

BS 5837 Arboricultural Report

Impact Assessment & Method Statement



at
109 Darnley Road
Gravesend
Kent
DA11 0SH

Dated
10th November 2023



CROWN
Tree Consultancy

Branching out through England and Wales

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1. Introduction

1.1. Instruction

1.1.1. We are instructed by Matthew Lenton-Magor to:

- Undertake a Tree Survey to BS 5837 at 109 Darnley Road 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 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.
- Produce a Tree Protection Plan and Arboricultural Method Statement specifying how the retained trees will be protected from accidental damage by demolition or construction activity.

1.2. Purpose of this Report

- 1.2.1. This report is produced according to the guidance and recommendations within BS 5837: 2012 - *Trees in Relation to Design, Demolition, and Construction*. It is tailored to accompany a planning application. It assesses the impact of all proposed construction works on the tree population. Tree removal, canopy pruning, and the impact upon roots from various groundworks are all considered in detail. Best practice mitigation is specified wherever appropriate.
- 1.2.2. The accompanying Arboricultural Method Statement specifies how the trees shall be protected from accidental damage by demolition and construction activities. It is designed to be enforceable and may be conditioned upon the granting of planning permission.
- 1.2.3. This document should not be used to inform management decisions relating to liability or risk management. Such decisions should be based on a more detailed inspection of the trees than was carried out for this report.

1.3. References

- 1.3.1. We have liaised with our client to attain an adequate understanding of the project to enable us to carry out an accurate assessment of the proposals and to specify suitable tree protection measures.

1.4. Survey Details

- 1.4.1. A visual ground-level assessment of all trees was undertaken on the 31st August 2023 by Carl Lothian. 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 have been plotted according to measurements taken on site.

1.5. Author

- 1.5.1. This report was compiled by Emma Hoyle FDS (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 Site Description

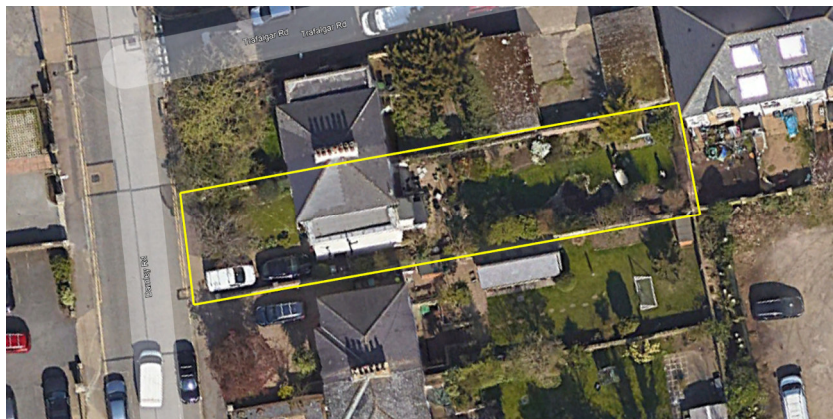
- 2.1.1. Number 109 Darnley Road is a semi-detached residential property with gardens to the front and rear.
- 2.1.2. The front garden is occupied by a paved driveway and front lawn. A Retention Category C Cherry tree (T5) grows adjacent to the front boundary. The rear garden is predominantly given over to a lawn and soft planting beds. Four Retention Category C trees and mixed shrubs grow at the rear of the dwelling.
- 2.1.3. In the adjacent garden to the north grow a Retention Category C (T6) and a Retention Category B tree (T7). The roots of these trees may extend into the site.
- 2.1.4. The site is a rectangular plot measuring approximately 41m by 9m and is generally flat with no abrupt level changes.
- 2.1.5. 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°26'14.69"N 0°21'46.81"E, and the altitude is approximately 18m above sea level¹.

2.3. Survey Extent

- 2.3.1. The area indicated below² shows the extent of the site. Our survey included all trees within the curtilage of the property and those adjacent to it.



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.

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 and T7

- 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. Species Present – Additional Information

- 3.3.1. The table below contains general information about the tree *species* (rather than the actual tree *specimens*) included in the survey. Its purpose is to assist readers who are unfamiliar with the characteristics of the various species.

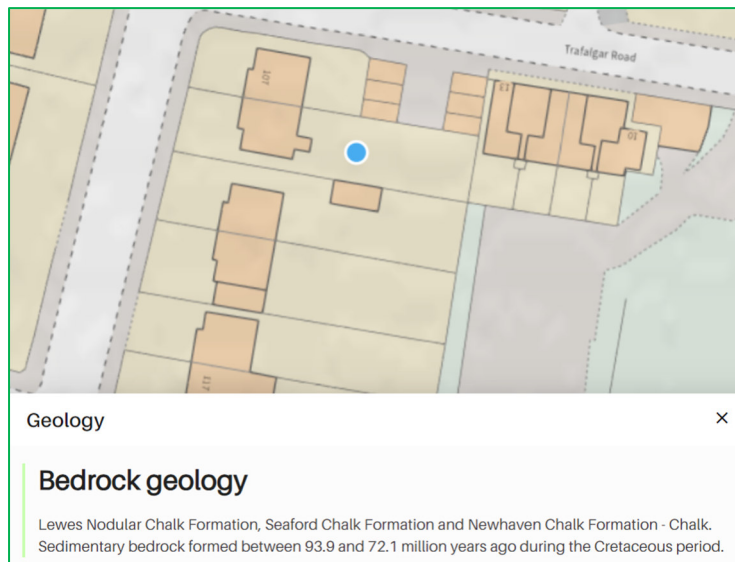
Species	Typical Height at Maturity (m)	Typical Canopy Spread at Maturity (m)	General Notes
Black Locust	20	12	Deciduous fast-growing tree native to the US. Part of the pea family and its roots fix nitrogen. Bright yellow 'Frisia' cultivar is widely planted in gardens. All parts are toxic except the flowers which appear in June. Seed pods ripen in winter. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Robinia+pseudoacacia for more info.
Cherry	8	10	Many cultivars available, bred for their abundance of spring flowers, edible cherries or ornamental bark (e.g. Tibetan Cherry). Usually white or pink flowering, often in very early spring. Usually with a single bole to around 2.5m and multi-stemmed thereafter. Most varieties have excellent autumn colour.
Elder	8	8	Deciduous tree native throughout Europe, N Africa and W Asia. Untidy, shrubby habit. Very fast growing. Covered in dense creamy flowers and deep red berries which are excellent for making wine. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Sambucus+nigra for more info.
Lawson Cypress	40	10	Erect, narrowly conical evergreen tree native to Southwest Oregon and N. W. California. Introduced to Britain in the 1850's and now a common tree in gardens and parks. Makes an excellent dense hedge. Many varieties are available including golden and miniature varieties. Easily distinguished from Leyland cypress by the presence of small cones. Visit http://www.pfaf.org/user/Plant.aspx?LatinName=Chamaecyparis-lawsoniana for more info.

The figures quoted regarding typical height and canopy spread should be treated as approximate. Actual heights and spreads vary according to several environmental factors such as soil conditions, climate, and the presence of competing vegetation. The figures quoted are not the maximum dimensions that the species may attain.

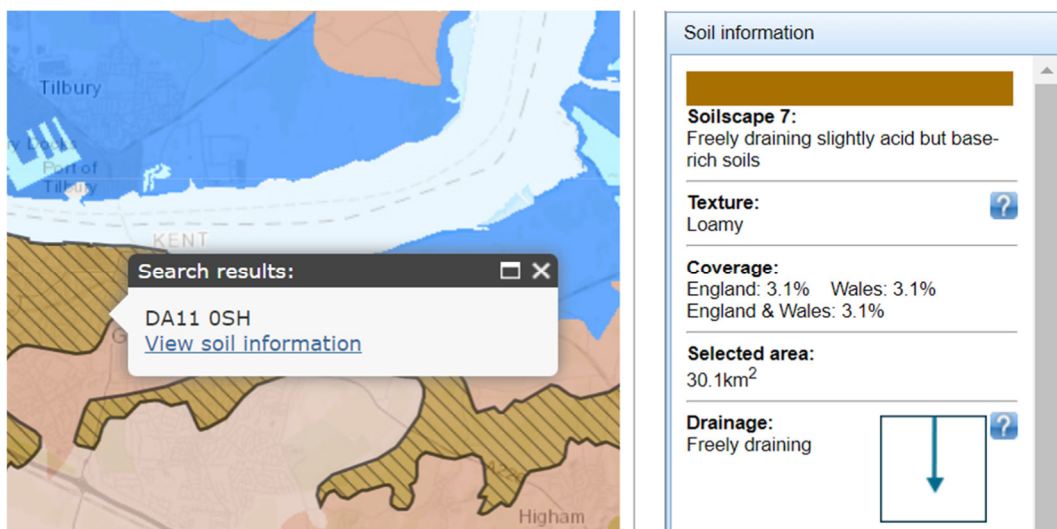
4. Local Geology and Soils

4.1. Desktop Research

4.1.1. Desktop research into local geology based on the postcode **DA11 0SH** obtained the following results:



Source: https://geologyviewer.bgs.ac.uk/?_ga=2.100849601.17774785.1660229567-1737936254.1660229567



Source <http://www.landis.org.uk/soilscapes/>

4.2. Site Investigations

4.2.1. We are unaware of any specific investigations into soil properties at the site.

4.3. Conclusion and Relevance

4.3.1. Based on the information reproduced in Section 3.1, local soils are assumed to have a loamy texture.

4.3.2. Loamy soils contain a mixture of clay and sand. Soil compaction may occur due to vehicular activity on building sites, so ground protection is recommended wherever vehicles operate. Most tree species will grow well in loamy soils.

4.3.3. Trees of most species are less likely to root deeply in clay soils. Any new surfacing over tree roots should avoid deep excavation and have good load-spreading properties.

5. Statutory Protection – TPOs and Conservation Area Status

Before undertaking most works on trees protected by a tree preservation order³, consent needs to be formally obtained from the local authority. Where trees are in a conservation area (but not protected by a TPO), works are generally not permitted without first giving the local authority six weeks' notice of intention⁴. Unauthorised works to protected trees, or trees in a conservation area, may result in criminal prosecution and a fine. Where works are required to implement a fully approved development, no such consent or notice is required.

5.1. Desktop Research

5.1.1. We were informed by Sharon Bickerstaff of Gravesham Borough Council on the 21st August 2023 that:

- The site is within the **Darnley Road Conservation Area**.
- There are no tree preservation orders affecting trees within the site.
- There are no tree preservation orders immediately adjacent to the site.

5.2. Felling Licences

5.2.1. Felling licences issued by the Forestry Commission are sometimes required before removing trees. However, these licenses are aimed toward woodland and forestry management. Felling licences are NOT required for any of the following:

- Lopping, topping or pollarding.
- Removal of small trees (stem diameter less than 8cm) or fruit trees.
- Works to any trees growing within domestic gardens, orchards, or the Inner London boroughs.
- Operations involving less than five cubic meters of timber in any quarter year.
- Thinning and understorey clearing operations.
- Dangerous trees, nuisance trees, some diseased trees.
- Where removal is required to enable a fully approved development.

5.2.2. More detailed guidance can be found at <https://www.gov.uk/government/publications/tree-felling-getting-permission>

5.2.3. Hence a felling licence is **not** required relating to the trees surveyed.

³ <https://www.gov.uk/guidance/tree-preservation-orders-and-trees-in-conservation-areas>

⁴ 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 six 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.

6. Arboricultural Impact Assessment

6.1. Overview

6.1.1. It is proposed to extend the existing basement to the front and rear of the dwelling and install a rear extension, as indicated on the drawings in Appendix 6. The existing layout is indicated in black, the proposed basement extension is indicated in blue, and the footprint of the proposed ground floor layout is indicated in pink.

6.1.2. 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	1 x Buddleia (T3), a young Holly and a Cotoneaster
Tree Removal: Retention Category U	None
Tree Pruning	T4 and small shrubby vegetation
RPA: Basement Foundations	T5 and T7
RPA: Rear Extension Foundations	None
RPA: New Hard Surface	None
RPA: Replace Existing Hard Surface	None
RPA: Underground Services	None Anticipated
RPA: Change of Ground Levels	None
RPA: Soil Compaction	Trees adjacent the construction area (preventable by installing tree protection measures)

6.1.1. 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.

6.1.2. The accompanying Arboricultural Method Statement (duplicated in Appendix 6) specifies the measures proposed to minimise all possible potential risks of damage to the retained trees.

6.2. Tree Removal

6.2.1. To enable the development, it is proposed to remove one Retention Category C Buddleia (T3), a young Holly and a Cotoneaster (see adjacent photograph). The vegetation to be removed is considered to have a low amenity value and its removal shall not have a significant impact on local amenity.



6.3. Tree Pruning

6.3.1. The retained tree canopies are sufficiently far from proposed building works and high over access routes such that they should not be impacted by construction activity and no significant pruning works are required to enable the development. However, the client intends to crown thin and re-shape the canopy of T5, which shall further increase clearance for construction activity.

6.3.2. It is also proposed to neatly trim the foliage of shrubby vegetation adjacent the footpath to increase clearance for access. Such pruning is not considered to be a material planning consideration.

6.4. Mitigation Planting

- 6.4.1. The rear garden offers opportunity to plant new trees as part of a post-development landscaping scheme.

6.5. Impact of Foundations

- 6.5.1. The proposed basement extension at the front of the dwelling encroaches into the periphery of the theoretical Root Protection Areas of T5 and T7. Less than 1.5% and less than 0.5% of their RPAs shall be affected (respectively). These incursions are extremely minor, and the potential impact is considered to be negligible.

- 6.5.2. The table below details the recommended mitigation to ensure impact is kept to the absolute minimum:

Tree No	Nature of Foundation	Portion of RPA	Proposed Mitigation
T5 and T7	Basement	1.5% (T5) and 0.5% (T7)	Pinning or Piling - Excavation to be limited to the footprint of the basement. Excavating a temporary batter slope is to be avoided. - Soil beyond the proposed footprint to remain undisturbed. - Methodology of basement installation to be specified by engineers and approved by the local authority prior to commencement.

- 6.5.3. These measures accord with industry best-practice⁵ and shall ensure impact on roots is extremely minor.

6.6. Impact of Surfacing

- 6.6.1. No new hard surfaces are proposed within the Root Protection Areas of trees.

6.7. Underground Services:

- 6.7.1. We are not aware of any new underground services that require installation within Root Protection Areas.

6.8. Changes in Ground Levels:

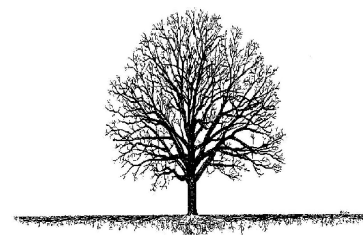
- 6.8.1. No changes to ground levels are proposed over Root Protection Areas.

Soil Compaction:

- 6.8.2. 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.

- 6.8.3. Healthy soils contain about 25% air space between solid particles. Increased loading of the soil 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.

- 6.8.4. It is important therefore that ground compaction and soil disturbance over Root Protection Areas should be avoided during the construction phase. Where access is required over Root Protection Areas, suitable ground protection measures must be installed.



6.9. Demolition Activities

- 6.9.1. No demolition is proposed close to retained trees.

⁵ BS 5837 (2012 section 7.5 and 7.6)

6.10. Waste and Materials Storage

- 6.10.1. 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 spillage avoids all Root Protection Areas.
- 6.10.2. Areas designated for the storage of building materials and waste products will need to be approved by the local authority. Root Protection Areas should be avoided. Where this is not possible, suitable ground protection measures will need to be installed.

6.11. Cabins and Site Facilities

- 6.11.1. Any cabins and welfare facilities should be located outside of Root Protection Areas wherever possible. Otherwise, the project arborist should be consulted, and approval obtained from the local authority.

6.12. Boundary Treatments

- 6.12.1. No changes are proposed to the existing boundary features that might impact on trees.

6.13. Impact of Retained Trees on the Development

- 6.13.1. Adequate space has been allowed between retained trees and the proposal. Consequently, the proposal shall not result in increased pressure to remove or overly prune any of the retained trees.
- 6.13.2. 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.

6.14. Summary

- 6.14.1. A Buddleia, a young Holly and a Cotoneaster shrub require removal.
- 6.14.2. Light trimming of foliage is proposed to a Yew, a Bay Laurel and an Elder to increase clearance along the footpath, and the canopy of T5 is to be thinned and reshaped.
- 6.14.3. The basement extension at the front of the dwelling is to be installed within the periphery of the RPAs of T5 and T7. Less than 1.5% of either Root Protection Areas shall be affected, so long as excavation is limited to the proposed footprint.
- 6.14.4. The proposed ground floor and basement extension at the rear shall have no direct impact on trees.
- 6.14.5. No new surfaces are proposed within Root Protection Areas.

6.15. Arboricultural Method Statement

- 6.15.1. The accompanying Arboricultural Method Statement specifies restrictions on construction activities to ensure minimal impact on retained trees. All of the potential impacts noted in this section are accounted for in the Arboricultural Method Statement. So long as these protection measures are fully implemented, there shall be no long-term detrimental impact on the health of the adjacent trees.

7. Photographs

Refer also to the Tree Constraints Plan for photo locations

Photo 1.



Photo 2.



Photo 3.



Photo 4.



Photo 5.



Photo 6.



Photo 7.



Photo 8.



Photo 9.



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. These 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: 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 3: Glossary of Tree Data

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 unlikely to develop into a major defect.

Appendix 4: Author & Surveyor Qualifications

Qualifications & Experience of Emma Hoyle FDS (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.

Qualifications & Experience of Carl Lothian – BSc (Hons) (Arboriculture).

Carl began his career undertaking a Level 3 extended diploma in arboriculture and forestry at Merrist Wood College in 2015. Upon completion of his diploma, Carl worked with several tree surgery firms completing a range of arboricultural works. In 2018 Carl began his BSc (Hons) in arboriculture and urban forestry, graduating with a first-class degree and attaining the Institute of Chartered Foresters student of the year award.

After graduating, Carl worked as a TreeRadar technician where he carried out tree root and decay surveys with specialist ground-penetrating radar equipment. During this time Carl was fortunate enough to work at prestigious sites, such as the Palace of Westminster and the National Maritime Museum.

Whilst working at Crown, Carl has undertaken a range of tree surveys and written reports relating to development, safety, subsidence, and decay detection. Carl is a professional member of the Consulting Arborist Society and an associate member of the Institute of Chartered Foresters.

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: 2015. *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](http://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 Drawings

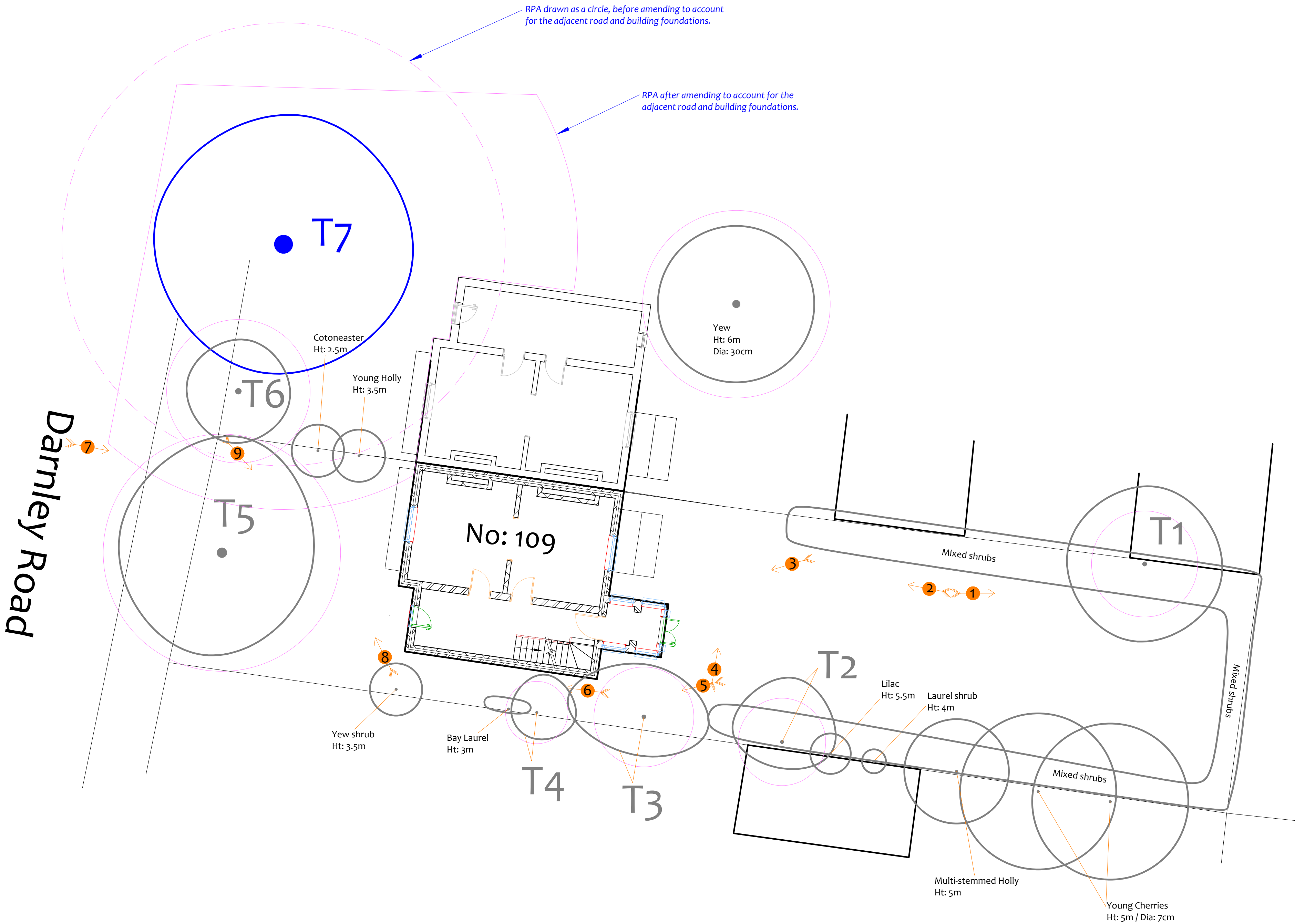
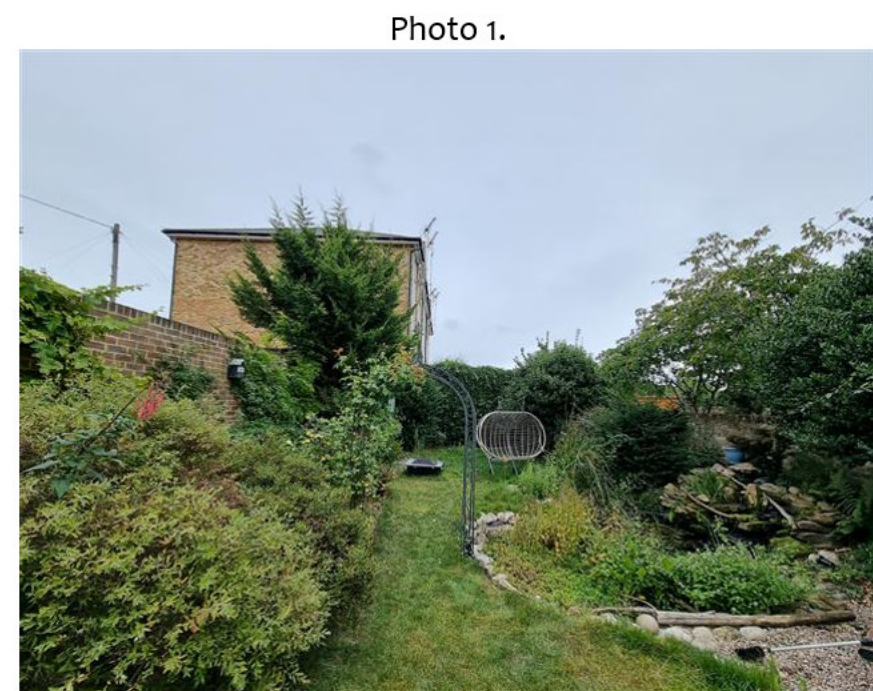
The Tree Data Schedule and any drawings accompanying this report follow this page. They are also provided as separate documents for ease of printing and screen viewing.

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)		Vigour	Amenity Value
								Priority	Inspect Freq (yrs)	Physiological Condition	Life Expectancy (yrs)
										Structural Condition	Retention Category
T1	Semi-Mature Lawson Cypress Chamaecyparis lawsoniana.	6.5	2	17	3 3 3		Position: Situated within the rear garden. Form: Single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. Defects: No significant defects observed.	No action required.		Moderate Good Good	Low 40+ C
	n/a							3			
T2	Semi-Mature Californian Lilac Ceanothus sp.	5	2	14	2.5 2 1		Position: Situated within the rear garden. Form: Twin-stemmed at 1m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Significant bark wound to stem (acceptable condition at present). Other: Recorded stem diameter is equivalent for 2 stems at 10cm.	No action required.		Moderate Good Good	Low 20-40 C
	n/a							3			
T3	Early-Mature Buddleia Buddleia sp.	4.5	1.5	16	2 3 2.5 1.5		Position: Situated within the rear garden. Form: Multi-stemmed at 1m with an unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects observed. Other: Recorded stem diameter is equivalent for 2 stems (10cm & 12cm).	No action required.		Moderate Good Good	Low 40+ C
	n/a							3			
T4	Young Elder Sambucus nigra.	3.5	1.5	10	1.5 1 1.5 1		Form: Twin-stemmed at ground level with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects observed.	No action required.		Moderate Good Good	Low 40+ C
	n/a							3			
T5	Early-Mature Cherry Prunus sp.	6.5	2.5	38	4.5 4 3.5 4		Position: Situated within the front garden. Form: Multi-stemmed at 2m with a balanced crown. History: Reduced. Defects: No significant defects observed. Other: Vegetation prevented detailed inspection.	No action required.		Moderate Good Fair	High 20-40 C +
	n/a							3			
T6	Early-Mature Elder Sambucus nigra.	6	3	23	2 2 2		Position: Situated on third party land. Form: Multi-stemmed at ground level with a poorly formed crown. History: No evidence of significant pruning. Defects: No significant defects observed. Other: Limited inspection, dimensions estimated for 3 x stems (15cm, 15cm and 8cm).	No action required.		Moderate Good Fair	Moderate 40+ C
	n/a							3			
T7	Mature Black Locust Robinia pseudoacacia.	14	2.5	71	5 5 5		Position: Situated on third party land. Form: Twin-stemmed at 1m with a balanced crown. History: No evidence of significant pruning. Defects: Ivy clad. Other: Limited inspection, dimensions estimated for 2 stems at 50cm.	No action required.		Moderate Good Fair	High 40+ B +
	n/a							3			

Tree Data Schedule

Reference	Age & Species	Height (m)	Crown Ht (m)	Crown Spread (m)			Scaled Tree Diagram (m)	Notes	Recommendations (Independent of any discovery proposals)		Vigour	Amenity Value	
				W	N	E			Priority	Inspect (Yes/No)		Physiological Condition	Structural Condition
T1	Semi-Mature Lawson Cypress <i>Chamaecyparis lawsoniana</i>	6.5	2	17	3	3		Position: Situated within the rear garden. Form: Single stemmed and vertical with a narrow, upright habit. History: No evidence of significant pruning. Defects: No significant defects observed.	No action required.		Moderate	Low	
									n/a	3	Good	40+	
T2	Semi-Mature Californian Lilac <i>Ceanothus</i> sp.	5	2	14	2	3.5		Position: Situated within the rear garden. Form: Twin-stemmed at 1m with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: Significant bark wound to stem (acceptable condition at present). Other: Recorded stem diameter is equivalent for 2 stems at 10cm.	No action required.		Moderate	Low	
									n/a	3	Good	20-40	
T3	Early-Mature Buddleia <i>Buddleia</i> sp.	4.5	1.5	16	3	2		Position: Situated within the rear garden. Form: Multi-stemmed at 1m with an unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects observed. Other: Recorded stem diameter is equivalent for 2 stems (10cm & 12cm).	No action required.		Moderate	Low	
									n/a	3	Good	40+	
T4	Young Elder <i>Sambucus nigra</i>	3.5	1.5	10	1	1.5		Form: Twin-stemmed at ground level with a slightly unbalanced crown. History: No evidence of significant pruning. Defects: No significant defects observed.	No action required.		Moderate	Low	
									n/a	3	Good	40+	
T5	Early-Mature Cherry <i>Prunus</i> sp.	6.5	2.5	38	4	4.5		Position: Situated within the front garden. Form: Multi-stemmed at 2m with a balanced crown. History: Reduced. Defects: No significant defects observed. Other: Vegetation prevented detailed inspection.	No action required.		Moderate	High	
									n/a	3	Good	20-40	
T6	Early-Mature Elder <i>Sambucus nigra</i>	6	3	23	2	2		Position: Situated on third party land. Form: Multi-stemmed at ground level with a poorly formed crown. History: No evidence of significant pruning. Defects: No significant defects observed. Other: Limited inspection, dimensions estimated for 3 x stems (15cm, 15cm and 8cm).	No action required.		Moderate	Moderate	
									n/a	3	Good	40+	
T7	Mature Black Locust <i>Robinia pseudoacacia</i>	14	2.5	71	5	5		Position: Situated on third party land. Form: Twin-stemmed at 1m with a balanced crown. History: No evidence of significant pruning. Defects: Ivy clad. Other: Limited inspection, dimensions estimated for 2 stems at 50cm.	No action required.		Moderate	High	
									n/a	3	Good	40+	

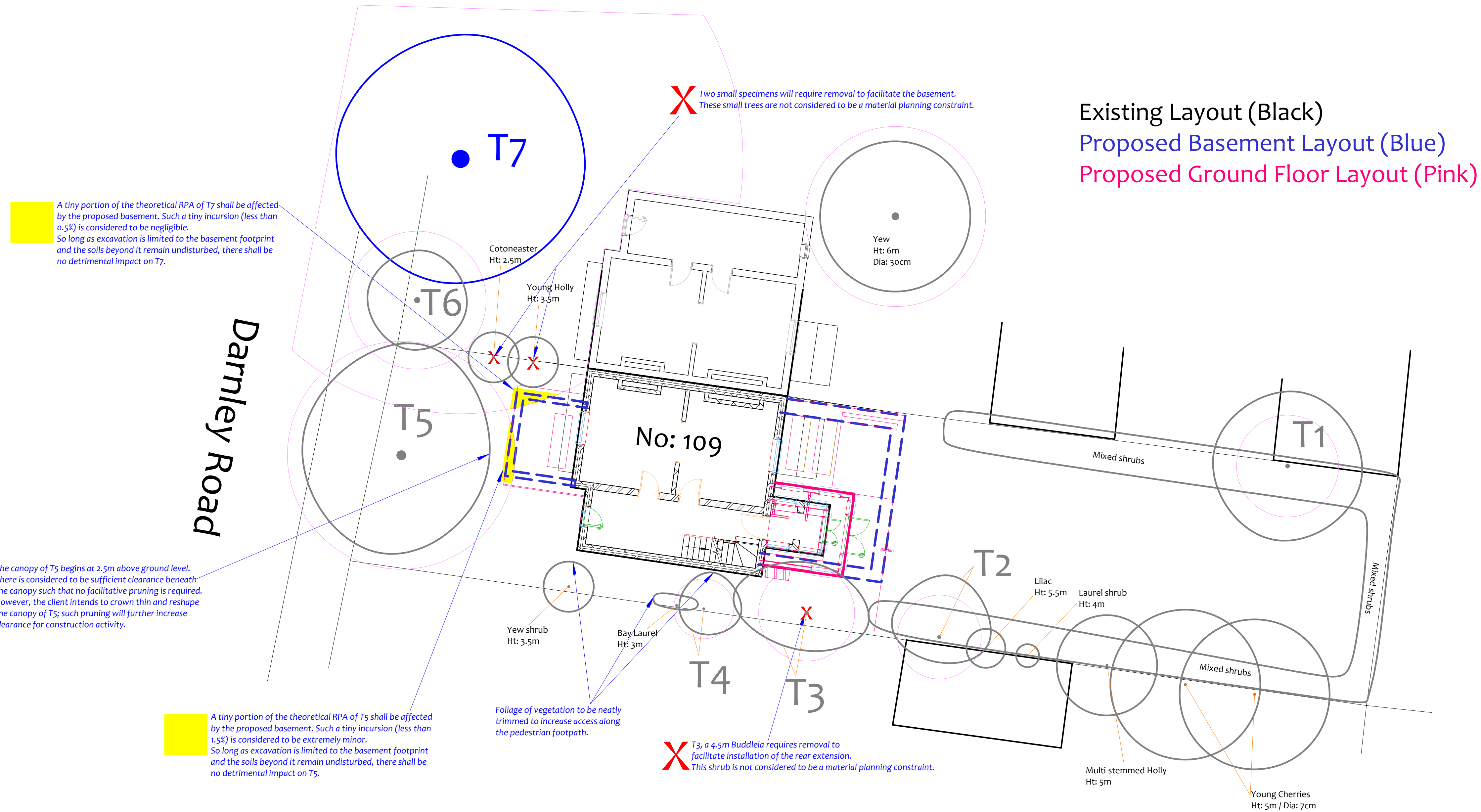
Photographs



Statutory Protection

We were informed by Sharon Bickerstaff of Gravesham Borough Council on the 21st August 2023 that:

- The site is within the Darnley Road Conservation Area.
- There are no tree preservation orders affecting trees within the site.
- There are no tree preservation orders immediately adjacent to the site.



Drawing No:	CCL 11602 / IAP Rev: 1
Title:	Impact Assessment Plan
Site:	109 Darnley Road Kent, DA11 0SH
Scale:	1:100
Paper Size:	A1



Tree Retention Categories	
Stems & canopies shown	
	Category A tree
	Category B tree
	Category C tree
	Category U 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.
	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.
	Unremarkable trees of low quality and merit. Individual specimens are not considered to be a material planning consideration.
	Trees unsuitable for retention due to their very poor condition.

Impact Assessment Plan

Status: Final - for submission

	B5 5837 Root Protection Area (radius = 12xstem diameter)
	Root Protection Area needing amendment due to site conditions, e.g. presence of existing road or building.
	Root Protection Area having been amended to account for site conditions
	

T1 = Tree No 1	G2 = Group No 2	H3 = Hedge No 3
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	Tree to be removed to facilitate the proposal
	Tree to be removed due to its low quality
	Proposed pruning

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.

Tree Ref.	Species	Height (m)	Root Protection Area		
			Radius (m)	m ²	Square (m)
T1	Lawson Cypress	6.5	2.0	13	3.6
T2	Californian Lilac	5	1.7	9	3.0
T3	Buddleia	4.5	1.9	12	3.4
T4	Elder	3.5	1.2	5	2.1
T5	Cherry	6.5	4.6	65	8.1
T6	Elder	6	2.8	24	4.9
T7	Black Locust	14	8.5	228	15.1

