BS 5837 Arboricultural Report

& Impact Assessment

at

15 Holly Lodge Gardens
London
N6 6AA

Dated
30th September 2022

CROWN
Tree Consultancy
Branching out through England and Wales

Contents

1. Introduction

1.1. Instruction

1.1.1. We are instructed by Paul Archer Design Ltd to:

- Undertake an Arboricultural Survey at 15 Holly Lodge Gardens and assess all trees potentially within influencing distance of proposed development within the site.
- Plot the trees on a Tree Constraints Plan and record the data in a Tree Data Schedule.
- Provide an overview of the site and any management recommendations.
- Determine if any of the trees are growing within a conservation area or are protected by a tree preservation order.
- Assess the potential impact of the development proposals and provide guidance as to appropriate mitigation measures.
- Produce an Arboricultural Impact Assessment for submission to the local authority.

1.2. Scope and Purpose of the Report

1.2.1. This report is designed to accompany a Section 211 Notice of Intent for proposed works under Permitted Development at the above site. It is produced according to the guidance and recommendations within *BS 5837: 2012 - Trees in Relation to Design, Demolition and Construction.*

1.3. References

1.3.1. We have liaised with the project architect to attain an adequate understanding of the project to enable us to carry out an accurate assessment of the proposals.

1.4. Survey Details and Findings

1.4.1. A visual ground-level inspection of all trees was undertaken on the 22nd July 2021 by Jack Dunn. No climbed inspections or specialist decay detection were undertaken. Details of how the survey was undertaken can be found in Appendix 1.

1.4.2. The tree locations shown on the accompanying plans which are reproduced in Appendix 6 are based on a measured plan of the site supplied to Crown Tree Consultancy. This plan had the tree positions already plotted. Where applicable, additional trees have been plotted by us according to measurements taken on site.

1.4.3. The findings of the survey are presented in The Tree Data Schedule, which is provided as a separate document as well as being appended to the end of this document within Appendix 6. The vegetation is further discussed in Section 3.

1.5. Author

1.5.1. This report was compiled by Emma Hoyle FDSc (Arboriculture), ED (Forestry & Arboriculture), M. Arbor. A. Details of the author's experience that qualify her to produce such a report are detailed in Appendix 4.

2. Site Overview

2.1. Brief Description

2.1.1. Number 15 Holly Lodge Gardens is a detached, two-storey residential property with gardens to the front and rear.

2.1.2. The front garden (see Photographs 1 and 2) contains a semi-mature Olive tree (T1), an early-mature Magnolia (T2) and a semi-mature Spindle (T3). All vegetation is located on a raised garden.

2.1.3. The larger rear garden (see Photographs 3 to 8) contains a semi-mature Yew (T5), a semi-mature Viburnum (T6), an early-mature Japanese Maple (T7) and a group of semi-mature Plum trees (G12). These trees are mostly located towards the rear of the garden.

2.1.4. In adjacent gardens are a semi-mature Box Elder (T4), an early-mature Ash (T8), a mature London Plane (T9), a semi-mature Horse Chestnut (T10) and an early-mature Elder (T11). The roots of these trees may extend into the site.

2.1.5. The site has several different levels and is mainly soft landscaped with some paved walkways and small retaining walls.

2.1.6. The Tree Constraints Plan and Tree Data Schedule (see Appendix 6) should be referred to for descriptions and locations of all trees.

2.2. Coordinates

2.2.1. The site coordinates are 51°34'4.14"N 0° 9'2.76"W and the altitude is approximately 114m above sea level[1].

2.3. Survey Extent

2.3.1. The area indicated below[2] shows the extent of the survey.

[1] To access satellite imagery and street views of the site these co-ordinates may be entered into: http://maps.google.co.uk/

[2] Image taken from Google Earth and may not be current

3. Vegetation Overview (independent of proposals)

This section summarises all the recommendations within the Tree Data Schedule regardless of whether trees are to be retained, felled or pruned to facilitate the proposed development. It does not specify works that may be required to facilitate the development proposals. The protection status of the trees is also reported in this section.

3.1. Preliminary Management Recommendations

3.1.1. The trees were all deemed to be in an acceptable condition and no significant defects were observed. Consequently, no remedial works have been recommended.

3.2. Future Inspections

3.2.1. The table below suggests a schedule of future inspections based on the condition and location of each tree:

Inspection Frequency (years)	Tree Number
0.5	None
1	None
1.5	None
3	T1, T2, T3, T4, T5, T6, T7, T8, T9, T10, T11 and T12

3.2.2. The trees should be inspected sooner if there is a noticeable decline in their condition or following extreme weather events.

3.3. Tree Protection Status – Site Specific

3.3.1. On 19th July 2021, we were informed by Rav Curry of London Borough of Camden that:

- The site is within the **Holly Lodge Estate Conservation Area**.
- There are no TPO's affecting trees within the site.
- There are no TPO's affecting trees immediately adjacent to the site.
- There is a TPO affecting a tree on the traffic island opposite the site. The tree affected is believed to be a Maidenhair tree.

3.4. Tree Protection – General Notes

3.4.1. Where trees are located in a conservation area (but not protected by a TPO), works are not permitted without first giving the local authority 6 weeks' notice of intention. During this time the local authority may elect to create a tree preservation order or to inform the applicant that they have no objection to the proposed works. If the local authority does not respond within 6 weeks, then the intended work may be undertaken. Note: the local authority cannot refuse consent for works to trees within a conservation area; they may only create a tree preservation order if they wish to have further control over what works are undertaken.

4. Arboricultural Impact Assessment

4.1. Overview

4.1.1. It is proposed to extend the existing building to the rear and install a new pool house in the rear garden as indicated on the plans in Appendix 6. Hard and soft landscaping works are also proposed. The existing layout is indicated in black, and the footprint of the proposed layout is indicated in green.

4.1.1. The table below summarises the potential impact on trees due to various activities.

Activity	Trees Potentially Affected
Tree Removal: Retention Category A	None
Tree Removal: Retention Category B	None
Tree Removal: Retention Category C	G12 and mixed shrubs
Tree Removal: Retention Category U	None
Tree Pruning	T7, T10 and T11
RPA: Extension Foundations	None
RPA: Pool House Foundations	T9 and T11
RPA: New Hard Surface	None
RPA: Replace Existing Hard Surface	None
RPA: Underground Services	T9
RPA: Change of Ground Levels	None
RPA: Soil Compaction	Trees adjacent to the construction area (preventable by installing tree protection measures)

4.1.2. Other potentially damaging activities often associated with construction sites include demolition or the careless use of plant machinery, hazardous materials, or fires. All of the above potential impacts are considered in detail throughout this section.

4.2. Tree Removal

4.2.1. It is proposed to remove the following Retention Category C Plum trees: G12. These are relatively small trees (height circa 4m, average stem diameter 15cm). They are located within a rear garden and are not visible from public vantage points. Consequently, they are considered to have a low amenity value, and their removal shall not have a significant impact on the visual amenity of the locality.

4.2.2. Further details can be found in the Tree Data Schedule.

4.3. Impact on Tree Canopies

4.3.1. It is proposed to prune the western canopy of T7 back by 1.5m to increase clearance for construction activity. Only small tertiary branches will require removal.

4.3.2. The south-western canopy of T10 is to be pruned back towards the boundary by a maximum of 1m to increase clearance for construction activity. Only small tertiary branches will require removal.

4.3.3. It is proposed to prune the southern canopy of the Elder, T11, back to the boundary to provide clearance for the construction of the pool house.

4.3.4. The pruning works must be undertaken sympathetically (working to BS 3998: 2010 guidelines). All other tree canopies shall be unaffected by the proposals.

4.4. Impact on Tree Roots

4.4.1. Rooting Habits:

4.4.2. A boundary wall separates T9, T10 and T11 from the site. The foundations of this wall shall influence the pattern of root proliferation such that roots are likely to be less prolific in the site, particularly at shallow depths.

4.4.3. Extension Foundations:

4.4.4. The foundations for the proposed extension do not encroach into the Root Protection Area of any retained tree. Consequently, no restrictions on foundation design or implementation are considered necessary from an arboricultural perspective.

4.4.5. Poolhouse Foundations:

4.4.6. The foundations for the new poolhouse extend into the theoretical Root Protection Areas of T9 and T11.

4.4.7. Approximately 6.5% of the theoretical Root Protection Area of T9 shall be affected (see the accompanying Impact Assessment Plan). The potential impact is considered to be relatively minor and within tolerable limits.

4.4.8. In order to minimise root severance, it is proposed to excavate the foundations within the Root Protection Area of T9 using hand tools only to a minimum depth of 0.75m under the supervision of the project arborist. Deeper excavation may be undertaken using a mechanical excavator so long as it operates from a suitable load spreading surface or ideally from outside all Root Protection Areas. Excavation for the foundations shall not extend more than 200mm beyond the build line in the direction of the trees. Any roots encountered during the excavation should be neatly pruned by the project arborist.

4.4.9. Research has shown that healthy trees of most species are able to withstand the loss of some roots (to a maximum of about 20% of the rooting area) with no long-term detrimental impact[3]. T9 was not observed to be exhibiting signs of stress at the time of the survey and was reasonably vigorous, indicating that its starch levels are quite high. It is anticipated that this tree shall tolerate such an incursion with no observable impact.

4.4.10. Excavation for the poolhouse is also required within the theoretical RPA of T11. However, no significant rooting activity is likely to be present in this area due to the influence of the boundary wall. Furthermore, it is also proposed to prune the canopy of T11 back to the boundary. This pruning will result in a reduction in demand for water and nutrients from the root system.

4.4.11. New Surfaces:

4.4.12. No new surfaces are proposed within the Root Protection Areas of any retained trees.

4.4.13. Underground Services:

4.4.14. Underground services require installation in the outer theoretical RPA of T9. However, no significant rooting activity is anticipated here due to the influence of the boundary wall on the likely rooting pattern and due to the installation of the pool house.

4.4.15. Changes in Ground Levels:

4.4.16. Except where the pool house is to be installed, no further changes to ground levels are proposed over Root Protection Areas.

3 Helliwell, *D.R. and Fordham, S.F. (1992) Tree Roots and Tree Growth. Reading Agricultural Consultants, Didcot, UK

4.4.17. **Soil Compaction:**

4.4.18. The majority of tree roots lie within the upper soil horizons. This is because the availability of oxygen decreases with depth and roots need to breathe to stay alive. In addition, nutrients are more readily available in the form of organic matter close to the soil surface.

4.4.19. Healthy soils contain about 25% air space between solid particles. Increased loading of the soils caused by construction activity causes air to be squeezed out as the soil becomes compacted, preventing roots from breathing. Even an increase in pedestrian activity may cause some soil compaction.

4.4.20. It is important that ground compaction and soil disturbance over Root Protection Areas should be avoided during the construction phase. This may be done by installing protective fencing and ground protection measures.

4.5. Demolition Activities

4.5.1. There are no structures that require demolition or significant surfaces that require removal close to trees.

4.6. Hazardous Materials

4.6.1. All hazardous materials (including cement and petrochemical products) will need to be controlled according to COSHH regulations in order to ensure there is no detrimental impact on tree health. Provision shall need to be made to ensure that cement and cement run-off are contained outside of all Root Protection Areas.

4.7. Cabins and Site Facilities

4.7.1. There is limited room for the siting of cabins and storage of materials / spoil during the construction phase so the logistics of the development shall need to be well organised to ensure that there is adequate space outside of the Tree Protection Zones for construction activity.

4.8. Boundary Treatments

4.8.1. We are not aware of any changes are proposed to the existing boundary features that might impact on trees.

4.9. Impact of Retained Trees on the Development

4.9.1. It is considered that adequate space has been allowed between all retained trees and the proposal. Consequently, the proposal shall not result in increased pressure to remove or prune any of the retained trees.

4.9.2. The closest trees to the proposal shall be located to the north so they shall not cast shade in its direction.

4.9.3. The foundations and any new surfaces should be designed to accommodate all potential impacts due to future tree rooting activity. These include potential vegetation-related subsidence, vegetation-related heave, and lifting of surfaces / light structures due to direct root pressure.

4.9.4. The gutters will need occasional maintenance to avoid blockage. This will be relatively easy to manage as the pool house is a single-storey building.

4.10. Summary

4.10.1. Only low-quality Plum trees and mixed shrubs are to be removed to enable the build. These are small trees and are hidden from public vantage points. Consequently, the impact of tree removal on local amenity shall be minimal.

4.10.2. Minor pruning works are proposed to three trees to ensure a sustainable clearance from buildings and for construction activity.

4.10.3. Foundations are proposed within the Root Protection Areas of T9 and T11. However, only fairly small portions of the RPAs shall be affected. It is proposed to excavate the foundations under arborist supervision who shall undertake any root pruning that is required.

5. Photographs

Photo 1.

Photo 2.

Photo 3.

Photo 4.

Photo 5.

Photo 6.

Photo 7.

Photo 8.

Appendix 1: BS 5837: 2012 – Guidance Notes

This Standard prescribes the principles to be applied to achieve a satisfactory juxtaposition of trees and structures. It sets out to assist those concerned with trees in relation to design, demolition and construction to form balanced judgements.

It acknowledges the positive contribution trees may offer to a site, as well as the negative aspects of retaining inappropriate trees. It addresses the negative impacts that construction activity may have upon trees and offers mitigation strategies to minimise these impacts.

The Standard suggests a three stage approach to ensure best practice is followed when developing close to trees:

A1.1 Stage 1: Survey Details and Notes

A ground level visual survey was undertaken. No climbed inspections or specialist decay detection were undertaken. Only trees with a stem diameter over 75mm, which lie within the site boundary or relatively close to it, were included.

Where applicable, trees with significant defects have been highlighted and appropriate remedial works have been recommended. However, this report should not be seen as a substitute for a full *Safety Survey* or *Management Plan* which are specifically designed to minimise risk and liability associated with responsibility for trees.

Wherever practicable dimensions were obtained using diameter tapes, logger's tapes, distometers and clinometers. Where obstacles prevent accurate measurement, dimensions are estimated. Trees on privately owned third party are surveyed from the best available vantage point and observations relating to the condition of these trees should be treated accordingly. All height measurements should be regarded as approximate.

Data is recorded for each tree and is presented in a Tree Data Schedule. Each tree is allocated a ***Retention Category*** according to its size, amenity value, condition and safe useful life expectancy. The categories are allocated independently of development proposals. Our interpretation of the Retention Categories is explained below:

A1.1.1 Retention Categories

A Category: Trees of high quality and amenity value. Usually, mature trees with a significant life expectancy which would enhance any development. Retention of these trees is strongly encouraged.

B Category: Trees of moderate quality and amenity value. Usually these are maturing trees or younger trees with exceptional form. Retention of these trees is desirable though the removal of occasional specimens may be acceptable.

C Category: Trees of low quality or small specimens with a relatively low amenity value. These trees are not considered to be a material planning constraint and their removal will generally be seen as acceptable in order to facilitate development.

U Category: Trees of such low quality that their removal is recommended regardless of development proposals.

Occasionally trees are borderline and do not fall neatly into one of the categories A, B or C. In such cases we apply a superscript (**+/-**) such that:

C^{+} Indicates borderline C/B, though Category C is deemed to be most appropriate.

B^{-} Indicates borderline C/B, though Category B is deemed to be most appropriate.

The British Standard suggests that each of the A, B and C categories may be further subdivided (A1, A2, A3, B1, B2, B3 etc) such that subcategory 1 denotes mainly arboricultural values, subcategory 2 denotes mainly landscape values and subcategory 3 denotes mainly cultural values (including conservation). Multiple subcategories may be used.

Our experience suggests that these subdivisions lack clarity and can be confusing. Within this report subcategories are **not** denoted. Where appropriate, the use of phrases such as '*Part of a formal group*', or '*Has a high ecological value*', or '*Offers good screening to the site*' are incorporated into the observation section of the Tree Data Schedule. We believe this conveys all relevant landscape and cultural information without any confusion.

Tree Constraints Plan (TCP). This indicates the position, crown spread, Retention Category and Root Protection Area of each tree. It is used to inform where development may proceed without causing damage to trees.

Root Protection Area (RPA). This is the area around each tree likely to contain the majority of roots. It should ideally remain undisturbed to avoid a detrimental impact on tree health. For single stemmed trees It is calculated according to the formula "radius of RPA" = "12 x stem diameter". Where a tree has more than one stem, the equivalent-single-stem diameter is usually recorded. This is calculated by adding the squares of the stems and then finding the square root of this total. The radius of the Root Protection Area is then calculated by multiplying the equivalent-stem-diameter by 12.

Shade Constraints. The previous Standard (BS 5837 2005) suggested that shade constraints should be indicated on the TCP. This are denoted as a circle-segment drawn northwest to due east with a radius equal to the height of the tree. These do not represent the actual shade pattern which varies through the seasons. Rather, they indicate the area most shaded by the tree throughout the course of the year. Ideally habitable room windows should be located outside of these shade constraints. Where we consider it appropriate, we will include shade constraints information on our Impact Assessment Plan or Proposed Layout Plan.

A1.2 Stage 2: Arboricultural Impact Assessment

After the initial survey and the production of the Tree Constraints Plan, arborists and designers are encouraged to work together to establish a design proposal with minimal impact on the high quality trees. An assessment should be made of all possible impacts including the impact that the trees may have upon the proposal. The arborist may recommend mitigation strategies to minimise these impacts and help achieve a more harmonious juxtaposition between buildings and trees.

A1.3 Stage 3: Arboricultural Method Statement

This type of report specifies the measures necessary to protect trees against damage from construction activity. The Method Statement should be written in a manner that it may be conditioned and enforced by the local authority upon granting of planning permission. The site manager should be familiar with all aspects of the Method Statement and should ensure that all persons working on the site are aware of those aspects which appertain to their work. This includes service installation engineers and operators of plant machinery.

Appendix 2: Explanation of Tree Data & Glossary

This section explains the terms used in the **Tree Data Schedule** (see Section 3 and Appendix 6).

A2.1 General Observations

Numbering System: Each item of vegetation has its own unique number prefixed by a letter such that T1=Tree 1, G2=Group 2, H3=Hedge 3 and W4=Woodland 4, S5=Shrub 5.

Age Categories:

Young	Usually less than 10 years old.
Semi-Mature	Significant future growth to be expected, both in height and crown spread (typically below 30% of life expectancy).
Early-Mature	Full height almost attained. Significant growth may be expected in terms of crown spread (typically 30-60% of life expectancy).
Mature	Full height attained. Crown spread will increase but growth increments will be slight (typically 60% or more of life expectancy).
Veteran	A level of maturity whereby significant management may be required in order to keep the tree in a safe condition.
Over Mature	As for veteran except management is not considered worthwhile.

Species: Common names and Latin names are given.

Height: Measured from ground level to the top of the crown.

Stem Diameter: Taken at 1.5m above ground level where possible. On multi-stemmed trees this measurement may be taken at ground level, though usually an indication of the number of stems and average diameter is given, e.g. 3 x 30cm.

Crown Height: Measured from ground level to the height at which the main crown begins. Where the crown is unbalanced it is measured on the side deemed to be most relevant. This is usually the side facing the area of anticipated development.

Tree Diagram: This scaled drawing is computer generated based on measurements taken for stem diameter, crown height and spread, and overall height. It is designed to help the reader rapidly assess the data. It is not an accurate representation of the form of the tree.

Crown Spread: Measured N, E, S & W, taken from the centre of the stem and usually rounded up to the nearest metre.

Observations: If a tree's position is considered to be relevant it will be commented upon (e.g. overhanging a children's play area). Tree form and pruning history are also recorded along with an account of any significant defects. Defects and descriptive terms are dealt with in more detail at the end of this section.

Recommendations: Usually based on any defects observed and intended to ensure that the tree is in an acceptable condition.

Priority Scale: Depending upon the threat posed by the tree, and the likelihood of failure, recommendations should be carried out according to the following priority scale:

Urgent	To be carried out as soon as possible.
Very High	To be carried out within 1 month.
High	To be carried out within 3 months.
Moderate	To be carried out within 1 year.
Low	To be carried out within 3 years.

Inspection Frequency: An interval of 6 months, 1 year, 1.5 years or 3 years is allocated before the next inspection is due. Wherever practical, consideration should be given to seasonal changes so that deciduous trees are not always surveyed in winter when they have no leaves, or in summer when leaves may obscure branches within the upper crown.

Vigour: An indication of growth rate and the tree's ability to cope with stresses:

High	Having above average vigour.
Moderate	Having average vigour.
Low	Having below average vigour.
Very Low	Tree is struggling to survive and may be dying.

Physiological Condition:

Good	Healthy and with no symptoms of significant disease.
Fair	Disease present or vigour is impaired.
Poor	Significant disease present or vigour is extremely low.
Very Poor	Tree is dying.

Structural Condition:

Good	Having no significant structural defects.
Fair	Some defects observed though no high priority works are required.
Poor	Significant defects found. Tree requires monitoring or remedial works.
Very Poor	Major defects which will usually require significant remedial works or tree removal.

Amenity Value:

Very High	Exceptional specimen, observable by a large number of people.
High	Attractive specimen, observable by a significant number of people.
Moderate	One of the above factors is not applicable.
Low	Unattractive specimen or largely hidden from view.

Life Expectancy: The estimated number of years before the tree may require removal. Classified as (<10), (10 – 20), (20 – 40), or (40+).

Retention Category: These are explained in detail in Appendix 1.

A2.2 Evaluation of Defects

Cavities, wounds, deadwood etc are all evaluated as follows:

Major	Such that structural integrity is, or will become, compromised and the tree is, or will inevitably become, hazardous.
Significant	A defect that may over time become a major defect, though not necessarily so. This will depend on the vigour of the tree and its ability to deal with decay etc.
Minor	A defect that is not likely to compromise the tree's structural integrity.

Appendix 3: Survey Methodology

Ground level visual surveys are carried out using the *Visual Tree Assessment* technique described by Mattheck and Broeler (1994) and endorsed by the Arboricultural Association (LANTRA Professional Tree Inspection course, 2007).

Structural condition is assessed by inspecting the stem and scaffold branches from all angles looking for weak branch junctions or symptoms of decay. Particular attention is paid to the stem-base. Cavities are explored using a metal probe in order to assess the extent of any decay. If this is not possible further inspection is recommended in the form of a climbed inspection or using specialist decay detection equipment.

The physiological condition is assessed by inspecting the stem, branches and foliage for symptoms of disease. The overall vigour of the tree is also taken into account.

Where significant defects are observed, recommendations are made according to a scale of priority in order to reduce the likelihood of structural failure. The position of the tree and its potential targets are taken into account.

Measurements are obtained using a diameter tape, clinometer, distometer and loggers tape. Where this is not practical measurements are estimated.

Some trees are surveyed as groups, though this is usually avoided close to areas likely to be developed.

Finally, a *Retention Category* is allocated as described in Appendix 1.1.1.

Appendix 4: Author's Qualifications

This report was written by arboricultural consultant Emma Hoyle who has the following resume:

Emma Hoyle FDSc (Arboriculture), ED (Forestry & Arboriculture), M. Arbor. A.

Emma is a qualified Arboricultural Consultant educated to Level 5 in Arboriculture at Askham Bryan College, is a professional member of the Arboricultural Association and is a LANTRA accredited *Professional Tree Inspector*. She has worked for Crown Consultants since 2015 and has since written numerous reports relating to all aspects of arboriculture including; planning and development, vegetation related subsidence, tree preservation orders and tree risk assessment. Emma regularly attends seminars and events in order to keep abreast with current knowledge and best practise in Arboriculture.

Prior to becoming an arboricultural consultant, Emma worked for two reputable tree surgery firms from 2008 and became an NPTC Qualified tree surgeon after completing a Level 3 Extended Diploma in Forestry and Arboriculture at Askham Bryan College. Emma also has experience in other areas of arboriculture such as forest clearance, tree planting, tree maintenance and landscaping.

Appendix 5: Further Information

Building Near Trees – General

National Joint Utilities Group publication # 10 (1995), *Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees. Downloadable at www.njug.demon.co.uk/pdf/NJUG%20Publication10.pdf*

NHBC Standards Chapter 4.2., *Trees and Buildings.*

Horticulture LINK project 212. (*University of Cambridge,* 2004), *Controlling Water Use of Trees to Alleviate Subsidence Risk.*

Tree Planting and aftercare

See www.trees.org.uk/leaflets.php# for downloadable leaflets on selecting a garden tree, planting, aftercare and veteran tree management.

British Standards

BS 5837: 2012. Trees in Relation to Design, Demolition and Construction – Recommendations.
Bs 3998: 2010. Recommendations for Tree Work.
BS 3936: 1992. Nursery Stock. Part 1: Specification for Trees and Shrubs.
BS 3936: 1992. Nursery Stock. Part 10: Specification for Groundcover Plants.
BS 4043: 1989. Transplanting Root-balled Trees.
BS 8004: 1986. Foundations.
BS 8103: 1995. Structural design of Low-Rise Buildings.
BS 8206: 1992. Lighting for Buildings.
BS 8545:2014. Trees: From nursery to independence in the landscape – Recommendations
BS 3882: 2007. Topsoil.
BS 4428: 1989. General Landscaping Operations (excluding hard surfaces).

Permission to do Works to Protected Trees / Tree Law

Forestry Commission (Edinburgh, 2003), *Tree Felling – Getting Permission*. Country Services Division - Forestry Commission. Downloadable at www.forestry.gov.uk/website/pdf.nsf/pdf/wgsfell.pdf/$FILE/wgsfell.pdf

Transport and the Regions (Department of the Environment, 2000), *Tree Preservation Orders, A Guide to the Law and Good Practice*. Downloadable at www.communities.gov.uk/publications/planningandbuilding/tposguide

C. Mynors, *The Law of Trees, Forests and Hedgerows* (Sweet and Maxwell, London, 2002)

Communities and Local Government website with numerous downloadable documents, from: http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/

Lighting Levels

P.J. Littlefair, *B.R.E. 209: Site layout planning for daylight and sunlight A guide to good practice.* B.R.E. Bookshop, London.

British Standards Institution. Code of practice for day lighting. *British Standard* BS 8206: Part 2 (1992).

Chartered Institution of Building Services Engineers. *Applications manual: Window Design* (London, 1987).

NBA Tectonics. A study of passive solar housing estate layout. *ETSU Report* S-1126. Harwell, Energy Technology Support Unit (1988).

I.P. Duncan; D. Hawkes, Passive solar design in non-domestic buildings. *ETSU Report* S-1110. Harwell, Energy Technology.

P. J. Littlefair, Measuring Daylight, *BRE Information Paper 23/93 f3.50.* (Advises on measuring daylight under the real sky or an artificial sky, allowing for the changing nature of sky light).

High Hedges

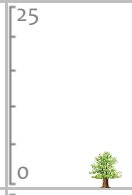
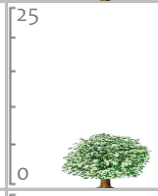
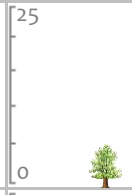
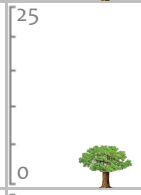
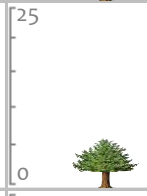
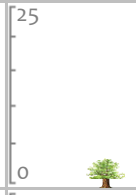
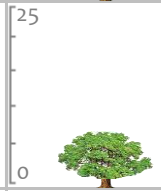
Communities and Local Government website with numerous downloadable documents, from: http://www.communities.gov.uk/planningandbuilding/planning/treeshighhedges/

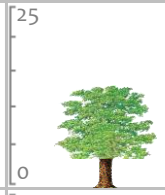
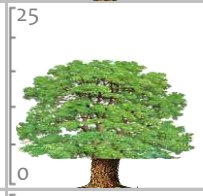
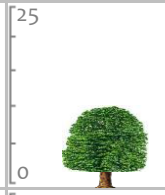
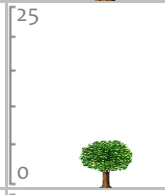
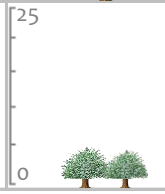
Tree Specific Websites

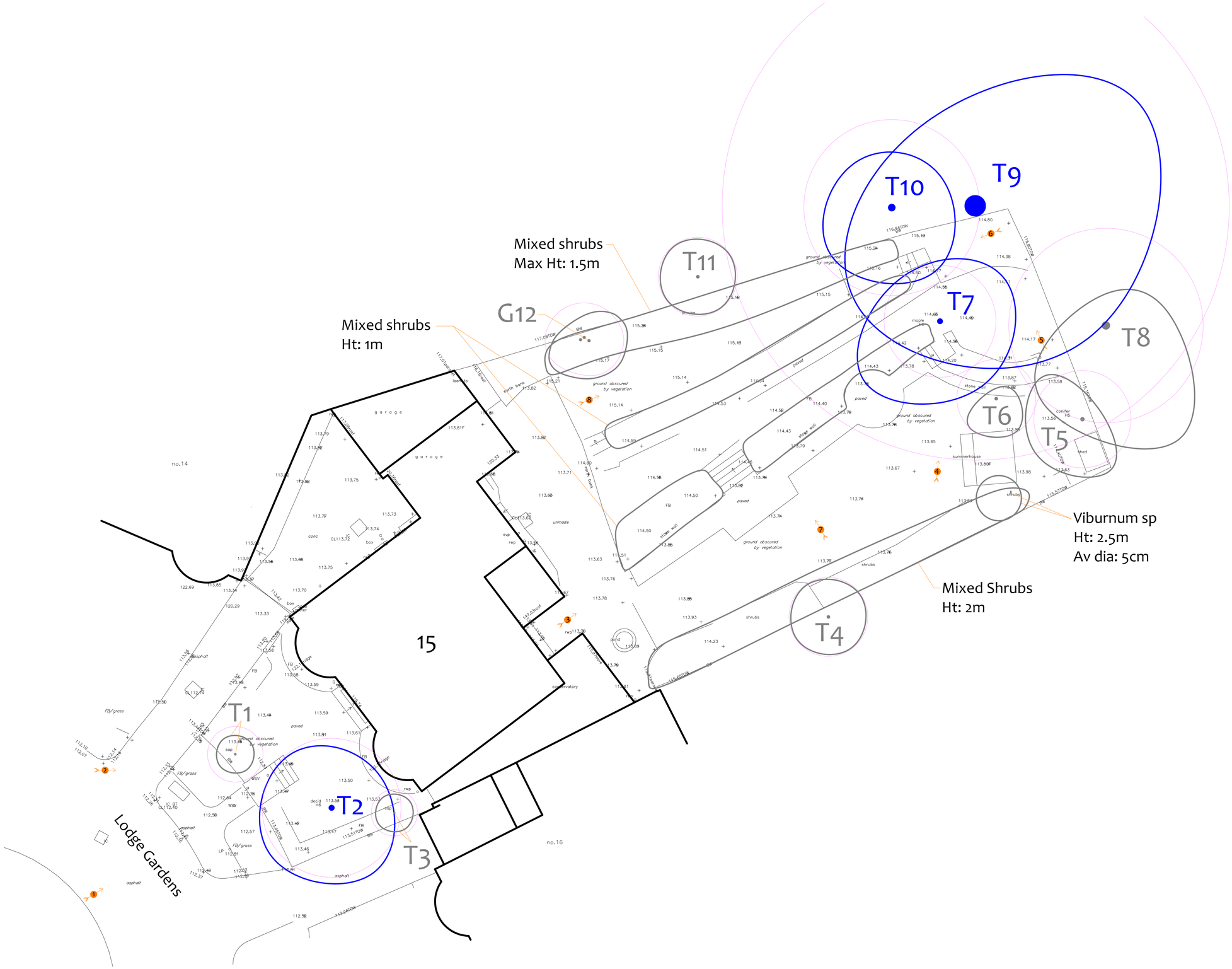
www.crowntrees.co.uk	Crown Consultants site containing useful information
www.trees.org.uk	Arboricultural Association
www.rfs.co.uk	Royal Forestry Society of England, Wales and N. Ireland
www.treehelp.Info	The Tree Advice Trust
www.woodland-trust.org.uk	The Woodland Trust
www.treecouncil.org.uk	The Tree Council

Appendix 6: Tree Data Schedule and Site Plan(s)

The Tree Data Schedule and any drawings accompanying this report follow this page. They are also provided as separate documents for ease of printing and screen viewing.

Reference (G = Group, H = Hedge)	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N / W / E / S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals) Priority	Inspect Freq (yrs)	Vigour / Physiological Condition / Structural Condition	Amenity Value / Life Expectancy (yrs) / Retention Category
T1	Semi-Mature **Olive** Olea europaea.	3	0.5	12	N 1, W 1, E 1, S 1		Position: Situated within the front garden. Form: Multi-stemmed at 0.5m with a balanced crown. History: Previously reduced. **Defects: No significant defects observed.**	No action required.	n/a	Moderate / Good / Good	Low / 40+ / C
T2	Early-Mature **Magnolia** Magnolia sp.	5.5	1	30	N 3.5, W 4, E 3, S 4		Position: Situated within the front garden. Form: Multi-stemmed at 0.5m with a well-formed crown. History: Previously reduced. **Defects: Old pruning wound at base (healing well).** Other: Three individual stems measured at 14cm, 19cm and 19cm in diameter.	No action required.	n/a	Moderate / Good / Good	Moderate / 40+ / B
T3	Semi-Mature **Spindle** Euonymus europaeus.	3.5	0	10	N 1, W 1, E 1, S 1		Position: Situated within the front garden. Form: Twin-stemmed at 1m with a balanced crown. History: Previously reduced. **Defects: Tight union with included bark (acceptable condition at present).**	No action required.	n/a	Low / Good / Good	Low / 40+ / C
T4	Semi-Mature **Box Elder** Acer negundo.	3.5	2	17	N 2, W 2, E 2, S 2		Position: Situated on third party land. Form: Multi-stemmed at 1.5m with a balanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated.	No action required.	n/a	Moderate / Good / Fair	Low / 40+ / C
T5	Semi-Mature **Yew** Taxus baccata.	5	2	21	N 3, W 3, E 1, S 3		Position: Adjacent rear boundary. Form: Single stemmed and vertical with a slightly unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.** Other: Suppressed speciemen.	No action required.	n/a	Moderate / Good / Good	Low / 40+ / C
T6	Semi-Mature **Viburnum** Viburnum.	2.5	0.5	17	N 0.5, W 2, E 1, S 2		Position: Situated within the rear garden. Form: Multi-stemmed at 0.5m with a slightly unbalanced crown. History: Previously reduced. **Defects: No significant defects observed.**	No action required.	n/a	Moderate / Good / Good	Low / 40+ / C
T7	Early-Mature **Japanese Maple** Acer japonicum.	6	1	29 @ Base	N 3, W 5, E 4, S 4		Position: Situated within the rear garden. Form: Multi-stemmed at 0.5m with a slightly unbalanced crown. History: No evidence of significant pruning. **Defects: Significant included bark at main stem junction. (acceptable condition at present).**	No action required.	n/a	Moderate / Good / Fair	Moderate / 40+ / B

Reference (G = Group, H = Hedge)	Age & Species	Height (m)	Crown Ht (m)	Diameter (cm)	Crown Spread (m) N / W / E / S	Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any development proposals) Priority	Inspect Freq (yrs)	Vigour / Physiological Condition / Structural Condition	Amenity Value / Life Expectancy (yrs) / Retention Category
T8	Early-Mature **Ash** Fraxinus excelsior.	13	4	42	N 1.5, W 5, E 3, S 7		Position: Situated on third party land. Form: Single stemmed with a slight lean and an unbalanced crown. History: Occasional pruning wounds due to crown lifting. **Defects: No significant defects observed.** Other: Poor specimen. Limited inspection, dimensions estimated.	No action required. n/a	3	Moderate Good Fair	Low 40+ C
T9	Mature **London Plane** Platanus x hispanica.	17	4	110	N 5, W 8, E 10, S 9		Position: Situated on third party land. Form: Multi-stemmed at 6m with an unbalanced crown. History: Previously topped at 6m. **Defects: Significant dead branch to easten canopy (acceptable due to location).** Other: Limited inspection, dimensions estimated.	No action required. n/a	3	Moderate Good Fair	Moderate 20-40 B
T10	Semi-Mature **Horse Chestnut** Aesculus hippocastanum.	10	2	38	N 3, W 4, E 3, S 4		Position: Situated on third party land. Form: Single stemmed and vertical with a balanced crown. History: No evidence of significant pruning. **Defects: Signs of Horse Chestnut Leaf Miner.** Other: Limited inspection, dimensions estimated.	No action required. n/a	3	Moderate Good Good	Moderate 40+ B
T11	Early-Mature **Elder** Sambucus nigra.	5	2	17	N 2, W 2, E 2, S 2		Position: Situated on third party land. Form: Multi-stemmed at 1m with a balanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.** Other: Limited inspection, dimensions estimated.	No action required. n/a	3	Moderate Good Good	Low 40+ C
G12	Semi-Mature **Plum** Prunus sp.	av 4	av 1	av 15	N av 1, W 2, E 2, S 2 each		Position: Adjacent northern boundary. Form: Single stemmed with a slight lean and an unbalanced crown. History: No evidence of significant pruning. **Defects: No significant defects observed.**	No action required. n/a	3	Moderate Good Good	Low 40+ C



Tree Constraints Plan

(Existing Layout)

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

See the accompanying report for more photographs

Tree Ref.	Species	Height (m)	Root Protection Area		
			Radius (m)	m²	Square (m)
T1	Olive	3	1.4	7	2.6
T2	Magnolia	5.5	3.6	41	6.4
T3	Spindle	3.5	1.2	5	2.1
T4	Box Elder	3.5	2.0	13	3.6
T5	Yew	5	2.5	20	4.5
T6	Viburnum	2.5	2.0	13	3.6
T7	Japanese Maple	6	2.9	26	5.1
T8	Ash	13	5.0	80	8.9
T9	London Plane	17	13.2	547	23.4
T10	Horse Chestnut	10	4.6	65	8.1
T11	Elder	5	2.0	13	3.6
G12	Plum	4	1.8	10	3.2

Drawing No: CCL 10889 / TCP Rev: 1

Title: Tree Constraints Plan (Existing Layout)

Site: 15 Holly Lodge Gardens N6 6AA

Scale: 1:100 (0 to 5) Paper Size: A1

CROWN Arboricultural Consultants 01422 316660

Tree Retention Categories
Stems & canopies shown

Category A tree	Trees of high quality with an estimated life expectancy of 40+ years. Usually large trees with significant presence or smaller trees with excellent form. Retention of these trees is highly desirable.
Category B tree	Trees of moderate quality with a life expectancy of 20+ years. Usually maturing trees, or younger trees with good form. Retention of these trees is desirable though less than Category A trees
Category C tree	Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.
Category U tree	Trees unsuitable for retention due to their very poor condition.

BS 5837 Root Protection Area (radius = 12xstem diameter)

Root Protection Area needing amendment due to site conditions, e.g. presence of exising road or building.

Root Protection Area having been amended to account for for site conditions

T1 = Tree No 1 G2 = Group No 2 H3 = Hedge No 3

1 Photo 1

MN = Measured North:

Canopy spreads are sometimes measured to an approximate N defined by site features. Often more accurate, especially where rows of trees are not aligned N-S or E-W.

Proposed Layout (Pale Green)

Insignificant portion of T10's RPA shall be affected by proposed excavations.

The outer foliage of T10 is to be trimmed back towards the boundary to ensure adequate clearance fro construction. Such pruning shall have a negligible impact on tree health.

Approximately 6.5% of the RPA of T9 shall be affected by excavation for the proposed swimming pool building. Such an incursion is considered to be relatively minor and within tolerable limits.
Excavation is to be undertaken using hand tools to a minimum depth of 0.75m and overseen by the project arborist. Any tree roots that are encountered should be retained where possible. Any tree roots that need to be severed should be neatly pruned by the arborist overseeing the excavation.

A small portion of T11, a Retention Category C Elder, shall be affected by proposed building foundations.

The overhanging canopy of T11 will also require pruning back to the boundary to provide clearance for construction of the pool house. Such pruning shall create a reduction in demand for water and nutrients upon the root system, therefore maintaining a balanced root:shoot ratio. Consequently, the loss of some roots due to excavation shall be offset by proposed canopy pruning.

Mixed shrubs
Max Ht: 1.5m

Mixed shrubs
Ht: 1m

T9 T10 T11 T7 T8 T6 T5 T4 T1 T2 T3 G12

Viburnum sp
Ht: 2.5m
Av dia: 5cm

Mixed Shrubs
Ht: 2m

The boundary wall foundations are likely to influence the rooting activity of T9, T10 & T11 such that their roots are less likely to proliferate at shallow depths within the site.

Light canopy pruning required to T7 to increase clearance from the proposal. Such pruning shall have little impact on its health or amenity value.

X *A group of small Plum trees (G12) require removal to facilitate the proposal and a mixture of shrubs. This vegetation is considered to have a low amenity value and its loss shall have no impact upon local amenity.*

no.14 · 15 · no.16 · Lodge Gardens

Tree Protection Status:

This location falls within The Holly Lodge Estate Conservation Area, but there are no TPOs at number 15.

There is a TPO on 1 x Maidenhair on the traffic island outside the front of number 15.

The next closest TPO is some way away at 94 Hillway, but all properties on your map are within this same Conservation Area.

Tree Ref.	Species	Height (m)	Root Protection Area Radius (m)	m²	Square (m)
T1	Olive	3	1.4	7	2.6
T2	Magnolia	5.5	3.6	41	6.4
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T4	Box Elder	3.5	2.0	13	3.6
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T8	Ash	13	5.0	80	8.9
T9	London Plane	17	13.2	547	23.4
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T11	Elder	5	2.0	13	3.6
G12	Plum	4	1.8	10	3.2

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Canopy spreads are sometimes measured to an approximate N defined by site features. Often more accurate, especially where rows of trees are not aligned N-S or E-W.

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Root Protection Area needing amendment due to site conditions, e.g. presence of exising road or building.

Root Protection Area having been amended to account for for site conditions

T1 = Tree No 1 G2 = Group No 2 H3 = Hedge No 3

X Tree to be removed to facilitate the proposal

X Tree to be removed due to its low quality

Proposed pruning

Tree Retention Categories
Stems & canopies shown

Category A tree — Trees of high quality with an estimated life expectancy of 40+ years. Usually large trees with significant presence or smaller trees with excellent form. Retention of these trees is highly desirable.

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Category C tree — Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.

Category U tree — Trees unsuitable for retention due to their very poor condition.

Drawing No: CCL 10889 / IAP Rev: 1
Title: Impact Assessment Plan (Existing Layout with Proposals Overlaid)
Site: 15 Holly Lodge Gardens N6 6AA
Scale: 1:100 Paper Size: A1

CROWN Arboricultural Consultants 01423 316660

Impact Assessment Plan

Impact Assessment Plan
(Existing Layout with Proposals Overlaid)