use of standard methodologies is considered to be acceptable in this instance.

6.20 Construction within RPAs

The construction of the replacement building will take place outside the RPAs of retained trees. Therefore the use of standard (trench) foundations is considered to be acceptable in this instance. However these works must be undertaken in a controlled and planned way to prevent direct and indirect damage to these trees. This will include the use of Tree Protection Fencing and Ground Protection Measures. Specifications for these are set out in the Arboricultural Method Statement.

6.21 Construction Activity

Uncontrolled construction activity could lead to direct or indirect damage to trees - both above and below ground. Therefore Tree Protection Fencing is proposed within the Arboricultural Method Statement to restrict and control and define construction activity and protect retained trees during the works.

6.22 Activity associated with the Construction Phase may take place within, or adjacent to, the asymmetrical RPAs of trees. This may involve vehicle, machinery and pedestrian movements. It is proposed that specific Ground Protection Measures are introduced to support these movements and prevent any indirect impacts on trees to be retained. These measures are set out within the Arboricultural Method Statement and will generally include the retention of existing hard standing elements.

6.23 Canopy Spreads and Presence of Trees

It is proposed to undertake tree works as part of the site development. These relate to the crown lifting – if required – of trees within G3 and G6 over the existing and proposed car parking areas. These canopies will be lifted to a maximum of 3.0-3.5 m as required to avoid interference with vehicles using the car park area. This separation will be maintained in the future.

6.24 All these works are considered to be minor and insignificant within the current form and condition of the trees. All proposed pruning works would follow guidance set out in the relevant British Standard (BS 3998:2010 - `Tree work - Recommendations') and will be carried out by a qualified tree surgeon/arboricultural contractor to ensure that the health, amenity and viability of the trees is maintained. All Arboricultural works should also comply with relevant bio-security measures – such as those set out in the Arboricultural Associations position statement `Biosecurity in Arboriculture and Urban Forestry'. Initial tree works are specified in the Arboricultural Method Statement.

6.25 Shading

The retained trees within this report are located to the site boundaries and at a significant distance from the proposed banqueting facility. There will be no substantial shading of the building and any that does occur will not be excessive or oppressive leading to future pressure to prune or fell retained trees due to the implementation of the project. Where

required consistent light levels will be achieved through permanent lighting of the rooms during hours of use and high `natural' light levels at all times of the day is not an important or overriding factor in the future operation of the building.

6.26 Levels

No ground level changes are currently proposed or should take place within the RPAs of retained trees except any discussed and assessed within this report.

6.27 Herbicides and Pesticides

The use of herbicides and pesticides is not proposed within the RPAs of retained trees as part of this application. Should this change then chemicals will be specified which will not have an impact on retained trees.

6.28 Utility Routes

The exact location of services is not known at this stage. However it is assumed that any existing service runs to the site will be used and will therefore have a limited (if any) impact on trees. However should this not be the case new services should be located outside the RPAs of retained trees – such as through the (widened) site access. If required specialised techniques – such as those set out in *'NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees' 2007* National Joint Utilities Group (NJUG) Volume No. 4: No. 1 – will be used. The situation regarding utility routes will need to be confirmed as part of conditions for a Planning Approval.

6.29 Temporary Site Buildings and Storage of Materials and Plant

Poor placement of temporary site buildings (including latrines), contractors parking, materials and plant can lead to direct damage to retained trees or indirect damage such as through the compaction of soils. The layout and operation of the site has therefore been considered and planned at this early stage to reduce or prevent any potential and significant damage to retained trees. This includes the erection of Tree Protective Fencing and use of Ground Protection Measures as set out above and in the Arboricultural Method Statement.

6.30 Erection of Boundary Treatments

New boundary treatments (fences) may be located within the RPAs of trees to define and secure the site boundaries or as part of the revised site layout. These are considered to be minor and insignificant to the long term retention of these trees. However they must be

undertaken in a controlled and planned way to ensure that these trees are not damaged by the works. Therefore a specification for the installation of these is set out in the Arboricultural Method Statement.

6.31 End Use of the Proposal

The proposals will be used as a banqueting facility at the end of the project.

7.0 <u>Recommendations</u>

- 7.1 All tree works removal and pruning should be undertaken prior to the start of the site development so as to avoid any conflict between trees and contractors during the implementation of the project.
- 7.2 Existing trees can be easily damaged directly through root severance and, inadvertently, through soil compaction which disrupts the soil structure causing asphyxiation of roots and subsequent root dysfunction. Spillage of toxic materials can also cause root death. Protection for trees selected for retention is essential to ensure they are not affected by the development.
- 7.3 Specifications for the protection of trees are proposed in the Arboricultural Method Statement. These include the use of Tree Protection Fencing and Ground Protection Measures and should be implemented to prevent, or limit, any significant damage to the roots of trees. Protective fencing should be erected as shown on the Tree Protection Plan.
- 7.4 The location and siting of all utilities should be outside of the RPAs of retained trees as enforced on site. If incursions within RPAs are unavoidable then specialised installation techniques will need to be agreed with an Arboriculturist before proceeding.
- 7.5 The phasing of the operations should follow that set out in the Arboricultural Method Statement to ensure that the protection of trees is prioritised. An Arboriculturist should be the main contact with the Local Authority Tree Officer and notify them of the proposed schedule prior to work commencing on site.

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8.0 General

8.1 This document sets out the methodologies for proposed works that affect trees on, and adjacent to, the site. These follow the granting of Planning Permission by the Local Planning Authority. Compliance with this (and subsequent) method statement(s) will be a requirement of all relevant contracts associated with the development proposals. Copies of this document will be available for inspection on site. The developer will inform the local planning authority if the arboricultural consultant is replaced. This method statement should be read in conjunction with Tree Protection Plan (TPP/BHGCBHS/010 B).

9.0 Phasing of the Works

- 9.1 The works are proposed to be undertaken in the following phases:
 - Pre-Development Works

Confirm temporary site structures, contractors parking and storage areas can be accommodated outside the Construction Exclusion Zones prior to start of the site development. Ensure these are located so that they do not have to be relocated during the development – or that any change is minimal - thereby avoiding unnecessary vehicle movements on site.

- Confirm operation of the development site with relevant contractors and thereby ensure that proposed tree protection measures are suitable and `fit for purpose'. If required modify proposed measures whilst still ensuring the protection of trees. This will include proposed Ground Protection Measures.
- Undertake pre-development tree works to G3 and G6 and remove trees and other vegetation not being retained as part of the site development.
- Demolition Phase

Confirm Tree Protection Fencing is in place and `fit for purpose' prior to the start of the Construction Phase. Confirm retention of existing hardstanding as Ground Protection Measures and install additional materials if required.

• Place temporary site structures - such as site huts and latrines – contractors parking and storage areas outside the Construction Exclusion Zones.

- Commence Demolition Phase.
- Undertake regular monitoring of the Tree Protection Measures to ensure they remain fit for the purpose of preventing unnecessary damage to trees. Should any unforeseen damage occur then this should be reported to the Local Planning Authority. Remedial tree surgery should be undertaken at the earliest opportunity as approved by a competent and qualified Arboriculturist.

<u>Construction Phase</u>

Confirm Tree Protection Fencing is in place and `fit for purpose' prior to the start of the Construction Phase. Modify its position as required following the Demolition Phase. Install Ground Protection Measures for the relevant part of the Construction Phase

- Place temporary site structures such as site huts and latrines contractors parking and storage areas outside the Construction Exclusion Zones.
- Commence Construction Phase.
- Undertake regular monitoring of the Tree Protection Measures to ensure they remain fit for the purpose of preventing unnecessary damage to trees. Should any unforeseen damage occur then this should be reported to the Local Planning Authority. Remedial tree surgery should be undertaken at the earliest opportunity as approved by a competent and qualified Arboriculturist.
- Completion of Construction Phase and removal of any temporary site structures.
- Removal of Tree Protection Fencing and any Ground Protection Measures.
- Landscaping of the site including planting of replacement trees.
- It is advisable to carry out a further tree survey to identify any remedial trees surgery that may be required following the completion of the development. This will include any changes in the condition of the trees that may have occurred from the original survey.
- 9.2 It is noted that some phases of the work may overlap. For instance some landscaping of the site may occur whilst Tree Protection Measures are still in place.

10.0 Construction Site Access

10.1 The access for construction site vehicles and contractors will follow the Designated Access Route which is the existing access point from Brockley Hill. This is within the potential RPA of Oak (T4). Therefore Ground Protection Measures (as set out below) are required to protect this tree for this element of the site development. This will include the retention of existing hard standing materials.

11.0 Pre-Development Tree Works

11.1 It is proposed to undertake the following works to trees within the site:

11.2 Crown Lifting – G4 and G6

Where required it is proposed to lift the canopies of these trees up to 3.0-3.5 m over adjacent parking areas (ground level). These are relatively young trees and these works are considered to be minor and insignificant to their long term viability. These works will be undertaken before the start of the Demolition Phase to avoid any potential conflict with contractors during the site development. These canopy heights will be maintained in the future.

- 11.3 Pruning of these trees will involve the removal of secondary branches or branch shortening rather than removal of branches back to the main stem. The amount of material to be removed and the diameter(s) of the pruning cut(s) will be the minimum required for the purpose. Final pruning cuts will be made to avoid injury of the wood and bark of the parent stem or branch above the cut. This will help avoid colonization by decay organisms and pathogens. If a branch collar is visible, the final cut should be just outside it. The timing of the work, and its impact on habitat and wildlife, should be determined and form part of the proposed work schedule.
- 11.4 All proposed pruning works would follow guidance set out in the relevant British Standard (BS 3998:2010 - `Tree work - Recommendations') and will be carried out by a qualified tree surgeon/arboricultural contractor to ensure that the health, amenity and viability of the trees is maintained. All Arboricultural works should also comply with relevant bio-security measures – such as those set out in the Arboricultural Associations position statement `Biosecurity in Arboriculture and Urban Forestry'.

12.0 Tree Protective Fencing

- 12.1 Root Protection Areas (RPAs) are the minimum areas (in m²) which should be left undisturbed around each retained tree as Construction Exclusion Zones. These areas have been calculated as part of the Arboricultural Survey. The protective distances where possible will be enforced by the use of robust protective fencing as outlined in BS 5837: 2012. The fencing will be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the trees.
- 12.2 In this instance it is proposed to use the following methods:
 - Timber hoarding will be fixed to timber posts set at 2.0-3.0 m centres (See Photograph F below) will be used to secure the site boundary. If applicable post holes for the timber hoarding will be hand dug using hand held tools and avoiding severance of significant roots of adjacent trees.



Photograph F – Example of Timber Hoarding Tree Protective Fencing.

• A vertical and horizontal scaffold framework, well braced to resist impacts (See Image G below). The vertical tubes will be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels will be securely fixed. Care will be taken when locating the vertical poles so as to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. If the presence of underground services precludes the use of driven poles, an alternative specification will be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.



Image G - Tree Protective Fencing – Vertical and horizontal scaffold framework

- 12.3 The exact composition of the soil is unknown. Clay soil, for instance, compacts very easily when wet, so it is essential that fenced areas remain undisturbed before and during construction to prevent root asphyxiation.
- 12.4 Laminated site warning signs will be attached to the fencing. These signs will state:

'CONSTRUCTION EXCLUSION ZONE - NO ACCESS

No storage of materials or use of machinery should take place within this area. These fences should remain intact unless under instruction from the site foreman following consultation with an Arborist.'

12.5 Tree Protection Fencing will be erected to protect retained trees before any machinery or pedestrians enter the site in connection with the Demolition Phase. Fencing will be modified slightly for the Construction Phase to allow for the removal of elements adjacent to Walnut (T2). The phased position of the fencing is shown on Tree Protection Plan (TPP/BHGCBHS/010 B). Otherwise it will not be removed or relocated – except to allow for grounds maintenance operations - until the main part of the development is complete. It may then be removed to allow for the landscaping of the site and the installation of hardstanding.

13.0 Ground Protection Measures including Installation of `No Dig' Surfacing

- 13.1 Site access on the line of the existing access will take place within the RPA of Oak (T4). Machinery or Pedestrian movements may occur within the RPA of Walnut (T2) during the Demolition Phase. Due to the proximity of the structure to the tree the use of Ground Protection Measures is not considered practical in this instance. A methodology for the removal of this structure is set out in `Demolition' below.
- 13.2 Vehicular movements may occur within the RPAs of G3, G6 and G8 in the area of the existing car park area during the site development. Specific and suitable Ground Protection Measures are proposed and these will include the retention of existing hardstanding with additional materials added as required. The structure of any protection measures will be designed to avoid localised compaction, by evenly distributing the carried weight over the Ground Protection Materials. The existing

hardstanding will be assessed to establish if it will carry the proposed weight loading without deforming and damaging any roots below. It required the following materials will be used:

13.3 (i) Machinery Movements

It is assumed that vehicles or machinery using this area will be over 2t loaded weight. For construction machinery exceeding 2 t gross weight a system will be proposed to an engineering specification designed in conjunction with arboricultural advice. This system could include a proprietary system such as heavy duty metal or plastic trackway panels which will accommodate the likely loading to which it will be subjected. The structure of this temporary surface will be designed to avoid localised compaction, by evenly distributing the carried weight over the track width or wheelbase of any machinery that is proposed to use the area. In this instance the final design of the system used would be confirmed in association with the relevant contractor as part of a Planning Condition for a Planning Approval.

13.4 The Ground Protection Measures will be in place prior to any vehicles entering the site in connection with the relevant part of the site development. These measures will only be removed once the relevant part of the Construction Phase is complete.

14.0 Demolition

14.1 Demolition of the existing building will take place outside the RPAs of retained trees but the removal of structures will occur adjacent to Walnut (T2). This phase of the work will be undertaken with great care in order not to damage this tree. The initial methodology and information provided here is specifically in relation to the protection and retention of trees during the Demolition Phase. It will be confirmed with the Demolition Contractor as part of the information required to discharge relevant conditions for the Planning Approval. The Tree Protection Fencing will be erected as set out above to form a Construction Exclusion Zone. See `Tree Protection Fencing' above

- 14.2 Existing hard standing areas including the floor of the structures will be left in place until all demolition works are complete. This will ensure contractors have good access around the site and will protect the underlying soil profiles. Access to the structures will be away from T2. Care must be taken in order not to damage the canopy of this tree. All demolition materials will be demolished into the existing building footprint and/or away from trees.
- 14.3 The ground floor slab and foundation will be broken out using hand held tools or equipment. Excavation of ground floor slab and foundations will be restricted to their existing depths and no greater.
- 14.4 All demolition materials will be moved to storage areas or directly loaded into vehicles and removed from site – unless to be used as part of the site construction. Storage areas will be located outside the Construction Exclusion Zone.

15.0 <u>Removal and Installation of Hard Standing within RPAs</u>

- 15.1 The site consists of existing tarmac and gravel surfaces within the RPAs of Oak (T4), G3, G6 and G8. These surfaces may be removed and formed into the landscaped areas of the site but generally they will be replaced with alternative surfacing. Hand held tools or machinery (under supervision) will be used to remove the existing hard standing materials within the RPAs of trees. Excavation will be undertaken to existing construction depths and no deeper.
- 15.2 As soon as the existing hard standing is removed measures must be put in place immediately to protect the underlying soil structure and protect roots from direct and indirect damage (such a desiccation). This will mean that either replacement hard standing or topsoil is laid within the areas immediately the existing top surface and subbase is removed.
- 15.3 The topsoil will conform to BS 3882 (2015) a good quality medium to light loam, free of perennial weeds. Stone content 20% dry weight. The soil will be delivered and stored outside the RPAs of the trees. The area will be lightly forked to break up any existing soil compaction. The soil will be tipped onto the landscaped area in small loads so as to avoid damage to roots or compaction or smearing of the underlying soil profile. The spreading of soil within the RPAs of retained trees will be undertaken by landscape operatives using hand held tools such as rakes and forks.

15.4 This element will be undertaken at the end of the development as the hard standing may be utilised as part of Ground Protection Measures during the development.

16.0 Site Organisation and Storage of Materials and Plant

- 16.1 During the proposed construction works attention will be paid to the protection and well being of retained trees. The site will be organised in such a manner so as to minimise the effects of the construction work on trees. This will include defining and containing the development footprint with Tree Protection Fencing.
- 16.2 All materials and plant to be used during, or generated by, the Development Phase will be stored outside the enforced tree protection areas. The operation of the site will be undertaken within the constraints imposed by the protection of trees. Where necessary materials will be brought to site in loads which are applicable to that phase of the works. This would help to minimise the development footprint within the site.
- 16.3 All toxic substances such as oils, bitumen's and residues from concrete mixing will be retained by effective catchment areas. No toxic material will be discharged within 10 m of a tree stem. No fires will be lit within 10 m of a tree stem.
- 16.4 All access onto and from the site will be via the Designated Access Route. All contractors parking, temporary latrines and any other temporary structures will be outside the Construction Exclusion Zones.

17.0 <u>Tree Protection and Utilities</u>

17.1 The exact location of services is not known at this stage. However it is assumed that any existing service runs to the site will be used and will therefore have a limited (if any) impact on trees. However should this not be the case new services should be located outside the RPAs of retained trees – such as through the (widened) site access. If required specialised techniques – such as those set out in *'NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees' 2007* National Joint Utilities Group (NJUG) Volume No. 4: No. 1 – will be used. The situation regarding utility routes will need to be confirmed as part of conditions for a Planning Approval.

18.0 Landscape Proposals Including Erection of Boundary Treatments

18.1 Any landscaping will avoid soil re-grading and unnecessary disturbance within the RPAs of retained trees. Any ground works, such as planting of trees or shrubs or the spreading of top soil, within the RPAs of retained trees will be use hand held tools.

18.2 New Boundary Treatments

New or replacement fencing may be erected as part of the proposed development to form defined or secure site boundaries.

- 18.3 Care will be taken when digging new holes and these will be undertaken by hand within these RPAs. Where roots larger than 25 mm are encountered the post hole (where possible) will be moved to ensure the roots are not affected. Where it is not possible to move the post hole roots larger than 25 mm will only be severed following consultation with an Arboriculturist, as they may be essential to the tree's health and stability. Roots smaller than 25 mm may be pruned back to create a clean cut, preferably to a side branch, using a proprietary cutting tool such as bypass secateurs or handsaws.
- 18.4 Roots which are exposed, but are to be retained, will be wrapped in dry, clean hessian sacking to prevent desiccation and to protect from rapid temperature changes. Prior to backfilling, any Hessian wrapping will be removed and retained roots should be surrounded with sharp sand or other loose granular fill, before soil or other material is placed over the roots. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.
- 18.5 At this point it is recommended that these treatments are erected at the end of the Construction Phase when the majority of construction works have occurred. Tree Protection Fencing will be removed whilst this element of the work is carried out.

19.0 Conclusion

19.1 This application is for `the demolition of the existing golf club buildings (Use Class D2) and construction of a new banqueting facility, (Use Class D2), widening of existing vehicular access from Brockley Hill, car and cycle parking, waste / recycling storage, landscape enhancements and associated works'.

- 19.2 Of the trees within this report a dead tree (Birch) within G6 and a Willow within G5 (to be confirmed following further investigations) are recommended to be removed for arboricultural reasons irrespective of this planning application. It is noted that the management of damaged trees may require their removal in the future depending on their viability.
- 19.3 Of the trees within this report some within a group an individual tree (T1) and a Golden Ash within G3 will be removed to implement the development. These are low quality or unremarkable `C' Category trees as set out in BS 5837:2012. They are not readily visible to the general public due to their internal position within the application site, relatively small size and intervening trees and other vegetation. However to mitigate for their removal it is proposed to undertake replacement tree planting within the site as part of the landscape proposals for the development. It is therefore assessed that the removal and replacement of these trees as part of the proposals will mean that the site development will not have a long term or significant impact on the visual amenity of the local area or its enjoyment by the general public. It is not so significant that it would lead to the refusal of Planning Permission.
- 19.4 There will be incursions within, or adjacent to, the RPAs and canopy spreads of trees as part of the development of the site. These include for site access, demolition of the existing building and structures, removal and installation of hardstanding, construction activity and the erection of boundary treatments. Overall the incursions within the RPAs have been assessed within the Arboricultural Impact Assessment to either have a minimal and insignificant impact on retained trees or can be reduced to an insignificant level through the use of relevant construction techniques. These are set out within the Arboricultural Method Statement. These will ensure that the development will be completed without having any undue impact on retained trees.
- 19.5 Retained trees will be protected during the site development. This report sets out how retained trees are an important part of the development of the site and how protection and retention of trees will be achieved. The effect on trees from the proposals will be minimal given the proposed site layout and conditions and providing that the Arboricultural Method Statement is implemented.
- 19.6 The development is therefore acceptable in arboricultural terms and should receive planning consent.

Appendix A Arboricultural Survey Brockley Hill Golf Club, Brockley Hill, Stanmore, HA7 4LR

1.0 Introduction

- 1.1 I visited the application site in April 2020 and January 2021 to inspect relevant trees in relation to a Planning Application on the site. These trees are within the area of the proposed development and may potentially have some significance to the proposed development. The survey includes the species, size, position and condition of these trees. A full list and description of Survey Terms is given below. The position of these trees has been noted on the accompanying Tree Protection Plan.
- 1.2 This survey has been prepared following guidance set out in BS 5837: 2012 `Trees in relation to design, demolition and construction. Recommendations'. It seeks to offer guidance in relation to planning application discussions or designs for the site. As suggested by BS5837: 2012 all trees with a stem diameter of less than 75 mm at 1.5 m above ground level were excluded from the survey.

2.0 Description of Survey Terms

- 2.1 **Tree Reference Number** is the number allocated as part of this Arboricultural Survey. This may be different from other surveys undertaken on the site.
- 2.2 **Height** of the tree is measured in metres to the centre of the crown or the highest point of the tree. There is a tolerance of plus or minus 1.0 m.
- 2.3 Crown Spread is taken at compass points N, E, S and W from the centre of the tree stem. This is to the nearest 0.5 m. Where tree canopies spread off-site then estimations (est) have been made. With regard to groups the average canopy spread is given. Where individuals within the group are significantly different from this these are shown on the plan and the maximum spread stated within the report.
- 2.4 **Stem Diameters** are taken at 1.5 m above ground level unless otherwise stated. Where measurements of trunk diameter are not possible then estimations (est) have been made. This may be due to ivy on the trunk or where trees are not on the application site. The annotation ms refers to multi-stemmed trees.

- 2.5 Root Protection Areas (RPAs) are calculated from stem diameter measurements as set out in BS5837: 2012 `Trees in relation to design, demolition and construction. Recommendations'. RPAs are the areas (in m²) around each retained tree which contain sufficient rooting volume to ensure the survival of the tree. The area will normally be represented on a plan as a circle or polygon. If shown as a circle the Radius of Root Protection Area Zone is included.
- 2.6 Age Class A young tree (Y) is within its first 1/3rd of life expectancy. A middle aged tree (MA) is within its second 1/3rd of life expectancy and a mature tree (M) is within its final third of life expectancy. An Over Mature tree (OM) is beyond its average life expectancy and a Veteran (V) is usually beyond the typical age range for the species but of biological, cultural or aesthetic value.
- 2.7 Physiological and Structural Condition Trees in a Good Physiological or Structural Condition have no visible problems or significant defects. Those in a Fair Condition have remedial symptoms or defects or where these symptoms or defects are not remedial but will not affect the Estimate Remaining Useful Contribution and those in a Poor Condition have defects which are not remedial and removal of the tree should be considered.
- 2.8 Comments give a description of the tree including its general form, description of any physical defects, disease or decay and other appropriate details based on the health, vitality and overall structural integrity. It also includes the environment in which the tree is growing.
 Recommendations for the management of the tree or group will be given where required. Any proposals for removal of trees will need to be agreed with the tree owner.
- 2.9 A tree of good form has a shape that is typical of the species or has amenity in its own right. A tree with moderate form has been affected by its environment and is not typical of the species and has limited amenity value on its own right though it may have a collective amenity with adjacent trees. A tree with poor form has low quality and may also have structural defects which will affect its long term retention. **Canopy height above ground level** is given where this is applicable.
- 2.10 **Estimated Remaining Useful Contribution** is the estimated number of years that the tree will continue to make a safe and useful contribution to its surroundings, taking into account its current age, physiological and structural condition and its current location or environment. This assumes that there will be no changes within its immediate environment.
- 2.11 **Category Grading** trees have been categorised in accordance with the cascade chart set out within BS5837: 2012 `Trees in relation to design, demolition and construction. Recommendations'.

2.12 The trees inspected as part of this report were inspected from the ground only and were not climbed. No samples of wood, roots, soils or fungus were taken for analysis. Observations of the trees were confined to what was visible from within the site and surrounding public places. A full hazard risk assessment of the trees was not undertaken.



Photograph H – Showing Willows within G5 and their association with the existing drainage ditch.

Tree Schedule

Tree Ref No.	Species Common Name (Scientific Name)	Height (m)	Stem Diameter (mm) <i>Root</i> <i>Protection</i> <i>Area</i> (m ²)	Radius of Root Protection Area zone (m)	Branch Spread (m)	Age Class	Physiological/ structural Condition	Comments Preliminary Management Recommendations within Current Environment 	Estimated Remaining Useful Contribution (years)	Category Grading
T1	Goat Willow (Salix caprea)	8	260 30.6	3.1	N - 4.0 E - 3.5 S - 3.0 W - 4.0	MA	Good/Fair	 Previously pollarded to around 1.5 m height. Crossing and rubbing limbs (c/r limbs) in the crown are a potential point of structural weakness and entry point for pathogens. Repollard tree to previous pollard points on a regular cycle to maintain structural integrity of these points. This will remove c/r limbs in the crown 	10+	C2
T2	Common Walnut (Juglans regia)	12	470 99.2	5.6	N - 4.5 E - 5.5 est S - 6.0 W - 6.5 est	MA	Good/Fair	 Tree of moderate form and condition. Previously pruned. Canopy to below 1.5 m above ground level at lowest point. No preliminary management recommendations at time of survey. 	10+	C1
Т3	Bay Willow (Salix pentandra)	18	980 434.5	11.8	N - 7.0 E - 7.0 S - 6.0 W - 6.0	Μ	Good/Good	 Tree of good form. Some minor damage in the stem in the crown. Canopy to below 1.5 m above ground level at lowest point (all round). No preliminary management recommendations at time of survey. 	40+	A1
Τ4	English Oak (Quercus robur)	14	810 296.9	9.7	N - 7.5 E - 7.0 est S - 7.0 W - 7.0 est	Μ	Good/Good	Tree growing to site entrance. Limbs have been removed over the existing access leaving stubs. Bark snags have been left around one stub. Some damage in the crown to be expected of a tree of this species at this age. Remains of fungal fruiting body to base of tree to west – possibly Inonotus dryadeus. Canopy to 3.5 m above ground level over site access. • Confirm identity of fungal fruiting body and use this information to guide the future management of the tree. Prune stubs back to sound wood removing any damaged around prune points.	20+	В1

Tree Ref No.	Species Common Name (Latin Name)	Height (m) range	Stem Diameter (mm) Root Protection Area (m²) <i>Radius of Root Protection Area</i> <i>zone (m)</i>	Branch Spread - min (max) (m)	Age Class (general)	Physiological/ Structural Condition (general)	Comments (general) Preliminary Management Recommendations 	Estimated Remaining Useful Contribution (years)	Category Grading
G1	8 no. Silver Birch (Betula pendula)	6-12	75 - 175 2.5 - 13.9 0.9 - 2.1	N - 3.0 (3.5) E - 2.5 (4.0) S - 3.0 (3.5) W - 3.0	Y	Fair/Fair	Trees growing closely together in 2 no. clumps. Moderate form.No preliminary management recommendations at time of survey.	10+	C2
G2	4 no. Crab Apple (Malus spp) and 1 no. Silver Birch (Betula pendula)	8-12	140 – 190 8.9 - 16.3 1.7 – 2.3	N - 3.0 E - 3.0 (3.5) S - 3.5 W - 3.0 (4.0)	Y	Fair/Fair	 Trees planted as a group or screen. Moderate form. Stakes still present to some trees. Remove tree stakes or cut to ground level to prevent any future impact on the tree. 	10+	C2
G3	23 no. Golden Ash (Fraxinus excelsior `Jaspidea')	4-8	110 – 250 5.5 – 28.3 1.3 – 3.0	N = 2.0 (3.5) E = 2.0 (3.5) S = 2.0 (3.5) W = 2.0 (3.5)	MA	Fair- Good/Fair- Good	Growing within landscaped strips between hardstanding formed of car park and access road areas. Some have stakes still present adjacent to the trees. One has tree guard embedded to trunk. Dieback in some of the trees. • Monitor condition of trees and manage accordingly. Remove dead wood (dieback) as required. Remove tree stakes or cut to ground level to prevent any future impact on the tree. Remove – as far as possible - embedded tree guard without further damaging the tree.	10+	C2

G4	3 no. Field Maple (Acer campestre), 4 no. Hawthorn (Crataegus spp), 1 no. Crab Apple (Malus spp)	6-12	100 – 278 (2 x 150 mm and 1 x 180 mm diameter stems) 4.5 – 35.0 1.2 – 3.4	$\begin{array}{c} {\sf N}-2.0\\ (3.5)\\ {\sf E}-2.0\\ (3.5)\\ {\sf S}-2.0\\ (3.5)\\ {\sf W}-2.0\\ (3.5)\\ {\sf all\ est}\end{array}$	Y-MA	Fair- Good/Fair- Good	 Trees of moderate form. Occasional Hazel (Corylus avellana) in the group. No preliminary management recommendations at time of survey. 	10+	C2
G5	5 no. White Willow (Salix alba)	16-18	529 (1 x 210 mm, 1 x 260 mm and 1 x 410 mm diameter stems) – 948 (300 mm x 10 diameter stems {mean}) 126.6 - 405.5 6.3 - 11.4	N - 6.5 (7.5) E - 4.5 (8.0) S - 5.0 (7.0) W - 4.0 (6.0)	MA-M	Fair- Good/Poor- Good	Growing in a line set back from car park edge. 1 no. Willow to eastern end of group has large split or crack to centre (base) of tree at junction of trunks. Appears to be starting to split apart and presents a potential risk to the users of the site. Canopies to below 1.5 m above ground level at lowest point, • It is recommended that the Willow within the split to the base is further assessed at the earliest opportunity to confirm its stability and structural integrity. This will guide the future management of this tree: either a significant canopy reduction to remove weight loading on the weakened area or the removal/`coppicing' of the tree and the planting of a suitable replacement.	4 no: 20+ 1 no: Less than 10 - 10+	4 no: B2 1 no: U-C2

G6	5 no. Golden Ash (Fraxinus excelsior `Jaspidea') and 1 no. Birch (Betula spp)	7-10	130 – 240 7.6 – 26.1 1.6 – 2.9	N = 0 (3.5) E = 2.5 (4.0) S = 2.0 (4.0) W = 2.5 (3.5)	MA	Fair- Good/Fair- Good	Trees planted as a group adjacent to car park area. Some Ash are affected (overshaded) by presence of adjacent mature Willows. 1 no. Birch within the group is dead. Canopies below 1.5 m over part of adjacent car park. • Remove dead Birch and retain on site as a dead wood resource.	5 no. Ash – 10+ 1 no. Birch – Less than 10	5 no. Ash – C2 1 no. Birch – U
G7	Several trees including Common Ash (Fraxinus excelsior) Hornbeam (Carpinus betulus) and Field Maple (Acer campestre)	6-14	190 - 310 16.3 - 43.5 2.3 - 3.7	N - 3.0 (5.0) E - 3.0 (5.0) S - 3.0 (5.0) W - 3.0 (5.0) all est	MA	Fair- Good/Fair- Good	Several offsite trees forming a small `wooded' area beyond the existing car park. Damage to several trees – possibly caused by Squirrels. Canopies to over 2.0 m above car park area. • Monitor damage in trees and manage accordingly – including removal of stems or whole tree if required.	10+	C2
G8	3 no. Common Ash (Fraxinus excelsior) and 1 no. English Oak (Quercus robur)	14-22	400 – 626 (2 x 300 mm and 1 x 460 mm diameter stems) 72.4 – 177.3 4.8 – 7.5	N - 5.0 (8.0) E - 5.0 (7.0) S - 5.0 (7.0) W - 5.0 (7.0) all est	Μ	Good/Fair- Good	Growing to either side of ditch to road boundary and adjacent to the site. Amenity value as a group. Some damage in the crowns. Previously pruned. Some are covered in ivy – full inspection of these trees not possible. Understorey of scrub including Common Hawthorn (Crataegus monogyna). • Monitor condition of trees on a regular cycle - as part of risk assessment on the site – due to trees position adjacent to roadway of Brockley Hill.	20+	В2