AGAR GROVE

TREE SURVEY AND IMPACT ASSESSMENT

DECEMBER 2013

HAYDEN'S
Arboricultural Consultants

Document prepared on behalf of the London Borough of Camden (Applicant) by:

HAYDEN'S
Arboricultural Consultants

5 Moseleys Farm Business Centre
Fornham All Saints
Bury St Edmunds
Suffolk
IP28 6JY

T: 01284 765391
W: www.treesurveys.co.uk

HAYDEN'S
Arboricultural Consultants

Tree Survey, Arboricultural Impact Assessment
Preliminary Arboricultural Method Statement & Tree Protection Plan
In Accordance with BS 5837:2012

Proj. No **3743**	**Agar Grove, Camden, London**		
Client:		Grant Associates	
Date of Report:	19/11/2013	Revision:	Original

Tree Survey, Arboricultural Impact Assessment, Preliminary Arboricultural Method Statement & Tree Protection Plan – In Accordance with BS 5837:2012

Summary

The purpose of this report is to provide a preliminary consideration of the arboricultural implications created by the proposed development. In accordance with the feasibility and planning sections of BS5837:2012 *"Trees in relation to design, demolition and construction – Recommendations"*, trees deemed to be within the influencing distance of the projected construction have been evaluated for quality, longevity, and initial maintenance requirements. Where trees do not have to be removed for health and safety reasons, a detailed and objective assessment has been made of the consequences of the intended layout.

In this circumstance it is intended to demolish an existing residential estate before constructing new dwellings with associated access roads along with areas of soft and hard landscaping. As a result seven groups of trees and forty five individual trees were inspected. The arboricultural related implications of the proposal are as follows:

1 It is necessary to fell four individual trees and one group of trees which are of moderate quality and fourteen individual trees and three landscape features which are of low quality/poor longevity in order to achieve the proposed layout.

2 Six individual trees and two landscape features require minor surgery to permit construction space or access. Six individual trees and two landscape features require linear root pruning to facilitate proposed buildings.

3 Six trees have been identified for removal irrespective of any development proposals. The removal of these items coincides with the requirements of the proposed layout.

4 The alignment of six buildings and one change to the alignment of a hard surface nominally intrude within the Root Protection Areas of six individual trees and two groups of trees to be retained. This has only minor influence on the Root Protection Area and as such it is considered appropriate to undertake linear root pruning, thus obviating the need for specialist construction techniques at these locations.

5 Where the alignment of the buildings do not encroach within the Root Protection Areas of any trees that are to be retained, and as assessed in accordance with BS5837:2012, no specialist foundation designs or construction techniques will be required to prevent damage to tree roots. Specialist foundations may still be required for other reasons, including mitigating the influencing distance of tree roots, and as such expert advice should always be sought from a Structural Engineer.

6 The alignment of new hard surfaces encroaches within the Root Protection Area of two individual trees and one group of trees that are to be retained. Furthermore, the replacement of a number of existing hard surfaces will include a rising of the pavement level in order to provide a single level of access across the site. Given the use of modern "no dig" construction techniques this is not considered to be a substantial issue.

7 This report recommends that specialist advice is obtained by expert practitioners in other disciplines. Such input should always be sought prior to the submission of this report in support of a planning application in order to demonstrate that the techniques and methods hereby proposed are achievable. In this particular circumstance it is necessary to contact the following:

- Structural Engineer (foundation design, item 4.4.1 and 4.4.2)
- Civil Engineer ("no dig" surfacing, item 4.4.3)

8 All trees and landscape features that are to remain as part of the development should suffer no structural damage provided that the findings with this report are complied with in full. This includes ensuring that protective fencing is erected and ground protection laid as detailed at items 4.2, 4.5 and 5.1 of this report.

9 Post Planning Permission – Subject to achieving Planning Permission, a detailed Arboricultural Method Statement and Tree Protection Plan will be required. This will include the following: fencing type, ground protection measures, "no dig" surfacing, access facilitation pruning specification, phasing and an extensive auditable monitoring schedule.

Contact Details

Client – Grant Associates			
Address 22 Milk Street Bath BA1 1UT	**Contact** Ms Claire Hobart	**Tel:** **E-mail:**	01225 332664 ch@grant-associates.uk.com

Local Planning Authority – London Borough of Camden Council			
Address Town Hall Judd Road London WC1H 9JE	**Trees Officer** Kevin Fisher	**Tel:** **E-mail:**	0207 9745616 mathias.genet@camden.gov.uk

Arboricultural Consultant – Hayden's Arboricultural Consultants Limited			
Address 5 Moseley's Farm Business Centre Fornham All Saints Bury St Edmunds Suffolk IP28 6JY	**Principal** Stephen Hayden	**Tel:** **E-mail:**	01284 765391 info@treesurveys.co.uk

Contents

1.0 Introduction

1.1 Terms of Reference

1.1.1 Hayden's Arboricultural Consultants Limited has been commissioned by Grant Associates to prepare a Tree Survey, Arboricultural Impact Assessment, Preliminary Arboricultural Method Statement and Preliminary Tree Protection Plan for the existing trees at Agar Grove, Camden, London.

1.1.2 The site survey was carried out on the 12th September 2013. The relevant qualitative tree data was recorded in order to assess the condition of the existing trees, their constraints upon the prospective development and the necessary protection and construction specifications required to allow their retention as a sustainable and integral part of the completed development.

1.1.3 Information is given on condition, age, size and indicative positioning of all the trees, both on and affecting the site. This is in accordance with the British Standard 5837:2012 *Trees in relation to design, demolition and construction - Recommendations.*

1.2 Scope of Works

1.2.1 The survey of the trees and any other factors are of a preliminary nature. The trees were inspected on the basis of the Visual Tree Assessment (VTA) method as developed by Mattheck and Breloer (1994). The trees were inspected from ground level with no climbing inspections undertaken. It is not always possible to access every tree and as such some measurements may have to be estimated. Trees with estimated measurements are highlighted in the schedule of trees. No samples have been removed from the site for analysis. The survey does not cover the arrangements that may be required in connection with the removal of existing underground services.

1.2.2 Whilst this is an arboricultural report, comments relating to non arboricultural matters are given, such as built structures and soil data. Any opinion thus expressed should be viewed as provisional and confirmation from an appropriately qualified professional sought. Such points are clearly identified within the body of the report.

1.2.3 An intrinsic part of tree inspection in relation to development is the assessment of risk associated with trees in close proximity to persons and property. Most human activities involve a degree of risk with such risks being commonly accepted, if the associated benefits are perceived to be commensurate. In general, the risk relating to trees tends to increase with the age of the trees concerned, as do the benefits. It will be deemed to be accepted by the client that the formulation of the recommendations for all tree management will be guided by the cost-benefit analysis (in terms of amenity), of the tree work.

1.3 Documentation

1.3.1 The following documentation was provided prior to the commencement of the production of this report;

- Definition of site boundary
- Description of requirements/deadlines
- Topographical survey/map
- Proposed site layout

2.0 The Site

2.1 Overview

2.1.1 The site is Agar Grove, Camden, London. The site is a small residential estate featuring a number of flats and dwellings with an intricate path network and areas of open space. Trees are scattered sporadically throughout the site. The site is bordered to the north, east and west by a public highway and to the south by a railway line. The site features a number of undulations some of which are quite steep and retained with retaining walls.

2.2 Soils

2.2.1 The soils type commonly associated with this site are slowly permeable and seasonally wet, slightly acid but base-rich loams and clays. They are of moderate fertility and mainly support seasonally wet pastures and woodlands type habitats. This soil type constitutes approximately 19.9% the total English land mass.

2.2.2 The data given was obtained from a desk top study which provides indications of likely soil types. By definition, this information is not comprehensive and therefore any decisions taken with regards the management, usage or construction on site should be based on a detailed soil analysis.

2.2.3 Further to item 2.2.2, this report provides no information on soil shrinkability. It may be necessary for practitioners in other disciplines (e.g. engineers considering foundation design) to obtain this data as required.

2.3 Statutory Tree Protection

2.3.1 The local planning authority London Borough of Camden Council has deemed it appropriate to provide statutory protection to trees on and/or neighbouring this site through the serving of a Tree Preservation Order (TPO), Ref no TPO S9. The effect of this on the owners, managers or any persons wishing to undertake work on preserved trees is to require them to obtain written permission from London Borough of Camden Council prior to actioning any surgery or felling etc. The purpose of this process is to try to ensure that the works are appropriate, proportionate, and in keeping with the long-term aims of the TPO (as expressed in the original TPO statement) but, given that trees are living organisms, and the locality within which they are set is liable to change, it is often the case that local planning authority decisions relating to TPO applications require regular review to reflect the current situation rather than the historical perspective of the original date of protection.

There are certain circumstances where written permission from the local planning authority may not be necessary before undertaking works. These include;

- Making a tree safe if it is an imminent threat to people or property.
- Removing dead wood, or a dead tree.

Owners, managers or any persons wishing to undertake work as an exemption to the written permission process **are required** to provide the local planning authority with 5 days notice prior to attending to a tree which they deem as being dead or dangerous; unless such works are required in an emergency.

It is the tree owner's responsibility to provide proof that the tree was indeed dead or dangerous should this exception be challenged; hence, it is advisable always to request an inspection by the Local Planning Authority prior to carrying out such operations. Furthermore, and even in the event of an emergency situation, there is still a duty to notify the local planning authority that work has been completed including supplying an explanation of the necessity. Failure to comply with the requirements of TPO legislation can lead to a maximum fine of up to £20,000 per tree.

Following our enquiry, the Local Planning Authority did not supply a copy of the schedule or plan identifying which trees are covered under the above order, as such, it has not been possible to identify the protected trees within this report.

3.0 Tree Survey

3.1 As part of this survey a total of forty five individual trees and seven groups of trees have been identified. These have been numbered T001 – T045 and G001 – G007 respectively.

3.2 A topographical survey was provided which showed the position of the trees on site. It should be noted however that topographical surveys are not always comprehensive and sometimes it is considered appropriate to record details of trees and landscape features omitted from or beyond the scope of the plan. If this circumstance occurs, the location of the individual tree or landscape feature is estimated. The position of each tree is shown on the attached drawing no. 3743-D.

3.3 In order to provide a systematic, consistent and transparent evaluation of the trees included within this survey, they have been assessed and categorised in accordance with the method detailed in item 4.3 of *BS 5837:2012 "Trees in Relation to Design, Demolition and Construction - Recommendations"*. For further information, please see the attached Explanatory Notes.

3.4 The detailed assessment of each tree and its work requirements with priorities are listed in the attached Schedule of Trees.

3.5 Several items would benefit from tree surgery or additional investigation, be it for health and safety, cultural, aesthetic, or structural reasons as detailed in the attached Schedule of Trees. Including the trees recommended for felling, the items requiring the **most urgent** intervention are as follows:

Within six months:

G007	Reduce two end trees down to height of two central trees and re-profile.
T044	Fell, grind stump and replace.

3.6 Over and above the general and prudent recommendation that all trees are inspected on an annual basis, the following items have been identified as requiring enhanced monitoring to assess any changes in faults and weaknesses etc as detailed in the Schedule of Trees:

G007	Monitor annually (tight stem unions/basal wounds).
T003	Monitor annually (fungal infection).
T017	Monitor annually (cavities in stem).
T018	Remove snapped and hanging branches. Monitor annually (cavities in stem).
T019	Remove snapped and hanging branches. Monitor annually (cavities in stem).
T040	Monitor annually (excessive epicormic growth).

3.7 In accordance with item 4.2.4 (c) of BS 5837:2012, the items inspected and detailed within this report have been selected for inclusion due to the likely influence of any proposed development on the trees, rather than strictly adhering to the curtilage of the site. However, it must be understood that there may be trees beyond the site and not included in this survey which may exert an influence on the development. Where works for cultural, health and safety, quality of life, or development purposes have been recommended on trees outside the ownership of the site, these can only progress with the agreement of the owner, except where it involves portions of the trees overhanging the boundary.

4.0 Arboricultural Impact Assessment

4.1 The Proposal

4.1.1 In this circumstance it is intended to demolish an existing residential estate before constructing new dwellings with associated access roads along with areas of soft and hard landscaping within the curtilage of the site.

4.2 Access

4.2.1 At various points across the site access is encumbered by the theoretical Root Protection Area (RPA) of trees to be retained. Where the RPA is safeguarded by existing hard surfaces, and from a purely arboricultural perspective, it will not be necessary to install a proprietary temporary load bearing road to protect tree roots. In areas of soft landscaping and where existing hard surfaces are to be removed it will be necessary to install a proprietary temporary load bearing surface to prevent compaction damage to tree roots. This must be installed prior to the start of demolition or construction, immediately after the completion of the necessary tree surgery and the installation of protective fencing. Full details of ground protection, including a phasing and location strategy will be supplied by Hayden's Arboricultural Consultants in the detailed Arboricultural Method Statement & Tree Protection Plan.

4.3 **Demolition**

4.3.1 Demolition of existing structures and the lifting of hard surfaces affects the theoretical RPA of fifteen individual trees and three groups of trees – G004, G005, G007, T005, T011, T017, T018, T021, T022, T023, T024, T025, T029, T030, T033, T038, T039 and T041. In order to prevent damage to these specimens works must only be completed with appropriate machinery or by hand within the calculated RPA and may only commence once protective fencing has been erected. In the proximity of the retained trees, all walls and material must be demolished inwards into the footprint of the building and away from the stems (often referred to as "top down, pull back"). Additionally, all plant and vehicles engaged in demolition should either operate outside the theoretical RPA, or should run on a temporary load baring surface to protect the underlying soil structure. All foundations and hard surfaces within the theoretical RPA are to be broken out with extreme care, either manually or with a breaker and small mini digger (operating outside the RPA, or on the temporary load baring surface).

4.4 **Construction**

4.4.1 Construction of foundations or structural supports marginally encroach within the calculated RPA of the following trees to be retained – G004, G007, T002, T041 and T043. Given the minor extent of the intrusion at these locations and allied to the presence of existing hard surfaces it was agreed with the LPA Trees Officer in an on-site meeting on 2nd October 2013 that linear root pruning as part of the access facilitation pruning (AFP) works would be appropriate in this instance. This operation will obviate the need for arboriculturally imperative specialized foundation construction methods in this situation. However, dependent on the soil type, species and topography, trees may have an influence on the soil beyond their calculated RPA. Given the proximity of the proposed construction to the trees to be retained, it is recommended that a Structural Engineer is consulted to assess the implications of the tree retention on the required foundation depth.

4.4.2 In the on-site meeting with the LPA Trees Officer on 2nd October 2013 it was agreed that root investigation works be undertaken to assess the level of root severance along the proposed foundation alignment within the calculated RPA of the following trees to be retained – T033, T038 and T039. The results of these investigation works found root growth was minimal (Appendix H), as such it has been assessed that linear root pruning as part of the access facilitation pruning (AFP) works would be appropriate in this instance. This operation will obviate the need for arboriculturally imperative specialized foundation construction methods in this situation. However, dependent on the soil type, species and topography, trees may have an influence on the soil beyond their calculated RPA. Given the proximity of the proposed construction to the trees to be retained, it is recommended that a Structural Engineer is consulted to assess the implications of the tree retention on the required foundation depth.

4.4.3 Installation of new hard surfaces encroach within the RPA of seven individual trees and two groups of trees to be retained – T005, T007, T008, T011, T038, T039, T041, G005 and G007. It is intended to raise levels across the site in order to provide level access. Where the raise in levels coincides with the RPA of retained trees, the infringement should be attended to by the use of "no dig" construction methods. In the detailed Arboricultural Method Statement & Tree Protection Plan, Hayden's Arboricultural Consultants will supply a sample design of "no dig" surfacing. However, the exact specification (adhering to the principles the sample design) must be designed by a Civil Engineer. Indicative cross sections have been provided in cross sections supplied to Hayden's by Grant Associates. The exact phasing for installing new hard surfaces within the RPA of retained trees will be supplied by Hayden's Arboricultural Consultants in the detailed Arboricultural Method Statement & Tree Protection Plan.

4.4.4 It is proposed to construct replacement hard surfaces in the RPA of T005, T011, T017, T018, T021, T022, T023, T024, T025, T029, T030, T033, T038, T039, T041, G005 and G007. In this situation hard surfacing already exists. If the process involves top dressing the existing surface there will be no implications for the retained trees. However, if the proposal involves removing the existing hard surface, this must be completed by hand, or with appropriate lightweight machinery under arboricultural supervision. The new hard surfacing must be of similar construction to that which has been removed to prevent any adverse impact on the RPA, and must include a barrier of sharp sand if roots are exposed during the lifting of the original surface.

4.5 Requirement for Tree Barrier Fencing

4.5.1 Prior to the commencement of demolition and immediately after the completion of the necessary tree surgery and felling work, protective fencing will be erected on site. This must be fit for purpose (including any ground protection if necessary) in full accordance with the requirements of BS 5837:2012. Exact positioning has not been included in this report due to the complex nature of the site, however, full details of fencing, based on Peter Brett Associates "Indicative Phases of Construction" drawing no. 28732-C-SK05, will be supplied by Hayden's Arboricultural Consultants in the detailed Arboricultural Method Statement & Tree Protection Plan.

4.6 Compound

4.6.1 The site provides adequate internal space to locate a construction compound outside the RPA of any trees and landscape features that are to be retained.

4.7 Phasing

4.7.1 The proposal involves the integration of a number of complex aspects that affect tree protection (e.g. – but not exclusively – access, movement of materials and the installation of services). For this reason the project must be carefully phased to ensure the highest level of protection for retained trees at all times. As part of the detailed Arboricultural Method Statement & Tree Protection Plan, Hayden's Arboricultural Consultants will produce an in depth arboricultural phasing recommendation, based on Peter Brett Associates "Indicative Phases of Construction" drawing no. 28732-C-SK05, to cover the major arboricultural operations on site as they affect retained trees.

4.8 **Monitoring**

4.8.1 In accordance with item 6.3 of BS 5837:2012, the site and associated development should be monitored regularly by a competent Arboriculturalist to ensure that the arboricultural aspects of the planning permission are complied with. As part of the detailed Arboricultural Method Statement & Tree Protection Plan, Hayden's Arboricultural Consultants will produce an extensive auditable monitoring schedule to assess the progress of key site events/activities.

4.9 **Cultural Implications for Retained Trees**

4.9.1 Moderate. Based on an on-site meeting with the LPA Tree Officer it is understood there is a requirement to ensure branch clearance from proposed buildings are adequate in order to comply with the council's 3 year management cycle. All canopy works have been recommended with this requirement in mind. Details of specific works are listed in the attached Schedule of Works to Permit Development.

4.9.2 Other works to retained trees (not relating to development) are listed on the attached Schedule of Works – Irrespective of Development.

4.10 **Landscape Implications**

4.10.1 In addition to trees and landscape features necessitating removal for health and safety, cultural or quality of life reasons, (as detailed in the attached Schedule of Works - Irrespective of Development) the items listed in the table below require felling to permit the proposed development to proceed:-

Feature No	Reason for Removal	BS * Category	Visual Amenity Assessment*
G001	Conflicts with proposed building.	C2	Low
G002	Conflicts with proposed buildings.	B2	High
G003	Conflicts with proposed new hard surfaces.	C2	Moderate
G006	Conflicts with proposed buildings.	C2	Low
T003	Conflicts with proposed building.	C1	Moderate
T004	Conflicts with proposed building.	C1	Low
T012	Inappropriate relationship with proposed new buildings and hard surfaces/service runs.	B1	High
T013	Conflicts with proposed building.	B1	Moderate
T014	Conflicts with proposed building.	C1	Moderate
T016	Conflicts with proposed building.	C1	Moderate
T019	Conflicts with proposed building.	C1	Moderate
T020	Conflicts with proposed building.	B1	Moderate

T027	Conflicts with proposed building.	C1	Low
T028	Conflicts with proposed new hard surfaces.	C1/U	Low
T031	Conflicts with proposed footpaths.	C1	Moderate
T032	Conflicts with proposed building.	C1	Moderate
T034	Conflicts with proposed building.	C1	Low
T035	Conflicts with proposed building.	C1	Low
T036	Conflicts with proposed new hard surfaces/open space.	C1	Moderate
T040	Conflicts with proposed building.	C1	High
T042	Inappropriate relationship with proposed building.	C1	Moderate
T045	Conflicts with proposed hard surface re-alignment	B1	Moderate

* Please see definitions in the Explanatory Notes attached to this report.

4.11 **Post Development Implications**

4.11.1 A number of trees are located in close proximity to the proposed buildings. In order to maintain appropriate clearances branches will need to be removed on a cyclical basis.

4.11.2 Due to the dynamic nature of trees and their interaction with the environment, their health and structural integrity is liable to change over time. Because of this it is recommended that all trees on or adjacent to the site be inspected on an annual basis.

4.11.3 As stated in BS 5837:2012, regular maintenance of newly planted trees is of particular importance for at least three years during the critical post-planting period and might, where required by site conditions, planning requirements or legal agreement, be necessary for five years or more. Therefore, the designer of the new landscaping should, in conjunction with the landscape design proposals, prepare a detailed maintenance schedule covering this period, and appropriate arrangements made for its implementation.

5.0 Design Advice, Preliminary Arboricultural Method Statement & Tree Protection Plan

5.1 Securing of Tree Structure and Root Protection Areas (RPA)

5.1.1 The trees to be retained will be protected by the use of stout barrier fencing. This fencing will be in accordance with the requirements of BS 5837:2012 including any necessary ground protection. Exact positioning has not been included in this report due to the complex nature of the site, however, full details of fencing, based on Peter Brett Associates “Indicative Phases of Construction” drawing no. 28732-C-SK05, will be supplied by Hayden’s Arboricultural Consultants in the detailed Arboricultural Method Statement & Tree Protection Plan.

5.1.2 All fencing provided for the safeguarding of trees will be erected prior to any demolition or development commencing on the site, therefore ensuring the maximum protection. This fencing, which must have all weather notices attached stating “Construction Exclusion Zone – No Access” will be regarded as sacrosanct and, once erected, will not be removed or altered without the prior consent of the Local Planning Authority.

5.1.3 Where footpaths, access drives, or parking bays are constructed within the RPA of retained trees, careful attention will be paid to the type of surface treatment used in these areas, details of which are given in item 5.8, below. If possible, these should be installed as a final phase of the project, thereby protecting the RPA throughout the major construction phase of the proposed development.

5.1.4 Where fencing is impractical, consideration must be given to other forms of effective above ground tree structure protection. An example of this would be a combination of Barksavers to secure the stems and a temporary load bearing surface to shield the ground.

5.2 Location of Site Office, Compound and Parking

5.2.1 The position of the office, compound and parking will be agreed in writing with the Local Planning Authority prior to commencement of any permitted development works. Any proposed re-location of these items through the various phases of development will be agreed prior to re-siting with the Local Planning Authority.

5.3 On Site Storage of Spoil and Building Materials

5.3.1 Prior to and during all construction works on site, no spoil or construction materials will be stored within the RPA of any tree on, or adjacent to the site, even if the proposed development is to be within the RPA. This is to reduce to a minimum the compaction of the roots of the trees. Details of the RPA for each tree where no spoil or building materials will be stored are indicated on the attached Preliminary Arboricultural Implication Assessment & Tree Protection drawing no. 3743-D. Any encroachment within this protected area will only be with the prior agreement of the Local Planning Authority.

5.3.2 Any facilities for the storage of oils, fuels or chemicals shall be sited on impervious bases and surrounded by impervious bund walls. The volume of the bund compound shall be at least equivalent to the capacity of the tank plus 10%. If there is a multiple tankage, the compound shall be at least equivalent to the capacity of the largest tank, or the combined capacity of interconnected tanks, plus 10%. All filling points, vents, gauges and sight glasses shall be located within the bund. The drainage system of the bund shall be sealed with no discharge to any watercourse, land or underground strata. Associated pipe-work shall be located above ground and protected from accidental damage. All filling points and tank overflow pipe outlets shall be detailed to discharge downwards into the bund.

5.3.3 All material storage facilities and work areas must consider the effects of sloping ground on the movement of potentially harmful liquid spillages towards or into protected areas.

5.4 Programme of Works

5.4.1 All tree surgery works, once approved by the Local Planning Authority, will be carried out prior to any other site works. Once completed, the proposed protective fencing will be erected along the lines indicated above. All of this will be carried out prior to commencement of any development works on the site. Outline details of the proposed programme are given in the Design and Construction and Tree Care flow chart attached (Appendix G-1).

5.5 Tree Surgery

5.5.1 All tree work will be agreed with the Local Planning Authority and will be carried out in line with BS 3998:2010 (Recommendations for Tree Works). An arboricultural contractor approved by the Local Planning Authority will carry out the work. Any alterations to the proposed schedule of works will be agreed with the Local Planning Authority prior to commencement of works.

5.6 Levels

5.6.1 Other than for any specific exception which may be referred to at item 4.4, no alterations to soil levels within the RPA of retained trees are envisaged. However, if it is necessary for these to occur, appropriate measures must be taken to prevent or minimise any detrimental effects on the affected root systems as detailed in 5.6.2 and 5.6.3 below.

5.6.2 If it is necessary to excavate so close to trees that roots greater than 50mm diameter are likely to be encountered, particular care will be taken to avoid damage. Excavation in these areas will be undertaken by hand or using an air spade, avoiding any damage to the bark. The roots will be surrounded with sharp sand prior to the replacing of any soil or other material in the vicinity.

5.6.3 If it is necessary to raise levels, it is essential that adequate supplies of water and oxygen through the soil to the trees' roots. Therefore, where necessary, a granular material will be used which will not inhibit gaseous diffusion. Possible options are no-fines gravel, cobbles or, Type 2 road-stone. All hard surfaces will be of suitable specification to allow such gaseous diffusion, e.g. brick pavers.

5.7 Services

5.7.1 Within Grant Associates drawing no. 377-AL-RT-2-(005, 006, 007 and 011), a service trench is shown to run along the edge of the proposed building line. It is proposed that linear root pruning as described at items 4.4.1 and 4.4.2 above will allow installation of these services within the RPA of retained trees.

5.7.2 Beyond the items discussed at item 5.7.1 above it is understood from a phone conversation with Claire Hobart of Grant Associates that all underground service runs will be placed outside the RPA of the trees on or adjacent to the site. If it is not possible to do this, the proposed length infringing the RPA will be hand dug 'broken trenches' (NJUG 4 paragraph 4) to ensure the maximum protection of the trees' roots. The trenches may also be excavated using an air spade, or trenchless technology can be employed if this methodology is considered appropriate by the relevant service company (thus allowing services to pass below and through the roots without the need for traditional excavation). If it is necessary to cut any small roots as part of any of these processes, they should to be severed in such a way as to ensure that the final wound is as small as possible and free from ragged, torn ends.

5.7.3 All routes for overhead services will aim to avoid the trees. Where this is not possible, any tree work will be agreed prior to commencement with the Local Planning Authority.

5.7.4 All service providers (Statutory Authorities) will be consulted prior to commencement of works with the aim of minimising the number of service runs on the site.

5.7.5 All service runs/trenches where they encroach within the RPA of retained trees will be agreed with the Local Planning Authority prior to commencement of works.

5.8 Hard Surface Types & Construction within the Root Protection Area

5.8.1 Where it is necessary to construct footpaths, driveways, non adoptable roads, and other hard surfaces within the RPA as calculated in accordance with BS 5837:2012 (item 4.6.1), it is proposed that the design will comply with the 'no-dig' principles of the Arboricultural Advisory Information Services (AAIS) Practice Note 12 "*Through the Trees to Development*" - the only difference being that instead of a geo-grid, a geo-textile base is provided, and the no-fines road stone is incorporated in and retained by a geo-web cellular confinement system. Given the individual requirements of each site, it is essential that a specialist engineer is consulted to specify the construction detail. Where it is necessary to remove any existing hard surface, or lower the ground level within the RPA, this may expose roots. This operation must be undertaken using hand tools or an air spade. Any roots found should be treated with the greatest care and surrounded by sharp sand to provide a level base. Please note that 'no-dig' surfaces are not always considered acceptable for adoption.

5.8.2 Where it is shown that the construction of a boundary wall or dwelling encroaches within the RPA of a retained tree, the foundations of the wall or dwelling will be designed in such a manner so as to minimise the detrimental affect of the construction on the tree's roots. In these situations any excavations within the RPA of an affected tree will only be undertaken following exploration of the existing root system with an air spade (or by hand digging if soil conditions preclude) and the necessary root pruning undertaken to allow excavation without unnecessary pulling and tearing of the roots to be retained. This will ensure minimal damage to tree roots where pad and beam or cantilever foundations are considered appropriate. Should a piling rig be required to create piles, any access facilitation pruning or felling necessary to allow access must be undertaken before the commencement of works and only with prior consent of the Local Planning Authority.

5.8.3 If boundary fencing is to be erected within the RPA of retained trees, it is proposed that the fence posts will be secured by the use of "Met-Posts" or similar design in order to keep the disturbance and damage of the roots of the trees to a minimum.

5.9 Reporting and Monitoring Procedures

5.9.1 In accordance with item 6.3 of BS 5837:2012, the site and associated development should be monitored regularly by a competent arboriculturalist to ensure that the arboricultural aspects of the planning permission (e.g. the installation and maintenance of protective measures and the supervision of specialist working techniques) are implemented. Furthermore, regular contact between the Site Manager and the Arboriculturalist allows them to effectively deal with and advise on any tree related problems that may occur during the development process. This system should be auditable. Should any issues arise during the arboricultural monitoring of the development the Arboriculturalist will contact the Local Planning Authority and appropriate action taken only with the prior permission of Grant Associates and the Local Planning Authority.

6.0 Recommendations

6.1 It is recommended that the measures outlined in this report are implemented in full to provide retained trees with the highest level of protection during the process of demolition and construction.

6.2 Subject to achieving Planning Permission, it is recommended that a detailed Arboricultural Method Statement & Tree Protection Plan should be provided. This will include the following: fencing type, ground protection measures, “no dig” surfacing, access facilitation pruning specification, project phasing and an extensive auditable monitoring schedule.

6.3 Tree surgery should be completed as detailed in the Schedule of Trees. Where this has been identified for reasons other than to permit development, this work should be completed within the advised timescales irrespective of any development proposals.

6.4 The tree surgery works proposed as part of this Survey are recommended to mitigate any identified problems that may be caused by trees in close proximity to the proposed development. To this end, should these recommendations be overruled, this Survey stands as the opinion of Hayden’s Arboricultural Consultants Limited, and therefore any damage or injury caused by trees recommended by this practice for felling or tree surgery works, to which the proposed schedule of works has been altered or the tree has been requested to be retained by the Local Planning Authority, cannot be the responsibility of this practice.

7.0 Limitations & Qualifications

Tree inspection reports are subject to the following limitations and qualifications.

General exclusions

Unless specifically mentioned, the report will only be concerned with above ground inspections. No below ground inspections will be carried out without the prior confirmation from the client that such works should be undertaken.

The validity, accuracy and findings of this report will be directly related to the accuracy of the information made available prior to and during the inspection process. No checking of independent third party data will be undertaken. Hayden's Arboricultural Consultants Limited will not be responsible for the recommendations within this report where essential data are not made available, or are inaccurate.

This report will remain valid for one year from the date of inspection, but will become invalid if any building works are carried out upon the property, soil levels altered in any way close to the property, or tree work undertaken. It must also be appreciated that recommendations proposed within this report may be superseded by extreme weather, or any other unreasonably foreseeable events.

If alterations to the property or soil levels are carried out, or tree work undertaken, it is strongly recommended that a new tree inspection be carried out.

It will be appreciated, and deemed to be accepted by the client and their insurers, that the formulation of the recommendations for the management of trees will be guided by the following:-

1. The need to avoid reasonable foreseeable damage.
2. The arboricultural considerations - tree safety, good arboricultural practice (tree work) and aesthetics.

The client and their insurers are deemed to have accepted the limitation placed on the recommendations by the sources quoted in the attached report. Where sources are limited by time constraints or the client, this may lead to an incomplete quantification of the risk.

Signed:

November 2013……
For and on Behalf of Hayden's Arboricultural Consultants Limited

9.0 References

British Standards Institute. (2010). *Recommendations for Tree Work BS 3998:2010* BSI, London.

British Standards Institute. (2012). *Trees in Relation to Design, Demolition and Construction – Recommendations BS5837:2012* BSI, London.

Tree Preservation Orders, A Guide to the Law and Good Practice (2005). Department for Communities and Local Government

Mattheck & Breloer H. (1994). *Research for Amenity Trees No.4: The Body Language of Trees*, HMSO, London.

NHBC Standards (2007) *Chapter 4.2 'Building Near Trees'*. National House-Building Council.

NJUG 4 Guidelines for the planning, installation and maintenance of utility apparatus in proximity to trees. Issued 16 November 2007.

Patch D. Holding B. (2006) *Arboricultural Practice Note 12 (APN12)*, *Through the Trees to Development.* Arboricultural Advisory and Information Service (AAIS).

Lonsdale D. (1999). *Research for Amenity Trees No 7: Principles of Tree Hazard Assessment and Management*, HMSO, London.

9.0 Appendices

Appendix	**A**	Species List & Tree Problems
Appendix	**B**	Schedule of Trees
Appendix	**C**	Schedule of Works - Irrespective of Development
Appendix	**D**	Preliminary Schedule of Works to Allow Development
Appendix	**E**	Explanatory Notes
Appendix	**F**	Tree Preservation Order Enquiry/Response
Appendix	**G**	Advisory Information & Sample Specifications

1. BS 5837:2012 Figure 1 - Flow Chart – Design and Construction & Tree Care
2. European Protected Species and Woodland Operations Decision Key to aid planning of woodland operations and protecting EPS (v.1)
3. BS 5837:2012 Figure 2 - Default specification for protective barrier
4. BS 5837:2012 Figure 3 - Examples of above-ground stabilizing systems
5. Air Spade Specification
6. Picus Sonic Tomograph

Appendix	**H**	Root Investigation Results
Appendix	**I**	3D Picus
Appendix	**J**	Drawing No 3743-D

Appendix A - Species List & Tree Problems

Species List:

Ash	*Fraxinus excelsior*
Birch sp	*Betula sp*
Cotoneaster	*Cotoneaster sp.*
Goat Willow	*Salix caprea*
Hawthorn	*Crataegus monogyna*
Hornbeam	*Carpinus betulus*
Horse Chestnut	*Aesculus x hippocastanum*
Lime sp.	*Tilia sp.*
London Plane	*Platanus x hispanica*
Manna Ash	*Fraxinus ornus*
Norway Maple	*Acer platanoides*
Ornamental Conifer	
Prunus sp.	*Prunus sp.*
Robinia	*Robinia pseudoacacia sp.*
Rowan	*Sorbus aucuparia*
Silver Birch	*Betula pendula*
Snowy Mespilus	*Amelanchier lamarckii*
Sycamore	*Acer pseudoplatanus*
Weeping Ash	*Fraxinus excelsior 'Pendula'*
Whitebeam	*Sorbus aria*
Willow sp.	*Salix sp.*

Tree Problems:

This gives a brief description of the problems identified in the attached Tree Survey.

Name: **Basal Suckers**	
Symptoms/Damage Type:	A profusion of shoots emanating from the base of the main stem close to ground level. Several species of trees but most notably Limes produce suckers as part of their naturalised habit however in some species this can be an indicator of elevated stress upon the tree.
Consequence:	Suckers do not cause direct harm to the tree in their self however they can be problematic where they impede free use of space such as where a tree is adjacent to a footpath or roadway. Where suckers are established they can impede visibility of the basal area of the stem and prevent identification of more significant defects such as decay cavities or fungal growths. If left unchecked the suckers can establish to become large limbs in their own right and spoil the form of the tree and presenting issues for future management as removal would leave large wounds around the stem base providing opportunity for ingress of decay.
Control Measures:	Regular pruning away of new sucker growth is recommended to prevent the development of the issues mentioned above dependent upon the implications and the trees location.

Name: **Deadwood**	
Symptoms/Damage Type:	This relates to dead branches in the crown of the tree. In the majority of cases, this is caused by the natural ageing process of the tree or shading due to its close proximity to neighbouring trees. However, in some situations, it may be related to fungal, bacterial or viral infection.
Consequence:	Depending upon the location and mass of dead wood removal of the affected tissue may be necessary to prevent harm to persons or property as the wood will become unstable as it decays and in some circumstances is likely to fall from the tree with little or no warning.
Control Measures:	Detailed monitoring should be undertaken on those trees showing signs of excessive deadwood production to identify the underlying cause.

Name: **Epicormic growth**	
Symptoms/Damage Type:	This is the production of numerous shoots on the main stem and branches of the tree. They are produced by the bursting into life of otherwise dormant buds. It is commonly associated with elevated levels of stress on the tree.
Consequence:	Whilst epicormic growth is usually symptomatic of an issue elsewhere within the tree heavy proliferation can cause the trees resources to become depleted or may mask significant structural weaknesses within the framework of the tree.
Control Measures:	Pruning off epicormic growth may be necessary to improve the visual amenity of the tree or prevent the development of a hazard or obstruction. No direct means of prevention are available other than therapeutic measures to alleviate stresses on the tree.

Appendix B

Schedule of Trees

SCHEDULE OF TREES (AIA) Agar Grove, Camden, London,

Surveyed By: Stephen Bones Date: 12/09/2013
Managed By: Stephen Bones

TreeNo / On site	Species	DBH / Min Dist / RPA (m²)	Height: Crown Base / Aspect	Height: Lowest Branch / Aspect	Visual / Age / SULE	Crown Spread / Water Demand / Ground Cover	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
G001	Ornamental Conifer x3	150	7		Low	N2, E2, S2, W2	No significant indicators of decay or disease. Low quality items growing close to buildings. Located in gardens with no access. All dimensions estimated.	C2	No works required.	4	Fell and grind stumps	0
Yes		1.8	1		SM	High						
		10.2			3	Bare Earth						
G002	London Plane x3	660	18		High	N7, E7, S6, W5.5	Group of three early mature trees located in a thin island of open space surrounded by tarmac and hard surfaces. Trees are of reasonable condition having a history of being heavily reduced on a cyclical basis. Northern most tree features a surface root emerging from ground level to the eastern aspect running north before deviating and returning to the ground. The southern most tree is growing directly adjacent to a fence post and this stem is starting to consume the fence. A lamp column is adjacent to this feature. There is evidence of a few small cavities within the crowns at old reduction points. Roots appear to be lifting the adjacent kerb stones and tarmac in the car parking area and adjacent footpath. Overall trees are of moderate quality.	B2	No works required.	4	Fell and grind stumps	0
Yes		7.92	4.5		EM	High						
		197.1			2	Tarmac						
G003	Birch sp. X3	160	6		Moderate	N2, E2, S2, W2	No significant indicators of decay or disease. A few small bark wounds present. Located in planting pits.	C2	No works required.	4	Fell and grind stumps	0
Yes		1.92	2		Y	Moderate						
		11.6			2	Tarmac						

TreeNo On site	Species	DBH Min Dist RPA (m^2)	Height Crown Base Aspect	 Lowest Branch Aspect	Visual Age SULE	Crown Spread Water Demand Ground Cover	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
G004	London Plane x11	800	16		Moderate	N6, E6, S4.5, W6	Group of eleven London Plane located behind a large fenced enclosure to the eastern aspect and a school nursery to the western aspect with no access to stems. All trees appear to be in reasonable condition although have a history of being regularly topped at approximately 13 to 14 metres. There is good re-growth visible from the reduction points. Trees are located adjacent to a large wall adjacent to a railway line. Overall trees provide a skyline feature to this aspect of the site. The tarmac played area extends into the root zone of the trees.	B2	No works required.	4	Reduce canopy spread of two eastern most trees by 2m to the north to leave a crown spread 4m back from the stem. Undertake linear root pruning along alignment shown on drawing no. 3743-D	0
Yes		9.6	4.5		M	Moderate						
		289.5			1	Bare Earth						
G005	London Plane x3	770	22		High	N6, E6, S4.5, W6	A group of three trees located to the eastern boundary. Trees feature long extended limbs, particularly over the adjacent highway and residential dwelling. Canopies appear to have good vigour and leaf colour.	B2	Undertake a reduction of the canopy by 3m in all directions, paying particular attention to extended limbs over the road and house.	3		
Yes		9.24	6		M	High						
		268.2			1	Grass						
G006	Cotoneaster x4, Prunus sp. X1	140	6		Low	N3, E4, S3, W2.5	Group of five trees located in an area of open space which comprises of block paving and a number of small tree planting pits. Trees are all of poor form growing adjacent to a building has resulted in asymmetric crowns. Trees have been regularly pruned to provide clearance. Overall they are a landscape feature of poor quality.	C2	No works required.	4	Fell and grind stumps	0
Yes		1.68	2		EM	Moderate						
		8.9			3	Concrete						

TreeNo	Species	DBH	Height		Visual	Crown Spread	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
On site		Min Dist	Crown Base	Lowest Branch	Age	Water Demand						
		RPA (m^2)	Aspect	Aspect	SULE	Ground Cover						
G007	Lime sp. X4	580	20		High	N5.5, E5.5, S5.5, W5.5	Group of four early mature specimens located adjacent to the northern site boundary directly adjacent to public highway. Trees have a history of being reduced with good vigorous re-growth present on the stems and reduction points. The eastern most tree features three stems from approximately 3.5 metres. These stems are tightly compacted together and feature large volumes of bark occlusion. The western most tree features basal wounds to the southern aspect. The two central trees are much smaller and feature no significant defects. It is recommended that the two end trees are reduced to the height of the two inner trees to reduce their sail area and wind loading on weak stems.	C2	Reduce two end trees down to height of two central trees and re-profile (priority 2). Monitor annually - tight stem unions/basal wounds. (priority 3).	2	Reduce canopy spread by 2.5m in all directions to leave a crown spread of 3m from stem. Reduce two end trees down to height of two central trees. Undertake linear root pruning along alignment as shown in drawing no. 3743-D	0
Yes		6.96	3.5		EM	Moderate						
		152.2			3	Tarmac						
T001	Sycamore	600	17		Moderate	N4, E4, S4, W4	Early mature specimen located in a compound which is padlocked. As such no access is possible to the stem of the tree. Survey has been undertaken from the adjacent car park approximately 30 metres away. To this end, all dimensions have been estimated. The tree has a history of being topped at approximately 15 metres with abundance of re-growth at the reduction points. Overall a low quality item.	C1	No works required.	4		
Yes		7.2	4	5	EM	Moderate						
		162.9		S	3	Bare Earth						

TreeNo On site	Species	DBH Min Dist RPA (m^2)	Height Crown Base Aspect	 Lowest Branch Aspect	Visual Age SULE	Crown Spread Water Demand Ground Cover	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
T002	Robinia	400	15		Moderate	N4, E6.5, S6, W4	Early mature specimen located in a compound which is padlocked, as such, no access is possible and the survey has been undertaken from the adjacent car park. To this end all dimensions have been estimated. It is unclear whether this is a twin stemmed specimen or two individual trees, however, the two stems form a homogenous canopy. The branches are abrading the adjacent building. The upper canopy appears to have a history of being reduced which has resulted in poor form. Overall this appears to be low quality item.	C1	No works required.	4	Reduce canopy spread to the east by 3m. Undertake linear root pruning as shown on drawing no. 3743-D	0
Yes		4.8	3	5	EM	Moderate						
		72.4		S	3	Bare Earth						
T003	Whitebeam	480	9		Moderate	N4.5, E4.5, S5, W4.5	Early mature specimen located in the very small island of soil, completely surrounded by tarmac. An old pruning wounds at 2.5 metres to the western aspect features a fungal pathogen, although given its decayed state identification is not possible. Scaffold limb to the northern aspect at 3.5 metres features a one metre long cavity with exposed heartwood which appears decayed with insect bore holes evident. A lamp column is located to the south western aspect. Roots are visibly lifting the adjacent concrete parking. Overall a low quality item.	C1	Monitor Annually (Fungal infection).	3	Fell and grind stump	0
Yes		5.76	3	2	EM	Moderate						
		104.2		S	3	Tarmac						
T004	Amelanchier	80	3.5		Low	N1.5, E1.5, S1.5, W1.5	Individual Tree. Stakes still present.	C1	Remove stake and tie.	3	Fell and grind stump	0
Yes		0.96	2	1.5	Y	Moderate						
		2.9		S	2	Tarmac						
T005	Whitebeam	450	11		Moderate	N5, E5, S6, W3	Group Tree. Tree features minor defects. Compacted root area. Tight stem unions. Asymmetric crown. Poor form.	C1	No works required.	3		
Yes		5.4	2.5	2	EM	Moderate						
		91.6		SE	3	Tarmac						

TreeNo On site	Species	DBH Min Dist RPA (m^2)	Height Crown Base Aspect	 Lowest Branch Aspect	Visual Age SULE	Crown Spread Water Demand Ground Cover	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
T006	Hornbeam	450	16		Moderate	N6, E6, S6, W6	Group Tree. Tree features significant defects. Girdling roots. Twin stemmed form. Tight stem unions. Large ribs beneath union. Roots lifting kerbs/tarmac.	U	Fell and grind stump and replace.	3		
Yes		5.4	3.5	2.5	EM	Moderate						
		91.6		NE	4	Tarmac						
T007	Willow sp.	270	10		Low	N5.5, E5, S4, W4	Open Grown Tree. Tree features minor defects. Minor deadwood. Bark wound from ground level up to 2 metres NE aspect. A tree of low quality.	C1	No works required.	4		
Yes		3.24	1	2.5	SM	High						
		33		NE	3	Grass						
T008	London Plane	770	16		Moderate	N6.5, E7.5, S6.5, W6.5	Individual Tree. No indicators of disease/decay/structural defects. Regularly reduced. Adjacent large wall/railway line. A tree with material conservation value.	B1	No works required.	4		
Yes		9.24	4.5	3.5	M	High						
		268.2		W	2	Grass						
T009	Norway Maple	500	15		Moderate	N6.5, E6.5, S6.5, W6.5	Early mature specimen located in the grounds of a nursery. Tree is located within a fenced area featuring raised ground, as such it has not been possible to gain access to the stem. The survey has been undertaken from an adjacent area of open space. Tree appears to be in reasonable condition although has a history of being reduced and at the last reduction appears to have been undertaken within the last two growing seasons. Tree appears to feature good vitality. Beyond this it is not possible to assess the stem for any defects. Shed located under the canopy to the western aspect. Level changes of approximately 1 metre in height. A tree of moderate quality but one which is going to require enhanced cyclical maintenance. To this end its safe useful life expectancy has been reduced.	C1	No works required.	4		
Yes		6	3.5	3	EM	Moderate						
		113.1		N	2	Mixed soft/hard surface						

TreeNo	Species	DBH	Height		Visual	Crown Spread	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
On site		Min Dist	Crown Base	Lowest Branch	Age	Water Demand						
		RPA (m^2)	Aspect	Aspect	SULE	Ground Cover						
T010	Goat Willow	250	8		Low	N5, E5, S4, W3	Open Grown Garden Tree. Tree features minor defects. Multi stemmed form. Tight stem unions. Poor form. Located in garden. No access. All dimensions estimated. Removal would benefit current site use.	U	Fell to ground level.	3		
Yes		3	1	2	SM	High						
		28.3		E	4	Bare Earth						
T011	London Plane	500	16		Moderate	N7, E7, S7, W7	Open grown tree located in a raised bed. This is situated in a fenced off play area which has been locked up resulting in no access to the internal area. The tree has been assessed from the adjacent footpath. The tree has a history of being reduced. There is good vigour on the regrowth and there appears to be no structural defects evident on the stem or scaffold limbs. Branches to the south eastern aspect grow close to an adjacent lamp column. Overall a tree of moderate quality.	B1	No works required.	4		
Yes		6	2.5	4	EM	High						
		113.1		W	2	Grass						
T012	London Plane	1400	27		High	N11, E10, S6.5, W7	Individual Tree. Tree features minor defects. Epicormic growth. High canopy. History of being reduced. Close to building. Branches extend over roof. A tree of moderate quality.	B1	Undertake a reduction back to previous points on a bi-annual basis.	3	Fell and grind stump	0
Yes		15	7	13	M	High						
		706.9		E	2	Grass						
T013	Sycamore	290	11		Moderate	N4.5, E4.5, S4.5, W5	Open Grown Tree. Tree features minor defects. Leaning stem. Poor form. Wounds on stem with exposed heartwood. Located on mound. History of being reduced. A tree of low quality.	B1	No works required.	4	Fell and grind stump	0
Yes		3.48	3	2.5	SM	Moderate						
		38		S	3	Grass						

TreeNo	Species	DBH	Height		Visual	Crown Spread	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
On site		Min Dist	Crown Base	Lowest Branch	Age	Water Demand						
		RPA (m^2)	Aspect	Aspect	SULE	Ground Cover						
T014	London Plane	790	17		Moderate	N7.5, E6, S5, W7	Open Grown tree located on a mound. Tree features significant defects. Swelling of stem at 1m. Two large cavities on main stem at approximatly 4-5m. History of reductions. Stem leans slightly to the northern aspect. Three Picus scans were undertaken at 5cm, 50cm and 150cm to investigate the swelling of the stem. This was found to contain alarge cavity extending down into the root bowl, but not connected to the decay above 3m. Results are included in the attached report.	C1	Reduce crown by 5m in height and re-profile.	3	Fell and grind stump	0
Yes		9.48	2	6	EM	High						
		282.3		E	3	Grass						
T015	Ash	190	6		Low	N3.5, E3.5, S2, W2.5	Individual Tree. Twin stemmed form. Self set. Adjacent fence. Poor quality tree. Removal would benefit current site use.	U	Fell and poison stump.	3		
Yes		2.28	0	0	SM	Moderate						
		16.3			4	Bare Earth						
T016	Lime sp.	400	11		Moderate	N4.5, E4.5, S5, W3	Individual Tree. Tree features minor defects. Compacted root area. Bark wounds. History of being reduced. Located in small tree pit. An unremarkable tree of very limited merit	C1	No works required.	4	Fell and grind stump	0
Yes		4.8	3.5	3.5	SM	Moderate						
		72.4		NW	3	Mixed soft/hard surface						
T017	Lime sp.	380	11		Moderate	N5, E4, S4.5, W4	Early mature specimen located in a small 1.5 metre squared planting pit which is heavily compacted located adjacent to area of car parking and has hard surfaces around the entire circumference. A large wound extends from ground level to a height of approximately 2.5 metres. To the eastern aspect of the stem there is good callus growth around the perimeter of the wound however the internal heartwood is starting to become decayed. The tree has a history of being reduced with being slightly suppressed to the eastern aspect by an adjacent tree. Overall a tree which is of moderate visual amenity but has no long term potential. This is reflected in its BS categorisation.	C1	Monitor Annually (Cavities in stem).	3		
Yes		4.56	2	3	SM	Moderate						
		65.3		E/W	3	Mixed soft/hard surface						

TreeNo	Species	DBH	Height		Visual	Crown Spread	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
On site		Min Dist	Crown Base	Lowest Branch	Age	Water Demand						
		RPA (m^2)	Aspect	Aspect	SULE	Ground Cover						
T018	Lime sp.	290	9		Moderate	N4.5, E4, S3.5, W2	Individual Tree. Tree features minor defects. Long linear wound to western aspect of stem extending from ground level to a height of 2 metres. Good callus growth around perimeter of wound however internal wood is decayed. Canopy features snapped and hanging branches. Canopy to western aspect is being suppressed by adjacent tree. Overall a poor quality item.	C1	Remove snapped and hanging branches. Monitor Annually (Cavities in stem)	3		
Yes		3.48	2		SM	Moderate						
		38		E	3	Mixed soft/hard surface						
T019	Lime sp.	430	12		Moderate	N6, E6, S5, W5	Semi mature specimen located in a small tree pit approximately 1.5 metres squared. A single stem emerges from ground level and features a large linear wound extending from just above ground level to a height of 2 metres. Good callus growth around perimeter of wound however internal wood appears decayed. Upper canopy appears structurally sound although there is major deadwood and dead hanging branches in the canopy. Basal suckers to western aspect of stem. Overall a tree of moderate visual amenity however is structurally compromised and this is reflected in its BS categorisation.	C1	Remove snapped and hanging branches. Monitor Annually (Cavities in stem).	3	Fell and grind stump	0
Yes		5.16	3.5	3.5	SM	Moderate						
		83.6		S	3	Mixed soft/hard surface						
T020	London Plane	500	13		Moderate	N7.5, E6.5, S8, W7	Open Grown Tree. No indicators of disease/decay/structural defects. Located in 1.5 x 1.5 metre planting pit surrounded by hard surface. A tree of moderate quality.	B1	No works required.	4	Fell and grind stump	0
Yes		6	3	2	SM	Moderate						
		113.1		N	3	Mixed soft/hard surface						
T021	London Plane	420	12		Moderate	N4.5, E3.5, S4.5, W4.5	Open Grown Tree. No indicators of disease/decay/structural defects. Regularly reduced. Located in small planting pit. A tree of moderate quality.	B1	No works required.	4		
Yes		5.04	4	3	SM	Moderate						
		79.8		W	1	Tarmac						

TreeNo	Species	DBH	Height		Visual	Crown Spread	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
On site		Min Dist	Crown Base	Lowest Branch	Age	Water Demand						
		RPA (m^2)	Aspect	Aspect	SULE	Ground Cover						
T022	London Plane	420	12		Moderate	N4.5, E5, S4, W3	Open Grown Highways Tree. No indicators of disease/decay/structural defects. Regularly reduced. Located in small planting pit. A tree of moderate quality.	B1	No works required.	4		
Yes		5.04	4	2	SM	Moderate						
		79.8		E	1	Tarmac						
T023	Lime sp.	270	11		Moderate	N3.5, E5, S4.5, W5.5	Highways Tree. No indicators of disease/decay/structural defects. Located in small planting pit. A tree of moderate quality.	B1	No works required.	4		
Yes		3.24	1	2	SM	Moderate						
		33		NW	2	Tarmac						
T024	London Plane	420	12		Moderate	N3.5, E3.5, S4.5, W4	Highways Tree. No indicators of disease/decay/structural defects. Located in small planting pit. Regularly reduced. A tree of moderate quality.	B1	No works required.	4		
Yes		5.04	3.5	3	SM	Moderate						
		79.8		W	2	Concrete						
T025	Lime sp.	360	11		Moderate	N5, E5, S5, W4	Highways Tree. No indicators of disease/decay/structural defects. Located in small planting pit. Small cavities at old pruning wounds on scaffold limbs. A tree of moderate quality.	B1	No works required.	4		
Yes		4.32	2.5	2	SM	Moderate						
		58.6		W	2	Concrete						
T026	Rowan	140	3		Low	N2, E1.5, S1, W1.5	Open Grown Tree. Tree features significant defects. Leaning stem. Lack of vigour. 1M high retaining wall to western aspect. Tree in significant and irreversible decline.	U	Fell to ground level.	3		
Yes		1.68	1.5	2	SM	Moderate						
		8.9		N	4	Grass						
T027	Hornbeam	130	3.5		Low	N2, E1.5, S2.5, W1.5	Open Grown Tree. No indicators of disease/decay/structural defects. 1 metre high retaining wall to western aspect. A young tree with future potential	C1	No works required.	4	Fell and grind stump	0
Yes		1.56	0	0	SM	Moderate						
		7.6		S	1	Grass						
T028	Ash	260	11		Low	N2.5, E2.5, S2.5, W2.5	Individual Tree. Tree heavily reduced. Is of poor form/low quality.	C1/U	No works required.	4	Fell and grind stump	0
Yes		3.12	3	2.5	EM	Moderate						
		30.6		S	4	Bare Earth						
T029	Lime sp.	270	12		Moderate	N4.5, E4.5, S3, W4	Open Grown Tree. Tree features minor defects. Contorted growth. Bark wounds. A tree without conservation or cultural value.	C1	No works required.	4		
Yes		3.24	2	3.5	SM	Moderate						
		33		W	2	Grass						

TreeNo On site	Species	DBH Min Dist RPA (m^2)	Height Crown Base Aspect	 Lowest Branch Aspect	Visual Age SULE	Crown Spread Water Demand Ground Cover	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
T030	Rowan	360	12		Moderate	N5.5, E5.5, S4, W5.5	Open Grown Tree. No indicators of disease/decay/structural defects. SULE low due to mature age.	C1	No works required.	4	Crown lift to 3m	0
Yes		4.32	2.5	2.5	M	Moderate						
		58.6		SW	3	Grass						
T031	Manna Ash	320	7		Moderate	N4, E4, S3.5, W4	Open Grown Tree. Poor form. Lack of vigour. A tree without conservation or cultural value.	C1	No works required.	4	Fell and grind stump	0
Yes		3.84	2.5	2	SM	Moderate						
		46.3		S	3	Grass						
T032	Silver Birch	160	11		Moderate	N2.5, E3, S2.5, W2	Open Grown Tree. No indicators of disease/decay. Twin stemmed form. Poor form. Stakes and ties still present. An unremarkable tree of very limited merit.	C1	Remove stake and tie.	3	Fell and grind stump	0
Yes		1.92	1.5	2.5	SM	Moderate						
		11.6		N	2	Grass						
T033	Lime sp.	590	17		High	N3, E4, S4, W2	Open Grown Tree. Tree features minor defects. Leaning stem. Regularly reduced. Adjacent highway. Concrete consumed by stem. A tree of low quality.	C1	No works required.	4	Reduce canopy spread to the south by 2m, to leave a crown spread of 2m to the south Reduce height by 4m to leave a height of 13m. Undertake linear root pruning along alignment shown on drawing no. 3743-D	0
Yes		7.08	3.5	3.5	M	Moderate						
		157.5		W	3	Mixed soft/hard surface						
T034	Silver Birch	130	4.5		Low	N3, E3, S3, W3	No indicators of disease/decay/structural defects. Top snapped out. Poor form. A tree of low quality.	C1	No works required.	4	Fell and grind stump	0
Yes		1.56	0	0	Y	Moderate						
		7.6		N	3	Bare Earth						
T035	Silver Birch	100	4.5		Low	N2.5, E2.5, S2.5, W2.5	Individual Tree. A young tree with future potential.	C1	No works required.	4	Fell and grind stump	0
Yes		1.2	1	1	Y	Moderate						
		4.5		N	1	Bare Earth						
T036	Silver Birch	150	8		Moderate	N4, E4, S4, W4	Individual Tree. No indicators of disease/decay/structural defects. No defined leader. Poor form. A tree of low quality.	C1	No works required.	4	Fell and grind stump	0
Yes		1.8	2	2	SM	Moderate						
		10.2		N	3	Block Paving						

TreeNo	Species	DBH	Height		Visual	Crown Spread	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
On site		Min Dist	Crown Base	Lowest Branch	Age	Water Demand						
		RPA (m^2)	Aspect	Aspect	SULE	Ground Cover						
T037	Ash	610	15		Moderate	N5, E4, S4, W3	Mature specimen which has a history of being managed as a pollard. Tree is located in a small pit which formerly had a brick wall around it although this has partially collapsed. The tree is surrounded by hard surfaces. Stem features a number of bark wounds with decay evident at 2.5 metres. The upper canopy has a history of being reduced. There is epicormic growth on the main stem. Overall this is a very poor quality item which has outlived its current location and would benefit from being removed and replaced. Tree in significant and irreversible decline.	U	Fell and grind stump and replace.	3		
Yes		7.32	2	3.5	M	Moderate						
		168.3		W	4	Tarmac						
T038	Lime	730	17		Moderate	N5, E4.5, S3, W3.5	Mature specimen located in a small raised planting pit featuring a small retaining wall. Tree features a lean towards eastern aspect. It shows a history of being heavily reduced. Tree features extensive epicormic growth on the main stem. Damage is occurring to the adjacent retaining wall. Overall an items of no individual quality however does have amenity value on the street scene.	C1	No works required.	4	Reduce canopy spread in all directions by 1m. Reduce height by 4m to leave a height of 14m. Undertake linear root pruning along alignment as shown in drawing no. 3743-D	0
Yes		8.76	3.5	5	M	Moderate						
		241.1		S	3	Tarmac						
T039	Lime sp.	710	18		High	N5, E5, S3.5, W3.5	Group Tree. No indicators of disease/decay/structural defects. Regularly reduced.	B1	No works required.	4	Reduce canopy height down to 6m, reprofiling canopy. Undertake linear root pruning along alignment as shown in drawing no. 3743-D	0
Yes		8.52	3.5	5	M	Moderate						
		228		S	2	Concrete						

TreeNo	Species	DBH	Height		Visual	Crown Spread	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
On site		Min Dist	Crown Base	Lowest Branch	Age	Water Demand						
		RPA (m^2)	Aspect	Aspect	SULE	Ground Cover						
T040	Horse Chestnut	800	18		High	N7, E5, S6, W5	Mature specimen located adjacent to the northern site boundary overhanging adjacent highway. Tree has a history of being pollarded at approximately 5 metres and is regularly reduced in the upper canopy. This has resulted in a dense volume of re-growth on the main stem, scaffold limbs and reduction points. Tree appears to have suffered from vascular tissue damage however there is good bark occlusion around these wounds and the tree appears to be recovering. The tree does appear to be struggling given the dense volumes of epicormic growth and as such it is considered it should be monitored on an annual basis for any further decline. Roots appear to be lifting the adjacent pavements.	C1	Monitor Annually (Excessive epicormic growth)	3	Fell and grind stump	0
Yes		9.6	1	5	M	Moderate						
		289.5		N	3	Concrete						
T041	Lime sp.	580	18		High	N5, E3.5, S3.5, W4.5	Group Tree. No indicators of disease/decay/structural defects. Epicormic growth. History of being reduced. A tree with material conservation value.	B1	No works required.	4	Reduce canopy spread to north by 1m and to the south and west by 0.5m, to leave a crown spread of 4m to the north and west, 3.5m to the east and 3m to the south. Reduce height by 4m to leave a height of 14m. Undertake linear root pruning along alignment as shown in drawing no. 3743-D	0
Yes		6.96	3	5	M	Moderate						
		152.2		N	2	Tarmac						
T042	Hawthorn	350	9		Moderate	N2.5, E1, S3.5, W3.5	Group Tree. No indicators of disease/decay/structural defects. Twin stemmed form. History of being reduced. Poor form. A tree of low quality.	C1	No works required.	4	Fell and grind stump	0
Yes		4.2	0.5	3	M	High						
		55.4		S	3	Tarmac						
T043	Sycamore	550	16		High	N5.5, E5.5, S6.5, W5	Open Grown Tree. No indicators of disease/decay/structural defects. Twin stemmed form. Asymmetric crown. Regularly reduced. A tree of moderate quality.	B1	No works required.	4	Undertake linear root pruning along alignment as shown in drawing no. 3743-D	0
Yes		6.6	4	3.5	EM	Moderate						
		136.8		E	3	Grass						

TreeNo	Species	DBH	Height		Visual	Crown Spread	Problems / Comments	BS Cat	Work Required (TS)	Priority (TS)	Work Required (AIA)	Priority (AIA)
On site		Min Dist	Crown Base	Lowest Branch	Age	Water Demand						
		RPA (m^2)	Aspect	Aspect	SULE	Ground Cover						
T044	Weeping Ash	610	16		High	N6.5, E5.5, S5.5, W5.5	Mature specimen located in an area of open space adjacent to public highway and site boundary. Stem features a large cavity to the south western aspect extending from 1.5 metres up to approximately 2.5 metres. The internal heartwood is heavily decayed. The upper canopy has a history of being reduced and features dieback of shoot tips and a lack of vigour with poor shoot extensions. Overall this tree is in decline. However, with its attractive nature the landowner may wish to retain the tree in the short term. With this in mind, it is advised that the deadwood be removed and the tree be monitored on a six monthly basis.	U	Fell, grind stump and replace.	2		
Yes		7.32	0	6	M	Moderate						
		168.3		N	4	Grass						
T045	Sycamore	450	15		High	N5.5, E5.5, S5.5, W5.5	Open Grown Highways Tree. No indicators of disease/decay/structural defects. Located in raised bed. Regularly reduced. Off site. A tree of moderate quality.	B1	No works required.	4	Fell and grind stump	0
Yes		5.4	6	5	EM	Moderate						
		91.6		S	2	Concrete						

Appendix C

Schedule of Works - Irrespective of Development

SCHEDULE OF WORK IRRESPECTIVE OF DEVELOPMENT

Agar Grove, Camden, London,

Surveyed By: Stephen Bones
Surveyed: 12/09/2013
Managed By: Stephen Bones

Tree No.	Species	Work required	Priority
G007	Lime sp. X4	Reduce two end trees down to height of two central trees and re-profile (priority 2).	**2**
T044	Weeping Ash	Fell, grind stump and replace.	**2**
G005	London Plane x3	Undertake a reduction of the canopy by 3m in all directions, paying particular attention to extended limbs over the road and house.	**3**
T004	Amelanchier	Remove stake and tie.	**3**
T005	Whitebeam	No works required.	**3**
T006	Hornbeam	Fell and grind stump and replace.	**3**
T010	Goat Willow	Fell to ground level.	**3**
T012	London Plane	Undertake a reduction back to previous points on a bi-annual basis.	**3**
T014	London Plane	Reduce crown by 5m in height and re-profile.	**3**
T015	Ash	Fell and poison stump.	**3**
T018	Lime sp.	Remove snapped and hanging branches.	**3**
T019	Lime sp.	Remove snapped and hanging branches.	**3**
T026	Rowan	Fell to ground level.	**3**
T032	Silver Birch	Remove stake and tie.	**3**
T037	Ash	Fell and grind stump and replace.	**3**

Schedule of Enhanced Monitoring

Agar Grove, Camden, London,

Surveyed By: Stephen Bones
Surveyed: 12/09/2013
Managed By: Stephen Bones

Tree No.	Species	Work required	Priority
G007	Lime sp. X4	Monitor annually - tight stem unions/basal wounds. (priority 3).	**2**
T003	Whitebeam	Monitor Annually (Fungal infection).	**3**
T017	Lime sp.	Monitor Annually (Cavities in stem).	**3**
T018	Lime sp.	Monitor Annually (Cavities in stem)	**3**
T019	Lime sp.	Monitor Annually (Cavities in stem).	**3**
T040	Horse Chestnut	Monitor Annually (Excessive epicormic growth)	**3**

Appendix D

Preliminary Schedule of Works to Allow Development

SCHEDULE OF WORKS (AIA)

Agar Grove, Camden, London,

Surveyed By: Stephen Bones
Surveyed: 12/09/2013
Managed By: Stephen Bones

Tree No.	Species	Work required	Priority
G001	Ornamental Conifer x3	Fell and grind stumps	**0**
G002	London Plane x3	Fell and grind stumps	**0**
G003	Birch sp. X3	Fell and grind stumps	**0**
G004	London Plane x11	Reduce canopy spread of two eastern most trees by 2m to the north to leave a crown spread 4m back from the stem. Undertake linear root pruning along alignment shown on drawing no. 3743-D	**0**
G006	Cotoneaster x4, Prunus sp. X1	Fell and grind stumps	**0**
G007	Lime sp. X4	Reduce canopy spread by 2.5m in all directions to leave a crown spread of 3m from stem. Reduce two end trees down to height of two central trees. Undertake linear root pruning along alignment as shown in drawing no. 3743-D	**0**
T002	Robinia	Reduce canopy spread to the east by 3m. Undertake linear root pruning as shown on drawing no. 3743-D	**0**
T003	Whitebeam	Fell and grind stump	**0**
T004	Amelanchier	Fell and grind stump	**0**
T012	London Plane	Fell and grind stump	**0**
T013	Sycamore	Fell and grind stump	**0**
T014	London Plane	Fell and grind stump	**0**
T016	Lime sp.	Fell and grind stump	**0**
T019	Lime sp.	Fell and grind stump	**0**
T020	London Plane	Fell and grind stump	**0**
T027	Hornbeam	Fell and grind stump	**0**
T028	Ash	Fell and grind stump	**0**
T030	Rowan	Crown lift to 3m	**0**
T031	Manna Ash	Fell and grind stump	**0**
T032	Silver Birch	Fell and grind stump	**0**
T033	Lime sp.	Reduce canopy spread to the south by 2m, to leave a crown spread of 2m to the south Reduce height by 4m to leave a height of 13m. Undertake linear root pruning along alignment shown on drawing no. 3743-D	**0**
T034	Silver Birch	Fell and grind stump	**0**
T035	Silver Birch	Fell and grind stump	**0**
T036	Silver Birch	Fell and grind stump	**0**
T038	Lime	Reduce canopy spread in all directions by 1m. Reduce height by 4m to leave a height of 14m. Undertake linear root pruning along alignment as shown in drawing no. 3743-D	**0**
T039	Lime sp.	Reduce canopy height down to 6m, reprofiling canopy. Undertake linear root pruning along alignment as shown in drawing no. 3743-D	**0**
T040	Horse Chestnut	Fell and grind stump	**0**

Tree No.	Species	Work required	Priority
T041	Lime sp.	Reduce canopy spread to north by 1m and to the south and west by 0.5m, to leave a crown spread of 4m to the north and west, 3.5m to the east and 3m to the south. Reduce height by 4m to leave a height of 14m. Undertake linear root pruning along alignment as shown in drawing no. 3743-D	**0**
T042	Hawthorn	Fell and grind stump	**0**
T043	Sycamore	Undertake linear root pruning along alignment as shown in drawing no. 3743-D	**0**
T045	Sycamore	Fell and grind stump	**0**

Appendix E

Explanatory Notes

Explanatory Notes

Categories

Below is an explanation of the categories used in the attached Tree Survey.

No Identifies the tree on the drawing.

Species Common names are given to aid understanding for the wider audience.

BS 5837 Main Category Using this assessment (BS 5837:2012, Table 1), trees can be divided into one of the following simplified categories, and are differentiated by cross-hatching and by colour on the attached drawing:

Category A - Those of high quality with an estimated remaining life expectancy of at least 40 years;

Category B - Those of moderate quality with an estimated remaining life expectancy of at least 40 years;

Category C - Those of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm;

Category U - Those trees in such condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.

BS 5837 Sub Category Table 1 of BS 5837:2012 also requires a sub category to be applied to the A, B, C, and U assessments. This allows for a further understanding of the determining classification as follows:

Sub Category 1 - Mainly arboricultural qualities;

Sub Category 2 - Mainly landscape qualities;

Sub Category 3 - Mainly cultural values, including conservation .

Please note that a specimen or landscape feature may fulfil the requirements of more than one Sub Category.

DBH (mm) Diameter of main stem in millimetres at 1.5 metres from ground level. Where the tree is a multi-stem, the diameter is calculated in accordance with item 4.6.1 of BS 5837:2012.

Age Recorded as one of seven categories:

Y Young. Recently planted or establishing tree that could be transplanted without specialist equipment, i.e. less than 150 mm DBH.

S/M Semi-mature. An established tree, but one which has not reached its prospective ultimate height.

E/M Early-mature. A tree that is reaching its ultimate potential height, whose growth rate is slowing down but if healthy, will still increase in stem diameter and crown spread.

M Mature. A mature specimen with limited potential for any significant increase in size, even if healthy.

O/M Over-mature. A senescent or moribund specimen with a limited safe useful life expectancy. Possibly also containing sufficient structural defects with attendant safety and/or duty of care implications.

V Veteran. An over-mature specimen, usually of high value due to either its age, size and/or ecological significance

D Dead.

Height Recorded in metres, measured from the base of the tree.

Crown Base Recorded in metres, the distance from ground and aspect of the lowest branch material.

Lowest Branch Recorded in metres, the distance from ground and aspect of the emergence point of the lowest significant branch.

Life Expectancy Relates to the prospective life expectancy of the tree and is given as 4 categories:

1 = 40 years+;

2 = 20 years+;

3 = 10 years+;

4 = less than 10 years.

Crown Spread Indicates the radius of the crown from the base of the tree in each of the northern, eastern, southern and western aspects.

Minimum Distance This is a distance equal to 12 times the diameter of the tree measured at 1.5 metres above ground level for single stemmed trees and 12 times the average diameter of the tree measured at 1.5 metres above ground level tree for multi stemmed specimens. (BS 5837:2012, section 4.6).

RPA This is the Root Protection Area, measured in square metres and defined in BS5837:2012 as "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". The RPA is shown on the drawing.. Ideally this is an area around the tree that must be kept clear of construction, level changes of construction operations. Some methods of construction can be carried out within the RPA of a retained tree but only if approved by the Local Planning Authority's tree officer.

Water Demand This gives the water demand of the species of tree when mature, as given in the NHBC Standards Chapter 4.2 "Building Near Trees".

Visual Amenity Concerns the planning and landscape contribution to the development site made by the tree, hedge or tree group, in terms of its amenity value and prominence on the skyline along with functional criteria such as the screening value, shelter provision and wildlife significance. The usual definitions are as follows:

Low	An inconsequential landscape feature.
Moderate	Of some note within the immediate vicinity, but not significant in the wider context.
High	Item of high visual importance.

Problems/ Comments May include general comments about growth characteristic, how it is affected by other trees and any previous surgery work; also, specific problems such as deadwood, pests, diseases, broken limbs, etc.

Work Required (TS) Identifies the necessary tree work to mitigate anticipated problems and deal with existing problems identified in the "Problems/comments" category.

Work Required (AIA) Identifies the tree work specifically necessary to allow a proposed development to proceed.

Priority

This gives a priority rating to each tree allowing the client to prioritise necessary tree works identified within the Tree Survey.

1 Urgent – works required immediately;

2 Works required within 6 months;

3 Works required within 1 year;

4 Re-inspect in 12 months,

0 Remedial works as part of implementation of planning consent.

BS 5837:2012 Terms and Definitions

Access Facilitation Pruning	One-off tree pruning operation, the nature and effects of which are without significant adverse impact on tree physiology or amenity value, which is directly necessary to provide access for operations on site.
Arboricultural Method Statement	Methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in loss of or damage to a tree to be retained.
Arboriculturist	Person who has, through relevant education, training and experience, gained expertise in the field of trees in relation to construction.
Competent Person	Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached. *NOTE - a competent person is expected to be able to advise on the best means by which the recommendations of this British Standard may be implemented.*
Construction	Site-based operations with the potential to affect existing trees.
Construction Exclusion Zone	Area based on the root protection area from which access is prohibited for the duration of a project.
Root Protection Area (RPA)	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.
Service	Any above or below ground structure or apparatus required for utility provision. **NOTE** - examples include drainage, gas supplies, ground source heat pumps, CCTV and satellite communications.
Stem	Principal above ground structural component(s) of a tree that supports its branches.
Structure	Manufactured object, such as a building, carriageway, path, wall, service run, and built or excavated earthwork.
Tree Protection Plan	Scale drawing, informed by descriptive text where necessary, based upon the finalized proposals, showing trees for retention and illustrating the tree and landscape protection measures.
Veteran Tree	Tree that, by recognized criteria, shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned. **NOTE** - these characteristics might typically include a large girth, signs of crown retrenchment and hollowing of the stem.

Appendix F

Tree Preservation Order Enquiry/Response

Liz Dunnett

From: Planning [Planning@camden.gov.uk]
Sent: 22 May 2013 10:09
To: Liz Dunnett
Subject: RE: Agar Grove, Camden
Attachments: TPO Enquiry - Agar Grove, Camden.JPG; MAP - AGAR GROVE AND AGAR PLACE.pdf

Dear Liz Dunnett

Thank you for your enquiry.

The area edge in red on your map is not in a Conservation Area. However, some of the trees fronting Agar Grove and Agar Place are covered by TPO S9.

I have attached a map showing some of the TPO trees represented by a green star.

Many thanks

Matthias Genet
Planning Technician | Fast Track and Validation Team
Tel.: 0207 974 5961 | Fax: 020 7974 1680 | matthias.genet@camden.gov.uk

Development Management | Regeneration and Planning
Culture and Environment Directorate | London Borough of Camden | Town Hall Extension | Argyle Street | London | WC1H 8EQ

Visit camden.gov.uk for the latest council information and news

---

From: Liz Dunnett [mailto:LizDunnett@treesurveys.co.uk]
Sent: 13 May 2013 14:05
To: Planning
Subject: FW: Agar Grove, Camden

Good afternoon

Could you please advise if the above mentioned address is covered by any TPO's or is within a conservation area?

I have attached a map to clarify the area we are looking at.

Many thanks

Kind Regards

Liz Dunnett
Administrator

Please consider your environmental responsibility - think before you print!

HAYDEN'S Arboricultural Consultants

Tel: 01284 765391 DD: 01284 715013 info@treesurveys.co.uk

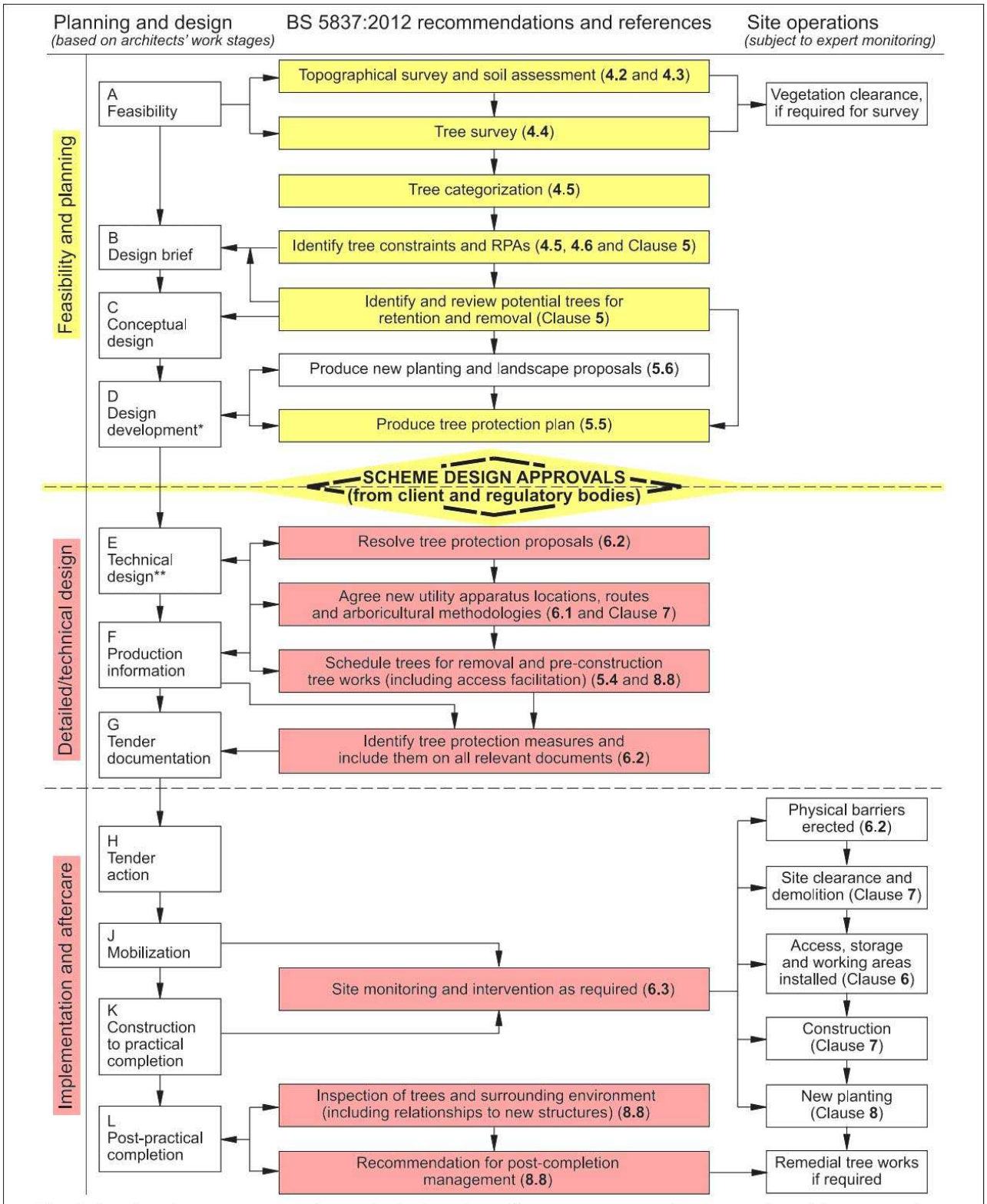
www.treesurveys.co.uk

5 Moseley's Farm Business Centre, Fornham All Saints, Bury St. Edmunds, Suffolk

Appendix G

Advisory Information & Sample Specifications

1. BS 5837:2012 Figure 1 - Flow Chart – Design and Construction & Tree Care



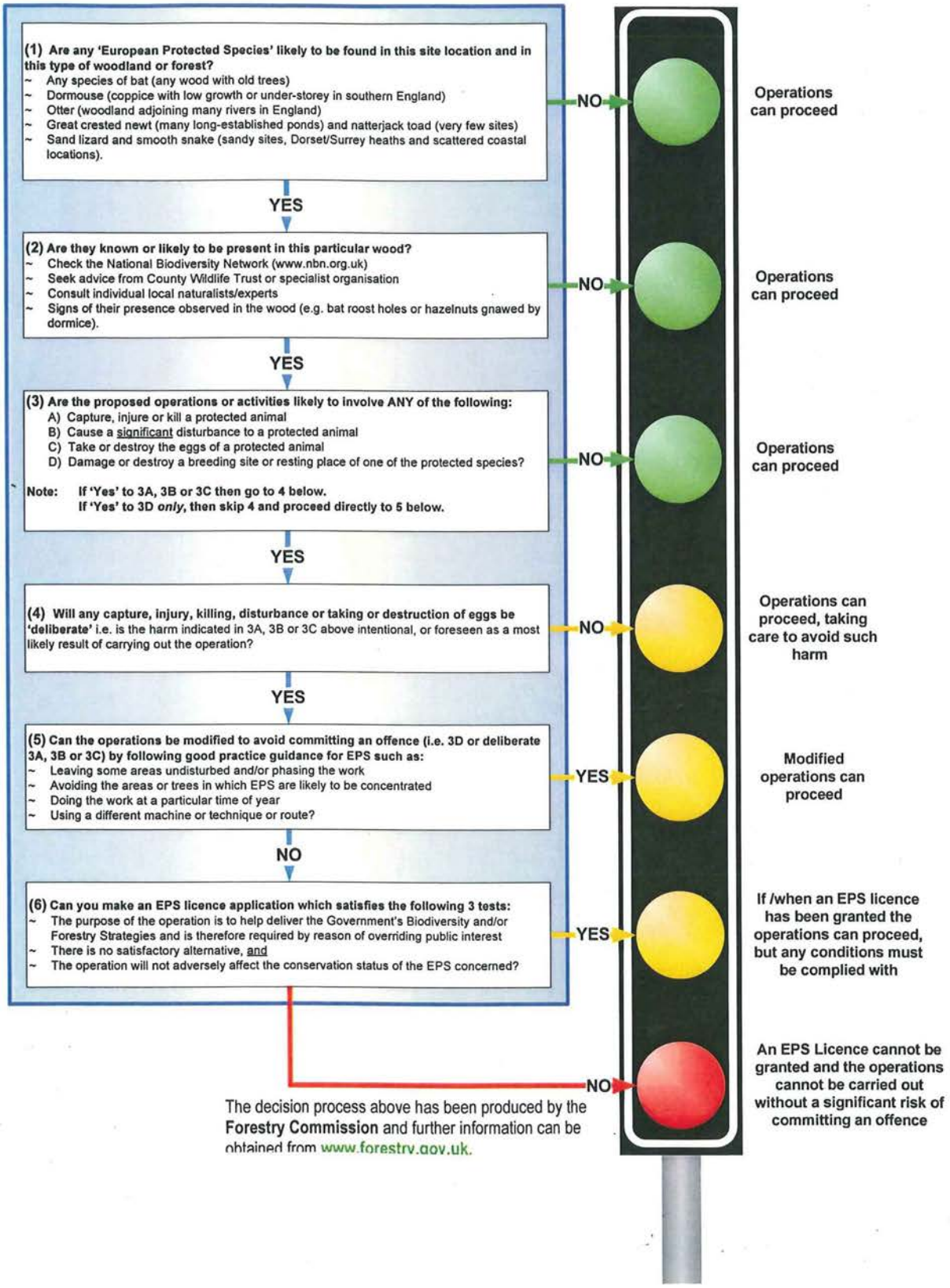
** The design development stage D in particular is an iterative process, responding to and resolving constraints as they emerge but, once completed, there needs to be a high level of certainty for proposed outcomes.*

*** See Commentary on Clause **6**.*

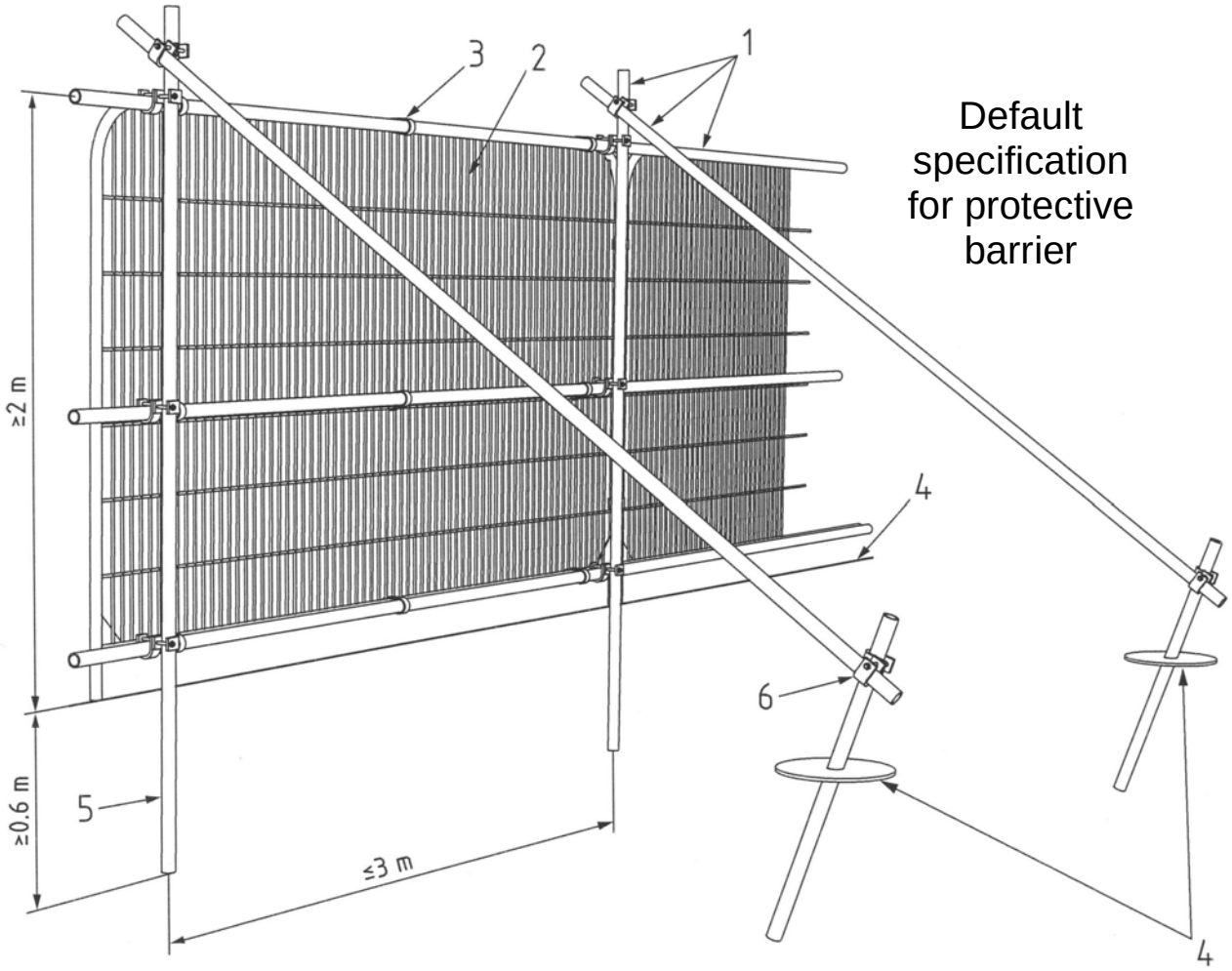
2.

European Protected Species and woodland operations
Decision tree to aid planning of woodland operations and protecting EPS (v.1)

The diagram below illustrates the questions that woodland managers and operators should consider when deciding whether they need to apply for an EPS licence. It should be noted that the diagram presents a simplified overview of the decision-making process.



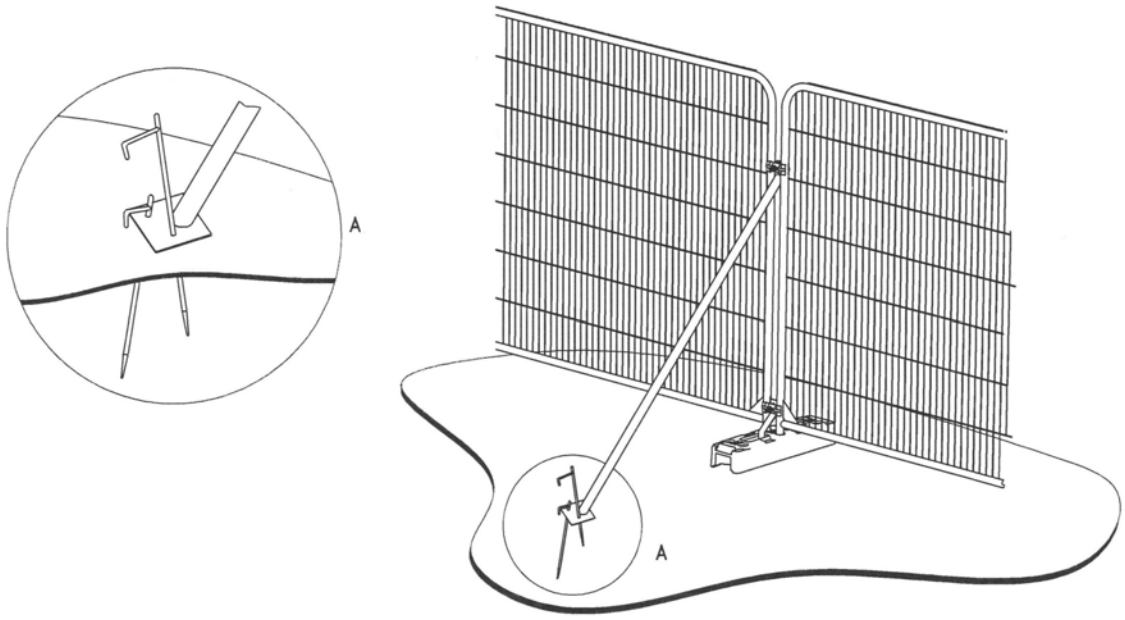
3. BS 5837:2012 Figure 2: Default specification for protective barrier



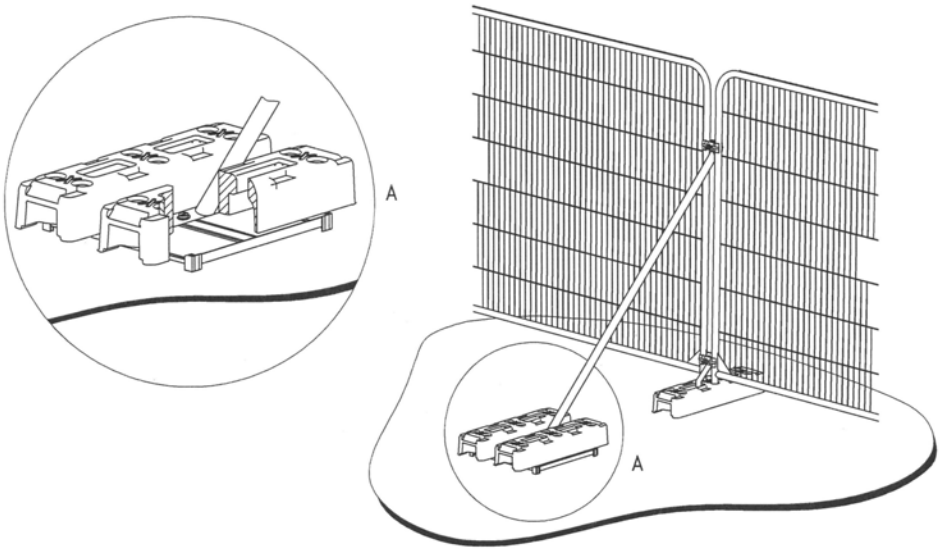
Key

1	Standard scaffold pole
2	Heavy gauge 2m tall galvanised tube and welded mesh infill panels
3	Panels secured to uprights and cross-members with wire ties
4	Ground level
5	Uprights driven into the ground until secure (minimum depth 0.6m
6	Standard scaffold clamps

4. BS 5837:2012 Figure 3: Examples of above-ground stabilizing systems



a) Stabilizer strut with base plate secured with ground pins



b) Stabilizer strut mounted on block tray

Appendix H

Root Investigation Results

Camden – Agar Grove

Following an onsite discussion with Alex Hutson, the LPA Trees Officer, it was agreed root investigation works would be undertaken to T033, T038 and T039 to establish the extent of root growth along the proposed building line/service trench. These works were undertaken on the 20th and 21st November 2013. The works were overseen by David Carmichael and Daniel Gospel of Haden's Arboricultural Consultants.

T033

A 5m long trench was excavated within an area of grass to a depth of approximately 450-500mm. The base of the trench was filled with large bricks and building rubble preventing deeper investigation.

Small fibrous roots were found in the top 50mm, below this only a few small roots were found.

Given the small volume of roots found it is our opinion that the proposed root pruning to facilitate the building foundations will not have an adverse impact on T033. It is recommended a minor crown reduction is undertaken to reduce the sail area and provide clearance for construction access.

T038

A 5m long trench was excavated within a tarmac car park to a depth of approximately 450-500mm. The top half of the trench features 50mm of tarmac with a sub-base of approximately 250mm. Below this the soil consisted of heavy clay.

A small volume of fibrous roots were found in the sub-base material and two larger roots of approximately 50mm were found at a depth of 450mm within the clay.

Given the small volume of roots found it is our opinion that the proposed root pruning to facilitate the building foundations/service trench will not have an adverse impact on T038. It is recommended a minor crown reduction is undertaken to reduce the sail area and provide clearance for construction access.

T039

A 5m long trench was excavated within an area of hard surface covered with paving slabs. The trench was excavated to a depth of approximately 350-400mm. A thin layer of sub-base was present below the paving slabs, with a soil comprising of dense building rubble beneath this. Due to the large volume of bricks present it was not possible to excavate deeper that 400mm.

A large volume of roots were found in the thin sub-base directly beneath the paving slabs, below this only minor fibrous roots were found in the building rubble.

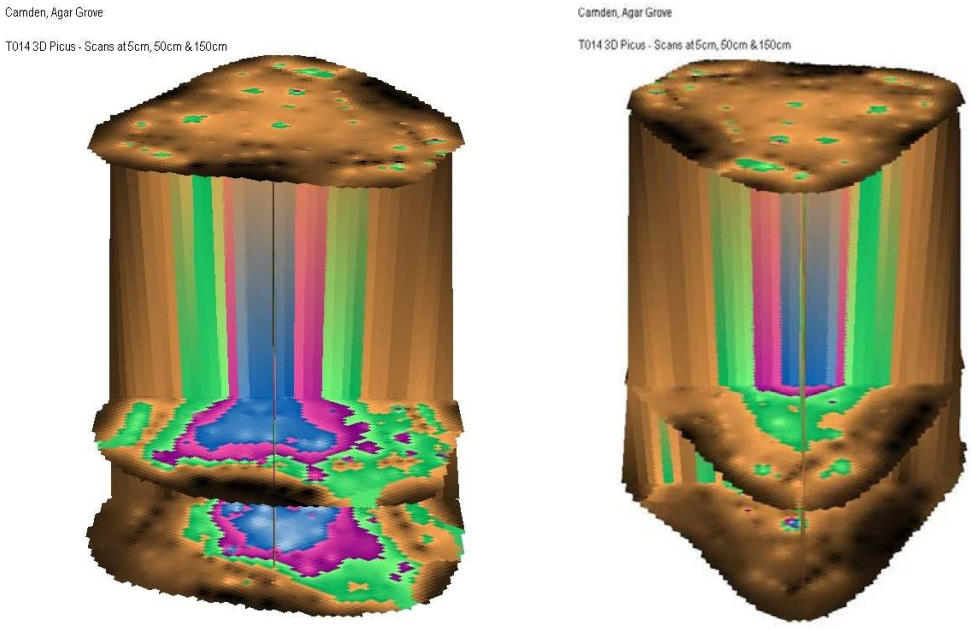
While a large number of roots were found, it is our opinion that the root severance required to facilitate the building foundations / service trench will not de-stabilise the tree, although it is recommended a crown reduction is undertaken to reduce the sail area and provide clearance for construction access.

Conclusion

Overall the root investigation has found that while a small volume of roots have been found, while the root pruning required to facilitate the proposed building line/service trench will have a minor effect on the trees concerned, the level of impact is negligible and unlikely to have a long term detrimental effect. It is recommended crown reductions be undertaken on all three trees as a precautionary measure in order to reduce the sail area and wind loading stress on the root plate. It is recommended the reduction works be undertaken as early as possible in Phase One of the Agar Grove Development Phasing Plan, while the root pruning be undertaken as late as possible in Phase Two of the Agar Grove Development Phasing Plan in order to minimise the stress caused by the two operations.

Appendix I

3D Picus



3D Picus result of T014. Scans taken at 5cm, 50cm and 150cm above ground level.

Picus: Camden

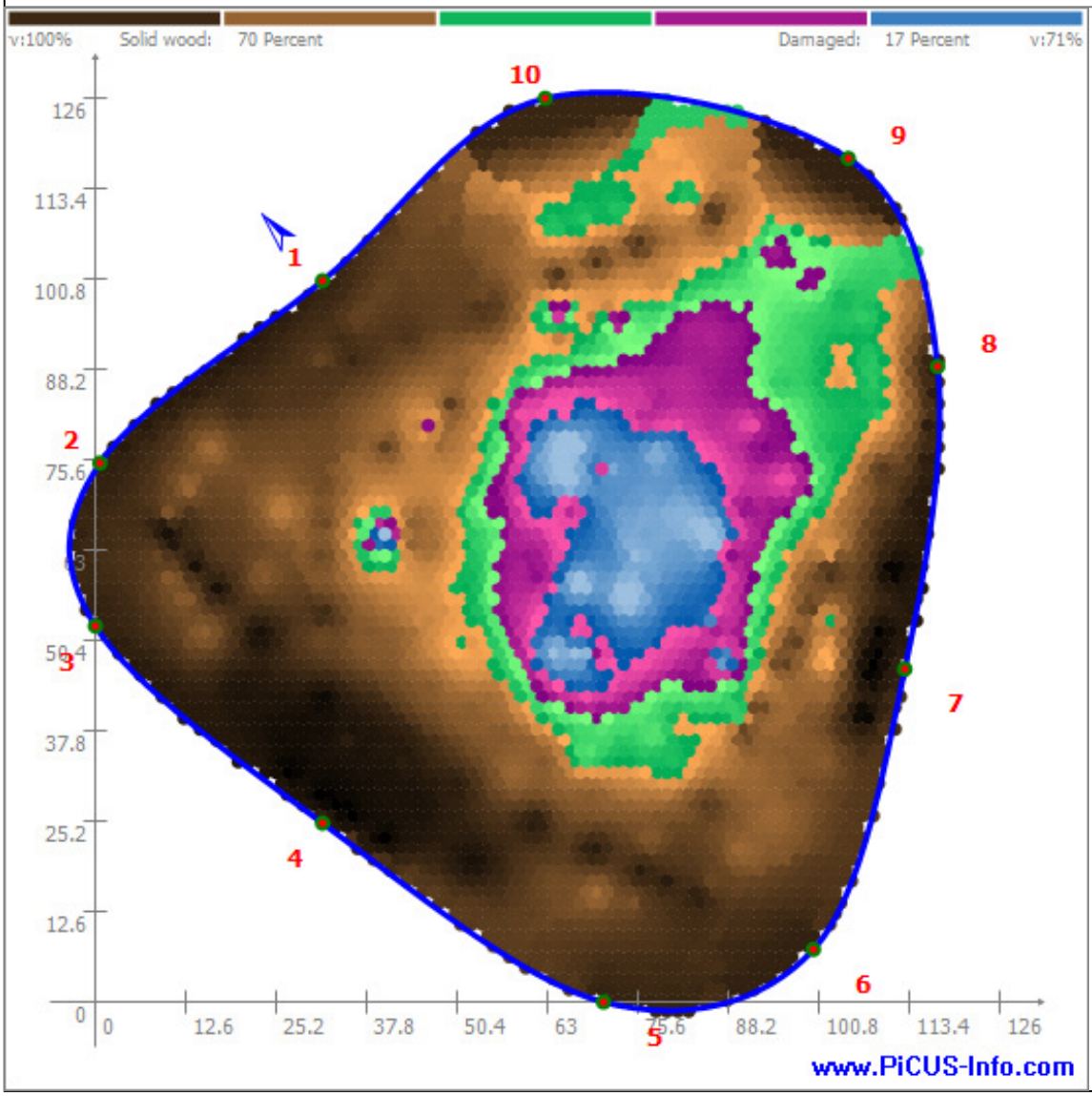
Client:
Grant Associates

Tree Expert:

Daniel Gospel
5 Moseleys Farm Business Centre
Fornham All Saints
Bury St. Edmunds
Suffolk

Tel: 01284 765391
Fax:
Domain: www.treesurveys.co.uk
email: info@treesurveys.co.uk

Tree species:	London Plane	Tree height [m]:	16
Town:	Camden	North at measuring point:	1
Neighbourhood:		Crown spread [m]:	7
Road:	Agar Grove	Position of measuring point 1:	N
		Trunk circumference (150cm height)[cm]:	245
Number of tree:	T014	Tomography level at height [cm]:	5
Measure date:	21/11/13 13:52:14		



Picus: Camden

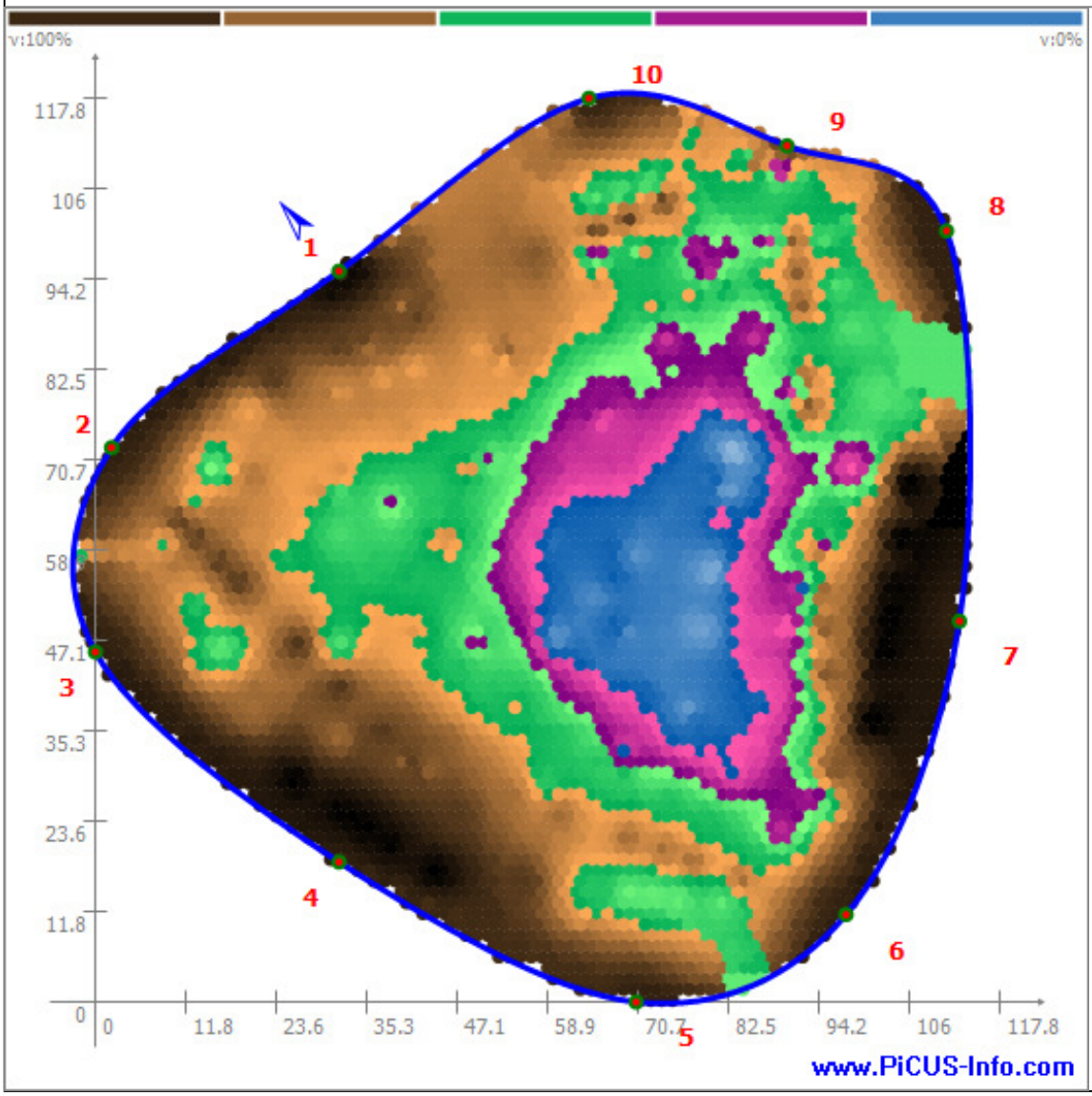
Client:
Grant Associates

Tree Expert:

Daniel Gospel
5 Moseleys Farm Business Centre
Fornham All Saints
Bury St. Edmunds
Suffolk

Tel: 01284 765391
Fax:
Domain: www.treesurveys.co.uk
email: info@treesurveys.co.uk

Tree species:	London Plane	Tree height [m]:	16
Town:	Camden	North at measuring point:	1
Neighbourhood:		Crown spread [m]:	7
Road:	Agar Grove	Position of measuring point 1:	N
		Trunk circumference (150cm height)[cm]:	245
Number of tree:	T014	Tomography level at height [cm]:	50
Measure date:	21/11/13 12:50:38		



Picus: Camden

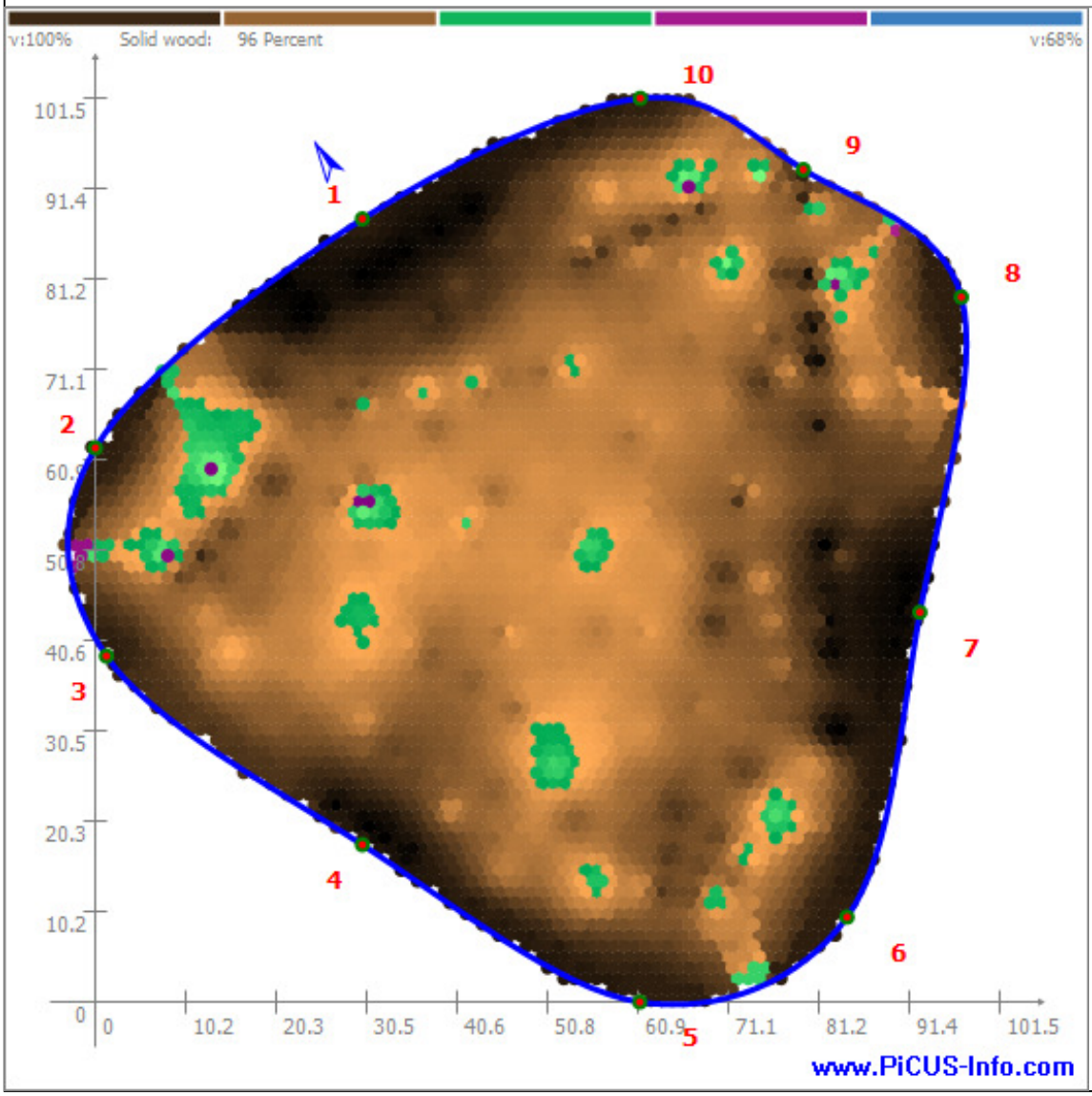
Client:
Grant Associates

Tree Expert:

Daniel Gospel
5 Moseleys Farm Business Centre
Fornham All Saints
Bury St. Edmunds
Suffolk

Tel: 01284 765391
Fax:
Domain: www.treesurveys.co.uk
email: info@treesurveys.co.uk

Tree species:	London Plane	Tree height [m]:	16
Town:	Camden	North at measuring point:	1
Neighbourhood:		Crown spread [m]:	7
Road:	Agar Grove	Position of measuring point 1:	N
		Trunk circumference (150cm height)[cm]:	245
Number of tree:	T014	Tomography level at height [cm]:	150
Measure date:	21/11/13 13:17:21		



Appendix J

Hayden’s Drawing

- Arboricultural Impact Assessments
- Arboricultural Method Statements
- Tree Constraints Plans
- Arboricultural Feasibility Studies
- Shade Analysis
- Picus Tomography
- Arboricultural Consultancy for Local Planning Authority
- Quantified Tree Risk Assessment
- Health & Safety Audits for Tree Stocks
- Tree Stock Survey and Management
- Mortgage and Insurance Reports
- Subsidence Reports
- Woodland Management Plans
- Project Management
- Ecological Surveys

Existing Tree/Hedge BS 5837:2012 Category B

Existing Tree/Hedge BS 5837:2012 Category C

Existing Tree/Hedge BS 5837:2012 Category C/U

Line of Root Protection Area (RPA) - calculated following guidelines set in BS 5837:2012

Existing Tree/Hedge to be Removed BS 5837:2012 Category U

Additional feature which doesn't meet BS 5837: 2012 categorisation but is included for reference

Dead or Dying Tree

Existing Tree/Hedge to be removed to allow for development BS 5837:2012 Category B

Existing Tree/Hedge to be removed to allow for development BS 5837:2012 Category C

Existing Tree/Hedge to be removed to allow for development BS 5837:2012 Category C/U

Areas where root presence is unlikely due to existing topogrpahy/structures

Trees which require crown reduction to facilitate the prospective development

Trees which require crown reduction to facilitate the prospective development

Existing Tree/Hedge to be crown lifted to allow for development

Areas of existing hard surfacing to be lifted and replaced

T033 T032 T031 T030 T028 T029 Rowan Rowan G005 T036 Silver Birch Dead Tree G006 T037 T038 Stem feat. Tight Unions Stem feat. Basal Wound G007 T035 T034 Hornbeam Hornbeam Field Maple Hawthorn G006 T039 T041 T040 T042 T043 T045 T015 Rowan G002 T013 T014 G003 T021 T022 T023 T024 T025 T018 T016 T017 T019 T020 Apple T026 Large Shrub T027 T044 T012 T011 EMERGENCY VEHICLE ACCESS T010 T003 T004 G001 T002 T001 T005 T006 T007 Elderberry Aspen T008 T009 G004 G004 G004 G004 Trees located on top of wall - 7/8m Hgt Trees located on top of wall - 7/8m Hgt

AGAR GROVE WROTHAM ROAD CAMLEY STREET St Thomas Court 1 to 19 1 3 5 8 12

North (Indicative)

CATEGORY AND DEFINTION

Trees unsuitable for retention	
Category U	Those in such condition that they cannot realistically be retained as living trees in the current land use for longer than 10 years
Trees to be considered for retention	
Category A	**Trees of high quality** with an estimated remaining life expectancy of at least 40 years
Category B	**Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years
Category C	**Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm

NOTE:

Hayden's Arboricultural Consultants were provided with a Topographical Survey but this did not show the position of all the trees/landscape features on this site. The locations of the additional features have been fixed using GPS. As such the position of the trees/landscape features should not be taken as exact but gives a fair distribution of their locations on site.

Scale 1:500

0m 10m 20m 30m 40m

0m 4m 8m 12m 16m

Scale 1:200

Rev:	Date:	By:	Revision:
-	28/11/13	AWG	Based on topographical survey drawing 1423-HB-X-00-M2-A-P-SurvTopo

The position, condition, and dimensions of the trees are based on a site survey undertaken on 03/05/13

"The original of this drawing was produced in colour - a monochrome copy should not be relied upon"

HAYDEN'S Arboricultural Consultants

5 Moseleys Farm Business Centre
Fornham All Saints,
Bury St Edmunds
Suffolk IP28 6JY

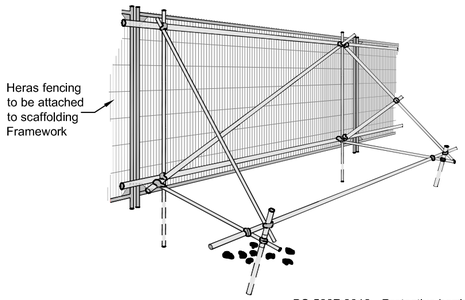
Tel: 01284 765391
Mobile: 07850 167400
Twitter: @treesurveyors
Email: info@treesurveys.co.uk
Web Page: www.treesurveys.co.uk

Client:	Drawing Title:
Grant Associates	TS & AIA Sheet 1 of 2

Site: Agar Grove, Camden

Date:	Drawn By:	Cad File Ref:
28/11/13	AWG	C\Il\Pro\3743-D-1 -AgarGrove-TS&AIA.dwg

Scale:	Checked By:	Drawing No:	Rev:
1:500 @ A2	SB	3743-D	-



BS 5837:2012 - Protective barrier

Existing Tree/Hedge BS 5837:2012 Category B

Existing Tree/Hedge BS 5837:2012 Category C

Line of Root Protection Area (RPA) - calculated following guidelines set in BS 5837:2012

Line of proposed Root Pruning

Surface to be lifted above existing level using 'No Dig' specification

Area beyond scope of survey/development

Areas of existing hard surfacing to be lifted and replaced

T033
T030
T029
G005
T038
G007
T039
T041
T043
T011
T017
T018
T021
T022
T023
T024
T025
T002
T001
T005
T007
T008
T009
G004
For cross-section info, see Grant Associates drawing no RT-2-004
For cross-section info, see Grant Associates drawing no RT-2-010
For cross-section info, see Grant Associates drawing no RT-2-005
For cross-section info, see Grant Associates drawing no RT-2-011
For cross-section info, see Grant Associates drawing no RT-2-006
For cross-section info, see Grant Associates drawing no RT-2-007
For cross-section info, see Grant Associates drawing no RT-2-008
For cross-section info, see Grant Associates drawing no RT-2-003
For cross-section info, see Grant Associates drawing no RT-2-001 & 002
For cross-section info, see Grant Associates drawing no RT-2-009
For cross-section info, see Grant Associates drawing no RT-2-012
Trees located on top of wall - 7/8m Hgt
Close boarded fencing
Trees located on top of wall - 7/8m Hgt

North (Indicative)

CATEGORY AND DEFINTION

Trees unsuitable for retention	
Category U	Those in such condition that they cannot realistically be retained as living trees in the current land use for longer than 10 years
Trees to be considered for retention	
Category A	**Trees of high quality** with an estimated remaining life expectancy of at least 40 years
Category B	**Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years
Category C	**Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm

NOTE:

Hayden's Arboricultural Consultants were provided with a Topographical Survey but this did not show the position of all the trees/landscape features on this site. The locations of the additional features have been fixed using GPS. As such the position of the trees/landscape features should not be taken as exact but gives a fair distribution of their locations on site.

Scale 1:500

0m 10m 20m 30m 40m

0m 4m 8m 12m 16m

Scale 1:200

Rev:	Date:	By:	Revision:
-	28/10/13	AWG	Based on drawing 377-AL-P-X-LB

The position, condition, and dimensions of the trees are based on a site survey undertaken on 03/05/13

"The original of this drawing was produced in colour - a monochrome copy should not be relied upon"

HAYDEN'S Arboricultural Consultants

5 Moseleys Farm Business Centre
Fornham All Saints,
Bury St Edmunds
Suffolk IP28 6JY

Tel: 01284 765391
Mobile: 07850 167400
Twitter: @treesurveyors
Web Page: www.treesurveys.co.uk
Email: info@treesurveys.co.uk

Client:	Drawing Title:
Grant Associates	TS & AIA Sheet 2 of 2

Site: Agar Grove, Camden

Date:	Drawn By:	Cad File Ref:
28/11/13	AWG	C\Il\Pro\3743-D-2 -AgarGrove-TS&AIA.dwg

Scale:	Checked By:	Drawing No:	Rev:
1:500 @ A2	SB	3743-D	-